Conference Schedule

SMFM 2025 Pregnancy Meeting

SMFM2025 PREGNANCY MEETING™

Postgraduate Courses and Scientific and Clinical Meeting

Society for Maternal-Fetal Medicine

January 27–February 1, 2025
Gaylord Rockies Resort and Convention Center
Aurora, Colorado

All abstract presentations take place at the Gaylord Rockies Resort and Convention Center.

SCHEDULE OF ORAL PRESENTATIONS

THURSDAY, January 30

7:15 AM–8:00 AM — **Opening Addresses and Awards**

8:00 AM–10:00 AM — **Oral Plenary Session 1**
Abstracts 1-8 | *Aurora Ballroom*

10:00 AM–10:30 AM — **Late-Breaking Research Presentations Session 1**
Abstracts LB01-02 | *Aurora Ballroom*

10:30 AM–12:30 PM — **Poster Session 1**
Abstracts 105-384 | *Exhibit Hall*

1:30 PM–3:30 PM — **Oral Concurrent Sessions**

Session 1 — **Equity, Public Health, and Policy**
Abstracts 9-18 | *Aurora Ballroom A*

Session 2 — **Clinical Obstetrics and Quality**
Abstracts 19-28 | *Aurora Ballroom B*

Session 3 — **Ultrasound and Genetics**
Abstracts 29-38 | *Aurora Ballroom CD*

4:00 PM–6:00 PM — **Poster Session 2**
Abstracts 385-665 | *Exhibit Hall*

FRIDAY, January 31

7:45 AM–8:00 AM — **Foundation for SMFM Chair Address**

8:00 AM–10:00 AM — **Oral Plenary Session 2 – Fellows Plenary**
Abstracts 39-46 | *Aurora Ballroom*

10:00 AM–10:30 AM — **Late-Breaking Research Presentations Session 2**
Abstracts LB03-04 | *Aurora Ballroom*

10:30 AM–12:30 PM — **Poster Session 3**
Abstracts 666-947 | *Exhibit Hall*

1:30 PM–3:30 PM — **Oral Concurrent Sessions**

Session 4 **Basic and Translational Science**
Abstracts 47-56 | *Aurora Ballroom A*

Session 5 **Hypertension**
Abstracts 57-66 | *Aurora Ballroom B*

Session 6 **Prematurity and Newborn**
Abstracts 67-76 | *Aurora Ballroom CD*

4:30 PM–6:00 PM — **Poster Session 4**
Abstracts 948-1227 | *Exhibit Hall*

SATURDAY, February 1

8:00 AM–10:15 AM — **Oral Concurrent Sessions**

Session 7 **Diabetes**
Abstracts 77-85 | *Aurora Ballroom A*

Session 8 **Fetus and Fetal Intervention**
Abstracts 86-94 | *Aurora Ballroom B*

Session 9 **Medical Complications**
Abstracts 95-104 | *Aurora Ballroom CD*

10:15 AM–10:30 AM — **Late-Breaking Research Presentations Session 3**
Abstract LB05 | *Aurora Ballroom A*

10:15 AM–10:30 AM — **Late-Breaking Research Presentations Session 4**
Abstract LB06 | *Aurora Ballroom B*

Future Pregnancy Meeting Dates

SMFM 2026 Pregnancy Meeting™
February 8–13, 2026
Caesars Forum
Las Vegas, NV

SMFM 2027 Pregnancy Meeting™
March 21–26, 2027
Gaylord National Resort and Convention Center
National Harbor, MD

SMFM 2028 Pregnancy Meeting™
April 23–28, 2028
Caesars Forum
Las Vegas, NV

Congratulations to Our Abstract Awards Winners

Bruce A. Work Award for Best Research by a Practicing or Training Maternal-Fetal Medicine Physician Outside of the US

5: Atosiban versus placebo in threatened preterm birth (APOSTEL 8-study): an international randomized controlled trial

Larissa I. van der Windt, MD

Disparities Award for Best Research on Diversity/Disparity in Health Outcomes

11: Black Maternal Morbidity and its Association with Systemic Racism

Sebastian Z. Ramos, MD

Dru Carlson Memorial Award for Best Research in Ultrasound and Genetics

3: Fetal fraction amplification enables accurate prenatal cell-free DNA screening at 8 weeks gestation

Lorraine Dugoff, MD

Norman F. Gant Award for Best Research in Maternal Medicine

58: Nifedipine versus Labetalol for Treatment of Postpartum Hypertension: A Randomized Controlled Trial

Todd R. Lovgren, MD

The SMFM Outstanding Early Career Investigator Travel Award *Supported by Dr. Laxmi Baxi*

69: Fully Quantitative Cervical Remodeling: Race Group Differences Responsibilities and Cautions

LeAnn A. Louis, MD, MPH

PREGNANCY

ABSTRACTS OPEN ACCESS

2025 SMFM Oral Schedule

Thursday, January 30, 2025 • 8:00 AM – 10:00 AM		
Time	**Abstract**	**Oral Plenary Session 1**
8:00 AM	1	**Antenatal corticosteroid in twin pregnancy at risk of late preterm birth: A randomized controlled trial** **Seung Mi Lee[1]**; Hyun Soo Park[2]; Soo Ran Choi[3]; Jeesun Lee[1]; Hyun Ji Kim[4]; Jee Yoon Park[4]; Kyung Joon Oh[4]; Geum Joon Cho[5]; Min-Jeong Oh[5]; Jin Hoon Chung[6]; Sun Min Kim[7]; Byoung Jae Kim[8]; Suk Young Kim[9]; Subeen Hong[10]; Young Mi Jung[5]; Se Jin Lee[11]; Ji Su Seong[12]; Haemin Kim[13]; Sohee Oh[8]; Joongyub Lee[1]; Ji Hoi Kim[1]; Hee Young Cho[14]; Chan-Wook Park[1]; Joong Shin Park[1]; Jong Kwan Jun[15] [1]Seoul National University College of Medicine, Seoul, Seoul-t'ukpyolsi; [2]Dongguk University Ilsan Hospital, Goyang, Kyonggi-do; [3]Inha University Hospital, Inha University College of Medicine, Incheon, Inch'on-jikhalsi; [4]Seoul National University Bundang Hospital, Seoul National University College of Medicine, Bundang, Kyonggi-do; [5]Korea University College of Medicine, Seoul, Seoul-t'ukpyolsi; [6]University of Ulsan College of Medicine, Asan Medical Center, Seoul, Seoul-t'ukpyolsi; [7]101 Daehak-ro, Jongno-gu, Seoul, Seoul-t'ukpyolsi; [8]Seoul Metropolitan Government Seoul National University Boramae Medical Center, Seoul, Seoul-t'ukpyolsi; [9]College of Medicine, Gachon University, Incheon, Inch'on-jikhalsi; [10]Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Seoul-t'ukpyolsi; [11]Kangwon National University Hospital, School of Medicine, Kangwon National University, Chuncheon, Kangwon-do; [12]Chung-Ang University Gwang-Myeong Hospital, Chung-Ang University College of Medicine, Gwang-Myeong, Kyonggi-do; [13]Kyungpook National University Chilgok Hospital, Kyungpook National University, School of Medicine, Daegu, Ch'ungch'ong-bukto; [14]Seoul National University, Seoul, Seoul-t'ukpyolsi; [15]Ewha Womans University College of Medicine, Seoul, Seoul-t'ukpyolsi
8:15 AM	2	**The Frequency and Severity of Complications after Previable PROM in Texas following SB8** Danna Ghafir[1]; **Emily Fahl[1]**; Nancy Ukoh[1]; Han-Yang M. Chen[1]; Sean C. Blackwell[1]; Julie Gutierrez[2]; Irene A. Stafford[1] [1]McGovern Medical School at UTHealth Houston, Houston, TX; [2]McGovern Medical School at The University of Texas Health Science Center at Houston (UTHealth), Houston, TX
8:30 AM	3	**Fetal fraction amplification enables accurate prenatal cell-free DNA screening at 8 weeks gestation** **Lorraine Dugoff[1]**; Summer Pierson[2]; Jhett Bordwell[3]; Brent Mabey[2]; Arielle B. Dorch[3]; Alexander Gutin[2]; Dmitry Pruss[2]; Diana Iliev[2]; Dale Muzzey[2]; Katie Johansen Taber[4] [1]University of Pennsylvania, Philadelphia, PA; [2]Myriad Genetics, Inc., Salt Lake City, UT; [3]Myriad Genetics, Inc., South San Francisco, CA; [4]Myriad Genetics, Inc., South San Fransisco, CA

Time	Abstract	Oral Plenary Session 1, continued
8:45 AM	4	**AI Significantly Improves Detection of Prenatal Ultrasounds Suspicious for Major Congenital Heart Defects by OBGYN/MFMs** **Jennifer Lam-Rachlin[1]**; Rajesh Punn[2]; Sarina K. Behera[3]; Miwa Geiger[1]; Matthias Lachaud[4]; Nadine David[5]; Sara Garmel[6]; Matthew K. Janssen[7]; Kendra Sylvester[8]; John Kennedy[9]; Jessica Spiegelman[1]; Mia A. Heiligenstein[10]; Nathan S. Fox[1]; Andrei Rebarber[1]; Greggory R. DeVore[11]; Carolyn M. Zelop[12]; Roger Bessis[13]; Marilyne Levy[14]; Bertrand Stos[14]; Malo De Boisredon[15]; Eric Askinazi[15]; Valentin Thorey[15]; Christophe Gardella[15]; Alisa Arunamata[2] [1]Icahn School of Medicine at Mount Sinai Hospital, New York, NY; [2]Pediatrics - Cardiology, Stanford University School of Medicine, Stanford, CA; [3]Palo Alto Medical Foundation, Sutter Health, Palo Alto, CA; [4]University of Grenoble Alpes, Grenoble, Rhone-Alpes; [5]Medical Training Center, Rouen, Haute-Normandie; [6]Michigan Perinatal Associates and Corewell Health, Dearborn, MI; [7]University of Pennsylvania, Pittsburgh, PA; [8]Perinatal Specialists of the Palm Beaches, West Palm Beach, FL; [9]Wayne State University School of Medicine, Detroit, MI; [10]Mount Sinai West, Astoria, NY; [11]The Fetal Diagnostic Center of Pasadena, Pasadena, CA; [12]Valley Health System, Paramus, NJ; [13]Centre d'Echographie de l'Odéon, Paris, Ile-de-France; [14]UE3C - Unité d'explorations cardiologiques - Cardiopathies Congénitales, Paris, Ile-de-France; [15]BrightHeart, Paris, Ile-de-France
9:00 AM	5	**Atosiban versus placebo in threatened preterm birth (APOSTEL 8-study): an international randomized controlled trial** **Larissa I. van der Windt[1]**; Job Klumper[1]; Ruben G. Duijnhoven[1]; Marjolein Kok[1]; Ben W. Mol[2]; Kate F. Walker[3]; Fionnuala M. M. McAuliffe[4]; Joris A. M. van der Post[5]; Carolien Roos[1]; Martijn A. Oudijk[1] [1]Amsterdam UMC, location University of Amsterdam, Amsterdam, Noord-Holland; [2]Monash University, Clayton, Victoria; [3]Centre of Perinatal Research University of Nottingham, Queen's Medical Centre, Dublin, England; [4]UCD Perinatal Research Centre, University College Dublin, Dublin 2, Dublin; [5]Amsterdam UMC, location University of Amsterdam, Amsterdam, Noord-Brabant
9:15 AM	6	**Prediction of severely small-for-gestational-age infants using a novel cell-free RNA model** Morten Rasmussen[1]; **Kara M. Rood[2]**; Aram Saravani[1]; Michal A. Elovitz[3]; Carrie Haverty[4]; Alison Moe[1]; Alison Cowan[1]; Arkady Khodursky[1]; Maneesh Jain[1]; Manfred Lee[1]; Thomas F. McElrath[5]; Elizabeth F. Sutton[6]; Arun Jeyabalan[7]; George R. Saade[8]; Antonio F. Saad[9]; Luis D. Pacheco[10]; Joseph R. Biggio, Jr[11]; Ebony B. Carter[12]; Antonina I. Frolova[13]; Esther Park-Hwang[14]; Cynthia Gyamfi-Bannerman[15]; Ai-ris Y. Collier[16]; William A. Grobman[2]; Vincenzo Berghella[17] [1]Mirvie Inc., South San Francisco, CA; [2]The Ohio State University, Columbus, OH; [3]Icahn School of Medicine at Mount Sinai, New York, NY; [4]Mirvie Inc., South San Fransisco, CA; [5]Brigham Women's Hospital, Boston, MA; [6]Woman's Hospital, Baton Rouge, LA; [7]University of Pittsburgh School of Medicine, Pittsburgh, PA; [8]Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA; [9]Inova Health, Falls Church, VA; [10]University of Texas Medical Branch, Galveston, TX; [11]Ochsner Health, New Orleans, LA; [12]University of North Carolina, Chapel Hill, NC; [13]Washington University School of Medicine, St. Louis, MO; [14]Multicare, Orlando, FL; [15]University of California, San Diego, San Diego, CA; [16]Beth Israel Deaconess Medical Center, Boston, MA; [17]Sidney Kimmel Medical College of Thomas Jefferson University, Philadelphia, PA
9:30 AM	7	**Metformin paradoxically increases insulin resistance during pregnancy in a Rhesus macaque model** **Enrico R. Barrozo[1]**; Tyler Dean[2]; Claire E. Jensen[3]; Melissa A. Suter[1]; Maxim D. Seferovic[1]; Kristin Sauter[2]; Jacob E. Friedman[4]; Maureen Gannon[5]; Stephanie R. Wesoloski[6]; Carrie E. McCurdy[7]; Paul Kievit[2]; Kjersti M. Aagaard[8] [1]Baylor College of Medicine and Texas Children's Hospital, Houston, TX; [2]Oregon National Primate Research Center, Beaverton, OR; [3]University of North Carolina, Chapel Hill, NC; [4]Harold Hamm Diabetes Center, University of Oklahoma Health Sciences Center, Oklahoma City, OK; [5]Vanderbilt University Medical Center, Nashville, TN; [6]University of Colorado, Anschutz Medical Campus, Aurora, CO; [7]University of Oregon, Eugene, OR; [8]Boston Children's Hospital, Division of Fetal Medicine and Surgery, Boston, MA; HCA Healthcare and HCA Healthcare Research Institute, Nashville, TN; HCA Texas Maternal Fetal Medicine, Houston, TX; Baylor College of Medicine and Texas Children's Hospital, Houston, TX, Boston, MA
9:45 AM	8	**INTER-ACT interpregnancy and pregnancy lifestyle intervention for a healthy future: a randomized controlled trial** Yael Winter Shafran[1]; Hanne Van Uytsel[2]; Annick Bogaerts[2]; Lieveke Ameye[2]; **Roland Devlieger[3]** [1]Kaplan Medical Center and REALIFE Research Group, Rehovot, HaMerkaz; [2]REALIFE Research Group, KU Leuven, Leuven, Vlaams-Brabant; [3]University Hospital Leuven, Leuven, Vlaams-Brabant

Thursday, January 30, 2025 • 10:00 AM – 10:30 AM

Time	Abstract	Late-Breaking Abstract Presentations Session 1
10:00 AM	LB01	**CErebro Placental RAtio based management in reduced fetal movements; an international cluster-randomized clinical trial (CEPRA)** **Laura A. Lens[1]**; Selina Posthuma[2]; Stefanie E. Damhuis[3]; Renée J. Burger, N/A[1]; Henk Groen[4]; Ruben G. Duijnhoven[5]; Sailesh Kumar[6]; Alexander E.P Heazell[7]; Asma Khalil[8]; Wessel Ganzevoort[9]; Sanne J. Gordijn[10] [1]Amsterdam UMC, Amsterdam, Noord-Holland; [2]Uiversity Medical Center Groningen, University Medical Center Groningen, Groningen; [3]Amsterdam University Medical Centers, Amsterdam University Medical Centers, Noord-Holland; [4]University Medical Center of Groningen, University Medical Center of Groningen, Groningen; [5]Amsterdam UMC, location University of Amsterdam, Amsterdam, Noord-Holland; [6]The University of Queensland, Brisbane, Queensland; [7]The University of Manchester, Manchester, England; [8]Fetal Medicine Unit, St George's Hospital, St George's University of London, Fetal Medicine Unit, St George's Hospital, S George's University of London, England; [9]Amsterdam University Medical Centers, Amsterdam, Groningen; [10]University Medical Center Groningen, Groningen, Groningen
10:15 AM	LB02	**iSEARCH RCT: Evaluating the effectiveness of maternal sildenafil to reduce complications related to intrapartum hypoxia** **Sailesh Kumar[1]**; Ben W. Mol[2]; William Tarnow-Mordi[3]; Jon Hyett[4]; Nadia Badawi[4]; Annalene Seidler[5]; Helen Liley[6]; Emily Callander[7]; Vicky Flenady[6]; Sue Walker[8]; Rachel O'Connell[4] [1]The University of Queensland, Brisbane, Queensland; [2]Monash University, Clayton, Victoria; [3]The University of Sydney, Sydney, New South Wales; [4]University of Sydney, Sydney, New South Wales; [5]Medical Uni Rostock, Rostock, Mecklenburg-Vorpommern; [6]Mater Research Institute-University of Queensland, Brisbane, Queensland; [7]University Technology Sydney, Sydney, New South Wales; [8]Department of Obstetrics, Gynaecology and Newborn Health, University of Melbourne, Melbourne, Victoria

Thursday, January 30, 2025 • 1:30 PM - 4:00 PM

Time	Abstract	Oral Concurrent Session 1 - Equity, Public Health, and Policy
1:30 PM	9	**Dysregulated gene expression in placentas with exposure to persistent maternal socioeconomic disadvantage** Greg E. Miller[1]; Lauren Keenan-Devlin[2]; Alexa A. Freedman[1]; Renee Odom-Konja[3]; Linda M. Ernst[3]; Steve Cole[4]; **Ann EB Borders[2]** [1]Northwestern University, Chicago, IL; [2]Endeavor Health, Evanston Hospital, Evanston, IL; [3]Endeavor Health, Evanston, IL; [4]University of California, Los Angeles, Los Angeles, CA
1:45 PM	10	**Association Between Maternal-Fetal Medicine Physician Density and Adverse Pregnancy Outcomes** Tetsuya Kawakita; **Rula Atwani**; Lindsay S. Robbins; George R. Saade Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA
2:00 PM	11	**Black Maternal Morbidity and its Association with Systemic Racism** **Sebastian Z. Ramos**; Meghan I. Short; Erika F. Werner; Chloe E. Bird; Ndidiamaka Amutah-Onukagha; Michael B. Siegel Tufts University School of Medicine, Boston, MA
2:15 PM	12	**Low-income Birthing Individuals' Need for and Satisfaction with Services in a One-Year Postpartum Navigation Program** **Maya J. Daiter[1]**; Laura Diaz[1]; Hannah M. Green[1]; Ying Cheung[1]; Viridiana Carmona-Barrera[1]; Brittney R. Williams[1]; Charlotte M. Niznik[1]; Joe M. Feinglass[1]; William A. Grobman[2]; Lynn M. Yee[1] [1]Northwestern University Feinberg School of Medicine, Chicago, IL; [2]The Ohio State University, Columbus, OH
2:30 PM	13	**Impact of WIC Enrollment on Adverse Maternal and Neonatal Adverse Outcomes in Medicaid Populations** **Reetam Ganguli[1]**; Stephen Wagner[2] [1]Elythea, San Jose, CA; [2]Beth Israel Deaconess Medical Center, Boston, MA

Thursday, January 30, 2025 • 1:30 PM - 4:00 PM		
Time	**Abstract**	**Oral Concurrent Session 1 - Equity, Public Health, and Policy, continued**
2:45 PM	14	**Homicide and Suicide: The Leading Cause of Maternal Death, and How Firearm Legislation Affects It** **Hooman A. Azad[1]**; Dana Goin[2]; Lisa Nathan[3]; Dena Goffman[1]; Uma M. Reddy[4]; Danielle Laraque-Arena[2]; Mary E. D'Alton[1] [1]Columbia University Medical Center, New York, NY; [2]Columbia University Mailman School of Public Health, New York, NY; [3]Columbia University Irving Medical Center, New York, NY; [4]Columbia University, New York, NY
3:00 PM	15	**Elimination of a threefold racial disparity in aspirin recommendation using integrated clinical decision support** **Melissa S. Wong[1]**; Rommy Coutelin Johnson[2]; Karla Gonzalez[1]; Ojiugo Onwumere[3]; Kristin Parrinella[4]; Camelita Thrift[3]; Samira Torna[1]; Matthew Wells[1]; Kimberly D. Gregory[3] [1]Cedars-Sinai Medical Center, Los Angeles, CA; [2]Cedars-Sinai, Los Angeles, CA; [3]Cedars Sinai Medical Center, Los Angeles, CA; [4]Kaiser-Permanente, Los Angeles, CA
3:15 PM	16	**Severe maternal morbidity differences by state Medicaid expansion and abortion coverage: national database analysis, 2014-2022** **Ishana Shetty**; Mark C. Valentine; Mark Hoofnagle; Jennifer Reeves; David L. Eisenberg Washington University, St. Louis, MO
3:30 PM	17	**Elevated micro- and nanoplastics detected in preterm human placentae** **Enrico R. Barrozo[1]**; Marcus A. Garcia[2]; Michael D. Jochum, Jr.[1]; Rui Liu[2]; Alex Nihart[2]; Eliseo Castillo[2]; Eliane El Hayek[2]; Jorge Gonzalez-Estrella[3]; Lori Showalter[1]; Cynthia Shope[1]; Melissa A. Suter[1]; Matthew J. Campen[2]; Kjersti M. Aagaard[4] [1]Baylor College of Medicine and Texas Children's Hospital, Houston, TX; [2]University of New Mexico, Albuquerque, NM; [3]Oklahoma State University, Stillwater, OK; [4]Boston Children's Hospital, Division of Fetal Medicine and Surgery, Boston, MA; HCA Healthcare and HCA Healthcare Research Institute, Nashville, TN; HCA Texas Maternal Fetal Medicine, Houston, TX; Baylor College of Medicine and Texas Children's Hospital, Houston, TX, Boston, MA
3:45 PM	18	**Severe Maternal Morbidity among Asian and Pacific Islander Parturients in a Contemporary Northern California Cohort** **Shalila A. de Bourmont[1]**; Janet Alexander[2]; Baiyang Sun[2]; Erica P. Gunderson[2]; Mara Greenberg[1] [1]Kaiser-Permanente Northern California, Oakland, CA; [2]Kaiser-Permanente Northern California, Pleasanton, CA

Thursday, January 30, 2025 1:30 PM - 4:00 PM		
Time	**Abstract**	**Oral Concurrent Session 2 - Clinical Obstetrics and Quality**
1:30 PM	19	**Aberrant Fetal Growth in ARRIVE Trial** **Bonnie L. Hermann[1]**; Cassidy A. O'Sullivan[2]; Fabrizio Zullo[3]; Suneet Chauhan[4]; Hector M. Mendez-Figueroa[5] On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units (MFMU) Network [1]UTHealth Houston, Houston, TX; [2]Christiana Care Health System, Newark, DE; [3]University of Rome La Sapienza, Rome, Lazio; [4]Christiana Care, Newark, DE; [5]McGovern Medical School at UTHealth, Houston, TX

Thursday, January 30, 2025 • 1:30 PM - 4:00 PM

Time	Abstract	Oral Concurrent Session 2 - Clinical Obstetrics and Quality, continued
1:45 PM	20	**Decreased Neuraxial Morphine Dose to Reduce Opioid Side Effects and use After Cesarean Delivery RCT** **Ayodeji Sanusi[1]**; Yumo Xue[2]; Kevin S. Shrestha[2]; Ayamo Oben[3]; Hanna Hussey[2]; Annalese Neuenschwander[2]; Michelle Tubinis[2]; Mark Powell[2]; Alan T. Tita[2]; Casey Brian[4] [1]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL; [2]University of Alabama at Birmingham, Birmingham, AL; [3]Maternal Fetal Consultants of Houston, Houston, TX; [4]West Virginia University, Morgantown, WV
2:00 PM	21	**Proportion of Time Spent in Category II Fetal Heart Tracing During Labor: Associated Adverse Outcomes** **Kristen A. Cagino[1]**; Rachel L. Wiley[2]; Aaron W. Roberts[3]; Claudia J. Ibarra[4]; Natalie L. Neff[5]; Kimen S. Balhotra[4]; Khalil M. Chahine[4]; Christina Cortes[4]; Shareen Patel[4]; Tala Ghorayeb[4]; Holly Flores[6]; Fabrizio Zullo[7]; Hector M. Mendez-Figueroa[4]; Suneet Chauhan[8] [1]UT Houston, Houston, TX; [2]University of California, San Diego, San Diego, CA; [3]McGovern Medical School at UTHealth Houston, Houston, TX; [4]McGovern Medical School at UTHealth, Houston, TX; [5]McGovern Medical School at UT Health, Houston, TX; [6]University of Texas Health Science Center, Houston, TX; [7]University of Rome La Sapienza, Rome, Lazio; [8]Christiana Care, Newark, DE
2:15 PM	22	**Tranexamic acid prophylaxis during cesarean delivery among patients with and without hypertension** **Adam K. Lewkowitz[1]**; Mariam Ayyash[2] On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units (MFMU) Network [1]Women & Infants Hospital of Rhode Island and Alpert Medical School of Brown University, Providence, RI; [2]Columbia University Irving Medical Center, New York, NY
2:30 PM	23	**Preclinical Development of a Continuous Fetal Lactate Biosensor to Detect Acidosis** **Jonathan M. Morris[1]**; Arjun Kaushik[2]; Michael Challenor[2]; Lee J. Hubble[2]; Chaitya Shah[2]; Maureen Ross[2]; Ranjusha Rajagopalan[2]; Hassan Mahmood[2]; Allana Gurney[3]; Hayley Powell[3]; Jane Choi[3]; Helen Kershaw[3]; Gabrielle Musk[3]; Jane Pillow[3] [1]University of Sydney, New South Wales; [2]VitalTrace Pty Ltd, Western Australia; [3]University of Western Australia, Crawley, Western Australia
2:45 PM	24	**After Cesarean Time Interval to Exercise (ACTIVE) Trial: A Randomized Controlled Trial** **Brittany J. Roser[1]**; James Kinderknecht[2]; Brett Toresdahl[3]; Patricia Ladis[4]; Sonali Iyer[5]; Megan Savage[6]; Timothy Dekker[7]; Paul Christos[5]; Robin B. Kalish[8] [1]Stony Brook University Hospital, NY; [2]Hospital for Special Surgery, New York, NY; [3]University of Utah Health, Salt Lake City, UT; [4]WiseBody Physical Therapists, New York, NY; [5]Weill Cornell Medical College, New York, NY; [6]Northwell Health at Lenox Hill, New York, NY; [7]Ascension Medical Group, Rochester, MN; [8]New York Presbyterian- Weill Cornell, New York, NY
3:00 PM	25	**Intrauterine Resuscitative Maneuvers for Management of Abnormal Fetal Heart Tracings: A Systematic Review and Meta-Analysis** **Amanda J. Jones[1]**; Fabrizio Zullo[2]; Luis Sanchez-Ramos[3]; Lauren C. Roby[1]; Stephanie Roth[4]; Suneet Chauhan[5]; Matthew K. Hoffman[1]; Anthony C. Sciscione[1] [1]Christiana Care Health System, Newark, DE; [2]University of Rome La Sapienza, Rome, Lazio; [3]University of Florida College of Medicine, Jacksonville, FL; [4]Christiana Care Health Services, Newark, DE; [5]Christiana Care, Newark, DE

Thursday, January 30, 2025 • 1:30 PM - 4:00 PM

Time	Abstract	Oral Concurrent Session 2 - Clinical Obstetrics and Quality, continued
3:15 PM	26	**Reducing Postpartum Hemorrhage: The Impact of a Standardized High-Dose Oxytocin Protocol** **Evan J. Keil[1]**; Elizabeth J. Campbell[2]; Joanne M. Bailey[2]; David E. Arnolds[2]; Diana Peacor[2]; Molly J. Stout[2]; Jourdan E. Triebwasser[1] [1]University of Michigan, Ann Arbor, MI; [2]University of Michigan Medical Center, Ann Arbor, MI
3:30 PM	27	**Hysterotomy using Barbed vs. Vicryl Suture for Scheduled Cesarean Delivery: A Randomized Controlled Trial** **Ayisha B. Buckley[1]**; Nicola F. Tavella[2]; Camila Cabrera[2]; Keisha S. Paul[2]; Mariah McKevitt[2]; Monica J. Patel[2]; Lauren A. Ferrara[2]; Jenny Tang[2]; Joanne Stone[3]; Calvin E. Lambert, Jr.[2]; Luciana A. Vieira[4]; Angela T. Bianco[2] [1]Weill Cornell Medical Center, New York, NY; [2]Icahn School of Medicine at Mount Sinai, New York, NY; [3]Mt. Sinai Medical Center, New York, NY; [4]Stamford Hospital, Stamford, CT
3:45 PM	28	**Investigating selection bias in research using placental pathology samples** **Linda M. Ernst[1]**; Alexa A. Freedman[2]; Renee Odom-Konja[1]; Lauren Keenan-Devlin[3]; Greg E. Miller[2]; Ann EB Borders[3] [1]Endeavor Health, Evanston, IL; [2]Northwestern University, Chicago, IL; [3]Endeavor Health, Evanston Hospital, Evanston, IL

Thursday, January 30, 2025 • 1:30 PM - 4:00 PM

Time	Abstract	Oral Concurrent Session 3 - Ultrasound and Genetics
1:30 PM	29	**Beyond the Fetus: Unveiling Maternal Health Risks Through Prenatal Genome Sequencing** **Brittany Arditi[1]**; Caitlin D. Baptiste[2]; Jessica L. Giordano[1]; Rachel Herz-Roiphe[2]; Vaidehi Jobanputra[3]; Ronald J. Wapner[4] [1]Columbia University Irving Medical Center, New York, NY; [2]Columbia University Medical Center, New York, NY; [3]New York Genome Center, New York, NY; [4]Columbia University, New York, NY
1:45 PM	30	**Artificial Intelligence System Accurately Detects Fetal Ultrasound Findings Suspicious For Major Congenital Heart Defects** **Carolyn M. Zelop[1]**; Jennifer Lam-Rachlin[2]; Alisa Arunamata[3]; Rajesh Punn[3]; Sarina K. Behera[4]; Matthias Lachaud[5]; Nadine David[6]; Greggory R. DeVore[7]; Andrei Rebarber[2]; Nathan S. Fox[2]; Marjorie Gayanilo[2]; Sara Garmel[8]; Philippe Boukobza[9]; Pierre Uzan[10]; Hervé Joly[11]; Romain Girardot[12]; Laurence Cohen[13]; Marilyne Levy[14]; Bertrand Stos[14]; Malo De Boisredon[15]; Eric Askinazi[15]; Valentin Thorey[15]; Christophe Gardella[15]; Miwa Geiger[2] [1]Valley Health System, Paramus, NJ; [2]Icahn School of Medicine at Mount Sinai Hospital, New York, NY; [3]Pediatrics - Cardiology, Stanford University School of Medicine, Stanford, CA; [4]Palo Alto Medical Foundation, Sutter Health, Palo Alto, CA; [5]University of Grenoble Alpes, Grenoble, Rhone-Alpes; [6]Medical Training Center, Rouen, Haute-Normandie; [7]The Fetal Diagnostic Center of Pasadena, Pasadena, CA; [8]Michigan Perinatal Associates and Corewell Health, Dearborn, MI; [9]CEDEF - Centre Européen de Diagnostic et d'Exploration de la Femme, Le Chesnay, Ile-de-France; [10]Groupe IMEF - Imagerie Médicale de l'Est Francilien, Rosny-sous-Bois, Ile-de-France; [11]CARPEDIOL - Cardiologie Pédiatrique, fœtale et congénitale adulte de L'Ouest Lyonnais, Ecully, Rhone-Alpes; [12]Unité de Dépistage de Cardiopathies Foetales et Néonatales, Bordeaux, Aquitaine; [13]ETCC - Exploration et Traitement des Cardiopathies Congénitales, Massy, Ile-de-France; [14]UE3C - Unité d'explorations cardiologiques - Cardiopathies Congénitales, Paris, Ile-de-France; [15]BrightHeart, Paris, Ile-de-France
2:00 PM	31	**Effect of Home Ultrasound in Patients with Previous Late Pregnancy Loss- A Randomized Control Trial** **Liat Mor[1]**; Hagit Eisenberg[2]; Liliya Tamayev[3]; Daniel Tairy[1]; Ben Oren[3]; Yael Ganor Paz[1]; Michal Levy[3]; Eran Weiner[2]; Giulia Barda[2] [1]Edith Wolfson Medical Center, Holon, HaMerkaz; [2]Wolfson Medical Center, Wolfson Medical Center, Tel Aviv; [3]Edith Wolfson Medical center, Holon, HaMerkaz

Thursday, January 30, 2025 • 1:30 PM - 4:00 PM		
Time	**Abstract**	**Oral Concurrent Session 3 - Ultrasound and Genetics, continued**
2:15 PM	32	**Genetic diagnoses in a national cohort with non-immune hydrops and other fetal effusions** **Natalie B. Gulrajani[1]**; Billie R. Lianoglou[2]; Katie Tick[3]; Nuriye Sahin-Hodoglugil[3]; Ugur Hodoglugil[4]; Patrick Devine[4]; Jessica Van Ziffle[4]; Mary E. Norton[2]; Teresa N. Sparks[3] [1]University of California, San Francisco, School of Medicine, San Francisco, CA; [2]Center for Maternal-Fetal Precision Medicine, University of California San Francisco, San Francisco, CA; [3]University of California, San Francisco, San Francisco, CA; [4]Genomic Medicine Laboratory, University of California, San Francisco, San Francisco, CA
2:30 PM	33	**Genomewide monogenic Non Invasive Prenatal Genetic Screening based on maternal cfDNA** Dolev Rahat[1]; Ravit Mesika[1]; Lilach Schneor[1]; **Noa Liscovitch-Brauer[2]**; Tom Rabinowitz[1]; Noam Shomron[1]; Reut Tomashov Matar[3]; Lina Basel-Salmon[3] [1]Identifai Genetics, Tel Aviv, Israel; [2]Identifai Genetics, Tel Aviv; [3]Raphael Recanati Genetic Institute, Rabin Medical Center, Beilinson Hospital, Tel Aviv
2:45 PM	34	**AI Assistance Enhances Physician Performance in Identifying Congenital Malformations** Clémentine Morisset[1]; Frédéric Logé-Munerel[1]; **Celia Amabile[1]**; Louis Chouinard[1]; Vianney Debavelaere[1]; Remi Besson[1]; Nikola Matevski[1]; Guillaume Corda[1]; Julien Stirnemann[2]; Yves Ville[3]; Yinka Oyelese[4]; Andrew Combs[5] [1]Sonio, Paris, Ile-de-France; [2]Hôpital Necker Enfants Malades, Paris, Ile-de-France; [3]University and Necker-Enfants Malades Hospital, Paris, Ile-de-France; [4]Beth Israel Deaconess Medical Center/Harvard Medical School, Boston, MA; [5]Pediatrix Medical Group, Sunrise, FL
3:00 PM	35	**Exploring Gastroschisis Patterns and Pesticide Use in California's Central Valley: A population-based cohort Study** **Alejandro Perez[1]**; Bharti Garg[2]; Hope Delgado[3]; Joshua F. Robinson[4]; Aaron B. Caughey[2]; Stephanie L. Gaw[4] [1]University of California, San Francisco, Kerman, CA; [2]Oregon Health & Science University, Portland, OR; [3]University of California, Berkeley, Berkeley, CA; [4]University of California, San Francisco, San Francisco, CA
3:15 PM	36	**AI software demonstrates strong performance for screening of Tetralogy of Fallot and Truncus Arteriosus Communis** **Remi Besson[1]**; Nicolas Fries[2]; Julien Stirnemann[3]; Yves Ville[4]; Guy Vaksmann[5] [1]Sonio, Paris, Ile-de-France; [2]Imagyn'Echo, Imagyn'echo Montpellier, Languedoc-Roussillon; [3]Hôpital Necker Enfants Malades, Paris, Ile-de-France; [4]University and Necker-Enfants Malades Hospital, Paris, Ile-de-France; [5]Cabinet Vendôme, Lille, Nord-Pas-de-Calais
3:30 PM	37	**Genetic Etiologies of Bilateral Renal Agenesis** **Bobby Brar[1]**; Robert Weatherford[2]; Carol Nowlen[1]; Katelynn Sagaser[3]; Ahmet A. Baschat[1]; Karin Blakemore[1]; Jena L. Miller[1]; Angie C. Jelin[1] [1]Johns Hopkins Medicine, Baltimore, MD; [2]Massachusetts General Hospital, Boston, MA; [3]23andMe, South San Fransisco, CA
3:45 PM	38	**Fully Quantitative Cervical Remodeling: Inter-pregnancy interval shows differences in biomechanical characteristics of the cervix** **Sarah M. Dwyer[1]**; LeAnn A. Louis[1]; Methodius G. Tuuli[2]; Adam K. Lewkowitz[2]; Julie Tumbarello[1]; Emily Dively, BSN[3]; Madeline Felske[1]; Wendy Sparks[1]; Giselle Kolenic[4]; Peinan Zhao[5]; Molly J. Stout[6] [1]University of Michigan Hospital, Ann Arbor, MI; [2]Women & Infants Hospital of Rhode Island and Alpert Medical School of Brown University, Providence, RI; [3]Washington University School of Medicine, St. Louis, MO; [4]University of Michigan, Ann Arbor, MI; [5]Washington University, St. Louis, MO; [6]University of Michigan Medical Center, Ann Arbor, MI

Friday, January 31, 2025 • 8:00 AM - 10:00 AM

Time	Abstract	Oral Plenary Session 2 (Fellows Plenary)
8:00 AM	39	**Methylergonovine to Decrease Blood Loss During Cesarean Delivery in Twins: A Triple-Blinded Placebo-Controlled Randomized Trial** **Helen B. Gomez Slagle[1]**; Shai Bejerano[2]; Russell S. Miller[2]; Dena Goffman[2]; Mary E. D'Alton[2]; Mirella Mourad[2] [1]Columbia University Irving Medical Center, New York, NY; [2]Columbia University Medical Center, New York, NY
8:15 AM	40	**Management of postpartum preeclampsia and hypertensive disorders (MOPP): Postpartum tight versus standard blood pressure control** **Emily B. Rosenfeld[1]**; Deepika Sagaram[1]; Rachel Lee[1]; Ernani Sadural[2]; Richard C. Miller[2]; Ruby Lin[1]; Deshae Jenkins[1]; Kristin Blackledge[3]; Ivana Nikodijevic[4]; Alex Rizzo[2]; Vanessa Martinez[1]; Emily E. Daggett[5]; Olivia McGeough[1]; Cande V. Ananth[1]; Todd J. Rosen[1] [1]Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ; [2]Cooperman Barnabas Medical Center, RWJBarnabas Health, Livingston, NJ; [3]Rutgers New Jersey Medical School and Cooperman Barnabas Medical Center, Livingston, NJ; [4]New Jersey Medical School, Newark, NJ; [5]Rutgers Robert Wood Johnson Medical School, Edison, NJ
8:30 AM	41	**Impact of living in a food desert on prenatal macro- and micronutrient intake** **Noor K. Al-Shibli[1]**; Anne L. Dunlop[2]; Suchitra Chandrasekaran[3] [1]Emory University, School of Medicine, Atlanta, GA; [2]Emory University School of Medicine, Atlanta, GA; [3]Emory University, Atlanta, GA
8:45 AM	42	**Small for gestational age prediction using unsupervised machine learning of first trimester fetal cardiac parameters** **Rebecca Horgan[1]**; Elena Sinkovskaya[1]; Erkan Kalafat[2]; George R. Saade[1]; Alfred Abuhamad[3] [1]Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA; [2]Koc University Hospital, Istanbul, Istanbul; [3]Eastern Virginia Medical School, Norfolk, VA
9:00 AM	43	**Pravastatin dose-range and pharmacokinetic study in a pregnant rat model** **Xiao-Yu Wang[1]**; Sydney Lammers[2]; Jennifer Reno-Graber[3]; Frederick Reno[3]; Alan Hoberman[4]; George R. Saade[5]; Monica Longo[6]; Victoria L. Pemberton[7]; Ronald J. Wapner[8]; Nicole Abbott[1]; Zhiliang Xie[1]; Joo Young Na[1]; Mitch A. Phelps[1]; Maged M. Costantine[1] [1]The Ohio State University, Columbus, OH; [2]The Ohio State University, College of Medicine, Columbus, OH; [3]Reno & Associates, FL; [4]Charles River Laboratories, PA; [5]Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA; [6]National Institute of Child Health and Human Development, Bethesda, MD; [7]National Heart, Lung, and Blood Institute, Bethesda, MD; [8]Columbia University, New York, NY
9:15 AM	44	**Patterns of perceived and everyday stress, resilience, and adverse placentally mediated outcomes** **Maura Jones Pullins**; Sarah Heerboth; Joy McNeal; Ashlyn Tolbert; Annie Dude; Johanna Quist-Nelson; Rebecca Fry; Tracy A. Manuck University of North Carolina, Chapel Hill, NC
9:30 AM	45	**Microfluidic Device Successfully Replaces Traditional Models of Pregnancy Associated Drug Pharmacokinetic Studies** **Ana Collins-Smith**; Ananth Kammala; Lauren Richardson; Xiao-ming Wang; Ramkumar Menon University of Texas Medical Branch, Galveston, TX
9:45 AM	46	**Continuous Glucose Monitoring for Gestational Diabetes Diagnosis: A Comparative Effectiveness Randomized Control Trial (PRECISE)** **Sarah A. Nazeer[1]**; Joycelyn A. Corntwaithe, RD, CDE[1]; Rafael Bravo Santos[1]; Claudia Pedroza[1]; Sean C. Blackwell[2]; Suneet Chauhan[3]; Farah H. Amro[2]; Ghamar Bitar[2]; Jon Tyson[1]; Baha M. Sibai[2]; Michal Fishel Bartal[4] [1]The University of Texas Health Science Center at Houston (UTHealth), Houston, TX; [2]McGovern Medical School at UTHealth Houston, Houston, TX; [3]Christiana Care, Newark, DE; [4]UTH Houston & Sheba Medical Center Israel, Houston, TX

Friday, January 31, 2025 • 10:00 AM – 10:30 AM

Time	Abstract	Late-Breaking Abstract Presentations Session 2
10:00 AM	LB03	**Single-dose intravenous iron versus oral iron for maternal iron deficiency anemia: a randomized controlled trial** Richard Derman[1]; Mrutyunjaya Bellad[2]; Manjunath Somannavar[2]; Sudhir Bhandari[3]; Sudhir Mehta[3]; Seema Mehta[3]; Dharmesh Sharma[3]; Yogesh Kumar[4]; Umesh Charantimath[4]; Amaresh Patil[5]; Ashalata Mallapur[6]; Umesh Ramdurg[6]; Radha Sangavi[7]; Praveen Patil[7]; Subarana Roy[8]; Phaniraj Vastrad[9]; Chander Shekhar[10]; Benjamin Leiby[10]; Rebecca Hartman[10]; Michael Georgieff[11]; Stephen Mennemeyer[10]; Zubair H. Aghai[12]; Simal Thind[10]; **Rupsa C. Boelig[13]** [1]Jefferson Health, Philadelphia, PA; [2]KLE Academy of Higher Education and Research's J N Medical College„ Belagavi, Karnataka; [3]Sawai Man Singh Medical College, Jaipur, Rajasthan; [4]KLE Academy of Higher Education and Research's J N Medical College„ KLE Academy of Higher Education and Research's J N Medical College„ Karnataka; [5]KLE Academy of Higher Education and Research's J N Medical College, Belagavi, Karnataka; [6]S Nijalingappa Medical and HSK Hospital and Research Center, Bagalkote, Karnataka; [7]Raichur Institute of Medical Sciences, Raichur, Karnataka; [8]ICMR – National Institute of Traditional Medicine, Belagavi, Karnataka; [9]Model Rural Health Research Unit, Sirwar, Karnataka; [10]Thomas Jefferson University, Philadelphia, PA; [11]University of Minnesota, Minneapolis, MN; [12]Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, PA; [13]Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, PA
10:15 AM	LB04	**Neonatal impact of prematurity risk biomarker screening with targeted interventions: A multicenter randomized controlled trial** Brian K. Iriye[1]; John O'Brien[2]; Christopher S. Ennen[3]; Perry Barrilleaux[4]; Jill Berkin[5]; Anna Palatnik[6]; Moeun Son[7]; Cynthia Gyamfi-Bannerman[8]; Mollie McDonald[9]; Glenn Markenson[10]; Anthony C. Sciscione[11]; Joseph R. Biggio, Jr[12]; Samuel Wolf[13]; Scott Sullivan[14]; Michael Walker[15]; Babak Shahbaba[16]; Stephen P. Pound[17] [1]Hera Womens Health, Las Vegas, NV; [2]University of Kentucky, Lexington, KY; [3]University of Virginia School of Medicine, Charlottesville, VA; [4]Ochsner Louisiana State University Health Shreveport, Shreveport, LA; [5]Icahn School of Medicine at Mount Sinai, New York, NY; [6]Medical College of Wisconsin, Milwaukee, WI; [7]Weill Cornell Medicine, New York, NY; [8]University of California, San Diego, San Diego, CA; [9]Austin Maternal-Fetal Medicine, Austin, TX; [10]Boston Medical Center, Boston, MA; [11]Christiana Care Health System, Newark, DE; [12]Ochsner Health, New Orleans, LA; [13]Emerald Coast OBGYN Clinical Research, Panama City, FL; [14]Inova Fairfax Medical Campus, Fairfax, VA; [15]Walker Bioscience, Carlsbad, CA; [16]University of California, Irvine, Irvine, CA; [17]Virginia Physicians for Women, North Chesterfield, VA

Friday, January 31, 2025 • 1:30 PM - 4:00 PM

Time	Abstract	Oral Concurrent Session 4 - Basic and Translational Science
1:30 PM	47	**Novel Neural Extracellular Vesicle miRNA Biomarkers Identify Suboptimal Response to Cooling in Neonatal Encephalopathy** **Sarah T. Mehl[1]**; Baharan Fekry[1]; Lierni Ugartemendia[1]; Dhanashree Rajderkar[2]; Nikolay Bliznyuk[2]; Shaveka Gaskins[2]; Michael D. Weiss[3]; Laura Goetzl[1] [1]McGovern Medical School at UTHealth Houston, Houston, TX; [2]University of Florida, Gainesville, FL; [3]University of Florida College of Medicine, Gainesville, FL
1:45 PM	48	**3D-printed humanized feto-maternal interface tests exosomal delivery of anti-inflammatory Interleukin-10 (IL-10) to reduce infection-associated inflammation** Leah Saylor[1]; Rahul Cherukuri[2]; Ananth Kammala[1]; Marc Ferrer[3]; Cristina Antich Acedo[3]; Arum Han[2]; Lauren Richardson[1]; **Ramkumar Menon[1]** [1]University of Texas Medical Branch, Galveston, TX; [2]Texas A&M University, College Station, TX; [3]National Center for Advancing Translational Sciences, National Institute of Sciences, Bethesda, MD
2:00 PM	49	**Decoy peptide to (pro)renin receptor as a potential therapeutic target for preeclampsia: a translational study** **Michelle Harris[1]**; Ahmed F. Pantho[2]; Kelsey R. Kelso[1]; Jessica C. Ehrig[3]; Ram R. Kalagiri[1]; Niraj Vora[1]; Thomas J. Kuehl[2]; Steven R. Lindheim[1]; Mohammad N. Uddin[4] [1]Baylor Scott & White Health Temple Medical Center, Temple, TX; [2]Artemis Biotechnologies LLC, Temple, TX; [3]Baylor Scott and White Health, Temple, TX; [4]Baylor Scott & White Medical Center and Texas A&M School of Medicine, Temple, TX

Friday, January 31, 2025 • 1:30 PM - 4:00 PM		
Time	**Abstract**	**Oral Concurrent Session 4 - Basic and Translational Science, continued**
2:15 PM	50	**Longitudinal changes in epigenetic aging in pregnant versus non-pregnant people: a prospective cohort study** **Danielle M. Panelli**; Nicole Gladish; Nicola C. Perlman; Andres Cardenas; Katherine Bianco Stanford University, Palo Alto, CA
2:30 PM	51	**Lactobacillus crispatus mitigates Group B Streptococcus-induced inflammation in the cervicovaginal epithelium** Briana Ferguson; Aaron Loder; Lauren Anton; **Kristin D. Gerson** University of Pennsylvania Perelman School of Medicine, Philadelphia, PA
2:45 PM	52	**Expression of CD300E in human myometrium and its impact on parturition** **Meera M. Thakkar[1]**; William E. Ackerman, IV[1]; Guomao Zhao[1]; Zoe B. Strong[1]; Elizabeth Feoktistov[2]; Ekaterina Snegovskikh[2]; Catalin S. Buhimschi[1]; Irina A. Buhimschi[1] [1]University of Illinois at Chicago, College of Medicine, Chicago, IL; [2]University of Illinois at Chicago, Chicago, IL
3:00 PM	53	**Personalized models of fetal brain development as biomarkers of offspring neurodevelopmental outcomes after maternal SARS-CoV-2** Lydia L. Shook; Liam T. McCrea; Olyvia Jasset; Steven D. Sheridan; Roy H. Perlis; **Andrea G. Edlow** Massachusetts General Hospital, Boston, MA
3:15 PM	54	**The Placental Vascular Transcriptome in Pregnancies Resulting in Low vs. Normal Birth Weight Neonates** **Samantha Carson[1]**; Morgan E. Wasickanin[1]; Emily Sheikh[1]; Hillary Kinsman[1]; Lydia Bettridge[1]; Katherine E. Free[1]; Jennifer Damicis[1]; Robert Walton[1]; Peter Napolitano[2]; Nicholas Ieronimakis[1] [1]Madigan Army Medical Center, Tacoma, WA; [2]University of Washington, Seattle, WA
3:30 PM	55	**Commonly Used Non-Steroidal Anti-Inflammatory Drug (NSAIDs) in Obstetrics & Associated Placental Cytotoxicity** **Ana Collins-Smith** University of Texas Medical Branch, Galveston, TX
3:45 PM	56	**Evaluating Semaglutide in Human Fetal Neural Stem Cells: Could Early Exposure Impact Neurodevelopment?** **Morgan E. Wasickanin[1]**; Samantha Carson[1]; Hillary Kinsman[1]; Katherine E. Free[1]; Jennifer Damicis[1]; Emily Sheikh[1]; Robert Walton[1]; Irina Burd[2]; Peter Napolitano[3]; Nicholas Ieronimakis[1] [1]Madigan Army Medical Center, Tacoma, WA; [2]University of Maryland, Baltimore, MD; [3]University of Washington, Seattle, WA
1:30 PM	57	**Myo-inositol Supplementation to Prevent Pregnancy Complications in Polycystic Ovary Syndrome: a Randomized Controlled Trial** **Anne W.T. Van Der Wel[1]**; Rebekka Bout-Rebel[2]; Chryselle M.C. Frank[3]; Ruben G. Duijnhoven[1]; Bo E. Van Bree[4]; Olivier Valkenburg[4]; Salwan Al-Nasiry[4]; Robbert H.F. van Oppenraaij[5]; Tatjana E. Vogelvang[6]; Michelle E.M.H Westerhuis[7]; Jan Peter de Bruin[8]; Hedwig P. van de Nieuwenhof[8]; Susanne C.J.P. Gielen[9]; Myrthe L. Bandell[10]; Mireille N. Bekker[11]; Maurice G.A.J. Wouters[1]; Velja Mijatovic[1]; Arie Franx[2]; Cornelis B. Lambalk[1]; Frank J.M. Broekmans[11]; Rebecca C. Painter[1]; Bart C.J.M. Fauser[12]; Joop S.E. Laven[2]; Bas B. van Rijn[13]; MYPP Investigator Group[2] [1]Amsterdam UMC, location University of Amsterdam, Amsterdam, Noord-Holland; [2]Erasmus University Medical Center, Zuid-Holland; [3]St. Antonius Ziekenhuis, Utrecht; [4]Maastricht UMC+, Limburg; [5]Maasstad Ziekenhuis, Zuid-Holland; [6]Het Diakonessenhuis, Utrecht; [7]Catharina Ziekenhuis, Noord-Brabant; [8]Jeroen Bosch Ziekenhuis, Noord-Brabant; [9]Franciscus, Zuid-Holland; [10]Albert Schweitzer ziekenhuis, Zuid-Holland; [11]University Medical Center Utrecht, Utrecht; [12]University of Utrecht and University Medical Center Utrecht, Utrecht; [13]Eindhoven University of Technology, Noord-Brabant

Friday, January 31, 2025 • 1:30 PM - 4:00 PM

Time	Abstract	Oral Concurrent Session 5 - Hypertension
1:45 PM	58	**Nifedipine versus Labetalol for Treatment of Postpartum Hypertension: A Randomized Controlled Trial** **Todd R. Lovgren[1]**; Ruofan Yao[2]; Brendan D. Connealy[3]; Robert Bonebrake[1]; Hemant Satpathy[1]; Emily Patel[1]; Matthew Brady[1]; Joshua Dahlke[4] [1]Nebraska Methodist Health System, Elkhorn, NE; [2]Loma Linda University Health, Loma Linda, CA; [3]Methodist Women's Hospital, Omaha, NE; [4]Nebraska Methodist Hospital, Elkhorn, NE
2:00 PM	59	**Defining postpartum cardiovascular physiology: Blood pressure trajectories in patients at risk for new-onset postpartum hypertension** **Ukachi N. Emeruwa[1]**; Minhazur R. Sarker[1]; Elizabeth Nicole Teal[1]; Marni B. Jacobs[2]; Louise C. Laurent[3]; Natalie A. Bello[4]; Timothy Wen[5]; Russell S. Miller[6]; Cynthia Gyamfi-Bannerman[1] [1]University of California, San Diego, San Diego, CA; [2]University of California, San Diego Health, San Diego, CA; [3]University of California, San Diego Medical Center, La Jolla, CA; [4]Cedars Sinai Medical Center, Los Angeles, CA; [5]University of California, San Diego, Irvine, CA; [6]Columbia University Medical Center, New York, NY
2:15 PM	60	**Severe Systolic Hypertension and Adverse Maternal Outcomes** **Yossi Bart[1]**; Hector M. Mendez-Figueroa[2]; Farah H. Amro[1]; Baha M. Sibai[1] [1]McGovern Medical School at UTHealth Houston, Houston, TX; [2]McGovern Medical School at UTHealth, Houston, TX
2:30 PM	61	**Postpartum Diuretics for Hypertensive Disorders of Pregnancy: A Systematic Review and Meta-Analysis** **Emma Trawick Roberts[1]**; Elana Jaffe[1]; Johanna Quist-Nelson[1]; Suneet Chauhan[2]; Baha M. Sibai[3]; Michal Fishel Bartal[4] [1]University of North Carolina, Chapel Hill, NC; [2]Christiana Care, Newark, DE; [3]McGovern Medical School at UTHealth Houston, Houston, TX; [4]UTH Houston & Sheba Medical Center Israel, Houston, TX
2:45 PM	62	**Association of Preeclampsia with Long-Term Risk of Neurodegenerative Disorders** **Maria Bazan[1]**; Ai-ris Y. Collier[2]; Tina Yi Jin Hsieh[2]; James Cheng-Chung Wei[3] [1]Beth Israel Deaconess Medical Center, Brighton, MA; [2]Beth Israel Deaconess Medical Center, Boston, MA; [3]Chung-Shan Medical School, Taichung, Taichung
3:00 PM	63	**Comprehensive blood pressure management to improve early postpartum blood pressure parameters: a randomized controlled trial** **Alexandra JD Phelps[1]**; Loveis Jackson[1]; Lilly He[1]; Ashanti E. Griggs-Cooks[1]; Neha Dudipala[2]; Etoi Garrison[1]; Kathryn J. Lindley[1]; Soha S. Patel[1]; Julia C. Phillippi[3]; Megan Webb[1]; Sarah S. Osmundson[1] [1]Vanderbilt University Medical Center, Nashville, TN; [2]Ohio State University College of Medicine, Columbus, OH; [3]Vanderbilt University School of Nursing, Nashville, TN
3:15 PM	64	**Hofbauer cells may mediate PE-associated placental dysfunction via APOE synthesis** **Bani Medegan Fagla**; Cielo Dela Rosa; Savita Sundar; Aswathi Jayaram; Erykah Walton; Jason York; Leon M. Tai; Guomao Zhao; Irina A. Buhimschi University of Illinois at Chicago, College of Medicine, Chicago, IL
3:30 PM	65	**Impact on Severe Maternal Morbidity following Statewide Improvements in Hypertensive Disorders of Pregnancy Care Processes** **Patrick Schneider[1]**; Allison Stevens[2]; Alyssa Antonini[2]; Michelle Menegay[3]; Allison Lorenz[3]; Stephen Afflito[3]; Rashelle Ghanem[4]; Ryan Everett[5]; Justin R. Lappen[6] [1]The Ohio State University, Wexner Medical Center, Columbus, OH; [2]Government Resources Center for the Ohio Colleges of Medicine, Columbus, OH; [3]Ohio Colleges of Medicine, Government Resource Center, Columbus, OH; [4]Ohio Department of Children and Youth, Columbus, OH; [5]Ohio Hospital Association, Columbus, OH; [6]Cleveland Clinic Foundation, Cleveland, OH
3:45 PM	66	**Adverse outcomes during delivery hospitalizations among patients with an intellectual or developmental disability diagnosis** **Manasa G. Rao[1]**; Timothy Wen[2]; Mary E. D'Alton[1]; Alexander M. Friedman[3]; Noelia Zork[3] [1]Columbia University Medical Center, New York, NY; [2]University of California, San Diego, Irvine, CA; [3]Columbia University Irving Medical Center, New York, NY

Friday, January 31, 2025 • 1:30 PM - 4:00 PM

Time	Abstract	Oral Concurrent Session 6 - Prematurity and Newborn
1:30 PM	67	**Azithromycin to prevent stillbirths and infant deaths in Mali: A 2x2 factorial placebo-controlled randomized trial** **Karen Kotloff[1]**; Amanda J. Driscoll[1]; Fadima Haidara[2]; Lawrence Moulton[3]; Jason Bailey[1]; Ousmane Samake[2]; Tiecoura Bocoum[2]; Jane Juma[2]; Awa Traore[2]; Mamadou Diallo[2]; Collins Okello[2]; Uma Onwuchekwa[2]; Mamoudou Kodio[2]; Yuji Chen[1]; Emily Deichsel[1]; Matthew Finholt-Daniel[4]; Robert L. Goldenberg[5]; Fleesie Hubbard[1]; Rebecca Maguire[1]; Melissa Page[4]; David Plotner[4]; Milagritos Tapia[1]; Dilruba Nasrin[1]; Samba Sow[2] [1]University of Maryland, School of Medicine, Baltimore, MD; [2]Centre pour le Développement des Vaccins, Mali, Bamako, Bamako; [3]Johns Hopkins, Bloomberg School of Public Health, Baltimore, MD; [4]RTI International, Durham, NC; [5]Columbia University School of Medicine, New York, NY
1:45 PM	68	**The effect of metformin in women who received betamethasone on maternal hyperglycemia and neonatal hypoglycemia** **Enav Yefet[1]**; Manal Massalha[2]; Gil Talmon[1]; Aminet Labay[1]; Marian matanis[1]; Erez Sleman[1]; Rima nassra[1]; Maya Frank Wolf[3]; Inshirah Sgayer[4]; Lior Lowenstein[4]; Zohar Nachum[2] [1]Tzafon Medical Center, Poriya, HaZafon; [2]Emak Medical Center, Afula, HaZafon; [3]Galilee Medical Center, Naharyia, HaZafon; [4]Galilee Medical center, Nahariya, HaZafon
2:00 PM	69	**Fully Quantitative Cervical Remodeling: Race Group Differences Responsibilities and Cautions** **LeAnn A. Louis[1]**; Sarah M. Dwyer[1]; Methodius G. Tuuli[2]; Adam K. Lewkowitz[2]; Julie Tumbarello[1]; Emily Dively, BSN[3]; Madeline Felske[1]; Wendy Sparks[1]; Anita M. Malone[1]; Peinan Zhao[4]; Molly J. Stout[5] [1]University of Michigan Hospital, Ann Arbor, MI; [2]Women & Infants Hospital of Rhode Island and Alpert Medical School of Brown University, Providence, RI; [3]Washington University School of Medicine, St. Louis, MO; [4]Washington University, St. Louis, MO; [5]University of Michigan Medical Center, Ann Arbor, MI
2:15 PM	70	**Neonatal outcomes after Caesarean versus vaginal birth: population-based cohort study of extremely preterm breech singletons** **Yanchen Wang[1]**; Pasqualina Santaguida[1]; Sameer Parpia[1]; Fabiana Bacchini[2]; Prakeshkumar S. Shah[3]; Kellie Murphy[3]; K. S. Joseph[4]; Sandesh Shivananda[5]; Sarah D. McDonald[1] [1]McMaster University, Hamilton, ON; [2]Canadian Premature Babies Foundation, Toronto, ON; [3]University of Toronto, Toronto, ON; [4]School of Population and Public Health, University of British Columbia, Vancouver, BC; [5]University of British Columbia, Vancouver, BC
2:30 PM	71	**The role of cervical elastography for the prediction of spontaneous preterm birth** **Anne-Sophie Lafortune[1]**; Louise Ghesquiere[2]; Paul Guerby[3]; Marie-Laurence Côté[1]; Genevieve Marcoux[4]; Annie Beaudoin[4]; Emmanuel Bujold[1] [1]Université Laval, PQ; [2]Université de Lille, Lille, Nord-Pas-de-Calais; [3]Université de Toulouse, Midi-Pyrenees; [4]CHU de Québec, CHU de Québec, PQ
2:45 PM	72	**Corticosteroids and Neonatal Hypoglycemia among Pregnant Individuals with Diabetes: Effect of Gestational Age at Delivery** **Ruby Lin**; Cande V. Ananth; Todd J. Rosen On behalf of the MOMPOD Consortium Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ
3:00 PM	73	**Pro-inflammatory vaginal cytokines, early PTB, and infectious morbidity in patients with asymptomatic cervical shortening** **Tracy A. Manuck** On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units (MFMU) Network University of North Carolina, Chapel Hill, NC

Friday, January 31, 2025 • 1:30 PM - 4:00 PM

Time	Abstract	Oral Concurrent Session 6 - Prematurity and Newborn, continued
3:15 PM	74	**Comparison of Polyester Fiber versus Polypropylene Suture Materials in Physical-Exam Indicated Transvaginal Cerclages** Daniel J. Martingano[1]; Amanda F. Francis Oladipo[2]; **Marwah Al-Dulaimi[3]**; Sandra Kumwong[4]; Andrea Ouyang[5]; Lauren Cue[6]; Ashley Nguyen[3]; Shailini Singh[7]; Alexander Ulfers[8]; Mark Rebolos[3]; Kristin Cohen[9]; Donald Morrish[3]; Iffath A. Hoskins[10]; Francis X. Martingano[11] [1]St. John's Episcopal Hospital-South Shore and William Carey University College of Osteopathic Medicine, Far Rockaway, NY; [2]Hackensack University Medical Center, Hackensack, NJ; [3]St. John's Episcopal Hospital-South Shore, Far Rockaway, NY; [4]Touro College of Osteopathic Medicine-Harlem Campus, New York, NY; [5]William Carey University, Hattiesburg, MS; [6]Rutgers University and the Jersey City Medical Center, Jersey City, NJ; [7]AtlantiCare Regional Medical Center, Pamona, NJ; [8]Walter Reed National Military Medical Center, Bethesda, MD; [9]RWJBarnabas Health - Trinitas Regional Medical Center, Elizabeth, NJ; [10]Albert Einstein College of Medicine - Montefiore Medical Center, New York, NY; [11]NYU Grossman School of Medicine - NYU Brooklyn, New York, NY
3:30 PM	75	**Antimuscarinic Receptor Blockade Reduces Uterine Muscle Contractions Potentially Providing A Novel Treatment For Preterm Labor** **Anthony G. Visco[1]**; Zachary Visco[2]; Chad Grotegut[3]; Cristina Linde[4]; Timothy Westfall[4]; Friederike Jayes[5] [1]NinoMed, LLC, Chapel Hill, NC; [2]University of North Carolina, Chapel Hill, NC; [3]Wake Forest University, Wake Forest, NC; [4]Reprocell, Beltsville, MD; [5]Duke University, Durham, NC
3:45 PM	76	**Vaginal microbiota as a predictor of preterm birth: a prospective cohort study** Laura Lesimple[1]; Jessica Rousseau Rousseau[1]; Luce Landraud[1]; Céline Plainvert[1]; Nathalie Grall[1]; Francois Goffinet[2]; Pierre-Yves Ancel[1]; Christophe Pannetier[3]; **Laurent Mandelbrot[4]**; Asmaa Tazi[1] [1]Assistance Publique Hôpitaux de Paris, Paris, Ile-de-France; [2]Université Paris Cité, Inserm, Centre for Research in Epidemiology and StatisticS (CRESS), Obstetrical Perinatal and Pediatric Epidemiology Research Team (EPOPé), Paris, Ile-de-France; [3]Assistance Publique Hôpitaux de Paris, Paris, Rhone-Alpes; [4]Hôpital Louis Mourier, APHP, Université Paris Cité, Colombes, Ile-de-France

Saturday, February 1, 2025 • 8:00 AM - 10:15 AM

Time	Abstract	Oral Concurrent Session 7 - Diabetes
8:00 AM	77	**Does large for gestational age and/or polyhydramnios warrant rescreening for gestational diabetes mellitus?** **Henry Lesser**; A. Dhanya Mackeen; David Chromey, II; Amanda J. Young; Celia Gray; Michael J. Paglia Geisinger Medical Center, Danville, PA
8:15 AM	78	**Breastfeeding patterns among parturients with diabetes: A secondary analysis of the MOMPOD randomized clinical trial** **Minhazur R. Sarker[1]**; Marni B. Jacobs[2]; Kim Boggess[3]; Ashley N. Battarbee[4]; Gladys (Sandy) A. Ramos[1] [1]University of California, San Diego, San Diego, CA; [2]University of California, San Diego Health, San Diego, CA; [3]University of North Carolina, Chapel Hill, NC; [4]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL
8:30 AM	79	**Predicting Future Diabetes: Impact of Abnormal Pregnancy OGTT Patterns** **Yael Winter Shafran[1]**; Tal Schiller[2]; Alena Kirzhner[2]; Edi Vaisbuch[2] [1]Kaplan Medical Center and REALIFE Research Group, Rehovot, HaMerkaz; [2]Kaplan Medical Center, Rehovot, HaMerkaz
8:45 AM	80	**Effect of Breastfeeding on the Early Postpartum Lipid Profile in Women with Gestational Diabetes Mellitus** **Harumi Kanzawa[1]**; Hiroshi Yamashita[1]; Ichiro Yasuhi[2] [1]NHO Nagasaki Medical Center, Omura City, Nagasaki; [2]NHO Nagasaki Medical Center, Omura-City, Nagasaki
9:00 AM	81	**Rates of Risk Appropriate Postpartum Care within Six Months after Delivery** **Jennifer F. Culhane**; Anna Denoble; Olivia Paoletti; Caitlin Partridge; Lisbet S. Lundsberg Yale School of Medicine, New Haven, CT

Saturday, February 1, 2025 • 8:00 AM - 10:15 AM		
Time	**Abstract**	**Oral Concurrent Session 7 - Diabetes, continued**
9:15 AM	82	**Metformin Use in Pregnancy Decreases Neonatal Fat Free Mass** **Claire E. Jensen[1]**; Ashley N. Battarbee[2]; Kim Boggess[1]; Kjersti M. Aagaard[3] On behalf of the MOMPOD Consortium [1]University of North Carolina, Chapel Hill, NC; [2]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL; [3]Boston Children's Hospital, Division of Fetal Medicine and Surgery, Boston, MA; HCA Healthcare and HCA Healthcare Research Institute, Nashville, TN; HCA Texas Maternal Fetal Medicine, Houston, TX; Baylor College of Medicine and Texas Children's Hospital, Houston, TX, Boston, MA
9:30 AM	83	**Interaction between Metformin and Baseline Insulin Requirements on Neonatal Outcomes in Pregnancies with Type-2 Diabetes** **Kevin S. Shrestha[1]**; Claire E. Jensen[2]; Kim Boggess[2]; Gladys (Sandy) A. Ramos[3]; Ashley N. Battarbee[4] [1]University of Alabama at Birmingham, Birmingham, AL; [2]University of North Carolina, Chapel Hill, NC; [3]University of California, San Diego, San Diego, CA; [4]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL
9:45 AM	84	**The Placental Transcriptome in Pregnancies Complicated by A2 Gestational Diabetes Mellitus** **Morgan E. Wasickanin[1]**; Samantha Carson[1]; Hillary Kinsman[1]; Lydia Bettridge[1]; Katherine E. Free[1]; Jennifer Damicis[1]; Emily Sheikh[1]; Robert Walton[1]; Peter Napolitano[2]; Nicholas Ieronimakis[1] [1]Madigan Army Medical Center, Tacoma, WA; [2]University of Washington, Seattle, WA
10:00 AM	85	**Childhood Sexual and Emotional Maltreatment are Associated with Increased Gestational Weight Gain** **NATALIE E. POLIEKTOV[1]**; Mariana Rocha[1]; Kaitlyn Stanhope[2]; Lauren Holt[1]; Alicia Smith[1]; Vasiliki Michopoulos[1]; Suchitra Chandrasekaran[3] [1]Emory University School of Medicine, Atlanta, GA; [2]Rollins School of Public Health, Atlanta, GA; [3]Emory University, Atlanta, GA

Saturday, February 1, 2025 • 10:15 AM – 10:30 AM		
Time	**Abstract**	**Late-Breaking Abstract Presentations Session 3**
10:15 AM	LB05	**Patient navigation to improve postpartum health care among low-income birthing people: a randomized controlled trial** **Lynn M. Yee[1]**; Joe M. Feinglass[1]; Brittney R. Williams[1]; Laura Diaz[1]; Viridiana Carmona-Barrera[1]; Ying Cheung[1]; Ka'Derricka Davis[1]; Chen Yeh[1]; Charlotte M. Niznik[1]; Michelle A. Kominiarek[2]; William A. Grobman[3] [1]Northwestern University Feinberg School of Medicine, Chicago, IL; [2]Northwestern Feinberg School of Medicine, Northwestern Feinberg School of Medicine/ Chicago, IL; [3]Women & Infants Hospital of Rhode Island / Alpert Medical School of Brown University, Brown University/Providence, RI

Saturday, February 1, 2025 • 8:00 AM - 10:15 AM		
Time	**Abstract**	**Oral Concurrent Session 8 - Fetus and Fetal Intervention**
8:00 AM	86	**Innovative transcardiac access to the fetal cerebral and pelvic arteries for diagnosis and treatment** **Michael A. Belfort[1]**; Emma Van Den Eede[2]; Karen Chen[3]; Carolyn A Altman[3]; Timo Krings[4]; Peter T Kan[5]; Tomohiro Arai[2]; Wasinee Tianthong[2]; Walter Coudyzer[6]; Caitlin D. Sutton[3]; Samuel G G. McClugage, III[3]; William E Whitehead[3]; Magdalena Sanz Cortes[1]; Larry H Hollier[3]; Jan A. Deprest[2]; Luc De Catte[6]; Luc Joyeux[3]; Thierry Huisman[3] [1]Texas Children's Hospital and Baylor College of Medicine, Houston, TX; [2]My FetUZ Fetal Research Center, Universitary Hospital Leuven, Leuven, Vlaams-Brabant; [3]Baylor College of Medicine and Texas Children's Hospital, Houston, TX; [4]University Health Network, ON; [5]UTMB, Houston, TX; [6]Universitary Hospital Leuven, Leuven, Vlaams-Brabant

Saturday, February 1, 2025 • 8:00 AM - 10:15 AM

Time	Abstract	Oral Concurrent Session 8 - Fetus and Fetal Intervention, continued
8:15 AM	87	**Predicting Outcomes in Congenital Diaphragmatic Hernia with Discordant Fetal MRI and Ultrasound Prognostic Indices** **Lamia A. Alamri[1]**; Jason Gien[1]; Payton Moody[1]; Blair W. Weikel[2]; Mariana Meyers[1]; Michael V. Zaretsky[1]; Sarkis C. Derderian[1]; Henry L. Galan[3] [1]University of Colorado, School of Medicine, Aurora, CO; [2]University of Colorado, School of Medicine and Colorado Fetal Care Center, Aurora, CO; [3]University of Colorado, School of Medicine, Children's Hospital of Colorado, Aurora, CO
8:30 AM	88	**Tracking twin growth from start to finish in 3D** **Jessica L. Gleason[1]**; Zhen Chen[2]; Rajeshwari Sundaram[2]; Kathryn A. Wagner[3]; Daniel He[4]; Wesley Lee[5]; Roger Newman[6]; Seth Sherman[7]; Edward Chien[8]; Robert Gore-Langton[7]; Luis F. Goncalves[9]; Katherine L. Grantz[1] [1]Epidemiology Branch, NICHD-NIH, Bethesda, MD; [2]National Institute of Child Health and Human Development, Bethesda, MD; [3]Massachusetts College of Pharmacy and Health Sciences, Boston, MA; [4]The Prospective Group, Fairfax, VA; [5]Baylor College of Medicine, Houston, TX; [6]Medical University of South Carolina, Columbia, SC; [7]The Emmes Company, Rockville, MD; [8]Cleveland Clinic, Cleveland, OH; [9]Phoenix Children's Hospital, Phoenix, AZ
8:45 AM	89	**Proteomic analysis of monochorionic pregnancies with twin-to-twin transfusion syndrome and selective fetal growth restriction** **Jessian L. Munoz**; Cara Buskmiller; Ahmed A. Nassr; Magdalena Sanz Cortes; Michael A. Belfort; Roopali V. Donepudi Texas Children's Hospital and Baylor College of Medicine, Houston, TX
9:00 AM	90	**Chronotropic rescue prior to cord clamping in fetal complete AV Block and severe bradycardia** **Samantha Holmes[1]**; Emily Bucholz[1]; Camila Londono-Obregon[1]; Jason Gien[1]; Nicholas Behrendt[1]; Michael V. Zaretsky[1]; Henry L. Galan[2]; Bettina Cuneo[3] [1]University of Colorado, School of Medicine, Aurora, CO; [2]University of Colorado, School of Medicine, Children's Hospital of Colorado, Aurora, CO; [3]University of Arizona, Tucson, AZ
9:15 AM	91	**Impact of a synthetic amniotic fluid upon fetal lung development** **Stephanie Finoti[1]**; Braxton Forde[2]; Samuel Martin[3]; Marc Oria[1]; Jose L. Peiro[4] [1]University of Cincinnati, Cincinnati, OH; [2]University of Cincinnati College of Medicine, Cincinnati, OH; [3]Cincinnati Children's Hospital Medical Center, Cincinnati, OH; [4]Cincinnati Children's Fetal Care Center, Cincinnati, OH
9:30 AM	92	**Effect of very preterm delivery on outcomes following in-utero spina bifida repair** **Michael V. Zaretsky[1]**; Virginia Lijewski[1]; Jagruti Anadkat[2]; Kelly A. Bennett[3]; Yair J. Blumenfeld[4]; Christopher Q. Buchanan[5]; Caitlin M. Clifford[6]; Timothy Crombleholme[7]; Samer Elbabaa[8]; Stephen P. Emery[9]; William H. Goodnight[10]; Hanmin Lee[11]; Joseph B. Lillegard[12]; Foong-Yen Lim[13]; Francois Luks[14]; Jena L. Miller[15]; Ueli Moehrlen[16]; Julie Moldenhauer[17]; Anita J. Moon-Grady[11]; Mauro Schenone[18]; Aimen F. Shaaban[19]; KuoJen Tsao[20]; Tim Van Mieghem[21]; Amy J. Wagner[22] On behalf of the fMMC Consortium sponsored by NAFTNet [1]University of Colorado, School of Medicine, Aurora, CO; [2]Washington University School of Medicine, St. Louis, MO; [3]Vanderbilt University Medical Center, Nashville, TN; [4]Children's Hospital at Stanford, Palo Alto, CA; [5]St. Louis Fetal Care Institute, St. Louis, MO; [6]University of Michigan Medical Center, Ann Arbor, MI; [7]Connecticut Children's Fetal Care Center, Hartford, CT; [8]Orlando Health Arnold Palmer Hospital for Children, Orlando, FL; [9]University of Pittsburgh, Pittsburgh, PA; [10]University of North Carolina at Chapel Hill, Chapel Hill, NC; [11]University of California, San Francisco, San Francisco, CA; [12]Midwest Fetal Care Center, Minneapolis, MN; [13]Cincinnati Children's Hospital, Cincinatti, OH; [14]Fetal Treatment Program of New England, Providence, RI; [15]Johns Hopkins Medicine, Baltimore, MD; [16]Children's Hospital Zurich, Zurich; [17]Children's Hospital of Philadelphia, Philadelphia, PA; [18]Mayo Clinic, Rochester, MN; [19]Chicago Institute for Fetal Health, Chicago, IL; [20]McGovern Medical School at the University of Texas Health Science Center at Houston (UTHealth) University of Texas Health Science Center, Houston, TX; [21]Mount Sinai Hospital and University of Toronto, Toronto, ON; [22]Children's Hospital of Wisconsin Fetal Concerns Center, Milwaukee, WI

Saturday, February 1, 2025 • 8:00 AM - 10:15 AM		
Time	**Abstract**	**Oral Concurrent Session 8 - Fetus and Fetal Intervention, continued**
9:45 AM	93	**In-utero ventriculosubgaleal shunt placement - a fetal lamb model of induced hydrocephalus** Shohra Qaderi[1]; Weston Northam[1]; Soner Duru[2]; Eyal Krispin[3]; Syril James[4]; Jose L. Peiro[5]; Braxton Forde[6]; Hamidreza Forourtan[7]; Ramen H. Chmait[8]; Scott A. Shainker[9]; Cassandra R. Duffy[9]; Nikan Zargarzadeh[1]; Ali Javinani[1]; Arthur Nedder[10]; Brittany Pattison[10]; lana Vasung[10]; Ryne A. Didier[10]; Michaela K. Farber[11]; Sebastian Seifert[12]; Darren B. Orbach[10]; P. Ellen Grant[10]; Benjamin C. Warf[10]; Yves Ville[13]; **Alireza A. Shamshirsaz[14]** [1]Boston Children's Hospital, Harvard Medical School, Boston, MA; [2]Cincinnati Children's Hospital, Cincinnati, OH; [3]Harvard Medical School, Boston, MA; [4]Hôpital Necker-Enfants Malades, Paris, Ile-de-France; [5]Cincinnati Children's Fetal Care Center, Cincinnati, OH; [6]University of Cincinnati College of Medicine, Cincinnati, OH; [7]Laparoscopy research center, Shiraz, Fars; [8]Keck School of Medicine, University of Southern California, Los Angeles, CA; [9]Beth Israel Deaconess Medical Center, Boston, MA; [10]BCH, Boston, MA; [11]BWH, Boston, MA; [12]Brigham & Women's Hospital, Boston, MA; [13]University and Necker-Enfants Malades Hospital, Paris, Ile-de-France; [14]Boston Children's Hospital, Brigham and Women's Hospital, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA
10:00 AM	94	**Role of placental superficial anastomoses in twin-twin transfusion syndrome (TTTS)** **Ramen H. Chmait[1]**; Lisa M. Korst[2]; Arlyn Llanes[1]; Kristine R. Rallo[1]; Andrew H. Chon[3]; Martha A. Monson[4]; Ruben A. Quintero[5] [1]Keck School of Medicine, University of Southern California, Los Angeles, CA; [2]Childbirth Research Associates, North Hollywood, CA; [3]Oregon Health & Science University, Portland, OR; [4]Intermountain Healthcare, University of Utah Health, Salt Lake City, UT; [5]The Fetal Institute, USFETUS Research Consortium, Miami, FL

Saturday, February 1, 2025 • 10:15 AM – 10:30 AM		
Time	**Abstract**	**Late-Breaking Abstract Presentations Session 4**
10:15 AM	LB06	**Comparing 162mg vs. 81mg Aspirin for Prevention of Preeclampsia (ASAPP): A Randomized Control Trial** **Amrin Khander[1]**; Kathy Matthews[2]; Charlene Thomas[3]; Paul Christos[4]; Stephen T. Chasen[5]; Daniel W. Skupski[3]; Laura E. Riley[3]; Phyllis August[6]; Line Malha[3] [1]Weill Cornell Medicine-New York Presbyterian Hospital, New York, NY, NY; [2]New Jersey Perinatal Associates, Livingston, NJ; [3]Weill Cornell Medicine, New York, NY; [4]Weill Cornell Medical College, New York, NY; [5]Weill-Cornell Medical College, New York, NY; [6]New York Presbyterian Weill Cornell Medicine, New York, NY

Saturday, February 1, 2025 • 8:00 AM - 10:30 AM		
Time	**Abstract**	**Oral Concurrent Session 9 - Medical Complications**
8:00 AM	95	**Prevention Of Methamphetamine Use among Postpartum People (PROMPT): A Pilot Randomized Controlled Trial** **Marcela C. Smid[1]**; Jasmin E. Charles[1]; Amanda A. Allshouse[2]; Stephanie Castro[1]; Grace Humiston[1]; Elysha Cash[2]; Adam G. Gordon[2]; Kristi Carlston[1]; Marie Gibson[1]; Gerald Cochran[1] [1]University of Utah Health, Salt Lake City, UT; [2]University of Utah, Salt Lake City, UT
8:15 AM	96	**Postpartum VTE risk by CHA2DS2-VASc score in patients with atrial fibrillation or flutter during pregnancy** **Virginia Y. Watkins[1]**; Miriam L. Estin[2]; Sarah C. Snow[1]; Cary C. Ward[1]; Marie-Louise Meng[1]; Jerome J. Federspiel[1] [1]Duke University School of Medicine, Durham, NC; [2]Duke university School of Medicine, Durham, NC

Saturday, February 1, 2025 • 8:00 AM - 10:30 AM

Time	Abstract	Oral Concurrent Session 9 - Medical Complications, continued
8:30 AM	97	**A Technology Enabled Solution for Perinatal Mental Health Collaborative Care Models: A Randomized Controlled Trial** **Emily S. Miller[1]**; David Mohr[2]; Dinah Williams[3]; Melissa Shikany[2]; Tracy Walsh[2]; Nathan W. Winquist[2]; Zara Mir[2]; Elizabeth L. Gray[2]; Shannon R. Smith[2]; Charles Krause[2]; Lara M. Baez[2]; Madhu C. Reddy[4] [1]Women & Infants Hospital of Rhode Island and Alpert Medical School of Brown University, Providence, RI; [2]Northwestern University Feinberg School of Medicine, Chicago, IL; [3]Women and Infants Hospital of Rhode Island, Providence, RI; [4]University of California, Irvine, Irvine, CA
8:45 AM	98	**Risk of severe maternal morbidity among pregnant people with colorectal cancer using a population database** **Shriddha Nayak[1]**; Kristin C. Darwin[2]; Arthur J. Vaught[2]; Marika Toscano[1] [1]Johns Hopkins University, School of Medicine, Baltimore, MD; [2]Johns Hopkins University, Baltimore, MD
9:00 AM	99	**Impact of breastfeeding on estimated risk of postpartum cardiovascular disease** **Christine P. Field[1]**; William A. Grobman[1]; Jiqiang Wu[1]; Anna Palatnik[2]; Mark B. Landon[1]; Denise Scholtens[3]; William Lowe[3]; Nilay S. Shah[4]; Jami Josefson[3]; Sadiya S. Khan[5]; Kartik K. Venkatesh[1] [1]The Ohio State University, Columbus, OH; [2]Medical College of Wisconsin, Milwaukee, WI; [3]Northwestern University, Northwestern University/Chicago, IL; [4]Northwestern University, Chicago, IL; [5]Northwestern University Feinberg School of Medicine, Chicago, IL
9:15 AM	100	**Intravenous Ferumoxytol versus Oral Ferrous Sulfate for Iron-Deficiency Anemia in Pregnancy: A Randomized Controlled Trial** **Irogue I. Igbinosa**; Stephanie A. Leonard; Ijeoma Iweakogwu; Elizabeth B. Sherwin; Caroline Berube; Deirdre J. Lyell Stanford University, Palo Alto, CA
9:30 AM	101	**Neurodevelopmental outcomes of 3-year-old children of mothers with SARS-CoV-2 infection in pregnancy** **Lydia L. Shook**; Victor Castro; Laura Ibanez-Pintor; Roy H. Perlis; Andrea G. Edlow Massachusetts General Hospital, Boston, MA
9:45 AM	102	**Maternal Gestational Weight Gain in GLP-1 Agonist Exposed and Unexposed Patients** Nishita Pondugula[1]; Jennifer F. Culhane[1]; Lisbet S. Lundsberg[1]; Caitlin Partridge[1]; **Audrey A. Merriam[2]** [1]Yale School of Medicine, New Haven, CT; [2]Yale New Haven Hospital, New Haven, CT
10:00 AM	103	**Placental Pathology Findings by Timing and Amount of Maternal Cannabis Exposure** **Shilpa S. Tummala[1]**; Amanda A. Allshouse[2]; Gwendolyn A. McMillin[1]; Jessica M. Comstock[2]; Elizabeth S. Doughty[2]; Robert M. Silver[2]; Torri D. Metz[2] [1]University of Utah Health, Salt Lake City, UT; [2]University of Utah, Salt Lake City, UT
10:15 AM	104	**The Impact of a Facilitated Postpartum-to-Primary Care Transition on Care Utilization within One Year Postpartum** **Arlin Delgado[1]**; Pichliya Liang[1]; Tierra Bender[1]; Kaitlyn E. James[1]; Alaka Ray[1]; Ishani Ganguli[2]; Jessica L. Cohen[3]; Mark A. Clapp[1] [1]Massachusetts General Hospital, Boston, MA; [2]Brigham and Women's Hospital, Boston, MA; [3]Harvard T.H. Chan School of Public Health, Boston, MA

Oral Plenary Session 1

Abstracts 1 – 8

THURSDAY
January 30
8 AM – 10 AM
Aurora Ballroom

MODERATORS
Cynthia Gyamfi-Bannerman, MD, MS
Anthony C. Sciscione, DO

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Plenary Session 1

Thursday, January 30, 2025 8 AM – 10 AM

1 | Antenatal Corticosteroid in Twin Pregnancy at Risk of Late Preterm Birth: A Randomized Controlled Trial

Seung Mi Lee[1]; Hyun Soo Park[2]; Soo Ran Choi[3]; Jeesun Lee[1]; Hyun Ji Kim[4]; Jee Yoon Park[4]; Kyung Joon Oh[4]; Geum Joon Cho[5]; Min-Jeong Oh[5]; Jin Hoon Chung[6]; Sun Min Kim[7]; Byoung Jae Kim[8]; Suk Young Kim[9]; Subeen Hong[10]; Young Mi Jung[5]; Se Jin Lee[11]; Ji Su Seong[12]; Haemin Kim[13]; Sohee Oh[8]; Joongyub Lee[1]; Ji Hoi Kim[1]; Hee Young Cho[14]; Chan-Wook Park[1]; Joong Shin Park[1]; Jong Kwan Jun[15]

[1]Seoul National University College of Medicine, Seoul, Seoul-t'ukpyolsi; [2]Dongguk University Ilsan Hospital, Goyang, Kyonggi-do; [3]Inha University Hospital, Inha University College of Medicine, Incheon, Inch'on-jikhalsi; [4]Seoul National University Bundang Hospital, Seoul National University College of Medicine, Bundang, Kyonggi-do; [5]Korea University College of Medicine, Seoul, Seoul-t'ukpyolsi; [6]University of Ulsan College of Medicine, Asan Medical Center, Seoul, Seoul-t'ukpyolsi; [7]101 Daehak-ro, Jongno-gu, Seoul, Seoul-t'ukpyolsi; [8]Seoul Metropolitan Government Seoul National University Boramae Medical Center, Seoul, Seoul-t'ukpyolsi; [9]College of Medicine, Gachon University, Incheon, Inch'on-jikhalsi; [10]Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Seoul-t'ukpyolsi; [11]Kangwon National University Hospital, School of Medicine, Kangwon National University, Chuncheon, Kangwon-do; [12]Chung-Ang University Gwang-Myeong Hospital, Chung-Ang University College of Medicine, Gwang-Myeong, Kyonggi-do; [13]Kyungpook National University Chilgok Hospital, Kyungpook National University, School of Medicine, Daegu, Ch'ungch'ong-bukto; [14]Seoul National University, Seoul, Seoul-t'ukpyolsi; [15]Ewha Womans University College of Medicine, Seoul, Seoul-t'ukpyolsi

8:00 AM - 8:15 AM

Objective: Recently, guidelines recommend corticosteroid injection in singleton pregnancy at risk of late preterm birth (34 ~36+6 weeks). However, the effectiveness of antenatal corticosteroid in twin pregnant women at risk of late preterm birth has not been evaluated, and there is a paucity of guideline in this population. In the current study, we evaluated if antenatal betamethasone administration reduces the risk of neonatal respiratory morbidity in late preterm twin neonates.

Study Design: In this multicenter randomized trial, we enrolled twin pregnant women at 34+0 to 36+5 weeks of gestation who were at risk of late preterm birth. The participants received betamethasone or placebo after randomization of 1:1 ratio. Primary outcome was severe neonatal respiratory morbidity, including at least one of the followings: the use of continuous positive airway pressure (CPAP) or high-flow nasal cannula for 12 hours or more, supplementary oxygen administration with a fraction of oxygen of at least 0.3 for 24 hours or more, mechanical ventilation, extracorporeal membranes oxygenation, or perinatal death within 72 hours after birth. The secondary outcome was other neonatal morbidities.

Results: Among 1620 neonates, the primary outcome occurred in 99 neonates with lower risk in the betamethasone group than in placebo group (39/818 [4.8%] vs. 60/802 [7.5%], relative risk (RR) 0.64 [95% CI, 0.42-0.98]) Other respirator morbidities were also lower in the betamethasone group, such as CPAP use for 2 hours or more (RR 0.58 [95% CI 0.35~0.95]) and transient tachypnea of the newborn (RR 0.47 [95% CI 0.25~0.89]). The risk of neonatal hypoglycemia was increased in the betamethasone group (RR 1.33 [95% CI 1.01~1.75]), but the risk of neonatal sepsis or maternal chorioamnionitis were not different between the two groups of cases.

Conclusion: The antenatal betamethasone administration in twin pregnant women at risk of late preterm birth significantly reduced the risk of neonatal respiratory morbidity.

Table. Neonatal respiratory complications

Characteristics	Placebo (n=802 babies)	Betamethasone (n=818 babies)	Relative Risk (reference: Placebo)	P value
Primary outcomes (Severe respiratory morbidities)	**60 (7.5%)**	**39 (4.8%)**	**0.64 (0.42-0.98)**	**0.038**
CPAP ≥12 h	**38 (4.7%)**	**19 (2.3%)**	**0.50 (0.29-0.87)**	**0.013**
High-flow nasal cannula ≥12 h	16 (2.0%)	12 (1.5%)	0.75 (0.35-1.61)	0.456
Fraction of inspired oxygen of ≥0.3 for ≥24 h	4 (0.5%)	5 (0.6%)	1.19 (0.34-4.14)	0.787
Mechanical ventilation	23 (2.9%)	17 (2.1%)	0.73 (0.38-1.40)	0.350
Extracorporeal membranes oxygenation	0 (0%)	2 (0.2%)	9.65 (0.52-178.00)	0.127
Perinatal death	0 (0%)	0 (0%)	-	-
Mild respiratory morbidities	64 (8.0%)	44 (5.4%)	0.68 (0.45-1.02)	0.063
CPAP ≥2 h	**48 (6.0%)**	**28 (3.4%)**	**0.58 (0.35-0.95)**	**0.031**
High-flow nasal cannula ≥2 h	21 (2.6%)	20 (2.4%)	0.94 (0.50-1.76)	0.838
Fraction of inspired oxygen of ≥0.3 for ≥4 h	6 (0.7%)	8 (1.0%)	1.27 (0.46-3.53)	0.646
Other respiratory morbidity	45 (5.6%)	31 (3.8%)	0.68 (0.41-1.13)	0.138
Respiratory distress syndrome	7 (0.9%)	8 (1.0%)	1.11 (0.38-3.19)	0.849
Transient tachypnea of the newborn	**34 (4.2%)**	**16 (2.0%)**	**0.47 (0.25-0.89)**	**0.021**
Apnea	1 (0.1%)	6 (0.7%)	3.71 (0.90-15.27)	0.070
Bronchopulmonary dysplasia	0 (0%)	2 (0.2%)	9.65 (0.52-178.00)	0.127
Pneumonia	0 (0%)	0 (0%)	-	-
Surfactant use	2 (0.2%)	1 (0.1%)	0.64 (0.15-2.75)	0.545
Pulmonary air leak	4 (0.5%)	2 (0.2%)	0.58 (0.16-2.06)	0.396

2 | The Frequency and Severity of Complications after Previable PROM in Texas following SB8

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8:15 AM - 8:30 AM

Objective: Robust contemporary data concerning previable PROM are limited. The impact of changes in state abortion laws on maternal outcomes also remains unknown. We sought to compare outcomes of pregnant individuals who develop previable PROM at our center before and after the implementation of Texas Senate Bill 8 (SB8).

Study Design: This is a retrospective cohort study across three tertiary care hospitals from January 1, 2018-March 31, 2023. ICD-10 codes were used to identify individuals with previable PROM. Chart review was done by trained research staff. Individuals with singleton or twin gestions and clinical diagnosis of PROM < 22 weeks were studied, excluding those with IUFD and/or active PTL. We compared clinical characteristics and outcomes of individuals before and after the implementation of SB8 on September 1, 2021. Our primary outcome was composite adverse outcome, which included ICU admission, transfusion, and/or sepsis. Multivariable Poisson regression with robust error variance was used to adjust for confounding factors for the primary outcome. Adjusted relative risk (aRR) with 95% CIs was calculated.

Results: Over the 5-year study period, 166 individuals met inclusion criteria (97 pre-SB8 vs 69 post-SB8). There were no differences in baseline characteristics pre- vs post-SB8 (Table 1). Prior to SB8, 49% of individuals opted for immediate delivery. No individuals in the post-SB8 cohort were induced with previable ROM as the sole indication for delivery. There was a higher rate of the composite adverse outcome (20.6% vs 37.7%; aRR 2.02, 95% CI 1.2-3.3), after adjusting for age, race and ethnicity, and gestational age at delivery. Time from rupture to delivery was longer in the post-SB8 cohort (median [IQR]: 1 [1-3] days vs 6 [2-12] days, p< 0.001) and demonstrated a higher incidence of sepsis (6.2% vs 31.9%; aRR 5.15, 95% CI 2.27-11.7).

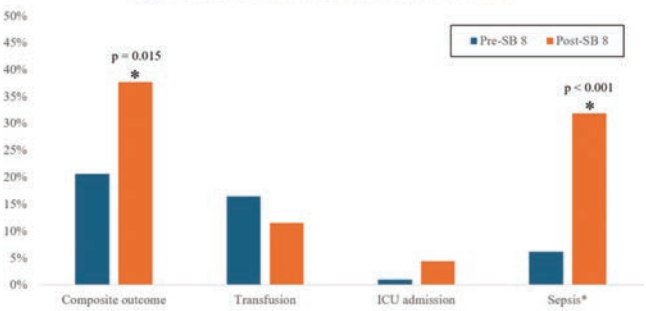
Conclusion: Prior to SB8, nearly one-half of individuals opted for pregnancy termination due to previable PROM. After SB8, risks of serious adverse outcomes increased nearly 2X, and the risk of sepsis increased over 4X.

Table 1. Baseline characteristics of patients presenting with previable PROM < 22 weeks pre- and post-SB 8

	Pre-SB 8			Post-SB 8	
Management	Immediate Induction (*n* = 48)	Expectant Management* (*n* = 49)	Total (*n* = 97)	Expectant Management (*n* = 69)	P-value (Pre vs Post)
Age (years)					0.87
<25	9 (18.8%)	9 (18.8%)	18 (18.6%)	11 (16.0%)	
25-34	21 (43.8%)	26 (53.1%)	47 (48.5%)	36 (52.2%)	
≥35	18 (37.5%)	14 (28.6%)	32 (33.0%)	22 (31.9%)	
Race/ethnicity					0.13
White	6 (12.5%)	2 (4.1%)	8 (8.3%)	9 (13.0%)	
Black/African American	7 (14.6%)	23 (46.9%)	30 (31.0%)	25 (36.2%)	
Hispanic	13 (27.1%)	10 (20.4%)	23 (23.7%)	21 (30.4%)	
Other	13 (27.1%)	6 (12.2%)	19 (19.6%)	10 (14.5%)	
Unknown/Not reported	9 (18.8%)	8 (16.3%)	17 (17.5%)	4 (5.8%)	
Gravidity	2.6 (1.5)	2.8 (1.9)	2.7 (1.7)	2.7 (1.5)	0.89
Parity	1.0 (1.3)	1.0 (1.4)	1.0 (1.3)	1.0 (1.2)	0.93
Term	0.8 (1.0)	0.8 (1.2)	0.8 (1.1)	0.7 (0.9)	0.63
Preterm	0.2 (0.4)	0.2 (0.5)	0.2 (0.5)	0.3 (0.7)	0.32
Abortion	0.7 (0.8)	0.8 (1.3)	0.8 (1.1)	0.7 (1.2)	0.82
Gestational age at rupture (weeks)	18.3 (1.9)	18.7 (2.4)	18.5 (2.1)	18.4 (2.1)	0.71
Tobacco/alcohol/drug use	1 (2.1%)	4 (8.2%)	5 (5.2%)	3 (4.35%)	1.00
BMI at delivery					0.29
<30	25 (52.1%)	21 (42.9%)	46 (47.4%)	27 (39.1%)	
≥30	23 (47.9%)	28 (57.1%)	51 (52.6%)	42 (60.9%)	
Anemia at admission	6 (12.5%)	1 (2.0%)	7 (7.2%)	6 (8.7%)	0.73
COVID positive on admission	2 (4.2%)	0 (0.0%)	2 (2.1%)	1 (1.5%)	1.00
STI during pregnancy	1 (2.1%)	3 (6.1%)	4 (4.1%)	8 (11.6%)	0.08
Chronic hypertension	9 (18.8%)	4 (8.2%)	13 (13.4%)	8 (11.6%)	0.73
Twin gestation	3 (6.3%)	3 (6.1%)	6 (6.2%)	7 (10.1%)	0.35
Fetal anomalies	3 (6.3%)	0 (0.0%)	3 (3.1%)	3 (4.4%)	0.74
Mode of delivery					0.49
Vaginal	46 (95.8%)	45 (91.8%)	91 (93.8%)	61 (88.4%)	
Primary cesarean	0 (0.0%)	1 (2.0%)	1 (1.0%)	3 (4.4%)	
Repeat cesarean	0 (0.0%)	3 (6.1%)	3 (3.1%)	3 (4.4%)	
Dilation and evacuation	2 (4.2%)	0 (0.0%)	2 (2.1%)	2 (2.9%)	

Data presented as *n* (%) or mean (SD)
*Expectant management category includes those who presented and spontaneously delivered and those who were induced for another delivery indication in addition to PROM.

Figure 1. Outcomes of Previable PROM Pre- and Post-SB 8



*Sepsis defined as a diagnosis of clinical IAI and two or more of the following: maternal tachycardia > 100, maternal fever 38C/100.4F, respiratory rate > 20 breaths per minute, WBC > 15,000, evidence of organ dysfunction/failure (including altered mental status, lactic acidosis, SBP <90 or SBP drop ≥40 mm Hg of normal, AKI).

3 | Fetal Fraction Amplification Enables Accurate Prenatal Cell-free DNA Screening at 8 Weeks Gestation

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[1]University of Pennsylvania, Philadelphia, PA; [2]Myriad Genetics, Inc., Salt Lake City, UT; [3]Myriad Genetics, Inc., South San Francisco, CA; [4]Myriad Genetics, Inc., South San Fransisco, CA

8:30 AM - 8:45 AM

Objective: Cell-free DNA (cfDNA) screening for fetal aneuploidy is typically offered beginning at 10 weeks' gestation. Prior to 10 weeks the proportion of placental cfDNA, known as the fetal fraction (FF), is often too low to allow for confident analysis. FF amplification, the preferential enrichment of placental cfDNA based on its shorter fragment size, may sufficiently increase FF to enable screening earlier than 10 weeks with high confidence and a low failure rate. This study aimed to evaluate the feasibility

of cfDNA screening using FF amplification prior to 10 weeks' gestation.

Study Design: Blood samples were collected from pregnant patients with singleton gestations at 6w0d-9w6d and ≥10w0d. Samples were processed using an approach that incorporates FF amplification. Logistic regression was used to evaluate the proportion of samples with low FF (< 4%) as a function of gestational age (GA). Aneuploidy and sex-call concordance were evaluated.

Results: 459 patients completed both blood draws. Additional cohort characteristics are described in the Table. FF ranged from 2.1- 34.7%, with lower GAs corresponding to lower FFs (Figure). Prior to the incorporation of FF amplification, 4.78% of samples at 10w0d had a low FF (< 4%). FF amplification allowed for comparable performance at 7w3d (the earliest date where < 4.78% of samples had FF < 4%). To reflect practical application in a clinical setting, we selected 8w0d through 9w6d as the "early GA" period. Among the 239 samples in the early GA period, one sample failed because of insufficient FF (FF = 2.5%), yielding a no-call rate of 0.42%. Three trisomies (two T21 and one T7) were identified in the early GA period, and each was concordant with the corresponding ≥10w0d call. All 238 passing samples had concordant sex calls in the early GA and ≥10w0d GA periods.

Conclusion: CfDNA screening using FF amplification provided accurate results as early as 8 weeks GA with a low no-call rate in this study population. Earlier prediction of risk for chromosomal abnormalities may provide patients with the option to have diagnostic testing with CVS at 10 weeks' gestation.

Table 1: Cohort Characteristics

Characteristic	Mean [range] or N (%)
All patients	459
Gestational age at 1st draw	
6 weeks 0 days to 6 weeks 6 days	128 (27.9%)
7 weeks 0 days to 7 weeks 6 days	92 (20.0%)
8 weeks 0 days to 8 weeks 6 days	159 (34.6%)
9 weeks 0 days to 9 weeks 6 days	80 (17.4%)
Mean fetal fraction at 1st draw [range]	10.7% [2.1% — 34.7%]
Mean fetal fraction at 2nd draw [range]	19.2% [5.5% — 35.7%]
Mean maternal BMI [range]	27.3 [15.5 — 49.1]
Mean maternal age [range]	32 [19 — 46]

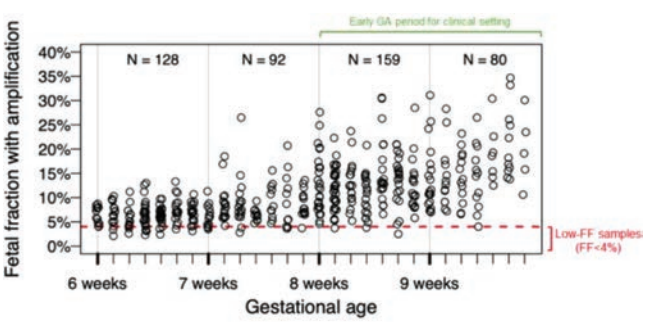

Figure 1: Fetal fraction as a function of gestational age. Dashed red line indicates the 4% FF generally considered to be the threshold below which a sample has "low FF".

4 | AI Significantly Improves Detection of Prenatal Ultrasounds Suspicious for Major Congenital Heart Defects by OBGYN/MFMs

Jennifer Lam-Rachlin[1]; Rajesh Punn[2]; Sarina K. Behera[3]; Miwa Geiger[1]; Matthias Lachaud[4]; Nadine David[5]; Sara Garmel[6]; Matthew K. Janssen[7]; Kendra Sylvester[8]; John Kennedy[9]; Jessica Spiegelman[1]; Mia A. Heiligenstein[10]; Nathan S. Fox[1]; Andrei Rebarber[1]; Greggory R. DeVore[11]; Carolyn M. Zelop[12]; Roger Bessis[13]; Marilyne Levy[14]; Bertrand Stos[14]; Malo De Boisredon[15]; Eric Askinazi[15]; Valentin Thorey[15]; Christophe Gardella[15]; Alisa Arunamata[2]

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8:45 AM - 9:00 AM

Objective: Congenital heart defects (CHDs) are a leading cause of infant morbidity and mortality partly due to low prenatal detection rates. We evaluated whether an artificial intelligence (AI) system can improve the detection of CHDs on fetal ultrasound exams among both general OBGYNs and MFM specialists.

Study Design: The AI system analyzes all grayscale 2D ultrasound cines of an exam and detects 8 morphological findings associated with severe CHDs. The presence of any such finding should justify patient referral for further examination. The AI system identifies each finding as present, absent or inconclusive, and highlights frames where findings can be assessed.

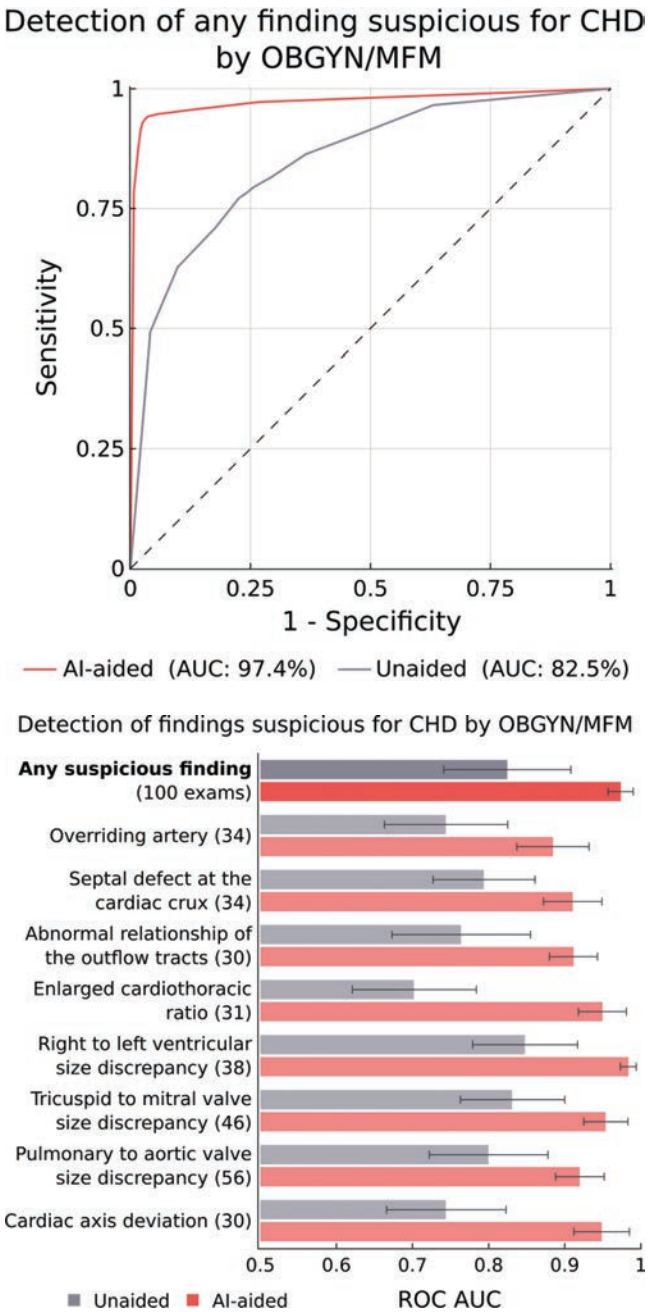
A dataset of 200 ultrasound exams from 11 centers in 2 countries was collected (single pregnancy, obstetric or detailed anatomic ultrasounds, or fetal echocardiograms, at 18-24 weeks gestation), with 100 exams having at least one suspicious finding. The ground truth for presence or absence of each finding was determined by a panel of expert fetal cardiologists. These exams were not used for the training of the AI system.

Fourteen physicians (OBGYNs and MFMs, 1-30+ years' experience) reviewed each exam both aided and unaided by the AI system, in randomized order, and annotated them for the presence or absence of any such finding and of each individual finding, along with confidence scores. Receiver operator characteristics (ROC) area under the curve (AUC), sensitivity and specificity were computed by comparing reviews to the ground truth.

Results: ROC AUC for detection of any finding was significantly higher for aided than unaided reviews: 0.97 (95% CI 0.96-0.99) vs 0.83 (0.74-0.91), p = 0.002 (DBM-OR method). Similar results held for sensitivity: 0.94 (0.89-0.98) aided vs 0.78 (0.69-0.88) unaided and specificity: 0.97 (0.95-0.99) aided vs 0.76 (0.63-0.89) unaided.

Mean reading time was shorter for aided (226 ± 218 s) than unaided (274 ± 241 s) reviews ($p < 0.001$).

Conclusion: Assistance by the AI system significantly improved detection of studies suspicious for CHD by OBGYNS and MFMs. AI may play a pivotal role in improving prenatal detection of CHD.



5 | Atosiban Versus Placebo in Threatened Preterm Birth (APOSTEL 8-study): an International Randomized Controlled Trial

Larissa I. van der Windt[1]; Job Klumper[1]; Ruben G. Duijnhoven[1]; Marjolein Kok[1]; Ben W. Mol[2]; Kate F. Walker[3]; Fionnuala M. M. McAuliffe[4]; Joris A. M. van der Post[5]; Carolien Roos[1]; Martijn A. Oudijk[1]

[1]Amsterdam UMC, location University of Amsterdam, Amsterdam, Noord-Holland; [2]Monash University, Clayton, Victoria; [3]Centre of Perinatal Research University of Nottingham, Queen's Medical Centre, Dublin, England; [4]UCD Perinatal Research Centre, University College Dublin, Dublin 2, Dublin; [5]Amsterdam UMC, location University of Amsterdam, Amsterdam, Noord-Brabant

9:00 AM - 9:15 AM

Objective: In many countries, threatened preterm birth (PTB) is treated with tocolytics to allow for a complete antenatal course of corticosteroids. Although effective in delaying birth, a positive effect on neonatal outcome has never been demonstrated. We assessed the effectiveness of atosiban for women with threatened PTB between 30 and 34 weeks of gestation in improving neonatal outcome.

Study Design: We performed a randomized double-blind placebo-controlled superiority trial in 26 hospitals in the Netherlands, England and Ireland. After informed consent, women with a singleton or twin pregnancy with threatened PTB between 30 and 34 weeks gestation were randomized (stratified by centre, 1:1 ratio) to intravenous atosiban or placebo for 48 hours. Primary outcome was a neonatal composite of perinatal mortality and morbidity. Treatment effect was expressed as relative risk (RR) with 95% confidence intervals (CI). To detect a reduction from 12% adverse perinatal outcome in the placebo group to 6% in the atosiban group with a power of 80%, we needed to randomise 722 women. Assuming a 5% drop-out rate, the sample size was calculated at 760 participants. Analysis was by intention-to-treat principle.

Results: From December 2017 to July 2023, we randomized 755 participants to atosiban (n = 377) or placebo (n = 378). Primary outcome was available for 752 participants with 884 infants. The primary outcome occurred in 37/449 (8.2%) infants in the atosiban group and 40/435 (9.2%) in the placebo group (RR 0.90, 95% CI 0.58 to 1.40). There were two (0.4%) and four (0.9%) perinatal deaths respectively (RR 0.48, 95% CI 0.09 to 2.63). There were no significant differences in other neonatal outcomes. Prolongation of pregnancy > 48 hours was significantly more often achieved in the atosiban group (292/375, 77.5%) compared to placebo (261/377, 69.2%) (RR 1.13, 95% CI 1.03 to 1.24).

Conclusion: We did not demonstrate superiority of atosiban over placebo in improving neonatal outcomes as a treatment for threatened PTB between 30 and 34 weeks of gestation. This questions the widespread use of tocolytics in many countries.

Table: obstetric and neonatal outcomes

	Atosiban mothers n=375 infants* n=449	Placebo mothers n=377 infants* n=435	RR (95% CI)	p-value
Obstetric outcomes				
Median gestational age at birth, weeks	33.9 [32.1 to 37.4]	34.1 [32.2 to 37.6]		0.83
Prolongation of pregnancy (time to delivery)				
Median, days	12.0 [3.0 to 37.0]	11.0 [2.0 to 42.0]		0.72
>48 hours	292 (77.9)	261 (69.2)	1.13 (1.03 to 1.24)	0.01
Neonatal outcomes*				
Median birthweight, grams	2142 [1821 to 2728]	2220 [1820 to 2845]		0.35
Primary adverse perinatal outcome	37 (8.2)	40 (9.2)	0.90 (0.58 to 1.40)	0.63
Perinatal mortality	2 (0.4)	4 (0.9)	0.48 (0.09 to 2.63)	0.40
BPD	1 (0.2)	2 (0.5)	0.48 (0.04 to 5.32)	0.55
NEC > stage 1	2 (0.4)	6 (1.4)	0.32 (0.07 to 1.59)	0.16
IVH > grade 2	3 (0.7)	6 (1.4)	0.48 (0.12 to 1.92)	0.30
PVL > grade 1	8 (1.8)	5 (1.1)	1.55 (0.51 to 4.70)	0.44
ROP > grade 2 or needing laser therapy	1 (0.2)	0	N/A	-
Culture proven sepsis	26 (5.8)	25 (5.7)	1.00 (0.58 to 1.75)	0.98

Outcome data are n (%) or median [IQR]. RR, risk ratio; CI, confidence interval; BPD, bronchopulmonary dysplasia; NEC, necrotising enterocolitis; IVH, interventricular haemorrhage; PVL, periventricular leukomalacia; ROP, retinopathy of prematurity.
Infants can have more than one of the components of the composite outcome.

6 | Prediction of Severely Small-for-Gestational-Age Infants Using a Novel Cell-free RNA Model

Morten Rasmussen[1]; Kara M. Rood[2]; Aram Saravani[1]; Michal A. Elovitz[3]; Carrie Haverty[4]; Alison Moe[1]; Alison Cowan[1]; Arkady Khodursky[1]; Maneesh Jain[1]; Manfred Lee[1]; Thomas F. McElrath[5]; Elizabeth F. Sutton[6]; Arun Jeyabalan[7]; George R. Saade[8]; Antonio F. Saad[9]; Luis D. Pacheco[10]; Joseph R. Biggio, Jr[11]; Ebony B. Carter[12]; Antonina I. Frolova[13]; Esther Park-Hwang[14]; Cynthia Gyamfi-Bannerman[15]; Ai-ris Y. Collier[16]; William A. Grobman[2]; Vincenzo Berghella[17]
[1]Mirvie Inc., South San Francisco, CA; [2]The Ohio State University, Columbus, OH; [3]Icahn School of Medicine at Mount Sinai, New York, NY; [4]Mirvie Inc., South San Fransisco, CA; [5]Brigham Women's Hospital, Boston, MA; [6]Woman's Hospital, Baton Rouge, LA; [7]University of Pittsburgh School of Medicine, Pittsburgh, PA; [8]Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA; [9]Inova Health, Falls Church, VA; [10]University of Texas Medical Branch, Galveston, TX; [11]Ochsner Health, New Orleans, LA; [12]University of North Carolina, Chapel Hill, NC; [13]Washington University School of Medicine, St. Louis, MO; [14]Multicare, Orlando, FL; [15]University of California, San Diego, San Diego, CA; [16]Beth Israel Deaconess Medical Center, Boston, MA; [17]Sidney Kimmel Medical College of Thomas Jefferson University, Philadelphia, PA

9:15 AM - 9:30 AM

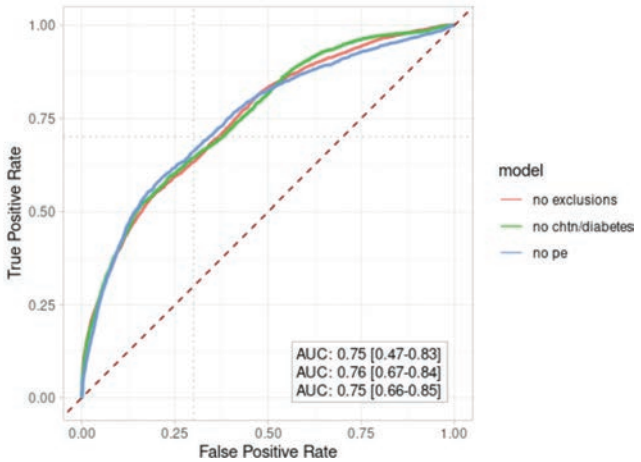
Objective: Pregnancies with suspected severe fetal growth restriction (FGR) require increased surveillance and earlier delivery due to their associated risk of stillbirth and other comorbidities. However, many infants born at < 3rd percentile (SGA3) are not detected until after delivery. We sought to understand the extent to which SGA3 can be predicted with a novel cell-free RNA (cfRNA) model, compared to the antepartum detection rate of SGA3.

Study Design: From a prospective cohort, 5,195 subjects with singleton gestations were enrolled from 11 U.S. sites and direct-to-participant mobile recruitment. Maternal blood was drawn between 17w4d-22w0d and pregnancy outcomes were adjudicated. Growth ultrasounds were performed for usual clinical indications. SGA3 was based on the Fenton growth chart. A cfRNA model was developed with features selected using sure independence screening and fit using cross-validation and L1 to reduce feature count. Rates of antepartum detection of SGA were estimated via the rate of FGR diagnosis.

Results: 115 (2.2%) delivered SGA3 infants, of whom 44.3% (N = 51) were detected antenatally with FGR. SGA3 was associated with preeclampsia, nulliparity, younger age, and Black race. A cfRNA model driven by *COL24A1* for prediction of SGA3 demonstrated an AUC of 0.75 (Fig). Excluding subjects with preeclampsia (N = 624, 22 SGA3) demonstrated comparable performance (AUC = 0.75), as did exclusion of subjects with chronic HTN and T1/T2DM (N = 555, 12 SGA3; AUC = 0.76). The cfRNA model predicted 59.1% (N = 68) of SGA3 infants. 30.4% (N = 35) were predicted to be SGA by cfRNA modeling but not FGR diagnosis vs. 14.8% (N = 17) predicted by FGR diagnosis but not cfRNA.

Conclusion: This large diverse study shows that antenatal detection of FGR is lacking, with the majority of SGA3 infants undiagnosed prior to birth. Improved diagnostic tools are required to identify these high-risk pregnancies. A cfRNA model identified the majority of SGA3 infants, independent of preeclampsia status. This novel cfRNA model represents a promising step toward the improved antepartum prediction and detection of severe FGR.

Fig. Test AUCs of cfRNA models on full population, excluding CHTN & T1/T2DM, and excluding preeclampsia



7 | Metformin Paradoxically Increases Insulin Resistance During Pregnancy in a Rhesus Macaque Model

Enrico R. Barrozo[1]; Tyler Dean[2]; Claire E. Jensen[3]; Melissa A. Suter[1]; Maxim D. Seferovic[1]; Kristin Sauter[2]; Jacob E. Friedman[4]; Maureen Gannon[5]; Stephanie R. Wesoloski[6]; Carrie E. McCurdy[7]; Paul Kievit[2]; Kjersti M. Aagaard[8]
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9:30 AM - 9:45 AM

Objective: Normal human and non-human primate pregnancy physiology includes mild insulin resistance, which enables appropriate fetal growth & species-specific accumulation of fetal adiposity. With rising diabetes in pregnancy, metformin use has become common despite its inferiority to insulin in managing maternal hyperglycemia. We hypothesized metformin inferiority during pregnancy may be due to differing pathophysiology of insulin resistance in pregnancy and tested this hypothesis in our recent Rhesus macaque model.

Study Design: Dams (n = 75) were randomized to vehicle control (VEH) or metformin (MET, 10 mg/kg twice daily) at pregnancy confirmation by GD30 and allocated to control (CHOW) or an isocaloric 35% fat Western-style diet (WSD). Glucose tolerance tests were conducted pre-pregnancy (Baseline), 3rd trimester, and 3 months postpartum. AUC for glucose and insulin, HOMA-IR, QUICKI, and Matsuda Index were calculated as insulin

resistance (IR) and sensitivity (IS) measures, respectively. Data were analyzed using two-way ANOVA or mixed-effects models and Tukey's test for multiple comparisons ($p < 0.05$).

Results: Consistent with pregnancy physiology, dams were insulin resistant during pregnancy (insulin AUC $p < 0.0001$) but not hyperglycemic ($p = 0.3$; Fig 1). Relative to VEH, initiation of metformin by GD30 resulted in increased IR (HOMA-IR, $p = 0.03$) and decreased IS (QUICKI & Matsuda, $p = 0.001$ & $p < 0.001$), both of which appropriately varied during gestation. Metformin was ineffective at treating IR during pregnancy and postpartum, with a paradoxical effect of significantly increased IR with metformin use compared to VEH (baseline vs 3rd trimester $q < 0.05$, Fig 2). Results were consistent when stratified by fetal sex and lactation status.

Conclusion: In our non-diabetic rhesus macaque model, we found that the pathophysiology and metformin-responsiveness of maternal pregnancy-related IR differ from non-pregnancy IR. These data are consistent with the lack of efficacy in human trials and underscore the need for longitudinal studies on the mechanisms and long-term health risks of metformin exposure during pregnancy.

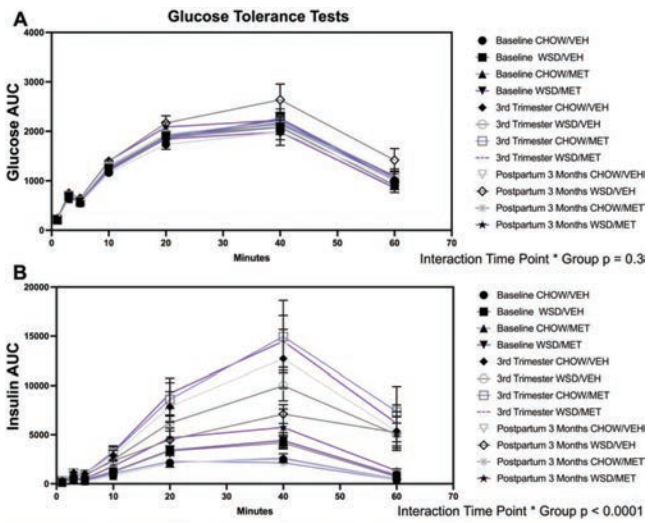


Figure 1. Rhesus Macaque Model for Insulin Resistance in Pregnancy and Not Hyperglycemia Confirmed by Maternal Glucose Tolerance Tests (GTT) Before, During, and After Pregnancy. A, Average glucose (mg/dL) area under the curve (AUC) stratified by time point and grouped by diet (CHOW or WSD) and treatment (VEH or MET). **B**, Average insulin (μU/mL) AUC stratified by time point and group. Significance was determined by two-way ANOVA (significance defined as a p-value < 0.05).

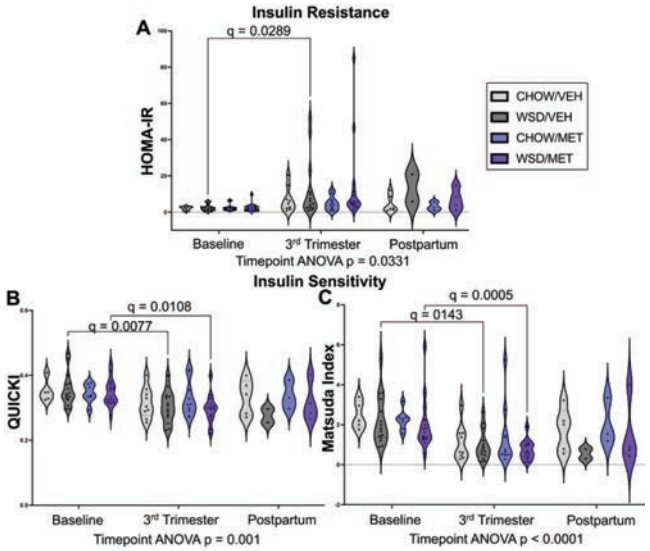


Figure 2. Metformin was Ineffective at Treating Insulin Resistance and Sensitivity Alterations During Pregnancy and 3 Months Postpartum. A-C, Homeostatic model assessment of insulin resistance (HOMA-IR; A), quantitative insulin sensitivity check index (QUICKI; B), and Matsuda index (C) stratified by time point and grouped by diet and treatment. Significance was determined by two-way ANOVA and Tukey's multiple corrections test (significance defined as an adjusted p-value (q) < 0.05).

8 | INTER-ACT Interpregnancy and Pregnancy Lifestyle Intervention for a Healthy Future: a Randomized Controlled Trial

Yael Winter Shafran[1]; Hanne Van Uytsel[2]; Annick Bogaerts[2]; Lieveke Ameye[2]; Roland Devlieger[3]

[1]Kaplan Medical Center and REALIFE Research Group, Rehovot, HaMerkaz; [2]REALIFE Research Group, KU Leuven, Leuven, Vlaams-Brabant; [3]University Hospital Leuven, Leuven, Vlaams-Brabant

9:45 AM - 10:00 AM

Objective: Maternal pre-pregnancy BMI and gestational weight gain (GWG) influence pregnancy outcomes. Interventions during pregnancy show limited success, highlighting the need for pre-pregnancy interventions. This study evaluated a comprehensive lifestyle intervention from the interpregnancy to subsequent pregnancy periods in individuals with a history of excessive GWG, aiming to reduce pregnancy complications.

Study Design: The INTER-ACT trial is a prospective multicenter randomized controlled trial (RCT) conducted from 2017 to 2019. A total of 1,450 participants with were randomized, with 390 experiencing a singleton pregnancy. The intervention included face-to-face coaching and an E-Health app focusing on nutrition, physical activity, and mental well-being. The control group had measurements and surveys. The primary outcome was a composite of pregnancy-induced hypertension, gestational diabetes, cesarean section, and large-for-gestational-age infants.

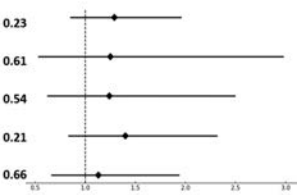
Results: The lifestyle intervention did not significantly reduce the composite outcome overall (OR 1.29, 95% CI 0.85 to 1.96). Adherence dropped substantially during the following pregnancy, with only 55% attending at least one coaching session and 38% using the app. A subanalysis revealed that participants who adhered to either the intervention or control follow-up had

a significantly reduced composite outcome compared to non-adherent participants, with ORs of 0.50 (95% CI: 0.26 to 0.98) and 0.48 (95% CI: 0.26 to 0.90), respectively.

Conclusion: This innovative, inclusive large-scale RCT highlights the potential of lifestyle interventions to improve pregnancy outcomes and underscores the importance of adherence and motivation. While the INTER-ACT intervention did not lower the composite outcome rate, those who maintained adherence either to the intervention or the follow-up showed significant benefits. Future trials should explore the impact of lifestyle interventions across diverse BMI ranges, particularly in the preconception and interpregnancy periods, and examine how to motivate participants to take a more active and aware role in their lifestyle choices.

Primary Outcomes of the INTER ACT study

	Intervention (N-193) n/N (%)	Control (N=197) n/N (%)	Odd ratio (95% CI)	P- value
Composite outcome	80/186	69/187	1.29 (0.85-1.96)	0.23
PIH	12/189	10/195	1.25 (0.53-2.98)	0.61
DM	19/187	16/192	1.24 (0.62-2.50)	0.54
CS	41/193	32/197	1.40 (0.83-2.32)	0.21
LGA	33/184	30/185	1.13 (0.66-1.94)	0.66



This table and forest plot represent the primary outcomes from the INTER-ACT Study following the second pregnancy. Diamond markers the odds ratios, with the 95% confidence intervals. Evaluated outcomes include Pregnancy-Induced Hypertension (PIH), Diabetes Mellitus (DM), Cesarean Section (CS), and Large for Gestational Age (LGA).

Oral Concurrent Session 1

Equity, Public Health, and Policy

Abstracts 9 – 18

THURSDAY
January 30, 2025
1:30 PM – 4:00 PM
Aurora Ballroom A

MODERATORS
Ebony B. Carter, MD
Aviva Lee-Parritz, MD

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Concurrent Session 1 – Equity, Public Health, and Policy

Thursday, January 30, 2025 1:30 PM – 4:00 PM

9 | Dysregulated Gene Expression in Placentas with Exposure to Persistent Maternal Socioeconomic Disadvantage

Greg E. Miller[1]; Lauren Keenan-Devlin[2]; Alexa A. Freedman[1]; Renee Odom-Konja[3]; Linda M. Ernst[3]; Steve Cole[4]; Ann EB Borders[2]
[1]Northwestern University, Chicago, IL; [2]Endeavor Health, Evanston Hospital, Evanston, IL; [3]Endeavor Health, Evanston, IL; [4]University of California, Los Angeles, Los Angeles, CAMA

1:30 PM - 1:45 PM

Objective: Persistent socioeconomic disadvantage is associated with many adverse health outcomes across the lifespan. One hypothesis is these risks start during gestation from hardship-related changes in placental gene expression. Studies in animal models have yielded results consistent with this hypothesis, but it has yet to be tested in large, diverse human cohorts.

Study Design: 605 patients with singleton pregnancies were recruited during their first trimester. Socioeconomic status (SES) data was collected using a standardized interview, and disadvantage was quantified by educational attainment and occupational prestige. Biopsies from distinct cotyledons of the placenta's chorionic villous layer were collected < 2 hours from delivery and used for genome-wide expression profiling via RNA-Seq on an Illumina NovaSeq X Plus. Data were analyzed with linear mixed models, adjusted for maternal age, race, ethnicity, BMI, obstetric risk, delivery mode, and fetal sex.

Results: 449 participants delivered at term and had complete data. At a threshold of 1.50 fold-change, analyses identified 1,859 transcripts that were differentially expressed across the 4 standard deviation range of SES. 1,311 transcripts were upregulated in conjunction with SES disadvantage and 548 were downregulated. Bioinformatic analyses yielded indications that SES disadvantage was associated with upregulated pro-inflammatory transcriptional pathways (those anchored by GATA, STAT, MAF, and IRF) in fetal myeloid cells, but also with downregulation of trophoblast transcriptional pathways involved in fetal organ maturation (those anchored by PBX, c-ETS, ELK1, PAX, and CREB).

Conclusion: These results suggest molecular correlates of maternal disadvantage during pregnancy are present in mRNA from the placenta chorionic villous layer demonstrating SES disparities in placental biology. Multiple dimensions of placental gene expression were dysregulated with exposure to SES disadvantage. Future work should focus on interventions that reduce SES disadvantage before and during pregnancy, and evaluate their impact on pregnancy outcomes and placental biology.

10 | Association Between Maternal-Fetal Medicine Physician Density and Adverse Pregnancy Outcomes

Tetsuya Kawakita; Rula Atwani; Lindsay S. Robbins; George R. Saade
Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA

1:45 PM - 2:00 PM

Objective: To examine the association between maternal-fetal medicine (MFM) physician density and adverse pregnancy outcomes at the state level.

Study Design: This was a cross-sectional analysis of publicly available state-level birth certificate data from 2018 to 2021. The number of MFM physicians per state each year was obtained from the American Medical Association database. The primary exposure was based on the density of MFM per state categorized by quartiles of the ratio of MFM in each state per 100,000 live births (low, fair, moderate, and high). Our primary outcome was maternal mortality rate during pregnancy and up to 42 days postpartum (MMR). Our secondary outcomes were maternal mortality rate up to 365 days postpartum, stillbirth rate, preterm birth rate, and cesarean delivery rate. We calculated incident rate ratios (IRR) with 95% confidence intervals (95%CI) using generalized estimating equations with Poisson distribution and exchange-correlation structure, accounting for confounders.

Results: The median state MFM density was 31.6 MFM per 100,000 births (interquartile 21.9-42.5). Of 14,803,520 births included in this analysis, 1,683,691 (11.4%) were in low MFM-density states, 5,193,402 (35.1%) births were in fair MFM-density states, 4,557,005 (30.8%) were in moderate MFM-density states,

and 3,369,422 (22.8%) were in the high MFM-density states. There was an inverse relationship between the MFM density in the state and its MMR per 100,000 live births (Figure 1). Compared to the low MFM-density states, high MFM-density states were associated with a lower risk of MMR, PRM, and preterm birth (Table 1). There were no significant differences in outcomes between low MFM-density states and fair or moderate MFM-density states except for stillbirths being lower in the moderate MFM-density states compared to the low MFM-density states.

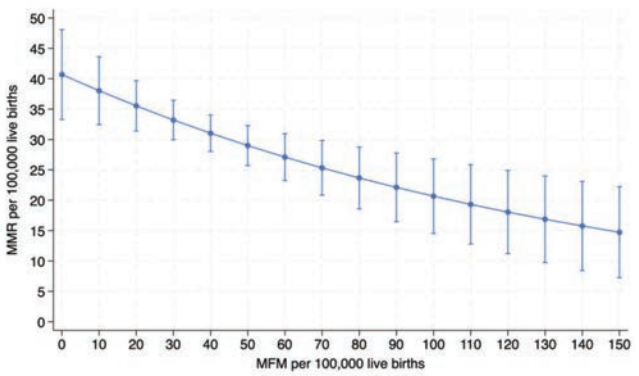
Conclusion: High MFM-density states have a decreased risk of maternal mortality compared to low MFM-density states, suggesting an association between MFM physician availability and decreased maternal mortality.

Table 1. Outcomes

	Low MFM density	Fair MFM density		Moderate MFM density		High MFM density	
	n	n	IRR (95%CI)	n	IRR (95%CI)	n	IRR (95%CI)
Total delivery N (%)	n=1,683,691	n=5,193,402		n=4,557,005		n=3,369,422	
MMR n (per 100,000)	668 (39.7)	1623 (31.3)	0.89 (0.69-1.14)	1302 (28.6)	0.88 (0.70-1.10)	932 (27.7)	0.74 (0.59-0.93)
PRM n (per 100,000)	896 (53.2)	2231 (43.0)	0.90 (0.73-1.10)	1977 (43.4)	0.92 (0.76-1.12)	1405 (41.7)	0.79 (0.65-0.95)
Stillbirth n (per 1,000)	33504 (19.9)	48899 (9.4)	0.68 (0.31-1.46)	30951 (6.8)	0.53 (0.29-0.98)	63010 (18.7)	1.18 (0.66-2.10)
Preterm birth, n (%)	181393 (10.8)	534269 (10.3)	0.96 (0.90-1.01)	462610 (10.2)	0.96 (0.91-1.02)	326276 (9.7)	0.88 (0.84-0.93)
Cesarean delivery, n (%)	534726 (31.8)	1698570 (32.7)	0.97 (0.93-1.02)	1395022 (30.6)	0.96 (0.91-1.01)	1076158 (31.9)	0.98 (0.93-1.04)

IRR: adjusted for race, ethnicity, insurance, chronic hypertension, and pregestational diabetes (low MFM density as referent).
Abbreviations: IRR (incidence rate ratio); MMR (maternal mortality rate during pregnancy and up to 42 days postpartum); PRM (pregnancy-related mortality, defined as maternal mortality rate during pregnancy and up to 365 days postpartum)

Figure 1. Maternal mortality rate according to the density of maternal-fetal medicine physicians.



Maternal-Fetal Medicine (MFM); MMR (maternal mortality rate per 100,000 live births)
Blue bars represent 95% confidence intervals.
Outputs were obtained from the generalized estimating equations.

11 | Black Maternal Morbidity and its Association with Systemic Racism

Sebastian Z. Ramos; Meghan I. Short; Erika F. Werner; Chloe E. Bird; Ndidiamaka Amutah-Onukagha; Michael B. Siegel
Tufts University School of Medicine, Boston, MAMA

2:00 PM - 2:15 PM

Objective: To explore the relationship between systemic racism and Black maternal morbidity using the Systemic Racism Index (SRI), a county-level measure that captures disparities in incarceration, education, economic status, employment, and segregation in Black versus White populations in the United States.

Study Design: Using CDC Vital Statistics data from 2019-2021, a Composite Adverse Maternal Outcome Score (CAMOS)—which included blood transfusion, ruptured uterus, unplanned hysterectomy, and intensive care unit admission—was calculated for Non-Hispanic Black (NHB) and Non-Hispanic White (NHW) patients. The Systemic Racism Index and its relationship to rates of morbidity in NHB and NHW patients were studied. Mixed-effects logistic regression models were fit, adjusting for individual level clinical factors and county-level community vulnerability using the CDC's Social Vulnerability Index (SVI).

Results: There were 5,703,315 births for which covariates were measured in the 1,181 counties with an SRI score. The CAMOS rate in NHB patients was 7.6 vs 4.9 per 1000 in the NHW population. After adjusting for overall community vulnerability using the Social Vulnerability Index and individual level clinical and demographic factors, there was a 20% increase in CAMOS rate in NHB patients for each standard deviation increase in the SRI factor score (aOR 1.20, 95% CI 1.14, 1.26) and an 11% increase for NHW patients (aOR 1.11, 95% CI 1.06-1.15).

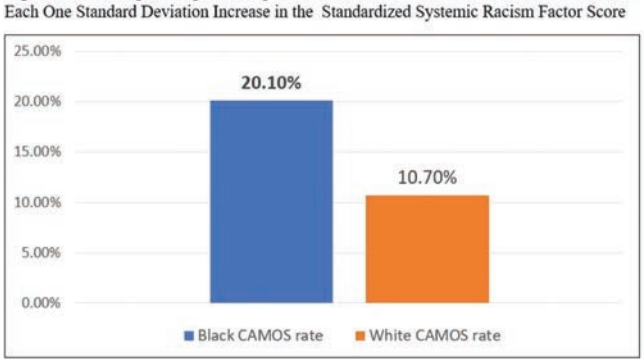
Conclusion: There is a significant relationship between systemic racism, as measured by the Systemic Racism Index, and maternal morbidity disparity in NHB and NHW patients. Even after controlling for individual risk factors and overall community vulnerability, there was a strong correlation between the Systemic Racism Index and maternal morbidity, suggesting a mechanism separate from resource allocation and access to a more deeply entrenched system that perpetuates inequity. These findings underscore the profound impact of systemic racism on maternal health outcomes and highlight the need for addressing structural inequalities to reduce racial disparities in maternal morbidity.

Table 1. Results of Mixed-effects Logistic Regression Analyses Using Random Intercept Modeling to Study the Relationship Between Systemic Racism Factor Scores and Non-Hispanic Black and Non-Hispanic White Composite Adverse Maternal Outcome Score Rates in Counties with > 1000 Black residents, 2019-2021 (N= 5,703,315 births, 1,181 counties)

Outcome Variable	Regressors	Percentage Change in CAMOS risk for Each Standard Deviation Increase in Systemic Racism Factor Score	95% CI	p-value
Black CAMOS rate	Multivariate*	20.1%	14.2% to 26.3%	<0.001
White CAMOS rate	Multivariate*	10.7%	6.3% to 15.3%	<0.001
Individual Level Regressors				
Advanced maternal age (≥35 years)		24.8%	21.0% to 28.7%	<0.001
Nulliparity		1.1%	-1.8% to 4.0%	0.464
Number of prenatal visits		0.56%	0.45% to 0.68%	<0.001
Multiple gestations		142%	130% to 155%	<0.001
TOLAC		16.6%	10.9% to 22.5%	<0.001
SVI		-10.1%	-22.6% to 4.4%	0.162

*Multivariate models control for advanced maternal age, nulliparity, number of prenatal visits, multiple gestations, Trial of Labor After Cesarean (TOLAC), Social Vulnerability Index (SVI)
CAMOS= Composite Adverse Maternal Outcomes Score

Figure 1: Percentage Change in Composite Adverse Maternal Outcome Score (CAMOS) for Each One Standard Deviation Increase in the Standardized Systemic Racism Factor Score

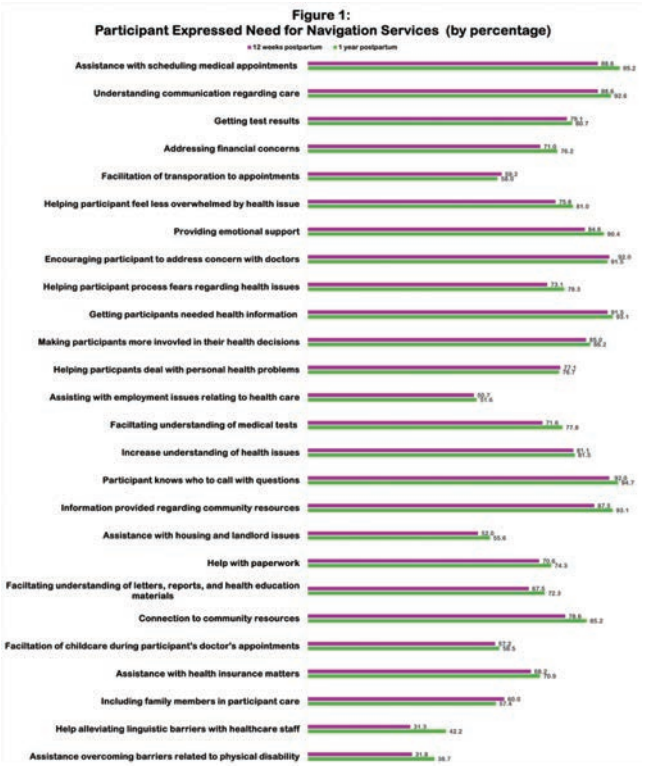


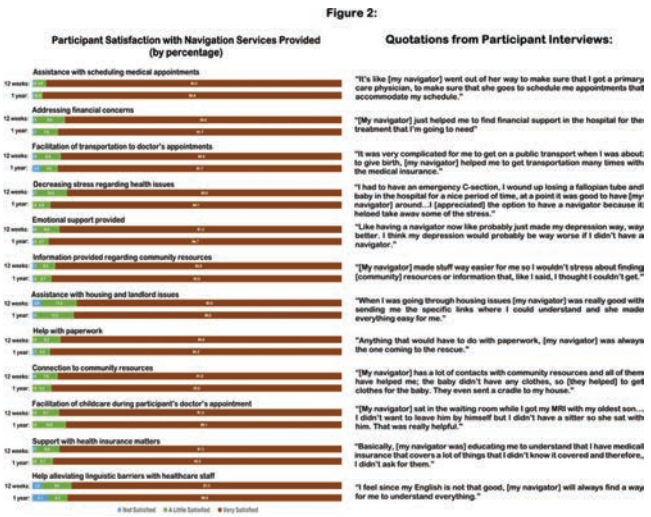
12 | Low-income Birthing Individuals' Need for and Satisfaction with Services in a One-Year Postpartum Navigation Program

Maya J. Daiter[1]; Laura Diaz[1]; Hannah M. Green[1]; Ying Cheung[1]; Viridiana Carmona-Barrera[1]; Brittney R. Williams[1]; Charlotte M. Niznik[1]; Joe M. Feinglass[1]; William A. Grobman[2]; Lynn M. Yee[1]
[1]Northwestern University Feinberg School of Medicine, Chicago, IL; [2]The Ohio State University, Columbus, OH

2:15 PM - 2:30 PM

Objective: Patient navigation seeks to reduce barriers to care and to overcome adverse social determinants of health. Navigating New Motherhood (NNM) is a trial in which low-income individuals are randomized to receive postpartum navigation for one year. We aimed to understand what services were most needed by participants along with satisfaction with the navigation program.
Study Design: This is a mixed methods analysis of data from NNM participants randomized to navigation. All navigated participants completed study visits at 4-12-weeks ("12 weeks") and 11-13 months ("1 year") postpartum. Visits included the 26-item "Patient Satisfaction with Navigation-Logistical (PSN-L)" measure, which queried about services needed and-for those services that were needed–satisfaction with the services received; the PSN-L is scored from -3.31 to +3.43 (higher scores indicate greater satisfaction). A randomly-selected sample of navigated participants also underwent in-depth qualitative interviews at 4-6 and 11-13 months postpartum. Transcripts from both interviews, which were focused on perception and utilization of navigation services, were analyzed via the constant comparative method. Themes were identified using a concurrent triangulation design using survey and interview data.
Results: Of 203 navigated participants, 201 completed the PSN-L at 12 weeks and 189 at 1 year. On nearly every PSN-L item at both time points, >50% of participants indicated need for navigation service, with similar types of needs at both time points (Fig 1). The mean PSN-L scores were 3.13 (SD 0.62) at 12-weeks and 3.14 (SD 0.59) at 1-year postpartum, revealing high satisfaction overall. Similarly, more than 90% of participants reported on the PSN-L that they were "very satisfied" with most domains (20/26 at 12 weeks and 23/26 at 1 year) of navigation services provided. These findings were corroborated by thematic analysis (Fig 2).
Conclusion: While most participants expressed that they needed many services to optimize their health, they reported they were very satisfied with the capacity of patient navigation to address those needs.





13 | Impact of WIC Enrollment on Adverse Maternal and Neonatal Adverse Outcomes in Medicaid Populations

Reetam Ganguli[1]; Stephen Wagner[2]
[1]Elythea, San Jose, CA; [2]Beth Israel Deaconess Medical Center, Boston, MA

2:30 PM - 2:45 PM

Objective: To evaluate the impact of the Women, Infants, and Children (WIC) program enrollment on severe maternal morbidities and neonatal adverse outcomes among pregnant Medicaid recipients from 2018 to 2022.
Study Design: A retrospective cohort study was conducted using data from the CDC National Vital Statistics System to compare maternal and neonatal outcomes between Medicaid-insured pregnant women enrolled in WIC (n = 4,552,866) and

those not enrolled in WIC (n = 2,948,168). Multivariate logistic regression was used to calculate adjusted odds ratios (aORs) with 95% confidence intervals (CIs) for various outcomes, adjusting for age, ethnicity, marital status, education status, and birth order.

Results: Enrollment in WIC was associated with a statistically significant reduction in several adverse outcomes. Women enrolled in WIC had a lower risk of postpartum hemorrhage (aOR 0.93, 95% CI [0.91-0.95], p < 0.001), unplanned hysterectomy (aOR 0.98, 95% CI [0.92-1.05], p = 0.014), and admission to the ICU (aOR 0.86, 95% CI [0.84-0.89], p < 0.001). Neonatal outcomes also improved among WIC participants, with reduced odds of NICU admission (aOR 0.90, 95% CI [0.90-0.91], p < 0.001) and low birth weight (aOR 0.91, 95% CI [0.91-0.92], p < 0.001). Furthermore, WIC enrollment was associated with higher rates of breastfeeding at discharge (aOR 0.84, 95% CI [0.84-0.84], p < 0.001).

Conclusion: Medicaid-insured pregnant women enrolled in the WIC program demonstrated a significantly lower risk of adverse maternal and neonatal outcomes compared to those not enrolled in WIC. Accessible and innovative outreach and engagement strategies to improve WIC enrollment among pregnant Medicaid members may be vital in reducing preventable preterm labor, NICU admissions, low birth weight infants, and severe maternal morbidities among health insurance plans.

Effect of WIC Enrollment on Adverse Maternal and Neonatal Outcomes Across Pregnant Medicaid Women

Sample Sizes: 4,552,866 on WIC and 2,948,168 not on WIC

Outcome	Odds Ratio	95% CI Lower	95% CI Upper	p-value
Severe Postpartum Hemorrhage	0.928574	0.909872	0.94766	<0.001
Unplanned Hysterectomy	0.979955	0.917968	1.046128	0.014
Admission to ICU	0.863404	0.835527	0.892211	<0.001
Maternal Transfer During Labor	0.814999	0.799727	0.830562	<0.001
Admission to NICU	0.904316	0.899979	0.908674	<0.001
Low Birth Weight Infant	0.91139	0.90693	0.915871	<0.001
Infant Breastfed at Discharge	0.840827	0.837702	0.843964	<0.001
Cesarean Section	1.121718	1.118119	1.125328	<0.001

14 | Homicide and Suicide: The Leading Cause of Maternal Death, and How Firearm Legislation Affects It

Hooman A. Azad[1]; Dana Goin[2]; Lisa Nathan[3]; Dena Goffman[1]; Uma M. Reddy[4]; Danielle Laraque-Arena[2]; Mary E. D'Alton[1]
[1]Columbia University Medical Center, New York, NY; [2]Columbia University Mailman School of Public Health, New York, NY; [3]Columbia University Irving Medical Center, New York, NY; [4]Columbia University, New York, NY

2:45 PM - 3:00 PM

Objective: In medical training, the dogma is this: the leading causes of maternal mortality are bleeding, infection, hypertension, and cardiovascular disease. This is only true when violence against women is excluded. We present the leading causes of death in pregnancy, compare violent death rates in pregnant and non-pregnant people, and investigate firearm legislation's association with these deaths.

Study Design: Case-level data on deaths in US women ages 15-44 (2005-2022) were collected using CDC's Limited Mortality File. Cause of death and pregnancy status were identified by *ICD-10* codes. A "pregnancy checkbox" identified additional deaths in pregnancy. We include the first 42 postpartum days in defining "pregnancy," consistent with national definitions.

We present the leading causes of death in pregnancy. We compare violent death rates among pregnant women and non-pregnant controls. A state-level, cross-sectional, ecologic panel study using negative binomial regressions is used to identify associations between domestic violence (DV) firearm laws and violent deaths in pregnancy.

Results: In 18 years, 20,421 pregnant women died. 2,293 were violent deaths (11%); of these, 1,407 (61%) were homicides and 886 (39%) were suicides. 1,261 violent deaths involved firearms (55%). Violence was the most common cause of death in pregnancy (Figure 1A); the incidence doubled from 2005-2022. Violent death was more frequent in pregnant women than non-pregnant controls (3.2 v 1.2 deaths per 100,000 population) (Figure 1B).

DV laws were associated with reductions in homicide and firearm death in pregnancy (range, 17-32%). Laws requiring relinquishment of firearms among DV perpetrators showed the strongest associations with reduced death rates (Table 1).

Conclusion: More pregnant women die from violence than any medical cause in the US, at higher rates than their non-pregnant counterparts. Firearm legislation is associated with fewer deaths, suggesting lethal means restriction may help curb this alarming trend. As maternal mortality rates rise, addressing violence should be a focus of clinicians and policymakers alike.

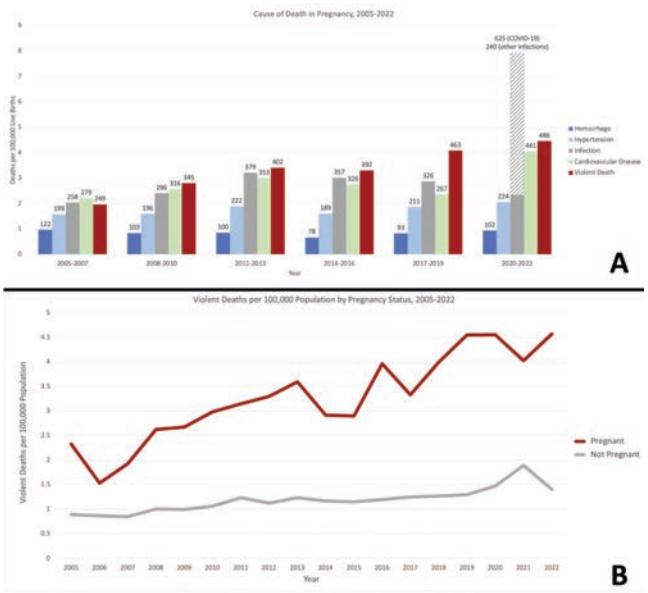


Figure 1: Death rates per 100,000 population are depicted in both panels.
Panel A: Death counts listed above each bar, with 3-year groupings for visual clarity. Covid-19 deaths are depicted separately as a hashed overlay.
Panel B: Population is considered live births for pregnancy and age/sex-specific population for non-pregnant individuals. (*Sources: CDC Natality File, U.S. Census Population Estimates*)

Table 1. Associations between various firearm laws addressing firearm ownership and possession by perpetrators of domestic violence and certain causes of death in pregnancy. Incidence rate ratios and 95% confidence intervals are presented.

		Manner of Death in Pregnancy		
		Violent Death	Homicide	Firearm Death
State-Level Firearm Legislation		IRR [95% CI]		
Misdemeanor Conviction	Ownership Prohibited	0.92 [0.80 - 1.06]	0.88 [0.76 - 1.03]	0.87 [0.74 - 1.03]
	Relinquishment Required	0.88 [0.75 - 1.04]	0.82 [0.67 - 1.01]	0.90 [0.72 - 1.12]
Restraining Order *(spouse/cohabitant only)*	Ownership Prohibited	0.93 [0.81 - 1.07]	0.83 [0.71 - 0.97]*	0.83 [0.70 - 0.97]*
	Relinquishment Required	0.93 [0.80 - 1.07]	0.83 [0.71 - 0.98]*	0.77 [0.65 - 0.92]*
Restraining Order *(any partner)*	Ownership Prohibited	0.86 [0.74 - 1.00]*	0.75 [0.63 - 0.89]*	0.72 [0.60 - 0.87]*
	Relinquishment Required	0.86 [0.71 - 1.04]	0.79 [0.62 - 0.99]*	0.68 [0.53 - 0.88]*
Stalking Offense	Ownership Prohibited	0.89 [0.78 - 1.02]	0.88 [0.76 - 1.02]	0.89 [0.76 - 1.05]
Removal of firearms required by law enforcement responding to domestic violence-related incident		0.77 [0.67 - 0.89]*	0.85 [0.72 - 1.00]*	0.80 [0.67 - 0.95]*

Negative binomial models are used to account for overdispersion. All models control for temporal trends, regional trends, and state-level firearm ownership using a validated proxy (Source: Siegel *et al., Inj. Prev.*, 2014).

*Asterisk and shading demonstrate statistical significance, $p < 0.05$.

15 | Elimination of a Threefold Racial Disparity in Aspirin Recommendation Using Integrated Clinical Decision Support

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3:00 PM - 3:15 PM

Objective: Low dose aspirin (LDA) for preeclampsia prevention is under-prescribed and Black pregnant people are disproportionately affected. Clinical decision support (CDS) embedded in the electronic health record (EHR) has been shown to improve compliance. The aim of this study was to evaluate whether the presence of a CDS tool (1) increased recommendation of LDA and (2) reduced the racial disparity.

Study Design: We performed a pre/post implementation study comparing two time periods: Oct 2019-Mar 2020 and Oct 2023-Mar 2024; parallel months were chosen to limit seasonal changes. We used manual chart review to assess patient factors (Table 1) and to identify LDA recommendation. Our primary outcome was the rate of LDA recommendation (documented discussion or order placed). We assessed rates of hypertensive disorders of pregnancy, obstetric and neonatal outcomes, and performed subgroup analysis for Black patients to determine whether there were differences in LDA recommendation.

Results: There were 677 patients in the pre-CDS and 649 in the post-CDS period; similar proportions met criteria to receive LDA (Table). A significantly greater proportion received LDA after the implementation of the CDS (pre-23.5%; post-78.1% p = < .0001) (Figure).

In the pre-CDS period, Black race was associated with even fewer recommendations (Black [10.4%] vs. non-Black [26.5%] p = 0.02). After implementation of the CDS, the racial disparity was eliminated (Black [82.1%] vs. non-Black [77.6%]), p = 0.54).

There were no differences in the rates of hypertensive disorders of pregnancy, obstetric or neonatal outcomes.

Despite CDS triggering for only 109 (40%) of those who met criteria, the LDA use increased for all meeting criteria (even those for whom the CDS did not trigger, e.g., a patient already on LDA).

Conclusion: The use of CDS for LDA prophylaxis tripled LDA use, eliminated a threefold racial disparity, did not increase adverse outcomes, and increased LDA use even for those for whom the CDS did not trigger. This suggests physician learning and behavior change contributed to increased compliance in addition to the CDS.

Figure 1: Implementation of clinical decision support (CDS) resulted in a significant increase in aspirin use and eliminated the racial disparity in recommendation.

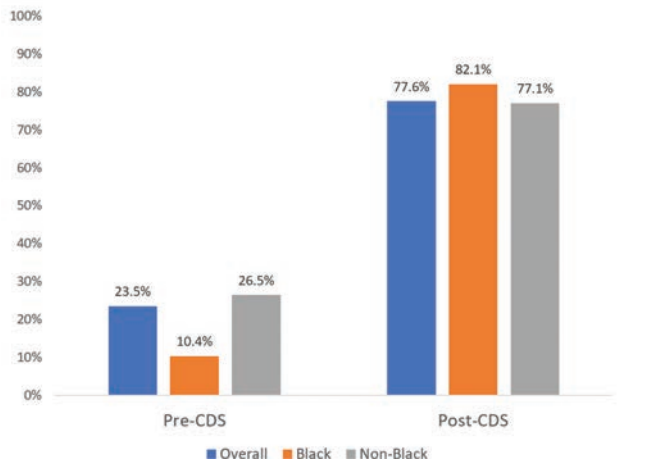

Table 1: Patient characteristics, obstetric, and neonatal outcomes in the pre- and post-implementation time periods among those for whom aspirin was indicated.

	Pre-CDS (n = 263)	Post-CDS (n = 277)	P
Demographics			
Age	36 (33-38)	36 (34-38)	0.09
Nulliparity	177 (67.3%)	186 (67.2%)	0.97
BMI >= 30	81 (30.8%)	91 (33.0%)	0.59
Race and ethnicity			0.07
White	108 (41.2%)	125 (45.1%)	
Hispanic	50 (19.1%)	62 (22.4%)	
Asian	43 (16.4%)	43 (15.5%)	
Black	48 (18.3%)	28 (10.1%)	
Other	13 (5.0%)	19 (6.7%)	
Multifetal gestation	5 (1.9%)	4 (1.44)	0.77
Chronic hypertension	42 (16.0%)	26 (9.4%)	0.02
Diabetes	5 (1.9%)	8 (2.9%)	0.45
Renal disease	1 (0.4%)	1 (0.4%)	0.76
Autoimmune disease	7 (2.7%)	14 (5.1%)	0.15
Family history of preeclampsia	1 (0.4%)	3 (1.1%)	0.34
Low socioeconomic status	50 (19.0%)	33 (12.0%)	0.02
Personal risk factors (low birthweight, small for gestational age, previous adverse pregnancy outcome, >10-year pregnancy interval)	9 (3.4%)	38 (13.7%)	<0.0001
Aspirin Outcomes			
Met Criteria for low-dose aspirin	263 / 677 (38.8%)	277 / 649 (42.7%)	0.16
Aspirin recommended or received	**62 (23.6%)**	**215 (77.6%)**	**<0.0001**
Outcomes			
Gestational age at delivery	39 (38.3-39.9)	39 (38.4-39.7)	0.19
Gestational Hypertension	28(10.6%)	29(10.5%)	0.96
Preeclampsia	33 (12.6%)	42 (15.2%)	0.37
Preeclampsia with severe features	21 (8%)	32 (11.5%)	0.24
Spontaneous preterm birth	2 (0.8%)	4 (1.5%)	0.44
Stillbirth	1 (0.4%)	1 (0.4%)	0.97
Small for gestational age	25 (9.6%)	37 (13.9%)	0.27
NICU Admission	34 (12.9%)	44 (15.9%)	0.33
Third trimester bleeding	0 (0%)	3 (1.1%)	0.13
Placental abruption	0 (0%)	2 (0.7%)	0.26

Values are n (%) or median (IQR)

16 | Severe Maternal Morbidity Differences by State Medicaid Expansion and Abortion Coverage: National Database Analysis, 2014-2022

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Washington University, St. Louis, MO

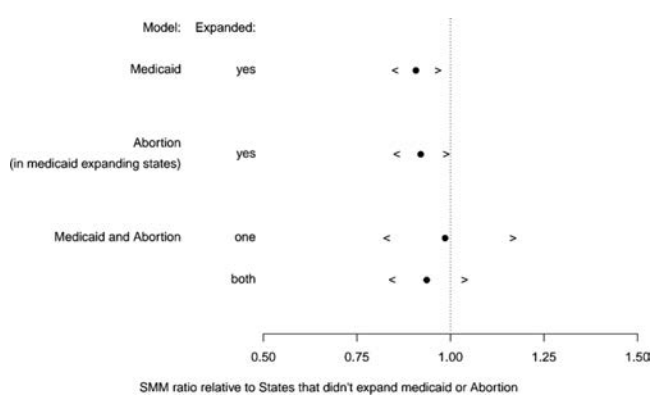
3:15 PM - 3:30 PM

Objective: The objective of this study was to compare the rate of severe maternal morbidity (SMM) state by state stratified by whether that state's Medicaid 1) underwent expansion under the Affordable Care Act (ACA) and 2) had coverage of abortion care beyond Hyde requirements.

Study Design: This was a retrospective cohort study using data on state level SMM rates (reported per 10,000 in-hospital deliveries) from 2014–2022 using the publicly available Healthcare Cost and Utilization Project (HCUP) Fast Stats dataset. We used a negative binomial generalized linear model to analyze SMM as a function of year and state with separate analysis by Medicaid expansion under the ACA and state Medicaid coverage of abortion care beyond Hyde requirements. Categorization of states was based on Kaiser Family Foundation designation.

Results: The rate of SMM was significantly reduced in states expanding Medicaid (0.907, 95% CI 0.852-0.967). Among the states that expanded Medicaid, the rate of SMM was further reduced in states that also expanded abortion coverage (0.920, 95% CI 0.856-0.988). When SMM was modeled as a function of state, year, and Medicaid/abortion expansion (i.e. neither, one, or both), we saw a decrease in SMM for expanding either Medicaid or abortion (0.985, 95% CI 0.829-1.16) and a larger decrease for expanding both (0.936, 95% CI 0.844-1.038), though neither trend reached significance.

Conclusion: The rate of SMM was significantly reduced in states that expanded Medicaid under the ACA compared to states that did not. Medicaid expanded states that additionally provided abortion coverage under Medicaid saw further reductions in the rate of SMM. When modeled simultaneously, Medicaid expansion and abortion expansion both trend towards decreased SMM, with expansion of both showing the largest decrease, although this did not reach significance in this data set. These findings add to growing literature that national policies like abortion restriction and Medicaid expansion significantly impact maternal health outcomes.



17 | Elevated Micro- and Nanoplastics Detected in Preterm Human Placentae

Enrico R. Barrozo[1]; Marcus A. Garcia[2]; Michael D. Jochum, Jr.[1]; Rui Liu[2]; Alex Nihart[2]; Eliseo Castillo[2]; Eliane El Hayek[2]; Jorge Gonzalez-Estrella[3]; Lori Showalter[1]; Cynthia Shope[1]; Melissa A. Suter[1]; Matthew J. Campen[2]; Kjersti M. Aagaard[4]
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3:30 PM - 3:45 PM

Objective: We and others recently demonstrated the widespread presence of micro- and nanoplastics (MNPs) in the environment and their documented absorption by humans, with deposition and bioaccumulation in the placenta. In the current study, we aimed to test the hypothesis that placental MNP concentrations and species differ between term and preterm birth.

Study Design: We analyzed human placentae collected at term (n = 100) and preterm (< 37 weeks gestation; n = 75). Placental specimens were subjected to pyrolysis-gas chromatography/mass spectrometry (Py-GC/MS) to quantify twelve types of MNPs: polyethylene (PE), polypropylene (PP), acrylonitrile butadiene styrene (ABS), styrene-butadiene rubber (SBR), polymethyl methacrylate (PMMA), polycarbonate (PC), polyvinyl chloride (PVC), polyurethane (PU), polyethylene terephthalate (PET), nylon 6 (N6), and nylon 66 (N66). For rigor & reproducibility, duplicate specimens were run & quantified relative to standards.

Results: Highly sensitive Py-GC/MS demonstrated significantly higher levels of PC, PVC & N66 MNPs in preterm placentae compared to term (Fig 1A; q = 0.002, 0.006, 0.013, respectively, by mixed-effects model with Sidak's multiple corrections). Moreover, despite shorter gestations, cumulative MNP concentrations were higher in preterm placentae (Fig 1B; preterm mean 203.0 μg/g tissue ± 19.41 SEM vs term mean 129.8 μg/g tissue ± 14.16 SEM, p< 0.0001 Mann-Whitney). Stratified analyses showed significant differences by fetal sex (Fig 1C) and race/ethnicity (Fig 2A) (q< 0.05), and a significant correlation between social deprivation indices (SDI) and MNP levels (Fig 2B). Total MNP levels in placentae were 121.9 times higher than those reported in human blood (p< 0.0001 Mann-Whitney).

Conclusion: Our findings suggest that MNPs accumulate in placentae from preterm births. Given the established link between MNPs and inflammation, we speculate that MNP bioaccumulation may play a role in modulating inflammatory preterm birth. These novel findings underscore the importance of prioritizing mechanistic studies to explore how MNPs impact fetal development and pregnancy outcomes.

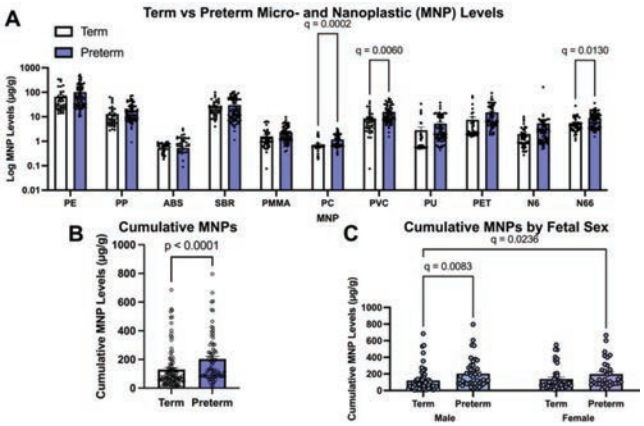

Figure 1. Despite shorter gestations, MNPs significantly bioaccumulate in placentae from preterm deliveries. Human placentae delivered at term (n=100) or preterm (n=75) were analyzed by Py-GC/MS to quantify 12 MNPs species. **A,** MNP data stratified by delivery group and visualizing all MNP types. Significance was determined by mixed-effects models with Sidak's multiple corrections test defined by an adjusted p-value (q) < 0.05. **B,** Cumulative MNPs per placenta stratified by term versus preterm. Significance was determined by Mann-Whitney test comparing ranks defined as p < 0.05. **C,** Cumulative MNPs stratified by fetal sex and term or preterm.

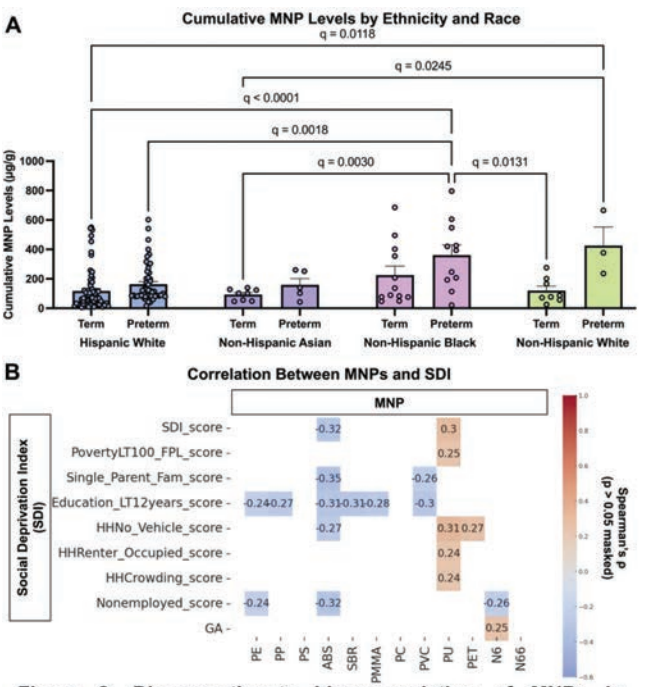

Figure 2. Disproportionate bioaccumulation of MNPs in placentae from preterm and term births in association with social deprivation indices (SDI). A, Cumulative MNP levels were compared by term versus preterm and stratified by ethnicity and race. Significance was determined by mixed-effects models with Sidak's multiple corrections test defined by q < 0.05. **B,** SDI was determined by Zip Code at delivery and compared to MNP levels by Spearson's correlation analysis. Insignificant comparisons (p > 0.05 were masked for clarity.

18 | Severe Maternal Morbidity among Asian and Pacific Islander Parturients in a Contemporary Northern California Cohort

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[2]Kaiser-Permanente Northern California, Pleasanton, CA

3:45 PM - 4:00 PM

Objective: To compare rates and types of severe maternal morbidity (SMM) among Asian, Native Hawaiian/Pacific Islander (NHPI), and White pregnant individuals in a large integrated health care delivery system.

Study Design: Retrospective cohort study of singleton gestations delivered ≥ 20 weeks in Kaiser Permanente Northern California (KPNC) 2009-2019, self-identified as Asian, NHPI or White. SMM was defined as presence at least 1 of 21 indicators per CDC criteria. Maternal characteristics at time of entry to prenatal care and obstetric comorbidities were compared between groups with White as the referent group. Absolute rates (cases per 10,000 births) of SMM and each SMM indicator at delivery hospitalization were compared between groups using chi-square statistics and logistic regression to estimate the adjusted relative risks for Asian and NHPI relative to the White subgroup.

Results: Among the 164,530 singleton deliveries analyzed, groups significantly differed in all maternal characteristics and obstetric comorbidities. NHPI patients were more likely to have higher rates of chronic and gestational hypertension, preeclampsia and pregestational diabetes (Table 1). SMM rates at delivery were significantly higher for NHPI (284/10,000) and Asian (258/10,000) subgroups than for the White referent group (p< 0.001,Table 2). Rates of SMM indicators differed between groups with higher rates of eclampsia, pulmonary edema/heart failure, shock, hysterectomy and blood products transfusion among NHPI; and higher rates of sepsis and DIC among Asian patients compared to White patients (all indicators p< 0.005, Table 2). Adjusting for covariates, the risk of SMM was higher for NHPI (RR 1.6; 95% CI 1.22-2.1) and Asian (RR 1.41; 95% CI 1.31-1.51) groups compared to the White referent group.

Conclusion: In this large cohort of NHPI, Asian and White patients, risk of SMM was highest for NHPI. Differences in rates of absolute SMM and SMM indicators were significant between groups highlighting the importance of disaggregating them in research and clinical settings to tailor care and reduce the disproportionately high rates of SMM.

Table 1: Pregnancy Characteristics; Clinical and Socio-Demographic of all Deliveries among Asian, NHPI, and White Individuals at Kaiser Permanente Northern California 2009-2019

Maternal Characteristics, n (column %)	All N=164,530	Asian N=66,090 (40.2%)	NHPI N=1,972 (1.2%)	White (referent) N=96,468 (58.6%)	P value
Age at delivery categories					<.0001
18-25 y	19,482 (11.8)	4,843 (7.3)	412 (20.9)	14,227 (14.7)	
26-30 y	51,766 (31.5)	20,682 (31.3)	659 (33.4)	30,425 (31.5)	
31-35 y	61,617 (37.5)	26,994 (40.8)	577 (29.3)	34,046 (35.3)	
36-40 y	26,845 (16.3)	11,579 (17.5)	269 (13.6)	14,997 (15.5)	
Prenatal parity					<.0001
Nulliparous (0 births)	100,651 (61.2)	39,337 (59.5)	1,017 (51.6)	60,297 (62.5)	
Primiparous (1 birth)	43,472 (26.4)	19,181 (29.0)	500 (25.4)	23,791 (24.7)	
Biparous (2 births)	14,500 (8.8)	5,542 (8.4)	266 (13.5)	8,692 (9.0)	
Multiparous (3 or more births)	5,907 (3.6)	2,030 (3.1)	189 (9.6)	3,688 (3.8)	
Chronic Hypertension	7,946 (4.8)	2,680 (4.1)	127 (6.4)	5,139 (5.3)	<.0001
Hypertensive disorders of pregnancy					<.0001
Preeclampsia	9,221 (5.6)	3,634 (5.5)	151 (7.7)	5,436 (5.6)	
Gestational hypertension	7,621 (4.6)	2,222 (3.4)	106 (5.4)	5,293 (5.5)	
Diabetes status, n (%)					<.0001
Pregestational diabetes	1,229 (0.7)	582 (0.9)	43 (2.2)	604 (0.6)	
Gestational diabetes	20,197 (12.3)	12,269 (18.6)	336 (17.0)	7,592 (7.9)	
Pre-pregnancy BMI					<.0001
Obesity class I (30-34.9)	16,232 (9.9)	4,656 (7.1)	338 (17.4)	11,238 (11.7)	
Obesity class II (35-39.9)	6,778 (4.1)	1,304 (2.0)	214 (11.0)	5,260 (5.5)	
Obesity class III (≥40)	3,980 (2.4)	395 (0.6)	141 (7.2)	3,444 (3.6)	
Neighborhood deprivation index (NDI)					<.0001
>0 and ≤1	35,255 (21.5)	13,040 (19.8)	631 (32.1)	21,584 (22.4)	
>1 (most deprived)	11,079 (6.7)	5,515 (8.4)	328 (16.7)	5,236 (5.4)	

Table 2: Overall Rates and Adjusted Risk of SMM and Rates of Specific Indicators at Delivery Hospitalization by Race and Ethnicity

	SMM at Delivery Hospitalization 2009-2019			
	Asian N=66,090 (40.2%)	NHPI N=1,972 (1.2%)	White N=96,468 (58.6%)	p-value
SMM	N (rate per 10,000 births)			
Overall severe maternal morbidity	1,705 (258.0)	56 (284.0)	1,809 (187.5)	<.0001
Adjusted* RR (95% CI)	**1.41 (1.31-1.51)**	**1.6 (1.22- 2.1)**	**Referent**	-
Specific SMM indicators,	N (rate per 10,000 births)			
Adult respiratory distress syndrome	54 (8.2)	1 (5.1)	38 (3.9)	0.002
Disseminated intravascular coagulation	309 (46.8)	4 (20.3)	372 (38.6)	0.014
Eclampsia	104 (15.7)	7 (35.5)	130 (13.5)	0.026
Ischemic stroke	18 (2.7)	0 (0.0)	10 (1.0)	0.0318
Pulmonary edema / Acute heart failure	65 (9.8)	2 (10.1)	50 (5.2)	0.002
Sepsis	299 (45.2)	5 (25.4)	229 (23.7)	<.001
Shock	41 (6.2)	3 (15.2)	26 (2.7)	<0.001
Air & thrombotic embolism	41 (6.2)	0 (0.0)	29 (3.0)	0.006
Blood products transfusion	928 (140.4)	34 (172.4)	907 (94.0)	<.001
Hysterectomy	92 (13.9)	4 (20.3)	49 (5.1)	<.001

* Adjusted for parity, age, pre-pregnancy BMI, diabetes status, smoking status, neighborhood deprivation index, government health insurance and English as primary language

Oral Concurrent Session 2

Clinical Obstetrics and Quality

Abstracts 19 – 28

THURSDAY
January 30, 2025
1:30 PM – 4:00 PM
Aurora Ballroom B

MODERATORS
Peter S. Bernstein, MD, MPH
Manisha Gandhi, MD

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Concurrent Session 2 – Clinical Obstetrics and Quality

Thursday, January 30, 2025 1:30 PM – 4:00 PM

19 | Aberrant Fetal Growth in ARRIVE Trial

Bonnie L. Hermann[1]; Cassidy A. O'Sullivan[2]; Fabrizio Zullo[3]; Suneet Chauhan[4]; Hector M. Mendez-Figueroa[5]; On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units (MFMU) Network

[1]UTHealth Houston, Houston, TX; [2]Christiana Care Health System, Newark, DE; [3]University of Rome La Sapienza, Rome, Lazio; [4]Christiana Care, Newark, DE; [5]McGovern Medical School at UTHealth, Houston, TX

1:30 PM - 1:45 PM

Objective: The primary objective was to compare the rate of cesarean delivery (CD) among individuals with newborns with aberrant growth (i.e. small- or large-for gestational age; SGA or LGA) who were induced versus expectantly managed in the ARRIVE trial. The secondary objectives were to compare the rate of hypertensive disorders of pregnancy (HDP), composite neonatal and maternal adverse outcome (CNAO, CMAO). We hypothesized that the rate of CD would be lower among those with newborns with aberrant growth who were induced versus those expectantly managed.

Study Design: A secondary analysis of the ARRIVE trial was performed, with the inclusion criteria of known gestational age and birthweight (BW). Newborns were classified as SGA (BW < 10%) or LGA (BW > 90%), using the nomogram by Alexander et al. CNAO and CMAO are defined in the Table. Relative risks (RR), 95% confidence intervals (CI) and number needed to treat (NNT) were calculated.

Results: The rate of aberrant growth was 14.0% (430/3,059) in the induced group and 13.9% (423/3,037) in the expectantly managed group (p = 0.17). CD rate among those with SGA or LGA newborns was significantly lower for those induced (21.6%) vs those expectantly managed (28.6%; RR 0.75, 95% CI 0.58-0.99). HDP also differed significantly between the two groups (9.7% vs 16.8%; RR 0.58; 95% CI 0.40-0.85).The NNT for induction to decrease the rate of CD and HDP among SGA or LGA was 14. The rate of CNAO was similar among the two groups: 7.2% in the induced vs. 7.7% in the expectantly managed group. Likewise, the CMAO—22.6% in the induced group versus 22.3% in the expectantly managed group—did not differ between the groups (p = 0.91; Table).

Conclusion: Among low-risk pregnancies with either SGA or LGA, induction at 39 weeks, compared to expectant management, was associated with 25% reduction in the rate of cesarean delivery and 42% reduction in hypertensive disorder, albeit with no difference in composite neonatal or maternal adverse outcomes. This finding provides support for induction of labor at 39 weeks especially for individuals with suspected neonatal aberrant growth.

Table 1. Aberrant growth among induced versus expectantly managed in ARRIVE Trial

	SGA/LGA & Induced (N=430)	SGA/LGA & Expectant Mx (N=423)	P Value	Relative Risk (95% CI)
Cesarean delivery	93 (21.6)	121 (28.6)	**0.02**	**0.75 (0.58–0.99)**
Hypertensive disorder of pregnancy	42 (9.7)	71 (16.8)	**0.01**	**0.58 (0.40–0.85)**
Aberrant growth				
SGA	284 (66.1)	248 (58.6)	0.17	1.12 (0.95-1.33)
LGA	146 (33.9)	175 (41.4)		
Composite neonatal adverse outcomes	31 (7.2)	33 (7.7)	0.77	0.93 (0.57-1.52)
Apgar score < 7 at 5 min	11 (2.6)	12 (2.8)		
Respiratory support~	15 (3.5)	21 (4.9)		
Hypoxic ischemic encephalopathy	1 (0.2)	2 (0.5)		
Neonatal seizure	0 (0)	0 (0)		
Confirmed pneumonia	2 (0.5)	4 (0.9)		
Sepsis	1 (0.2)	0 (0)		
Birth trauma*	7 (1.6)	6 (1.4)		
Hypotension requiring pressor support	1 (0.2)	0 (0)		
Composite maternal adverse outcomes	98 (22.6)	96 (22.3)	0.91	1.01 (0.76-1.34)
Chorioamnionitis	66 (15.4)	62 (14.7)		
3rd or 4th degree laceration	18 (7.9)	15 (7.7)		
Postpartum hemorrhage	21 (4.9)	20 (4.7)		
Incisional extensions at cesarean	3 (3.3)	4 (3.4)		
Postpartum infection	8 (1.9)	9 (2.1)		
Venous thromboembolism	0 (0)	1 (0.2)		
Admission to intensive care unit	0 (0)	2 (0.5)		

Data presented as N (%)
SGA, small for gestational age (birthweight < 10th percentile for gestational age); LGA, large for gestational age (birthweight > 90th percentile for gestational age); Mx, management; RR, relative risk; CI, confidence intervals
~Consistent of any of the following: Mechanical ventilation, continuous positive airway pressure or high flow nasal cannula, cardiorespiratory resuscitation
*Consisted of any of the following: clavicular, skull or other fracture, brachial plexus palsy, other neurologic injury, facial nerve palsy retinal hemorrhage
Bolded if significantly different

20 | Decreased Neuraxial Morphine Dose to Reduce Opioid Side Effects and use After Cesarean Delivery RCT

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[1]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL; [2]University of Alabama at Birmingham, Birmingham, AL; [3]Maternal Fetal Consultants of Houston, Houston, TX; [4]West Virginia University, Morgantown, WV

1:45 PM - 2:00 PM

Objective: 1 in 300 opioid naive women become persistent opioid users after cesarean delivery (CD). Regional anesthesia with neuraxial morphine (NM) reduces opioid consumption after surgery. However, >70% of patients have pruritus or urinary retention with the standard 150mcg NM dose. We assessed if reduced NM dose decreases opioid side effects while preserving pain control at CD.

Study Design: RCT of 85 patients undergoing scheduled CD at a US tertiary center. Exclusion criteria were quadratus lumborum (QL) block refusal, preeclampsia, insulin-treated diabetes, placental abnormalities or opioid use disorder. Primary exposure was NM dose. The intervention was 50 mcg NM, bilateral ultrasound-guided QL block, spinal 12 mg bupivacaine and 15mcg fentanyl. The control group received 150 mcg NM and adjunctive therapies above. Scheduled acetaminophen/NSAIDS and additional opioid therapy for breakthrough pain were available for both groups. Primary outcomes were opioid use 24hours prior to discharge and opioid side effects (recorded medications or urinary retention). Regression models estimated risk ratios/differences for outcomes between groups. Analyses were intent to treat.

Results: Of 85 eligible patients, 43(50.6%) were randomized to 50mcg NM and 42(49.4%) to 150mcg NM. The mean age and BMI were 30.3 ± 5.6yrs and 36.0 ± 8.1kg/m^2, and >95% had a low transverse hysterotomy. There were no significant differences in baseline characteristics between groups. Lower NM dose did not significantly reduce opioid side effects (itching RR 0.55, 95% CI 0.27-1.10; nausea/vomiting RR 0.90, 95% CI 0.45-1.80), or use 24 hours prior to discharge (RD -1.63, 95% CI -8.47-5.21). Among secondary outcomes, total OMEs were similar between groups. However, intervention group had higher OMEs for parenteral opioids and in the first 24hours, as well as higher recovery room and day of surgery pain scores. No significant differences in other secondary outcomes were noted.

Conclusion: Lower NM dose was not associated with significant reductions in opioid side effects or use 24hours prior to discharge.

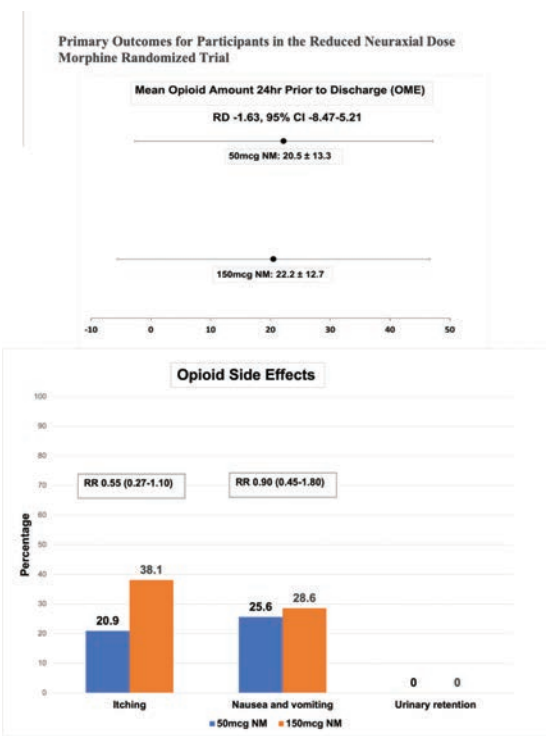

Table: Secondary Outcomes for Participants in the Reduced Neuraxial Dose Morphine Randomized Trial

	50mcg NM + QL	150mcg NM + QL	RD/RR (95% CI)
Total OME	88.4 ± 77.3	81.96 ± 81.9	6.45 (-27.89,40.80)
First 24hrs	29.1 ± 26.6	16.61 ± 21.2	12.51 (2.11,22.91)*
Day 1	31.7 ± 25.3	25.71 ± 24.0	6.03 (-4.61,16.67)
Day 2	19.0 ± 22.0	25.36 ± 27.7	-6.35 (-17.11,4.42)
Day 3	8.6 ± 16.9	14.29 ± 21.4	-5.74 (-14.05,2.57)
Oral- Oxycodone/ Hydrocodone	71.7 ± 65.3	73.93 ± 74.1	-2.24 (-32.35,27.87)
IV- Dilaudid/ Morphine/ Fentanyl	16.7 ± 18.7	8.04 ± 13.3	8.70 (1.67,15.72)*
Average Pain score (0-10)	2.5 ± 1.7	1.96 ± 1.5	0.54 (-0.17,1.24)
PACU	2.1 ± 2.2	0.95 ± 1.4	1.15 (0.34,1.96)*
POD0	2.4 ± 1.8	1.58 ± 1.5	0.80 (0.08,1.52)*
POD1	2.7 ± 2.0	2.90 ± 2.1	-0.24 (-1.14,0.66)
48-72	2.8 ± 2.4	2.41 ± 1.9	0.34 (-0.67,1.36)
Length of indwelling urinary catheter after cesarean delivery (hours)	11.6 ± 5.4	11.31 ± 5.3	0.31 (-2.60,3.21)
Time to ambulation	10.88 ± 5.26	9.93 ± 5.6	0.95 (-1.45,3.35)
Hours to Clears	2.95 ± 1.11	3.03 ± 1.1	-0.08 (-0.58,0.42)
Hours to solid food	8.86 ± 8.11	7.20 ± 5.5	1.66 (-3.60,6.91)
Time to PACU clearance (hours)	1.81 ± 0.96	2.13 ± 0.94	-0.32 (-0.76,0.11)
Readmission	7 (16.3%)	5 (11.9%)	1.37 (0.47,3.97)
NICU admission	16 (37.2%)	13 (31.0%)	1.20 (0.66,2.18)
Non-opioid medication			
Ibuprofen (mg)	5985.0 ± 1784.5	6486.5 ± 1684.3	-501.49 (-1290.80,287.83)
Acetaminophen (mg)	7256.2 ± 1776.7	7792.3 ± 1787.2	-536.06 (-1334.53,262.41)
Ketorolac (mg)	50.0 ± 14.3	51.9 ± 14.5	-1.94 (-8.58, 4.69)
Maximum Pain score (0-10)	7.2 ± 2.3	7.0 ± 2.7	0.29 (-0.82, 1.41)
First 24hrs	6.0 ± 3.0	4.6 ± 3.4	1.43 (-0.01, 2.86)
Day 1	6.4 ± 2.7	6.4 ± 2.7	-0.01 (-1.21, 1.19)
Day 2	5.6 ± 3.5	6.2 ± 3.3	-0.55 (-2.14,1.04)
Day 3	4.6 ± 4.0	5.5 ± 3.3	-0.85 (-3.03,1.33)

Data are N(%) or Mean ±SD; OME- Oral morphine equivalent; QL- Quadratus Lumborum Block; NM – Neuraxial Morphine; PACU- Post anesthesia care unit; RR- Relative risk; RD- Risk difference; CI- Confidence intervals; *p<0.05; Opioid side effect medication therapy- itching [diphenhydramine/ nalbuphine], nausea and vomiting [promethazine/ondansetron]; 6 (7.1%) patients were treated contrary to NM dose assignment.

21 | Proportion of Time Spent in Category II Fetal Heart Tracing During Labor: Associated Adverse Outcomes

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2:00 PM - 2:15 PM

Objective: To ascertain if the proportion of time spent in Category II fetal heart rate tracing (FHRT) among singleton term (≥ 37 wks) laboring patients was associated with adverse outcomes.

Study Design: Obstetricians—blinded to maternal characteristics and outcomes—reviewed the available FHRT (120 minutes before delivery, at 20 min segments) for all deliveries within a 15-month period. Term, non-anomalous, singleton pregnancies who attempted labor were included. We excluded those that only had persistent category I or any segment with category III. Cohort was divided into 3 groups: Category II for < 33% of the time (Group 1), for 33-66% of the time (Group 2), and > 66% of the time (Group 3). The primary outcome was the rate of composite neonatal adverse outcomes (CNAO); the secondary outcomes were cesarean delivery (CD) for non-reassuring FHRT and

composite maternal adverse outcomes (CMAO). Adjusted odds ratio (OR) with 95% confidence intervals (CI) were calculated.!

Results: Among the 5,160 consecutive deliveries, 2,780 (54%) met the inclusion criteria. Of the 321,980 min of FHRT reviewed, 223,000 min (69%) were category II. Specifically, 10% were in Group 1, 26% in Group 2, and 64% in Group 3. Characteristics of FHRT which differed among the 3 groups were frequency of minimal variability, as well as variable, late and prolonged decelerations (Table 1). CD for non-reassuring FHRT differed significantly between the groups ($p < 0.01$). The rate of CNAO did not differ among the groups ($p = 0.72$), however the CMAO differed significantly ($p = 0.02$). Adjusted OR comparing category II for Group 1 vs. Group 2 and for Group 1 vs. Group 3 indicated that CD for NR-FHRT, CNAO and CMAO did not differ significantly among the groups (Table 2).

Conclusion: Among term deliveries, the majority of FHRTs are category II for over two-thirds of the total time during the last 120 min of labor. The proportion of time fetal heart rate tracing was in category II did not significantly influence cesarean delivery for non-reassuring tracing and adverse outcomes for the neonatal-maternal dyad.

Table 1. Characteristics of category II fetal heart rate tracing

	Category II FHRT < 33%* (Group 1) (N=275)				Category II FHRT 33-66%%* (Group 2) (N=727)				Category FHRT II > 66%%* (Group 3) (N=1,778)			
	N	%	95% CI		N	%	95% CI		N	%	95% CI	
Baseline												
Normal	272	98.9%	97.7%	100.0%	719	98.9%	98.1%	99.7%	1,737	97.7%	97.0%	98.4%
Tachycardia	25	9.1%	5.7%	12.5%	81	11.1%	8.9%	13.4%	239	13.4%	11.9%	15.0%
Variability												
Marked	5	1.8%	0.2%	3.4%	13	1.8%	0.8%	2.8%	79	**4.4%**	**3.5%**	**5.4%**
Moderate	275	100.0%	100.0%	100.0%	727	100.0%	100.0%	100.0%	1,647	**92.6%**	**91.4%**	**93.8%**
Minimal	38	13.8%	9.7%	17.9%	174	**23.9%**	**20.8%**	**27.0%**	730	**41.1%**	**38.8%**	**43.3%**
Absent	10	3.6%	1.4%	5.8%	20	2.8%	1.6%	3.9%	35	2.0%	1.3%	2.6%
Decelerations												
Early	56	20.4%	15.6%	25.1%	221	**30.4%**	**27.1%**	**33.7%**	406	22.8%	20.9%	24.8%
Variable	163	59.3%	53.5%	65.1%	606	**83.4%**	**80.6%**	**86.1%**	1,668	**93.8%**	**92.7%**	**94.9%**
Late	82	29.8%	24.4%	35.2%	371	**51.0%**	**47.4%**	**54.7%**	1,225	**68.9%**	**66.7%**	**71.0%**
Prolonged	96	34.9%	29.3%	40.5%	364	**50.1%**	**46.4%**	**53.7%**	1,121	**63.0%**	**60.8%**	**65.3%**

Data presented as N (%)
*During the last 20-120 min of fetal heart rate tracing, the duration it was in category II
Percentages reported as percentage of column
CI, confidence intervals; FHRT, fetal heart rate tracing (interpreted by obstetricians—blinded to the outcomes—as described in ACOG Practice Bulletins # 106 and # 116)
Bolded if the 95% CI are non-overlapping (compared to category II FHRT <33%)

Table 2. Category II fetal heart rate tracing among parturients with singletons at ≥ 37 weeks

	Category II < 33%* (Group 1) (N=275)	Category II 33-66%* (Group 2) (N=727)	Comparison of Groups 1 vs. 2 aOR[1] (95% CI)	Category II > 66%* (Group 3) (N=1,778)	Comparison of Groups 1 vs. 3 aOR[1] (95% CI)
Cesarean delivery for NR FHRT	21 (7.6%)	53 (7.3%)	0.86 (0.51 – 1.47)	196 (11.0%)	1.18 (0.73 – 1.91)
Composite neonatal adverse outcomes	4 (1.5%)	12 (1.7%)	1.11 (0.35-3.48)	22 (1.2%)	0.80 (0.27-2.35)
Apgar score < 7 at 5 min	1 (0.4%)	8 (1.1%)		16 (0.9%)	
Mechanical ventilation	0 (0.0%)	1 (0.1%)		1 (0.1%)	
Hypoxic ischemic encephalopathy	0 (0.0%)	2 (0.3%)		5 (0.3%)	
Neonatal seizure	0 (0.0%)	0 (0.0%)		4 (0.2%)	
Confirmed sepsis	3 (1.1%)	4 (0.6%)		5 (0.3%)	
Neonatal death	0 (0.0%)	1 (0.6%)		0 (0.0%)	
Composite maternal adverse outcomes	37 (13.5%)	109 (15.0%)	1.06 (0.71-1.60)	333 (18.7%)	1.25 (0.86-1.82)
Estimate blood loss ≥ 1,000 mL	13 (4.7%)	39 (5.4%)		84 (4.7%)	
Chorioamnionitis	4 (1.5%)	3 (0.4%)		17 (1.0%)	
Endometritis	5 (1.8%)	24 (3.3%)		99 (5.6%)	
Uterine incision extension (T or J)	1 (0.4%)	1 (0.1%)		2 (0.1%)	
Venous thromboembolism	0 (0.0%)	0 (0.0%)		1 (0.1%)	
Admission to intensive care unit	0 (0.0%)	4 (0.6%)		4 (0.2%)	
Death	0 (0%)	0 (0%)		0 (0%)	

Data presented as N (%)
*During the last 20-120 min of fetal heart rate tracing, the duration it was in category II
[1]Adjusted for induction of labor and amnioinfusion
NR FHRT, non-reassuring fetal heart rate tracing (interpreted by obstetricians—blinded to the outcomes—as described in ACOG Practice Bulletins # 106 and # 116)
Bolded if significantly different

22 | Tranexamic Acid Prophylaxis During Cesarean Delivery Among Patients with and Without Hypertension

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2:15 PM - 2:30 PM

Objective: Chronic and pregnancy-related hypertension (hereafter "HTN") are associated with increased risk of obstetric hemorrhage and blood transfusion. Should hemorrhage occur among those with HTN, the choice of uterotonics is constrained (methergine is contraindicated). Thus, while prophylactic use of tranexamic acid (TXA) during cesarean delivery (CD) does not alter rates of obstetric hemorrhage or blood transfusion overall, prophylactic TXA during CD may reduce these morbidities among patients with HTN. Our objective was to examine the effect of prophylactic TXA during CD on peripartum bleeding-related outcomes for patients by HTN status.

Study Design: This is a non-prespecified secondary analysis of a multicenter, placebo-controlled trial of patients undergoing CD who were randomized to 1g of TXA or placebo. For this analysis, all participants were included. The study population was split into subgroups on the basis of HTN prior to delivery. The primary outcome was a composite of maternal death or blood transfusion before hospital discharge or seven days postpartum, whichever occurred first. Blood transfusion was defined as the transfusion of packed red cells or whole blood or cell-savor autotransfusion device use. Secondary outcomes are in Table 1. Relative risks (RR) were calculated for categorical and mean differences for continuous outcomes. *P* values for interaction with HTN were calculated.

Results: Of the 10,995 participants randomized in the parent trial, 2707 (24.6%) had HTN (7.1% chronic hypertension and 17.5% pregnancy related). The primary outcome did not differ among those who received TXA versus placebo in either subgroup (HTN: TXA 4.9% vs placebo 6.0%; RR 0.84 (95% CI 0.62, 1.16); no HTN: TXA 3.2% vs placebo 3.7%; RR 0.91 (0.73, 1.14); *p* for interaction 0.64). For all secondary outcomes, the interaction *p* was non-significant (all $p > 0.05$).

Conclusion: The effect of prophylactic TXA during CD on maternal death or blood transfusion within one week postpartum and on other peripartum bleeding-related outcomes does not differ by the presence of HTN.

Table 1: Outcomes among patients with hypertension versus without hypertension who received tranexamic acid or placebo during cesarean delivery

		Hypertension			No Hypertension		
	p-value for interaction	Tranexamic Acid (N=1357)	Placebo (N=1350)	Relative Risk or Mean Difference (95% CI)*	Tranexamic Acid (N=4168)	Placebo (N=4120)	Relative Risk or Mean Difference (95% CI)*
Primary Outcome							
Maternal death or blood transfusion by hospital discharge or 7 days postpartum, whichever was earlier†	0.64	67 (4.9)	81 (6.0)	0.84 (0.62, 1.16)	134 (3.2)	152 (3.7)	0.91 (0.73, 1.14)
Secondary Outcomes							
Intrapartum estimated blood loss >1 liter	0.08	94/1123 (8.4)	125/1146 (10.9)	0.77 (0.59, 0.99)	245/3518 (7.0)	243/3427 (7.1)	0.98 (0.83, 1.17)
Intervention in response to bleeding and related complications by 7 days postpartum	0.18	248 (18.3)	295 (21.9)	0.84 (0.72, 0.97)	644 (15.5)	691 (16.8)	0.92 (0.84, 1.02)
Surgical or radiologic interventions by 7 days postpartum	0.25	49 (3.6)	59 (4.4)	0.83 (0.57, 1.20)	184 (4.4)	172 (4.2)	1.06 (0.86, 1.30)
Uterotonic agent other than oxytocin by 48 hours postpartum	0.29	190 (14.0)	227 (16.8)	0.83 (0.70, 0.99)	459 (11.0)	505 (12.3)	0.90 (0.80, 1.01)
Open-label use of tranexamic acid by 7 days postpartum	0.49	31 (2.3)	36 (2.7)	0.86 (0.53, 1.38)	77 (1.9)	73 (1.8)	1.04 (0.76, 1.43)
Transfusion of any blood product by 7 days postpartum	0.55	68 (5.0)	82 (6.1)	0.83 (0.60, 1.13)	137 (3.3)	156 (3.8)	0.87 (0.69, 1.09)
Change in hemoglobin level – g/dl‡	0.42	-1.7 ± 1.1	-1.9 ± 1.2	-0.2 (-0.2, -0.1)	-1.8 ± 1.0	-1.9 ± 1.1	-0.1 (-0.2, -0.1)
Median postoperative duration of hospital stay – days	>0.99	3 (3, 4)	3 (3, 4)	0.0 (-0.1, 0.1)	3 (2, 3)	3 (2, 3)	0.0 (-0.1, 0.0)

Data are n (%) or median (interquartile range). Abbreviations: Confidence Interval = CI; g/dL = grams / deciliter
* Relative risk was calculated for categorical outcomes and mean difference was calculated for continuous outcomes.
† Adjusted for a preoperative hemoglobin level of less than 8 grams / deciliter.
‡ Comparing the most recent value before delivery to the lowest measurement obtained during the first 48 hours postpartum.

23 | Preclinical Development of a Continuous Fetal Lactate Biosensor to Detect Acidosis

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2:30 PM - 2:45 PM

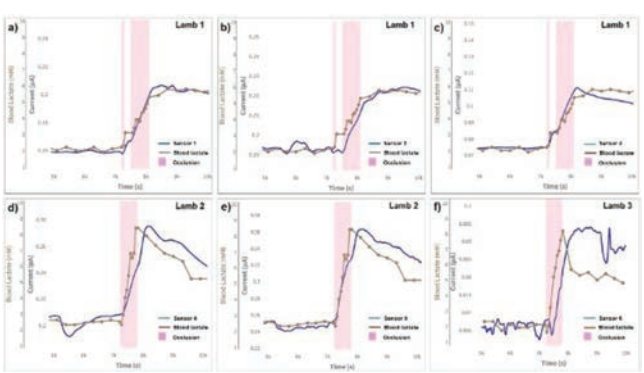
Objective: Accurate detection of fetal acidosis in labor is an unmet clinical need. Objectives of this study are:

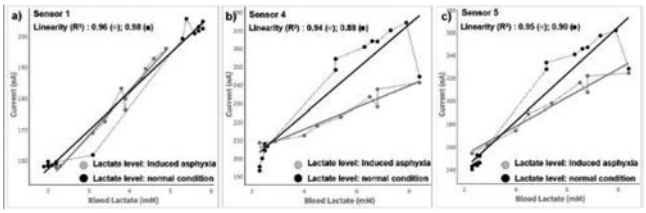
1. To validate a subcutaneous biosensor for continuous lactate monitoring (CLM) to detect acidosis in a fetal lamb model of asphyxia.
2. Assess the utility of the CLM biosensor for intrapartum fetal monitoring, by correlating sensor-detected lactate levels with contemporaneously collected blood lactate values.

Study Design: Ewes (n = 3) with singleton pregnancy were anesthetized and the lamb's head was exteriorised. Multiple biosensors were placed onto the lamb's scalp, with electrical current outputs captured. Venous blood samples were collected at regular intervals across the protocol, and lactate and other physiological parameters recorded. After baseline, the umbilical cord was occluded for ten minutes, with recordings continuing over at least three hours during recovery.

Results: **Figure 1** shows the relationship between biosensor current (μA), venous blood lactate (mM), and time (s) during the fetal lamb model experiments (animal n = 3; biosensor n = 6), highlighting the utility of the biosensor in monitoring in-vivo lactate levels. **Figure 1** illustrates a strong correlation between sensor-measured current and blood lactate levels over time. This is supported by the graphs in **Figure 2 (a-c)**, with the correlation ($R^2 > 0.88$) between sensor current and blood lactate measurements. These results support the capability of the CLM biosensor to detect continuous real-time changes in fetal lamb lactate concentration, crucial for early detection and management of fetal asphyxia during labor and delivery.

Conclusion: This study demonstrates the capability of an innovative subcutaneous biosensor for CLM in detecting early signs of fetal lactic acidosis, highlighted by the strong correlation between sensor-detected lactate levels and venous blood lactate levels. This technology has the potential to enable continuous fetal lactate measurement, with the ability to revolutionize intrapartum care and improve neonatal outcomes. Ethics and governance approvals are in progress to commence first-in-fetus studies.





24 | After Cesarean Time Interval to Exercise (ACTIVE) Trial: A Randomized Controlled Trial

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2:45 PM - 3:00 PM

Objective: Cesarean delivery (CD) is the most common surgery performed in the United States, accounting for 30% of all births. Currently, there are no clear guidelines on when to initiate exercise after CD. Our objective was to evaluate the impact of early exercise, beginning 2 weeks postpartum, on physical and mental wellbeing.

Study Design: We conducted a prospective, parallel-group, randomized trial (ClinicalTrials.gov NCT04345757) at a single academic center between 2022-2024. Patients ≥ 18 years undergoing CD were included. Significant maternal or neonatal complications were excluded. Patients were randomized 1:1 to either a video-based, structured exercise program beginning 2 weeks postpartum or to routine postpartum care, typically avoiding exercise for 6 weeks. The primary outcome was wellbeing at 6 weeks postpartum, assessed using the Patient-Reported Outcomes Measurement Information System Global Short Form (PROMIS-GSF). Secondary outcomes included PROMIS-GSF physical and mental wellbeing sub-scores, post-operative complications and self-reported breastfeeding (BF) supply. Sample size was calculated to achieve 80% power to detect a 4-point difference in PROMIS-GSF score, with $\alpha = 0.05$. Data was analyzed using two-sample t-test and Fischer exact test as appropriate.

Results: 846 patients were assessed for eligibility: 646 were excluded, 200 were randomized and 63 completed the primary outcome measure. There was no difference in baseline demographics, obstetric characteristics or baseline PROMIS-GSF score between groups (Table 1). While there was no difference in 6 week PROMIS-GSF score, there was a trend towards improved physical health sub-score in the structured exercise group (Table 2). There were no differences in mental health sub-score (Table 2), postoperative complication rates or BF supply.

Conclusion: Structured exercise two weeks after CD appears to be safe and did not adversely impact physical or mental wellbeing. While low survey completion rate was a limitation, this pilot data will help to inform future research powered to measure the impact of early exercise on enhanced recovery after CD.

Table 1: Baseline characteristics by study group assignment.

	Structured Exercise (n = 100)	Control (n = 100)
Maternal age (y)	35.1 ± 3.88	35.0 ± 4.13
Race and Ethnicity		
Non-Hispanic, White	61 (61.0%)	62 (62.0%)
Non-Hispanic, Black or African American	7 (7.0%)	11 (11.0%)
Hispanic	11 (11.0%)	6 (6.0%)
Asian	19 (19.0%)	18 (18.0%)
Other/ Declined	2 (2.0%)	3 (3.0%)
Insurance Type		
Private Insurance	95 (95.0%)	95 (95.0%)
BMI (kg/m2)	25.02 ± 4.40	25.44 ± 4.81
Parity (median; IQR)	1.0 (1.0 - 2.0)	1.0 (1.0 - 2.0)
Planned Cesarean Section	64 (64.0%)	48 (48.0%)
Maternal Conditions		
Chronic Hypertension	4 (4.0%)	4 (4.0%)
Gestational Hypertension or Preeclampsia	9 (9.0%)	17 (17.0%)
Pre-Gestational Diabetes	3 (3.0%)	2 (2.0%)
Gestational Diabetes	3 (3.0%)	1 (1.0%)
Pre-existing Anxiety/ Depression	19 (19.0%)	19 (19.0%)
Baseline Activity (Godin Leisure Score)	35.88 ± 19.11	35.42 ± 18.06
Baseline PROMIS Raw Score	37.49 ± 5.61	38.58 ± 4.85

Table 2: PROMIS-GSF and PROMIS sub-scores by study group assignment.

	Structured Exercise (n=27)	Control (n=36)	P value
PROMIS-GSF score			
Raw Score (mean ± SD)	39.30 ± 5.07	38.53 ± 4.84	0.54
Physical Health Sub-score			
Raw Score (mean ± SD)	16.00 ± 1.94	15.53 ± 1.76	0.32
T-Score (mean ± SD)	51.26 ± 6.15	48.85 ± 8.05	0.20
Mental Health Sub-score			
Raw Score (mean ± SD)	15.41 ± 2.66	15.33 ± 2.54	0.91
T-Score (mean ± SD)	52.23 ± 7.13	51.99 ± 6.75	0.89

25 | Intrauterine Resuscitative Maneuvers for Management of Abnormal Fetal Heart Tracings: A Systematic Review and Meta-Analysis

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3:00 PM - 3:15 PM

Objective: To evaluate the effectiveness of 7 intrauterine resuscitative maneuvers (IRMs)—amnioinfusion, maternal oxygen supplementation, tocolysis, maternal repositioning, discontinuation of labor stimulation, and treatment of maternal hypotension or tachysystole—in mitigating adverse outcomes in the setting of non-reassuring fetal heart tracings (NRFHT).

Study Design: We conducted a systematic review and meta-analysis of randomized controlled trials (RCTs) of laboring patients with NRFHT randomized to receive one of the 7 IRMs versus no intervention. The primary outcome was Apgar score < 7 at 5 minutes. Secondary outcomes included cesarean delivery rate (CD), CD for NRFHT, relief of NRFHT, umbilical artery (UA) pH < 7.10, UA pH < 7.20, and NICU admission. Summary measures were reported as relative risk (RR) with 95% confidence interval (CI) using the random effects model of DerSimonian and Laird. Higgins I2 > 0% was used to identify heterogeneity.

Results: Of 11,372 abstracts reviewed, 8 RCTs were eligible and included: 682 patients randomized to amnioinfusion vs none; 170 randomized to oxygen supplementation vs. none; and 523 randomized to tocolysis before CD vs. none. Likelihood of relief of NRFHT was significantly higher in the amnioinfusion group (68.0% vs 3.27%; RR 18.9; 95% CI 7.16, 50.26) and CD for NRFHT was significantly lower (37.8% vs 54.2%; RR 0.70; 95% CI 0.60, 0.82) vs none. Likelihood of UA pH < 7.20 was significantly lower in the tocolysis group (18.7% vs 35.4%; RR 0.40; 95% CI 0.17-0.93) vs none. The likelihood of Apgar score < 7 at 5 minutes, UA pH < 7.10, and NICU admission was similar in each group across interventions. We did not identify eligible RCTs for change in maternal position, discontinuation of labor stimulation, or treatment of maternal hypotension or tachysystole.

Conclusion: Amnioinfusion for NRFHT was found to relieve NRFHT and reduce CD. Oxygen for NRFHT did not reduce CD or improve fetal outcomes. Tocolysis for NRFHT reduced the rate of rate of fetal acidosis with UA pH < 7.20. No eligible RCTs were found for other IRMs in the setting of NRFHT.

Table 1: Meta-Analysis of randomized controlled trials of intrauterine resuscitative maneuvers versus no interventions for abnormal fetal heart tracings

	# trials	Relief of NRFHT	CD	CD for NRFHT	Apgar score < 7 at 5 minutes	UA pH < 7.10	UA pH < 7.20	NICU Admission
Amnioinfusion vs none[1]								
Totals	3	83/122 (68.0) vs 4/122 (3.27)	28/73 (38.3) vs 28/75 (37.3)	129/341(37.8) vs 185/341 (54.2)	13/341 (3.81) vs 33/341 (9.67)	-	-	14/219 (6) vs 31/219 (14)
RR (95%CI); p; I2, NNT		**18.97 (7.16, 50.26); 0.00001; 0%; 2**	-	**0.70 (0.60- 0.82); <0.00001; 0%; 6**	0.47 (0.16- 1.38); 0.17; 53%	-	-	-
Oxygen supplementation vs none[2]								
Totals	2	-	8/105 (7.6) vs 4/111 (3.6)	4/105 (3.8) vs 2/111 (1.8)	2/105 (1.9) vs 4/111 (3.6)	2/93 (2.1) vs 3/104 (2.8)	-	3/105 (2.8) vs 5/111 (4.5)
RR (95%CI); p; I2		-	2.08 (0.62, 6.90); 0.24; 0%	1.68 (0.33-8.53); 0.53; 0%	0.55 (0.10, 3.09); 0.49; 0%	0.75 (0.12, 4.59); 0.75; 0%	-	0.64 (0.16, 2.60); 0.53; 0%
Tocolysis prior to CD vs none prior to CD[3]								
Totals	3	-	-	-	5/209 (2.4) vs 6/216 (2.8)	30/241 (12.4) vs 45/245 (18.4)	12/64 (18.7) vs 23/65 (35.4)	44/258 (17.0) vs 63/265 (23.8)
RR (95%CI); p; I2, NNT		-	-	-	0.94 (0.26, 3.41); 0.92; 6%	0.68 (0.45-1.04); 0.07; 0%	**0.40 (0.17, 0.93); 0.03; 6%, 6**	0.75 (0.37, 1.53); 0.43; 68%

[1] *Studies included: Miyazaki et al Am J Obstet Gynecol 1985; Abdel-Aleem et al Int. J. Gynecol. Obstet. 2005; Regi et al J. Reprod. Med. 2009*
[2] *Studies included: Raghuraman et al JAMA Pediatr. 2018; Moors et al Am J Obstet Gynecol MFM 2020*
[3] *Studies included: Kuller et al J. Perinat. Med. 1997; Briozzo J. Obstet. Gynaecol. et al 2007; Zahar et al Med. J. Malays. 2023*

* To identify studies to include or consider for this systematic review, a medical librarian developed detailed search strategies for each database. The databases included in this search were PubMed (NLM), Embase.com (Elsevier), Cochrane CENTRAL (Wiley) and CINAHL Ultimate (EBSCOHost) using a combination of keywords and subject headings. A grey literature search included clinicaltrials.gov, WHO ICTRP and medRxiv. All final searches were performed on March 22, 2024. A protocol was registered at PROSPERO (CRD42023409756). 8 RCTs were determined to be eligible for data extraction and quality assessment.

NRFHT: non-reassuring fetal heart tracing; CD: cesarean delivery; UA: umbilical artery; NICU: neonatal intensive care unit

26 | Reducing Postpartum Hemorrhage: The Impact of a Standardized High-Dose Oxytocin Protocol

Evan J. Keil[1]; Elizabeth J. Campbell[2]; Joanne M. Bailey[2]; David E. Arnolds[2]; Diana Peacor[2]; Molly J. Stout[2]; Jourdan E. Triebwasser[1]
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3:15 PM - 3:30 PM

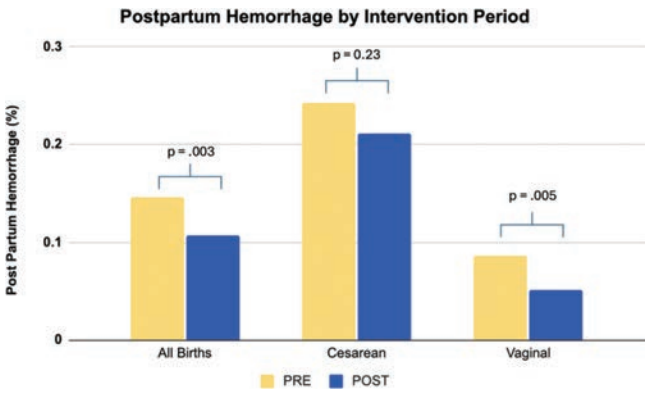
Objective: Oxytocin protocols to prevent postpartum hemorrhage (PPH) vary widely, with limited data suggesting higher doses may reduce PPH. We examined the impact of increasing the dose of oxytocin for active management of the third stage of labor on PPH.

Study Design: We performed a single-center quality improvement project at a large academic medical center. The pre-intervention phase (PRE) was Jan 1 - Apr 6, 2024 and post-intervention phase (POST) was Apr 7 - Jul 6, 2024. Quantitative blood loss (QBL) was routinely used throughout. PRE-oxytocin protocol was 30 units in 500 mL given over 1 h followed by 3.6 units over 1 h. POST-protocol was 60 units in 1 L given over 1 h. Implementation steps included updating medication orders and infusion pumps and providing staff training. Process measures were uterotonic administration between QBL 500mL and 1L and exposure to >18h of oxytocin during labor, which were monitored using weekly control charts. Healthcare rules were applied to detect special cause variation. Relative risks were calculated to assess the intervention's impact.

Results: PPH was less frequent POST (14.6% vs. 10.8%, RR 0.74 [95% CI 0.61-0.90], **Figure**) despite no change in cesarean

birth rate (37.9% vs. 35.3%, p = 0.16) or receipt of any oxytocin during labor (37.0% vs. 38.9%, p = 0.34). Reduction in PPH was most pronounced among vaginal births (8.7% vs. 5.2%, RR 0.60 [95% CI 0.42-0.86]). The magnitude of change in PPH was similar for cesarean births though not statistically significant (24.3% vs. 21.1%, RR 0.87 [95% CI 0.69-1.10]). Reduction in PPH was not attributable to other process measures as there was no special cause variation in uterotonic administration (mean 64%) or Oxytocin for >18h (mean 18%) during the study period.

Conclusion: Implementing an oxytocin protocol of 60 units given over 1 hour reduced overall PPH rates, particularly for vaginal births.



27 | Hysterotomy using Barbed vs. Vicryl Suture for Scheduled Cesarean Delivery: A Randomized Controlled Trial

Ayisha B. Buckley[1]; Nicola F. Tavella[2]; Camila Cabrera[2]; Keisha S. Paul[2]; Mariah McKevitt[2]; Monica J. Patel[2]; Lauren A. Ferrara[2]; Jenny Tang[2]; Joanne Stone[3]; Calvin E. Lambert, Jr.[2]; Luciana A. Vieira[4]; Angela T. Bianco[2]

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3:30 PM - 3:45 PM

Objective: Intraoperative reduction of blood loss correlates with reduced morbidity. We examined whether Cesarean Deliveries (CD) had significantly lower quantitative blood loss (QBL) when the hysterotomy was closed with barbed suture.

Study Design: This was a single site randomized controlled trial. Patients with a scheduled term CD gave informed consent and were randomly assigned barbed or vicryl suture for hysterotomy closure. Block randomization controlled for primary or repeat CD. We excluded patients with increased risk of hemorrhage (PPH). The primary outcome was QBL (mL). Secondary outcomes were time for hysterotomy closure, additional hemostatic sutures, and postoperative pain (via numerical scoring system). Among covariates for which we adjusted were provider level (Resident, Fellow, Attending) and provider experience with the suture. Multivariable linear regressions estimated adjusted means. A two-sided $\alpha < 0.05$ indicated significance. An a priori calculation determined 226 subjects were needed to detect a 30% difference in mean QBL with 85% power.

Results: From 2021 to 2023, 226 subjects were assigned barbed (n = 113) or vicryl suture (n = 113). The groups did not differ on demographic or clinical variables. More hysterotomies using barbed suture were done by fellows ($p = 0.02$). The groups differed in provider experience with the suture ($p < 0.001$). Regression models showed a difference in mean QBL between the barbed (521.0 minutes [95%CI: 447.3, 594.7]) and vicryl (558.8 minutes [95%CI: 441.4, 676.2]) groups. There was a shorter time for hysterotomy (4.5 vs 6.1 minutes [95%CI: 4.0, 5.0]) and less postoperative pain (3.3 vs 3.4 [95%CI: 3.0, 3.6]) in the barbed suture group.

Conclusion: Closing hysterotomies with barbed suture at scheduled CDs is associated with decreased QBL, postoperative pain, and hysterotomy closure time. These results suggest potential for reduced surgical morbidity and improved patient experience with use of barbed suture. Further studies are needed to corroborate our findings.

	Suture Type		
	Vicryl N = 113	Stratafix N = 113	
	N (%), mean (sd)	N (%), mean (sd)	p
Order of Cesarean			0.79
Primary	55 (48.7)	57 (50.4)	
Repeat	58 (51.3)	56 (49.6)	
Age			0.10
Mean	34.7 (5.0)	35.9 (6.1)	
Race			0.69
White	56 (49.6)	47 (41.6)	
Black	15 (13.3)	14 (12.4)	
Asian	14 (12.4)	15 (13.3)	
Hispanic/Latina	21 (18.6)	26 (23.0)	
Other	7 (6.2)	11 (9.7)	
Insurance			0.51
Private	86 (76.1)	93 (82.3)	
Public	13 (11.5)	9 (8.0)	
None	14 (12.4)	11 (9.7)	
BMI at delivery			0.29
< 30	49 (43.4)	59 (52.2)	
30 - 39.9	48 (42.5)	44 (39.0)	
40 +	16 (14.2)	10 (8.9)	
Smoking History			0.65
None	110 (97.3)	111 (98.2)	
Previous or Current Smoker	3 (2.7)	2 (1.8)	
Gestational Age at Delivery			0.60
Mean	38.6 (0.95)	38.6 (0.94)	
Nulliparity			0.89
No	69 (61.1)	68 (60.2)	
Yes	44 (38.9)	45 (39.8)	
History of Pregnancy Loss			0.14
One or more	53 (46.9)	42 (37.2)	
Perinatal Comorbidities			
Gestational Hypertension			0.78
Yes	7 (6.2)	6 (5.3)	
Gestational Diabetes			0.86
Yes	18 (15.9)	19 (16.8)	
Pre-eclampsia			0.65
Yes	3 (2.7)	2 (1.8)	
Cholestasis			1
Yes	1 (1.0)	1 (1.0)	
Pregestational Diabetes			0.17
Yes	1 (1.0)	4 (3.5)	
Chronic Hypertension			0.23
Yes	12 (10.6)	7 (6.2)	
Inflamatory Bowel Disease			0.58
Yes	6 (5.3)	8 (7.1)	
Asthma			0.06
Yes	4 (3.5)	11 (9.7)	
Provider Level			0.02
Attending	41 (36.3)	39 (34.5)	
Resident	33 (29.2)	30 (26.5)	
Intern	4 (3.5)	1 (1.0)	
Fellow	25 (22.1)	41 (36.3)	
Physician Associate	10 (8.8)	2 (1.8)	
Number of Prior Times Reported Using Assigned Suture			< 0.001
0-10	3 (2.7)	96 (86.5)	
10-40	4 (3.6)	8 (7.2)	
40-100	9 (8.1)	1 (1.0)	
> 100	95 (85.6)	6 (5.4)	

Table 2

Multivariable* Linear Regression Models	Suture Type		
	Vicryl N = 113	Stratafix N = 113	
	Mean (95% CI)	Mean (95% CI)	p
Quantitative Blood Loss (mL)	558.8 (441.4, 676.2)	521.0 (447.3, 594.7)	< 0.001
Time of hysterotomy closure (minutes)	6.1 (5.3, 6.9)	4.5 (4.0, 5.0)	< 0.001
Postoperative Pain Score	3.4 (3.0, 3.8)	3.3 (3.0, 3.6)	< 0.001
Number of Additional Hemostatic Sutures	0.4 (-0.2, 1.0)	0.2 (-0.2, 0.6)	0.51

*Models adjusted for type of CD (primary vs repeat, stat vs not stat), history of prior uterine surgery, prescribed anticoagulants, use of additional hemostatic sutures or agents, use of uterotonics, level of operator and operator experience

28 | Investigating Selection Bias in Research Using Placental Pathology Samples

Linda M. Ernst[1]; Alexa A. Freedman[2]; Renee Odom-Konja[1]; Lauren Keenan-Devlin[3]; Greg E. Miller[2]; Ann EB Borders[3]
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3:45 PM - 4:00 PM

Objective: Increasing research interest has focused on placental pathology and pregnancy outcomes. Clinically-requested pathology cases are often used for research due to convenience, which may lead to selection bias. We leveraged a large cohort of prospectively-collected placentas to compare prevalences of placental pathology in cases with and without a clinically-requested pathology exam (CPE) and to quantify potential selection bias.

Study Design: All placentas were prospectively collected from participants in the Stress, Pregnancy, and Health (SPAH) study, including those with and without CPE. In all cases, placental pathology was categorized and graded in 4 major groups: acute inflammation (AI), chronic inflammation (CI), fetal vascular malperfusion (FVM) and maternal vascular malperfusion (MVM). We compared the distribution of placental pathology in cases with and without CPE. Odds ratios (OR) for preterm birth (PTB) and small for gestational age (SGA) infant were calculated in the whole SPAH cohort and compared with the CPE subcohort. Relative odds ratios (ROR) were used to quantify selection bias. Models were adjusted for sociodemographic and pregnancy characteristics.

Results: 575 placentas were collected and examined, 287 with CPE and 288 without CPE. The prevalence of AI, CI and FVM was similar among the 2 groups. However, the prevalence of MVM was significantly higher in CPE placentas, particularly for high grade MVM (15% vs 8%, $p < 0.001$). In adjusted models, high grade MVM was significantly associated with increased odds of PTB and SGA in the whole SPAH cohort and the CPE sub-cohort (PTB: SPAH OR = 5.62, CPE OR = 7.56; SGA: SPAH OR = 8.13, CPE OR = 8.25). RORs show a 30% overestimation of the association between MVM and PTB, and only a 2% overestimation in SGA when using a CPE sample.

Conclusion: MVM was the only placental pathology seen more frequently in the CPE sample. Research using a CPE only sample may overestimate associations, particularly for MVM and PTB. Because we quantified the selection bias, the RORs from our data can be used to adjust estimates in studies using retrospective CPE samples.

Table 1. Pathology distributions

	SPAH sample	NO Clinically requested pathology examination (NO CPE)	Clinically requested pathology examination (CPE)	p-value
	N=575	N=288	N=287	
Placental size				
Small for gestational age	154 (27)	79 (27)	75 (26)	0.235
Appropriate for gestational age	377 (65)	193 (67)	184 (64)	
Large for gestational age	44 (8)	16 (6)	28 (10)	
Acute Inflammation				
None	252 (44)	125 (43)	127 (44)	0.179
Low Grade	240 (42)	134 (47)	106 (37)	
High Grade	83 (14)	29 (10)	54 (19)	
Chronic Inflammation				
None	259 (45)	132 (46)	127 (44)	0.821
Low Grade	193 (34)	90 (31)	103 (36)	
High Grade	123 (21)	66 (23)	57 (20)	
Fetal Vascular Malperfusion				
None	384 (67)	194 (67)	190 (66)	0.968
Low Grade	149 (26)	71 (25)	78 (27)	
High Grade	42 (7)	23 (8)	19 (7)	
Maternal Vascular Malperfusion				
None	**407 (71)**	**220 (76)**	**187 (65)**	**0.002**
Low Grade	**101 (18)**	**44 (15)**	**57 (20)**	
High Grade	**67 (12)**	**24 (8)**	**43 (15)**	

Value represent N (%)

Oral Concurrent Session 3

Ultrasound and Genetics

Abstracts 29 – 38

THURSDAY
January 30, 2025
1:30 PM – 4:00 PM
Aurora Ballroom CD

MODERATORS
Shani Delaney, MD
Angie C. Jelin, MD

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Concurrent Session 3 – Ultrasound and Genetics

Thursday, January 30, 2025 1:30 PM – 4:00 PM

29 | Beyond the Fetus: Unveiling Maternal Health Risks Through Prenatal Genome Sequencing

Brittany Arditi[1]; Caitlin D. Baptiste[2]; Jessica L. Giordano[1]; Rachel Herz-Roiphe[2]; Vaidehi Jobanputra[3]; Ronald J. Wapner[4]
[1]Columbia University Irving Medical Center, New York, NY; [2]Columbia University Medical Center, New York, NY; [3]New York Genome Center, New York, NY; [4]Columbia University, New York, NY

1:30 PM - 1:45 PM

Objective: Genome sequencing (GS) has been demonstrated to be of benefit in the evaluation and management of fetal structural anomalies. However, the management of maternal ancillary findings on trio analysis has not been described. Our objective was to evaluate the frequency and clinical impact of maternal genomic variants identified after fetal GS.

Study Design: This is a secondary analysis of all patients undergoing prenatal GS between September 2022-November 2023 at a single institution under a research protocol. 420 fetuses (279 anomalous and 141 non-anomalous) were included. GS was performed in a CLIA certified laboratory and results reported to parents. Genome analysis was performed through a proband-focused trio approach: pathogenic and likely pathogenic variants were identified in the fetus and parental inheritance was subsequently determined. All maternally inherited findings were adjudicated by a multidisciplinary team of maternal fetal medicine physicians, laboratory geneticists, and genetic counselors to determine the impact on pregnancy and postpartum care. Pathogenic and likely pathogenic variants in genes with implications for peripartum management were reported to the care providers.

Results: 3.8% (16/420) of patients had a maternally inherited, reportable, autosomal dominant finding. Among patients with a reportable finding, 9/16 (56.25%) were referred to a subspecialist for further management and/or underwent additional workup aimed at identifying and preventing risk for maternal morbidity (Table 1). Familial cascade testing was discussed with all patients and performed in 4/16 (25.0%) families. Only 2/16 (12.5%) of genes reported in our analysis are on the American College of Medical Genetics and Genomics secondary findings list.

Conclusion: In addition to providing a fetal diagnosis, prenatal sequencing will identify maternal genetic diseases with the potential to cause peripartum maternal morbidity and mortality. Future research is required to understand the clinical impact of these findings and to develop management protocols.

Anomalous Fetus cohort				
Fetal phenotype	**Gene**	**Associated diseases**	**Maternal phenotype**	**Referral/Additional workup**
Cystic hygroma	TEK	Congenital glaucoma	None	- Ophthalmology referral - Glaucoma exam
Congenital diaphragmatic hernia	CRYBA1	Congenital cataracts	None	-Ophthalmology referral
Bilateral renal agenesis	GREB1L	Renal hypodysplasia/ aplasia	Unilateral renal agenesis	-None
Rocker bottom feet, club foot, hand clenching	PKD2	Polycystic kidney disease	Polycystic kidneys	-None
Bilateral persistently clenched digits (#3-5)	SCNA4	Hypokalemic periodic paralysis	Episodic muscle stiffness	-Neurology referral -Electromyography
Unilateral pre-axial polydactyly	DMPK	Muscular dystrophy	None	-Neurology, cardiology, ophthalmology referrals -Echocardiogram
Short long bones	ARCN1	Short stature micrognathia syndrome	None	-None
Bilateral clubbed feet	SOX9	Campomelic dysplasia	Fibromyalgia	-None
Limb reduction	VWF	Von Willebrand Disease	Unknown	-Unknown
Persistent left SVC, dilated coronary sinus, atrial septal defect	VWF	Von Willebrand Disease	Unknown	-Unknown
Non-anomalous Fetus cohort				
Advanced maternal age	BAG3	Dilated cardiomyopathy	Chronic hypertension	-Cardiology referral -Echocardiogram
Abnormal NIPT (XXY)	MIB1	Left ventricular non-compaction cardiomyopathy	None	-Cardiology referral -Echocardiogram, Zio patch, cardiac MRI
Cystic fibrosis carrier couple	MIB1	Left ventricular non-compaction cardiomyopathy	Palpitations (normal EKG)	-Cardiology referral - Echocardiogram, Zio patch, cardiac MRI
Advanced maternal age	RNF213	Moya moya disease	Headaches	-Neurology referral -Renal artery Dopplers, MRI/MRA brain
Elective	GCK	Maturity onset diabetes of the young	None	-None
Advanced maternal age	HNF1A	Maturity onset diabetes of the young	None	-Endocrinology referral -Diabetes workup

30 | Artificial Intelligence System Accurately Detects Fetal Ultrasound Findings Suspicious For Major Congenital Heart Defects

Carolyn M. Zelop[1]; Jennifer Lam-Rachlin[2]; Alisa Arunamata[3]; Rajesh Punn[3]; Sarina K. Behera[4]; Matthias Lachaud[5]; Nadine David[6]; Greggory R. DeVore[7]; Andrei Rebarber[2]; Nathan S. Fox[2]; Marjorie Gayanilo[2]; Sara Garmel[8]; Philippe Boukobza[9]; Pierre Uzan[10]; Hervé Joly[11]; Romain Girardot[12]; Laurence Cohen[13]; Marilyne Levy[14]; Bertrand Stos[14]; Malo De Boisredon[15]; Eric Askinazi[15]; Valentin Thorey[15]; Christophe Gardella[15]; Miwa Geiger[2]

[1]Valley Health System, Paramus, NJ; [2]Icahn School of Medicine at Mount Sinai Hospital, New York, NY; [3]Pediatrics - Cardiology, Stanford University School of Medicine, Stanford, CA; [4]Palo Alto Medical Foundation, Sutter Health, Palo Alto, CA; [5]University of Grenoble Alpes, Grenoble, Rhone-Alpes; [6]Medical Training Center, Rouen, Haute-Normandie; [7]The Fetal Diagnostic Center of Pasadena, Pasadena, CA; [8]Michigan Perinatal Associates and Corewell Health, Dearborn, MI; [9]CEDEF - Centre Européen de Diagnostic et d'Exploration de la Femme, Le Chesnay, Ile-de-France; [10]Groupe IMEF - Imagerie Médicale de l'Est Francilien, Rosny-sous-Bois, Ile-de-France; [11]CARPEDIOL - Cardiologie Pédiatrique, fœtale et congénitale adulte de L'Ouest Lyonnais, Ecully, Rhone-Alpes; [12]Unité de Dépistage de Cardiopathies Foetales et Néonatales, Bordeaux, Aquitaine; [13]ETCC - Exploration et Traitement des Cardiopathies Congénitales, Massy, Ile-de-France; [14]UE3C - Unité d'explorations cardiologiques - Cardiopathies Congénitales, Paris, Ile-de-France; [15]BrightHeart, Paris, Ile-de-France

1:45 PM - 2:00 PM

Objective: Prenatal detection of congenital heart defects (CHD) improves patient outcomes. Despite advances in imaging techniques and equipment, prenatal diagnosis remains low. We evaluated the accuracy of an artificial intelligence (AI) system to detect 2nd trimester (2T) ultrasound studies suspicious for CHD.

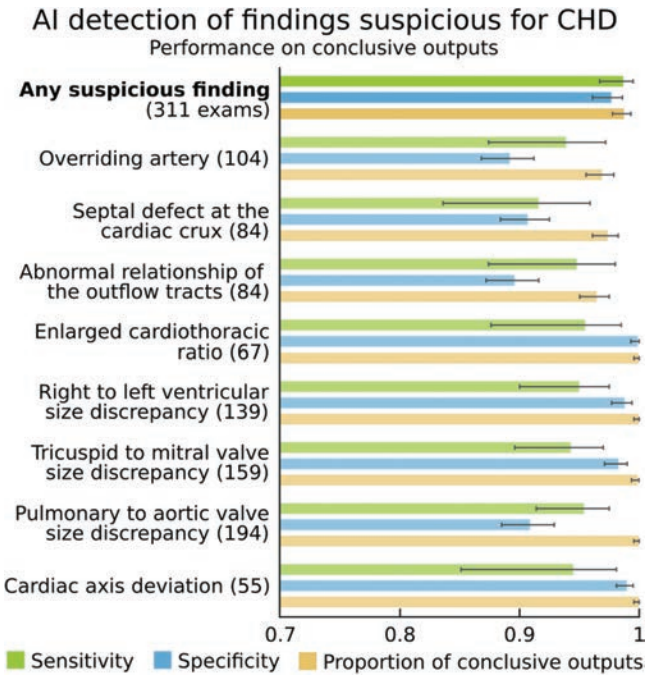
Study Design: The AI system analyzes all grayscale 2D ultrasound cines of a study and detects 8 morphological findings suspicious for CHD. The findings were selected such that most major forms of CHD would feature at least one such finding, and the presence of any of these would flag the study for referral for further examination.

We retrospectively included 877 exams (obstetric or detailed anatomic ultrasounds, or fetal echocardiograms), in singleton pregnancies, between 18-24 weeks gestation from 11 centers, including 311 exams with a major CHD, cardiomegaly or levo/dextrocardia. Each exam included 4-chamber, LVOT and RVOT views documented in cines, and was not used for training of the AI system.

For each exam, 3 expert fetal cardiologists annotated the presence or absence of each finding and majority voting was used as the ground truth. The AI system predicted the presence, absence or inconclusiveness (in case of low confidence) of each finding. An exam was predicted positive if at least one finding was present, negative if all findings were absent and inconclusive otherwise.

Results: Regarding the detection of any finding, the AI system had a conclusive output for 98.8% (95%CI 97.8-99.3) of exams. On exams with a conclusive output, sensitivity was 98.7% (96.7-99.5), and specificity was 97.7% (96.1-98.6). Performance per individual finding is presented in the Figure. To better represent the general low risk population despite the artificially high prevalence of exams with at least one suspicious finding (311/877), per-finding specificity was computed on exams negative to all findings.

Conclusion: The AI system accurately detected 2T ultrasound exams suspicious for CHD consistent with experts in most cases. The AI system may improve the prenatal ultrasound detection of CHD and thereby improve outcomes.



31 | Effect of Home Ultrasound in Patients with Previous Late Pregnancy Loss- A Randomized Control Trial

Liat Mor[1]; Hagit Eisenberg[2]; Liliya Tamayev[3]; Daniel Tairy[1]; Ben Oren[3]; Yael Ganor Paz[1]; Michal Levy[3]; Eran Weiner[2]; Giulia Barda[2]

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2:00 PM - 2:15 PM

Objective: We aimed to evaluate the effect of incorporating twice-weekly telemedicine home-ultrasound sessions on maternal anxiety and antenatal attachment in patients with a history of late pregnancy loss.

Study Design: In this randomized controlled trial, patients with a history a pregnancy loss beyond 20 weeks of gestation were recruited during their subsequent pregnancy and randomized into either a control group receiving standard high-risk care or a study group receiving additional twice-weekly home-ultrasound sessions. Home-ultrasound scans were guided by a physician via telemedicine and assessed basic fetal wellbeing using a Pulsenmore device. Two validated questionaries assessed maternal anxiety- the State-Trait Anxiety Inventory Scale (STAI-S) and the Revised Prenatal Distress Questionnaire (NuPDQ). Maternal attachment was evaluated using the Maternal Antenatal Attachment Scale (MAAS-2). All questionnaires were filled in the beginning, mid and end of follow up time. The primary outcome

was the STAI-S score at the final prenatal visit (STAI-3). In order to detect a 20% difference in the primary outcome, a sample size of 50 patients was required.

Results: Fifty patients were recruited and completed the study, 25 in each group. Demographic characteristics were similar between the groups. The home ultrasound group presented significantly decreased STAI-3 scores ($p = 0.022$), a significantly increased MAAS-3 score ($p = 0.022$) and less unscheduled emergency department visits during this time ($p = 0.024$) compared to control. Multivariate regression analyses confirmed significant and independent associations between reduced STAI and improved MAAS and the use of home-ultrasound (Table 1).

Conclusion: Incorporating home-ultrasound visits into prenatal care in patients with prior late pregnancy loss may significantly reduce maternal anxiety and enhance maternal attachment. These findings suggest that home ultrasound technology can be a valuable tool in managing maternal anxiety in this subset of patients.

Logistic regression analyses examining the association between maternal anxiety, antenatal attachment and emergency department visits to home ultrasound follow-up among patients with previous late pregnancy loss

	Unstandardized B	95% CI for B	p-value
STAI-3	-9.45	[-17.11, -1.7]	**0.017**
MAAS-3	4.59	[0.12, 9.06]	**0.044**
Unscheduled ED visits	-1.46	[-3.37, 0.45]	0.130

Values reflect the results of multivariate logistic regression analyses adjusted for parity, gestational age at previous IUFD, assisted reproductive technology, use of anti-depressants. STAI- state-trait anxiety index; MAAS- maternal antenatal attachment scale; ED- emergency department.

32 | Genetic Diagnoses in a National Cohort with Non-Immune Hydrops and Other Fetal Effusions

Natalie B. Gulrajani[1]; Billie R. Lianoglou[2]; Katie Tick[3]; Nuriye Sahin-Hodoglugil[3]; Ugur Hodoglugil[4]; Patrick Devine[4]; Jessica Van Ziffle[4]; Mary E. Norton[2]; Teresa N. Sparks[3]
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2:15 PM - 2:30 PM

Objective: Many single gene disorders are associated with non-immune hydrops fetalis (NIHF) and other fetal effusions. However, less is known about how these diseases present uniquely in utero. We aimed to characterize how genetic diseases present in utero with NIHF, other single effusions, and concurrent anomalies.

Study Design: This is a prospective national cohort of pregnancies with unexplained NIHF, pleural effusion, pericardial effusion, ascites, skin edema, cystic hygroma, increased nuchal translucency (NT) ≥3.5mm, or a combination of these. All ultrasound reports for each pregnancy were reviewed. A CLIA-approved laboratory performed exome sequencing (ES) and results were provided to patients. Each case was categorized as presenting with NIHF, single effusion (pleural or pericardial effusion, ascites, or skin edema), or increased NT or cystic hygroma, all with or without concurrent structural anomalies.

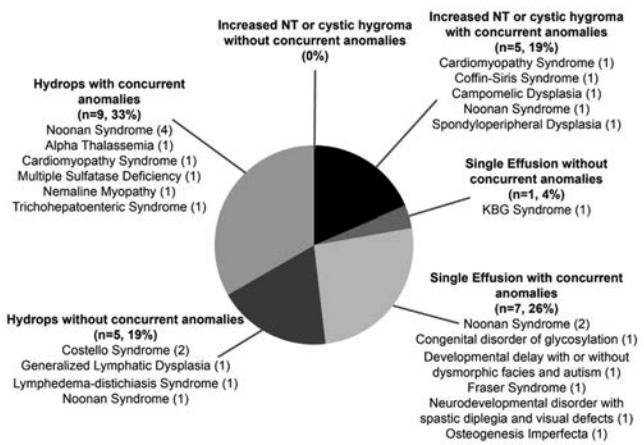
Results: 118 pregnancies underwent ES. There was a high diagnostic yield among cases with NIHF and single fetal effusions (17-36%), both with and without concurrent anomalies (Table 1). For cases with increased NT or cystic hygroma, the diagnostic yield was 42% for cases with concurrent anomalies, but zero in the absence of concurrent anomalies. Genetic diseases identified varied widely (Fig. 1). RASopathies, musculoskeletal disorders, and cardiomyopathies presented variably with and without concurrent anomalies and with all types of fetal effusions. Primary lymphedema syndromes presented later in gestation with NIHF and without concurrent anomalies. Diseases associated primarily with postnatal neurodevelopmental delay were seen with single fetal effusions and increased NT, with and without concurrent anomalies.

Conclusion: ES yielded a diagnosis in a high proportion of cases with NIHF and other single fetal effusions, with the exception of isolated increased NT or cystic hygroma. Certain genetic diseases presented broadly with all types of fetal effusions, while others presented more uniquely. Understanding these patterns informs accurate prenatal diagnosis, clinical counseling, and management.

Table 1. Frequency of genetic diseases presenting with NIHF and other isolated effusions.

Type of fetal effusion	Frequency of genetic disease	p-value
NIHF with concurrent anomalies (n=45) NIHF without concurrent anomalies (n=14)	20% 36%	0.29
Single effusion with concurrent anomalies (n=25) Single effusion without concurrent anomalies (n=6)	28% 17%	>0.99
Increased NT or cystic hygroma with concurrent anomalies (n=12) Increased NT or cystic hygroma without concurrent anomalies (n=16)	42% 0%	<0.01

Figure 1: Genetic diseases identified in positive cases by phenotypic category



33 | Genomewide monogenic Non Invasive Prenatal Genetic Screening based on maternal cfDNA

Dolev Rahat[1]; Ravit Mesika[1]; Lilach Schneor[1]; Noa Liscovitch-Brauer[2]; Tom Rabinowitz[1]; Noam Shomron[1]; Reut Tomashov Matar[3]; Lina Basel-Salmon[3]
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2:30 PM - 2:45 PM

Objective: Current methods for prenatal screening using cell-free DNA (cfDNA) for monogenic disorders have significant limitations. They are restricted to a predefined set of variants or genes, require impractically high fetal fractions (FFs) for clinical settings, or focus on paternally-inherited variants. Since paternal genetic material is often unavailable, there is a critical need for a father-independent solution. We present a comprehensive noninvasive prenatal genetic screening method that accurately predicts the fetal genotype at any location in the genome using only a maternal DNA sample.

Study Design: We conducted a study involving nine families with singleton pregnancies, with varying FF values (7-25%) where the parents are carriers for a severe monogenic disorder. We performed whole genome sequencing (WGS) of both maternal genomic DNA and maternal plasma and predicted the fetal genotypes for the pathogenic variants and across the entire genome.

Results: Our study includes seven families with a pathogenic single nucleotide variant (SNV): four families where both parents shared a common recessive pathogenic variant (e.g., congenital chloride diarrhea), two families with suspected compound heterozygous pathogenic variants (e.g., cystic fibrosis), and one family with a dominant pathogenic variant (Treacher collins syndrome). We accurately predicted the fetal disease status in all tested families (Table 1). We also conducted a genome-scale analysis of our algorithm's performance over millions of genomic sites where the mother was a carrier. Our method achieved an area under the curve (AUC) of 0.89 for homozygous variants (Figure 1).

Conclusion: Our study presents a novel approach for genome-wide non-invasive prenatal screening, addressing a critical clinical need. We demonstrate the clinical feasibility of this approach as early as the first trimester. Our genome-wide method can be extended to detect variants of all types and scales, including copy number variations and aneuploidies, and it also allows for the detection of de novo fetal variants.

Family	Condition	Gestational age	FF (%)	Inheritance	Predicted fetal disease status	True disease status
IG01	Cystic fibrosis	12	12.36	Compound	Healthy	Healthy
IG02	Epidermolysis bullosa	33	25.5	AR	Healthy	Healthy
IG03	Congenital chloride diarrhea	11	6.97	AR	Carrier	Carrier
IG04	Propionic acidemia	11	10.57	AR	Affected	Affected
IG05	Infantile convulsions and choreoathetosis (ICCA)	19	10.44	AR	Carrier	Carrier
IG06	Treacher collins	12	12.02	AD	Affected	Affected
IG07	Glutaric acidemia IIC	12	15.18	Compound	Affected	Affected

Table 1: Clinical information, predicted fetal disease status and true fetal disease status (from amnio/CVS) across the study families. AD - autosomal dominant, AR - autosomal recessive, compound - compound heterozygous.

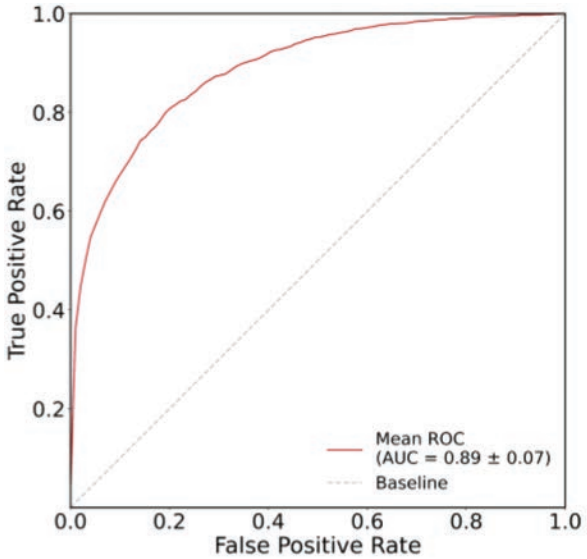

Figure 1: ROC curve showing the performance of our non-invasive prenatal screening algorithm. Values were calculated over variants in the entire genome and the average over families in the study cohort is shown.

34 | AI Assistance Enhances Physician Performance in Identifying Congenital Malformations

Clémentine Morisset[1]; Frédéric Logé-Munerel[1]; Celia Amabile[1]; Louis Chouinard[1]; Vianney Debavelaere[1]; Remi Besson[1]; Nikola Matevski[1]; Guillaume Corda[1]; Julien Stirnemann[2]; Yves Ville[3]; Yinka Oyelese[4]; Andrew Combs[5]

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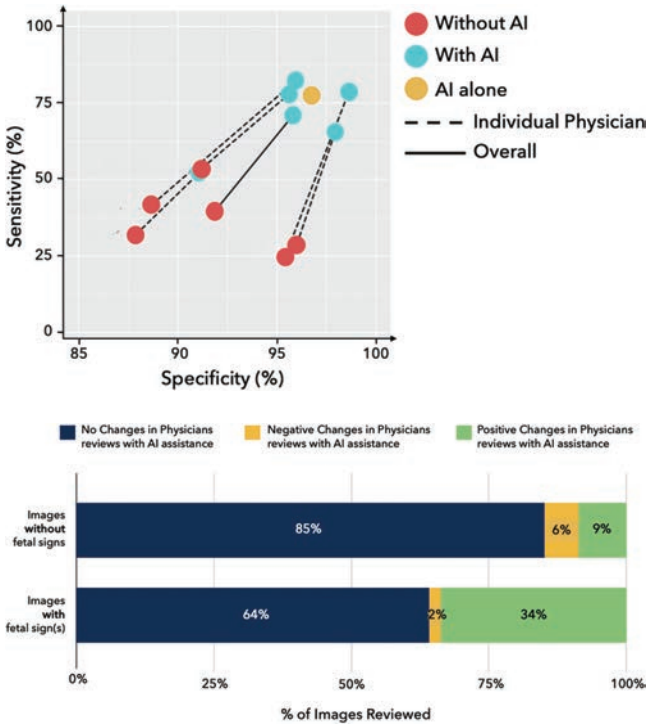
2:45 PM - 3:00 PM

Objective: Accurate sonographic identification of congenital malformations by interpreting Healthcare Practitioners (HCP) is critical for effective prenatal care. An AI software (under development, not FDA cleared) was trained to detect 10 fetal signs on automatically recognized views within its scope. This study aims to evaluate whether physician performance in identifying malformations improves with the assistance of the AI software versus without.

Study Design: A total of 1453 fetal images were labeled by experts and then reviewed by five physicians with varied profiles (Maternal-Fetal Medicine specialists, Obstetricians/Gynecologists, and General Radiologists). The reviews were conducted in two sessions (with and without the AI software), separated by one week to minimize recall bias. Each provider reviewed a mix of pathological and non-pathological images.

Results: There was a clear improvement for each reviewer and in overall performance - from 40% sensitivity (92% specificity) to 70% (96% specificity) with AI support (Figure 1). When assisted by the AI, physicians refined their reviews to more closely match the AI's output, leading to notable enhancements in performance (Figure 2).

Conclusion: AI-powered review of fetal images improves physician identification of signs of fetal malformations, highlighting the potential clinical impact of AI software to support more precise diagnosis.

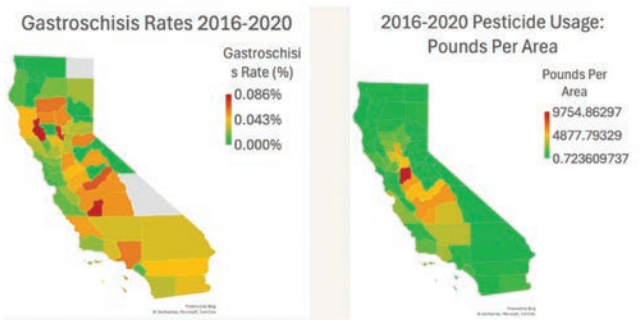


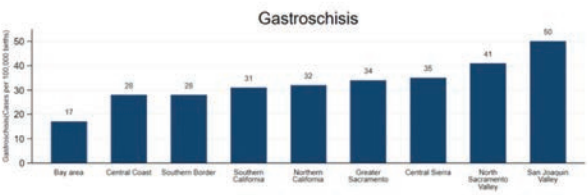
35 | Exploring Gastroschisis Patterns and Pesticide Use in California's Central Valley: A population-based cohort Study

Alejandro Perez[1]; Bharti Garg[2]; Hope Delgado[3]; Joshua F. Robinson[4]; Aaron B. Caughey[2]; Stephanie L. Gaw[4]
[1]University of California, San Francisco, Kerman, CA; [2]Oregon Health & Science University, Portland, OR; [3]University of California, Berkeley, Berkeley, CA; [4]University of California, San Francisco, San Francisco, CA

3:00 PM - 3:15 PM

Objective: The incidence of gastroschisis has been rising in regions with significant agricultural practices. Certain pesticides (e.g. atrazine, mineral oil) have been associated with gastroschisis in epidemiological studies.
Study Design: This is a retrospective cohort study of all California births from 2016-2020 utilizing linked birth certificate and hospital discharge records. We identified gastroschisis cases by ICD-10 code Q79.3 and geographically assessed maternal residence by zip code. Pesticide usage by county was obtained from publicly available databases from California Department of Pesticide Regulation for years 2016-2020. The usage of pesticides by county was calculated by pounds applied per total land area. We analyzed data from the following pesticides previously linked to gastroschisis: atrazine, mineral oil, oxyfluorfen, and glyphosate. We also investigated sulfur, which was the most widely applied pesticide in CA during this time period. Multivariable logistic regression, adjusting for maternal demographics, socioeconomic factors, and birth-related variables was used to identify associations between pesticide application and gastroschisis.
Results: During the study time, there were 2,218,394 births and 656 cases of gastroschisis (0.3 cases/1000 births). Pregnant individuals in the San Joaquin Valley had 1.4 times higher odds of gastroschisis (95% CI: 1.1-1.7) compared to other CA regions (0.5/1000 vs 0.3/1000, respectively). Analysis of the five pesticides of interest revealed higher gastroschisis rates in counties with greater usage of sulfur (aOR = 1.22; 95% CI: 1.00-1.49; p = 0.046) and mineral oil (aOR = 1.24; 95% CI: 1.05-1.45, p = 0.009).
Conclusion: These findings suggest an association between pesticide exposure, particularly sulfur and mineral oil, and risk of gastroschisis. More studies are needed to further illuminate causal relationships and guide targeted preventive strategies and management approaches for reducing gastroschisis incidence in vulnerable populations.





36 | AI Software Demonstrates Strong Performance for Screening of Tetralogy of Fallot and Truncus Arteriosus Communis

Remi Besson[1]; Nicolas Fries[2]; Julien Stirnemann[3]; Yves Ville[4]; Guy Vaksmann[5]
[1]Sonio, Paris, Ile-de-France; [2]Imagyn'Echo, Imagyn'echo Montpellier, Languedoc-Roussillon; [3]Hôpital Necker Enfants Malades, Paris, Ile-de-France; [4]University and Necker-Enfants Malades Hospital, Paris, Ile-de-France; [5]Cabinet Vendôme, Lille, Nord-Pas-de-Calais

3:15 PM - 3:30 PM

Objective: Congenital malformations are under-diagnosed during fetal ultrasound (US) exams. Artificial Intelligence (AI) could make the examination safer by drawing the practitioners eyes to suspicious images. Objective is to evaluate the feasibility to build an AI recognizing the overriding great vessel images of the Tetralogy of Fallot (ToF) or Truncus arteriosus communis (TAC).
Study Design: An AI software (under development, not FDA approved) was trained on tens of thousands annotated US images from 30 major USA and European sites including the images of

102 patients with diagnosed ToF. No cases of TAC were used by the algorithm during the training phase.
A first validation database is composed of 99 overriding aorta from ToF cases and 2153 normal images coming from these same centers. A second validation database was composed of 21 ToF and 7 TAC cases built from literature images between 2001 and 2021. Each exam was reviewed by one fetal US expert responsible for extracting all the images showing an overriding great vessel. The AI software was evaluated on its ability to accurately identify this sign.
Results: On the 99 overriding aorta images of the first validation database, the AI software reached 94.95% sensitivity in raising an alert. On the literature images, respectively on ToF and TAC cases, the algorithm identified an overriding great vessel on resp. 36 and 12 images, reaching a sensitivity of resp. 90% and 92.3%. On the control group, 98.8% specificity was reached (Fig.1).
Conclusion: This study demonstrated the feasibility in building a reliable alert system for screening of ToF along with the performance of such an algorithm in detecting pathologies non-seen during training (TAC) thanks to including well-known ultrasound semiology to guide the AI learning phase. Further tests on independent DBs from new centers are needed to better assess the AI software's robustness.

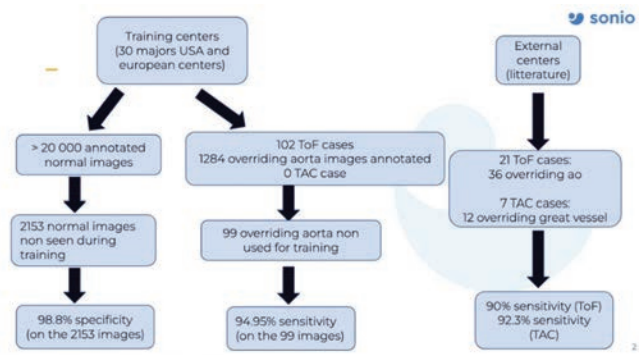


Figure 1: Composition of the different databases and performance of the AI on them

37 | Genetic Etiologies of Bilateral Renal Agenesis

Bobby Brar[1]; Robert Weatherford[2]; Carol Nowlen[1]; Katelynn Sagaser[3]; Ahmet A. Baschat[1]; Karin Blakemore[1]; Jena L. Miller[1]; Angie C. Jelin[1]
[1]Johns Hopkins Medicine, Baltimore, MD; [2]Massachusetts General Hospital, Boston, MA; [3]23andMe, South San Fransisco, CA

3:30 PM - 3:45 PM
Objective: Bilateral renal agenesis (BRA) with anhydramnios due to fetal anuria has a poor prognosis due to severe pulmonary hypoplasia. Although often isolated, BRA may be one feature of a larger, complex genetic disorder. Our objective was to further elucidate the genetic etiologies of fetuses with BRA.
Study Design: We performed a retrospective cohort study of all patients with fetal BRA presenting to an academic medical center for evaluation under the Renal Anhydramnios Fetal Therapy (RAFT) trial over a five-year period. Maternal demographics, ultrasound reports, and genetic screening/diagnostic testing results were reviewed. Pedigrees were also assessed to help inform potential inheritance.
Results: From 2017–2022, 52 patients with fetal BRA presented for evaluation. Extrarenal anomalies were seen in 17 (33%), most commonly cardiac (11), CNS (4), and skeletal (4). Aneuploidy screening was performed in 32 (62%), and none screened positive for the common autosomal aneuploidies. Diagnostic testing, offered to all, was completed in 37 patients (71%) with a 19% testing yield (7/37) (Table 1). 25 of the 37 had isolated BRA. Of 14 karyotypes, 1 case of 47, XXX was appreciated. Chromosomal microarray, performed in 28 patients, identified 3 copy number variants (CNVs): (2q21.1 duplication, 16p13.11 duplication, and 22q11.2 microdeletion). Exome sequencing revealed a pathogenic abnormality in 3 out of 5 patients (heterozygous variants in *GREB1L* and *RET*, compound heterozygous variants in *FREM2*). Of 7 patients with abnormal diagnostic testing, only 3 had extrarenal anomalies. Pedigrees were elicited in 46 patients with 13 (28%) reporting a family history of a genitourinary anomaly.
Conclusion: Approximately 1 in 5 fetuses with BRA have abnormal genetic testing. This highlights the importance of a comprehensive diagnostic testing approach in this population. Future research routinely employing molecular methodologies that interrogate for potentially etiologic CNVs and single gene disorders in pregnancies with BRA is needed to further our understanding of this condition, and to better inform parental counseling.

Case Number	Diagnostic Testing Result	Method of Testing	Extrarenal Anomalies
Case 1	47,XXX	Karyotype	None
Case 2	775 kb duplication of 2q21.1 (includes *CFC1*)	CMA	Pulmonic valve stenosis
Case 3	1.2 mb duplication of 16p13.11	CMA	None
Case 4	2.6 mb deletion of 22q11.21	CMA	Dilated cardiomyopathy, pulmonary atresia with intact ventricular septum
Case 5	Heterozygous variant in *GREB1L* (c.5016G>A)	WES	None
Case 6	Heterozygous variant in *RET* (c.2617C>T)	WES	None
Case 7	Compound heterozygous variants in *FREM2* (c.750_751dupGA and c.5162dupA)	WES	Congenital high airway obstruction, ascites, VSD

Table 1: Bilateral renal agenesis fetuses with abnormal diagnostic genetic testing. CMA: Chromosomal microarray, WES: Whole Exome Sequencing, VSD: Ventricular septal defect

38 | Fully Quantitative Cervical Remodeling: Inter-pregnancy interval shows differences in biomechanical characteristics of the cervix

Sarah M. Dwyer[1]; LeAnn A. Louis[1]; Methodius G. Tuuli[2]; Adam K. Lewkowitz[2]; Julie Tumbarello[1]; Emily Dively, BSN[3]; Madeline Felske[1]; Wendy Sparks[1]; Giselle Kolenic[4]; Peinan Zhao[5]; Molly J. Stout[6]
[1]University of Michigan Hospital, Ann Arbor, MI; [2]Women & Infants Hospital of Rhode Island and Alpert Medical School of Brown University, Providence, RI; [3]Washington University School of Medicine, St. Louis, MO; [4]University of Michigan, Ann Arbor, MI; [5]Washington University, St. Louis, MO; [6]University of Michigan Medical Center, Ann Arbor, MI

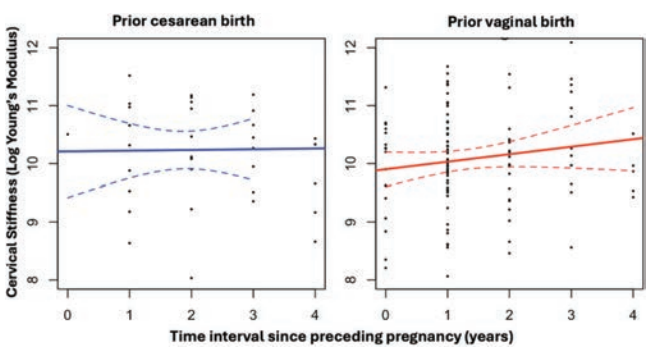
3:45 PM - 4:00 PM

Objective: Short interval pregnancy is known to confer obstetric risks in subsequent pregnancies. We aimed to examine starting cervical stiffness based on time elapsed since prior pregnancy and mode of delivery in prior pregnancy.

Study Design: We invented fully quantitative cervical elastography (FQ-CES), which modifies a transvaginal ultrasound probe to quantify both pressure applied and tissue deformation, thereby yielding a fully quantified strain-based elastography system that provides a numeric quantification (Young's modulus) of cervical tissue stiffness. This system is operator independent and can be compared across patients and within patients over time. This analysis is a prospective cohort study of people with singleton pregnancies presenting for prenatal care. Exposure is time in years since immediate prior pregnancy and mode of delivery of prior pregnancy. Outcome is fully quantitative cervical stiffness in the first trimester. Mixed regression models were used.

Results: 196 individuals included. Median years since prior pregnancy is 2 years (IQR 1,3 years). Prior vaginal birth shows a progressive hardening (13.8% change in Young's Modulus per year) over the 3 years following birth ($p = 0.18$) whereas cesarean birth shows stable cervical stiffness (1.3% change in Young's Modulus per year; $p = 0.95$).

Conclusion: Cervical tissue remodeling after pregnancy may be differ after vaginal versus cesarean births. First trimester cervical stiffness may be associated with time since last pregnancy. The inter-pregnancy interval is a critically understudied time window which may provide insights into optimizing pregnancy outcomes.



Oral Plenary Session 2

(Fellows Plenary)

Abstracts 39 – 46

FRIDAY
January 31, 2025
8:00 AM – 10:00 AM
Aurora Ballroom

MODERATORS
Bryann Bromley, MD
Mark A. Clapp, MD, MPH

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Plenary Session 2 (Fellows Plenary)

Friday, January 31, 2025 8:00 AM – 10:00 AM

39 | Methylergonovine to Decrease Blood Loss During Cesarean Delivery in Twins: A Triple-Blinded Placebo-Controlled Randomized Trial

Helen B. Gomez Slagle[1]; Shai Bejerano[2]; Russell S. Miller[2]; Dena Goffman[2]; Mary E. D'Alton[2]; Mirella Mourad[2]
[1]*Columbia University Irving Medical Center, New York, NY;*
[2]*Columbia University Medical Center, New York, NY*

8:00 AM - 8:15 AM

Objective: To evaluate whether prophylactic administration of intramuscular (IM) methylergonovine after cord clamping reduces blood loss during cesarean delivery (CD) in twin pregnancies.

Study Design: This single-center randomized placebo-controlled triple-blinded trial compared the effects on blood loss at CD of IM methylergonovine versus saline placebo control. Pregnant individuals with twin gestations at ^{3}34 weeks of gestation undergoing planned CD were enrolled. Methylergonovine or saline placebo was administered immediately after umbilical cord clamping of the second twin in addition to standard care with oxytocin. The primary outcome was change in maternal hemoglobin (Hgb) level from preoperative to postoperative day 1 (POD 1). We planned to enroll 66 patients to detect a standard deviation (SD) greater drop in postoperative maternal Hgb, assuming -1.40 (0.83) g/dL Hgb difference in planned CDs (90% power, alpha 0.05). Pearson chi-square, or Fisher's exact test, and Wilcoxon rank-sum with intent-to-treat principles were performed as appropriate.

Results: From February 2023 through March 2024, 77 patients were eligible and 66 participated. There were no demographic differences between methylergonovine and placebo groups. Median gestational age at delivery was 37 weeks for both groups. Mean Hgb drop at POD 1 was 1.1 g/dL (SD 0.7 g/dL) for methylergonovine and 2.1 g/dL (SD 0.9 g/dL) for placebo ($p< 0.001$). Median quantitative blood loss was significantly lower in patients receiving prophylactic methylergonovine (891cc versus 1017cc, $p = 0.003$). Postpartum hemorrhage rates were lower in the methylergonovine group (18.2% vs 54.5%, $p = 0.002$). There were 7 cases of unblinding due to hemorrhage in the placebo group compared to no cases in the methylergonovine group ($p = 0.01$); unblinded subjects received methylergonovine.

Conclusion: Prophylactic IM methylergonovine administered during twin CD after umbilical cord clamping significantly reduced intraoperative blood loss and hemoglobin drop at POD 1. These data support further study of methylergonovine as a preventative treatment strategy at the time of twin CD.

Table 1: Surgical Characteristics and Outcomes by Randomized Treatment Group

	Methylergonovine (n=33)	Placebo (n=33)	p
Surgical Characteristics			
Indication for cesarean delivery			1.0
Elective	9 (27.3)	10 (30.3)	
Malpresentation of presenting twin	8 (24.2)	7 (21.2)	
Repeat	10 (30.3)	9 (27.3)	
Abnormal fetal testing	4 (12.1)	5 (15.2)	
Vasa/placenta previa	0 (0.0)	1 (3.0)	
History of myomectomy	2 (6.1)	1 (3.0)	
Spinal anesthesia	33 (100.0)	33 (100.0)	-
Hysterotomy type			1.0
Low transverse	33 (100.0)	32 (97.0)	
Classical	0 (0.0)	0 (0.0)	
T- or J-incision	0 (0.0)	1 (3.0)	
Anterior placenta	22 (66.7)	21 (63.6)	0.80
Tubal ligation performed	5 (15.2)	4 (12.1)	1.0
Surgical Outcomes			
Change in maternal hemoglobin (g/dL), mean, SD	1.1 (0.7)	2.1 (0.9)	<0.001
Total surgical time (minutes), median, IQR	62.0 (54; 75)	61.0 (49; 69)	0.79
Estimated blood loss (cc), median, IQR	800.0 (800; 900)	1000.0 (800; 1098)	0.003
Quantitative blood loss (cc), median, IQR	891.0 (743; 966)	1017.0 (931; 1211)	0.003
Postpartum hemorrhage‖	6 (18.2)	18 (54.5)	0.002
Intraoperative prostaglandin administration	0 (0.0)	2 (6.1)	0.49
Intraoperative carboprost tromethamine administration	1 (3.0)	4 (12.1)	0.36
Intraoperative tranexamic acid administration	2 (6.1)	7 (21.2)	0.15
Unblinding due to active hemorrhage†	0 (0.0)	7 (21.2)	0.01
Intraoperative hemostatic floseal	1 (3.0)	2 (6.1)	1.0
Intraoperative intravenous fluid volume (cc), mean, SD	1708.7 (747.2)	1871.9 (752.5)	0.38
Postpartum infection complications§	0 (0.0)	2 (6.1)	0.49
Maternal length of stay (days), median, IQR	4.0 (3.0; 4.0)	4.0 (4.0; 6.0)	<0.001
Hospital readmission	1 (3.0)	3 (9.1)	0.61
Blood transfusion	2 (6.1)	4 (12.1)	0.67
Hysterectomy	0(0.0)	0 (0.0)	-

Data are presented as N (%), unless otherwise indicated.
‖Defined as quantitative blood loss of greater or equal to 1000cc
§Defined as endometritis, surgical site infection, or pelvic abscess
†Unblinded subjects received methylergonovine

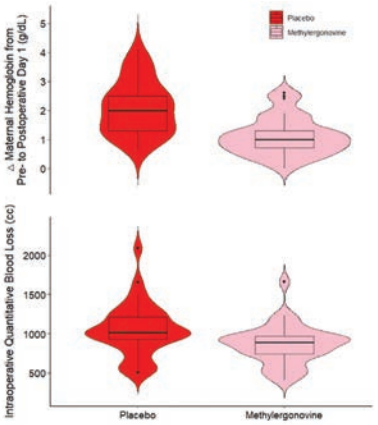


Figure 1: Violin Plots with Superimposed Box Plots of Change in Maternal Hemoglobin and Intraoperative Blood Loss by Randomized Treatment Group.

Violin plots display the density of the overall data, and boxplot boxes display the median and interquartile range

40 | Management of Postpartum Preeclampsia and Hypertensive Disorders (MOPP): Postpartum Tight Versus Standard Blood Pressure Control

Emily B. Rosenfeld[1]; Deepika Sagaram[1]; Rachel Lee[1]; Ernani Sadural[2]; Richard C. Miller[2]; Ruby Lin[1]; Deshae Jenkins[1]; Kristin Blackledge[3]; Ivana Nikodijevic[4]; Alex Rizzo[2]; Vanessa Martinez[1]; Emily E. Daggett[5]; Olivia McGeough[1]; Cande V. Ananth[1]; Todd J. Rosen[1]

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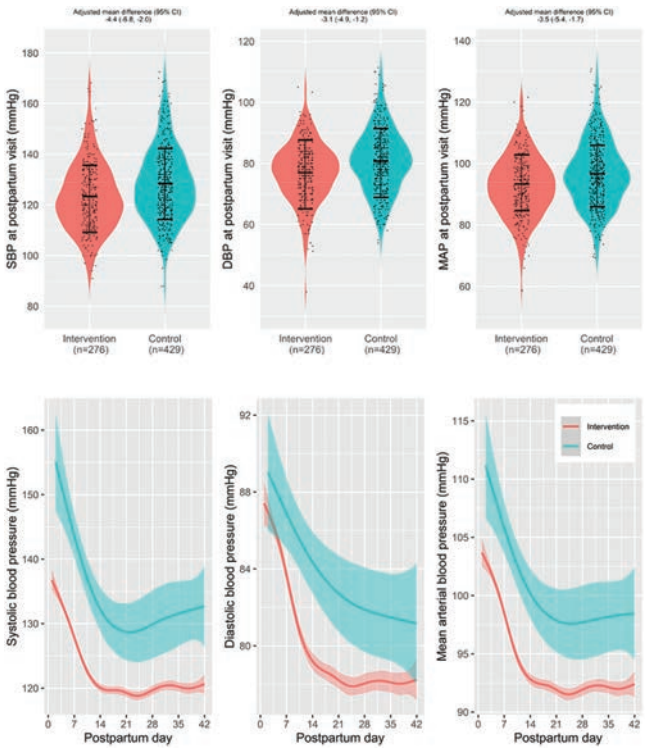
8:15 AM - 8:30 AM

Objective: To assess the effect of lowering the blood pressure (BP) threshold for treatment to 130/80 mmHg from the ACOG standard of 150/100 mmHg, coupled with remote BP monitoring, in managing postpartum patients with hypertensive disorders and reducing Emergency Department (ED) visits.

Study Design: A prospective cohort of postpartum patients was recruited in a multicenter study between March 2023 and March 2024 and treated to maintain BP < 130/80 mmHg for six weeks postpartum. These patients were compared to a retrospective cohort of patients delivered from February 2021 to February 2023 who were treated to maintain BP < 150/100 mmHg. Eligible patients were 18 years or older with a diagnosis of hypertensive disorder. The primary outcome was an ED visit for hypertensive disorders. Secondary outcomes included hospital readmissions and changes in BP at six weeks postpartum. We matched subjects between the interventional and the retrospective cohort through the propensity score method.

Results: There were 392 patients enrolled in the interventional cohort and 1,204 patients in the retrospective cohort. After the propensity score match, 276 and 429 patients remained in the intervention and retrospective cohorts. ED visits for hypertensive disorders occurred in 3.6% (n = 10) in the interventional cohort and 8.5% (n = 36) in the retrospective cohort (risk difference [RD] -4.8, 95% confidence interval [CI] -8.2, -1.3; matched odds ratio [OR] 0.32, 95% CI 0.10, 1.01). There were fewer hospital readmissions for hypertensive disorders (RD -3.2, 95% CI -5.7, -0.8; OR 0.09, 95% CI 0.003, 2.31). Compared to the retrospective group, systolic and diastolic BP at six weeks postpartum in the intervention group were, on average, 4.4 mmHg (95% CI -6.8, -2.0) and 3.1 mmHg (95% CI -4.9, -1.2) lower (**Figure 1**). BP and mean arterial pressure were lower throughout the six weeks in the intervention group (**Figure 2**).

Conclusion: Tighter BP control with remote patient monitoring was associated with a clinically meaningful reduction in postpartum ED visits for hypertensive disorders and lower blood pressure at six weeks postpartum.



41 | Impact of Living in a Food Desert on Prenatal Macro- and Micronutrient Intake

Noor K. Al-Shibli[1]; Anne L. L. Dunlop[2]; Suchitra Chandrasekaran[3]

[1]Emory University, School of Medicine, Atlanta, GA; [2]Emory University School of Medicine, Atlanta, GA; [3]Emory University, Atlanta, GA

8:30 AM - 8:45 AM

Objective: Nutritional deficiencies and associated adverse pregnancy outcomes are emerging threats to public health. Little is known about the impact of the lived food environment on prenatal diet quality. This study aimed to explore the impact of living in a food desert (FD) on macro- and micro-nutrient intake in pregnancy.

Study Design: We performed a single-center prospective pregnancy cohort study from 2014-2024. Participants were a subset of those enrolled in the Atlanta African American Maternal-Child Cohort, which included pregnant people ages 18-40 with a singleton 8-14 weeks' gestation who identified as Black/African American. Block-Bodnar food frequency questionnaires (FFQ) were administered at 8-14 or 24-30 weeks' gestation. Responses were used to estimate dietary intake of macro/micronutrients. Address of primary residence was assigned to a census tract; FD status was assigned to low-income & low-access tracts

according to U.S. Department of Agriculture (USDA) definitions. Descriptive and bivariate statistics were utilized.

Results: Of n = 543 pregnancies, n = 242 (45%) lived in a FD. Median BMI was 28.3 and 27.1 in FD and non-FD, respectively (p = 0.321). FD census tracts had more housing units that utilized Supplemental Nutrition Assistance Program (SNAP) benefits: 586 vs 362 (p< 0.0001). Living in a FD was not associated with significant differences in macro/micronutrient intake (Table 1). However, a large proportion of FD & non-FD cohorts had insufficient micronutrient intake. Rates of insufficient intake were highest for vitamin D, magnesium, folic acid, & iron (Table 2).

Conclusion: Interestingly, our data demonstrates no difference in prenatal intake of macro/micronutrients according to residence in a FD. Both groups had high rates of insufficient micronutrient intake regardless of living in a FD or non-FD. These findings highlight the current prenatal nutritional crisis and support a shift in policy focus to nutrition education, food prescription programs, and diet culture to optimize maternal nutrition status in pregnancy and beyond.

Table 1: Macro- and Micro-nutrient intake by Food Desert Status

Median	Non-Food Desert	IQR [Q1-Q3]	Food Desert	IQR [Q1-Q3]	p-value
Age, years	26	8 [22-30]	24	8 [21-29]	0.005
BMI,* mg/kg^2	27.1	7.79 [23.3-33.7]	28.3	8.18 [23.8-34.5]	0.321
Macronutrients:					
Kcal†	1741	1700 [1103-2803]	1801	1631 [1156-2788]	0.759
Protein, g	62.65	60.28 [41.63-101.9]	62.66	55.29 [40.46-95.75]	0.721
Total fat, g	69.78	67.61 [46.43-114.0]	74.69	67.27 [47.02-114.3]	0.908
Carbohydrates, g	219.23	209.7 [139.7-349.5]	223.4	205.7 [145.6-351.3]	0.667
Micronutrients:					
Calcium, mg	734.38	714.5 [455.9-1170]	697.41	679.4 [455.3-1135]	0.612
Phosphorous, mg	1109.38	1081 [704.8-1786]	1073.83	1017 [687.3-1705]	0.764
Iron, mg	12.68	12.37 [8.28-20.65]	13.385	11.88 [7.73-19.61]	0.952
Sodium, mg	2862.21	2777 [1938-4715]	2869.65	2551 [1896-4447]	0.871
Potassium, mg	2419.54	2158 [1508-3666]	2381.7	2059 [1478-3537]	0.659
Thiamine, mg	1.4	1.34 [0.94-2.27]	1.49	1.34 [0.88-2.21]	0.923
Riboflavin, mg	1.73	1.77 [1.11-2.88]	1.7	1.61 [1.01-2.67]	0.894
Niacin, mg	18.19	17.57 [11.21-28.78]	18.6	16.04 [11.33-27.37]	0.958
Vitamin C, mg	121.15	146.3 [66.94-213.3]	115.525	147.2 [66.71-213.9]	0.920
Folic acid, mcg	139.3	162.3 [76.75-239.0]	143.095	158.6 [80.24-238.8]	0.869
Zinc, mg	9.45	9.35 [5.86-15.21]	9.105	8.00 [5.81-13.81]	0.649
Vitamin B6, mg	1.73	1.60 [1.13-2.73]	1.725	1.74 [1.07-2.81]	0.798
Magnesium, mg	260.33	236.0 [160.6-396.6]	246.575	218.1 [162.7-380.8]	0.767
Vitamin B12, mg	4.12	4.69 [2.42-7.11]	3.81	3.95 [2.50-6.46]	0.606
Vitamin D, IU	113.95	145.4 [56.79-202.2]	100.165	126.1 [57.19-183.3]	0.521
Vitamin K, mcg	171.23	250.6 [85.54-336.1]	145.66	227.4 [76.9-304.3]	0.247
Copper, mg	1.19	1.13 [0.771-1.90]	1.14	1.04 [0.779-1.82]	0.719
Selenium, mcg	80.55	82.04 [52.29-134.3]	81.74	77.50 [54.10-131.6]	0.941

*BMI, †kilo-calorie

Table 2: Rates of Insufficient Nutrient Intake by Food Desert Status

	Number of individuals with insufficient intake, n (%)					
	Dietary			Dietary + Supplements		
	Non-Food Desert	Food Desert	p-value	Non-Food Desert	Food Desert	p-value
Macronutrient:						
Protein	174 (57.8)	141 (58.3)	0.915			
Micronutrients:						
Calcium	200 (66.4)	171 (70.7)	0.971	187 (62.1)	154 (63.6)	0.989
Copper	301 (100)	242 (100)	1.000	301 (100)	242 (100)	1.000
Folate	283 (94.0)	231 (95.5)	0.992	134 (44.5)	114 (47.1)	0.978
Iron	254 (84.4)	204 (84.3)	0.999	112 (37.2)	91 (37.6)	0.996
Magnesium	209 (69.4)	173 (71.5)	0.986	198 (65.8)	170 (70.3)	0.969
Niacin	149 (49.5)	114 (47.1)	0.980	68 (22.6)	51 (21.1)	0.982
Phosphorous	75 (24.9)	62 (25.6)	0.992	75 (24.9)	62 (25.6)	0.992
Potassium	183 (60.8)	155 (64.0)	0.977	183 (60.8)	155 (64.1)	0.977
Riboflavin	116 (38.5)	90 (37.2)	0.988	56 (18.6)	42 (17.4)	0.983
Selenium	96 (31.9)	76 (31.4)	0.995	49 (16.3)	31 (12.8)	0.949
Thiamine	149 (49.5)	115 (47.5)	0.984	63 (20.9)	51 (21.1)	0.998
Vitamin B12	83 (27.6)	69 (28.5)	0.990	42 (14.0)	30 (12.4)	0.976
Vitamin C	96 (31.9)	81 (33.5)	0.984	51 (16.9)	38 (15.7)	0.983
Vitamin D	81 (26.9)	72 (29.8)	0.993	262 (87.0)	218 (90.1)	0.982
Vitamin K	81 (26.9)	72 (29.8)	0.970	81 (26.9)	72 (29.8)	0.970
Zinc	180 (59.8)	161 (62.4)	0.981	79 (26.3)	63 (26.0)	0.998

42 | Small for Gestational Age Prediction Using Unsupervised Machine Learning of First Trimester Fetal Cardiac Parameters

Rebecca Horgan[1]; Elena Sinkovskaya[1]; Erkan Kalafat[2]; George R. Saade[1]; Alfred Abuhamad[3]

[1]Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA; [2]Koc University Hospital, Istanbul, Istanbul; [3]Eastern Virginia Medical School, Norfolk, VA

8:45 AM - 9:00 AM

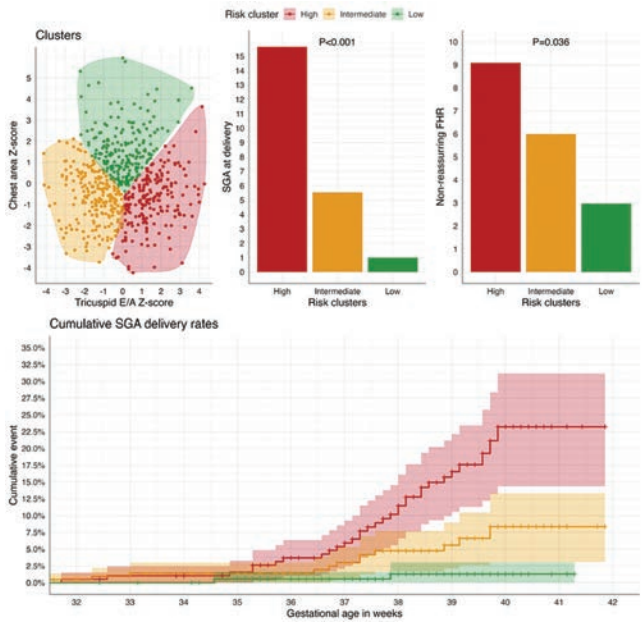
Objective: To use unsupervised machine learning techniques on first trimester fetal cardiac parameters to predict risk of subsequent small for gestational age (SGA) birthweight.

Study Design: This was a prospective cohort study which enrolled patients at ≤ 13+6 weeks' gestation without fetal, umbilical cord or placental abnormalities. At the 1st trimester ultrasound, the chest area, heart area, ventricular inlet lengths, spectral and color Doppler of the atrioventricular valves, valvular regurgitation and myocardial performance index were assessed. K-Medoids clustering was applied to sort fetuses into risk groups for SGA, defined as a birthweight < 10th percentile for gestational age. Candidate variables were selected with regression analyses and the Elbow method was used to determine the optimal number of clusters. Cumulative rates of outcomes were plotted with Kaplan-Meier analysis and model performance was tested with area under the curve values with repeated cross-validation.

Results: 617 pregnancies were included in the analysis, of whom 45 (7.3%) delivered an SGA neonate. Z-scores of chest area (P = 0.027) and tricuspid valve E/A ratio (P< 0.001) showed an independent association with delivery of an SGA neonate and were used in the clustering algorithm. Unsupervised learning algorithm found 3 risk clusters, low (n = 202), intermediate (n = 217), and high (n = 198). The rates of SGA (1.0%, 5.5% and 15.7%, P< 0.001) and non-reassuring fetal heart rate tracings (3.0%, 6.0% and 9.1%, P = 0.036) differed significantly between the three risk clusters (Figure 1). AUC values of the model in cross-validation samples were 0.79 (IQR: 0.76–0.81). Using low risk cluster as a threshold, model sensitivity was 95.5% and specificity was 35.0%. The negative predictive value for ruling out SGA was 99.0%.

Conclusion: Unsupervised machine learning of first trimester fetal cardiac parameters can effectively stratify risk for SGA

neonates. Our findings support the hypothesis that fetal growth trajectory is impacted by early development and may explain the association between fetal growth and programming of adult cardiovascular function.



43 | Pravastatin Dose-Range and Pharmacokinetic Study in a Pregnant Rat Model

Xiao-Yu Wang[1]; Sydney Lammers[2]; Jennifer Reno-Graber[3]; Frederick Reno[3]; Alan Hoberman[4]; George R. Saade[5]; Monica Longo[6]; Victoria L. Pemberton[7]; Ronald J. Wapner[8]; Nicole Abbott[1]; Zhiliang Xie[1]; Joo Young Na[1]; Mitch A. Phelps[1]; Maged M. Costantine[1]

[1]The Ohio State University, Columbus, OH; [2]The Ohio State University, College of Medicine, Columbus, OH; [3]Reno & Associates, FL; [4]Charles River Laboratories, PA; [5]Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA; [6]National Institute of Child Health and Human Development, Bethesda, MD; [7]National Heart, Lung, and Blood Institute, Bethesda, MD; [8]Columbia University, New York, NY

9:00 AM - 9:15 AM

Objective: Pravastatin has biologic plausibility and promising preliminary clinical data for the prevention of preeclampsia. We sought to determine its pharmacokinetic (PK) properties and biodisposition in a Sprague Dawley (SD) pregnant and juvenile offspring rat model.

Study Design: Pregnant female SD rat dams (n = 18/dose) were administered pravastatin by gavage at doses of 0 (ctrl), 15, 45, and 90 mg/kg/day starting on gestation day (GD) 6 through postnatal day (PND) 6. Randomly selected male and female juvenile pups were dosed at 0 (ctrl), 15, 45 and 90 mg/kg/day (n = 18/sex/dose) on PND7 until PND21. Brain, liver, and plasma samples were collected, and pravastatin and its primary metabolite, 3α-hydroxy pravastatin, were measured with validated HPLC assay to calculate PK parameters on GD20 F0 dams, GD20 F1 fetuses (pooled), and PND21 F1 male and female pups.

Results: Pravastatin at all doses was well tolerated in the F0 dams and F1 pups and did not affect growth or development of the F1 pups. Incremental dosing was associated with increasing plasma exposures in F0 dams, F1 fetuses, and F1 pups (AUC and Cmax; Tables 1, 2). Exposure levels in the dams was equivalent to 5- to 67-fold increase over those observed in pregnant women on pravastatin 20mg/day (Table 1). GD20 PK data show very low transfer of pravastatin from dams to fetuses, with F1 fetus exposures ~≤5% that of F0 dams (Table 1). Direct dosing of F1 pups resulted in systemic exposure that was significantly higher than exposure of the dams. Brain PK data show very low brain exposure for both pravastatin and 3α-hydroxy pravastatin in F1 GD20 fetuses and PND21 pups (Tables 1, 2). Liver PK profiles show dose-dependent increased exposure compared with brain at similar doses.

Conclusion: In a rat model, maternal to fetal transfer of pravastatin is minimal and fetal and postnatal juvenile pup brain exposure to pravastatin and its metabolite is limited. Our studies also demonstrate no overt toxicity in the dams or offspring with antenatal pravastatin use and support the continued research in repurposing of pravastatin for preeclampsia prevention.

Table 1: Pravastatin plasma PK of F0 dams, F1 fetuses (pooled) plasma and brain (all GD20)

	Dose (mg/kg/day)	C_{max} (nM)	AUC_{last} (nM*hr)	Ratio of F1 Fetal pooled samples/ F0 Dams plasma*	Plasma AUC in F0 Dams / Pregnant people (dosed 20 mg/day)**
F0 Dams **Plasma** (GD 20)	15	127	180		5 x
	45	4,048	2,381		67 x
	90	1,688	2,112		60 x
F1 **Fetal** Pooled **Plasma** (GD 20)	15	3.14	8.67	0.048	
	45	160	68.3	0.029	
	90	26.3	55.4	0.026	
F1 **Fetal** Pooled **Brain** (GD 20)	15	6.98	20.2	0.112#	
	45	6.83	24.8	0.010#	
	90	7.91	28.0	0.013#	

AUC = area under the curve; GD = gestational day; nM = nanomolar
* Based on AUC comparisons
** Data in human from a prior study of pregnant people receiving 20 mg/day pravastatin from before 16 weeks' gestation till delivery, with pravastatin AUC assessed at 30-34 weeks' gestation
# ratio of F1 GD20 pooled brains to F0 dams plasma based on AUC.

Table 2: Pravastatin plasma and brain PK of F1 female and male pups (PND21)

	Dose (mg/kg/day)	C_{max} (nM)	AUC_{last} (nM*hr)	Ratio of F1 pup brain (PND 21) / F1 plasma (PND21) *
F1 Female Pups **plasma** (PND 21)	15	531	790	
	45	4,740	5,347	
	90	29,667	29,381	
F1 Male Pups **plasma** (PND 21)	15	580	817	
	45	4,937	4,722	
	90	16,183	22,304	
F1 Female **Brain** Pups (PND 21)	15	6.63	11	0.014
	45	19.8	55.8	0.010
	90	95.5	145	0.005
F1 Male Pups **Brain** (PND 21)	15	20.5	33.5	0.041
	45	31.5	42.9	0.009
	90	73.9	161	0.007

AUC = area under the curve; PND = postnatal day
* Based on AUC

44 | Patterns of Perceived and Everyday Stress, Resilience, and Adverse Placentally Mediated Outcomes

Maura Jones Pullins; Sarah Heerboth; Joy McNeal; Ashlyn Tolbert; Annie Dude; Johanna Quist-Nelson; Rebecca Fry; Tracy A. Manuck

University of North Carolina, Chapel Hill, NC

9:15 AM - 9:30 AM

Objective: Prenatal stress is common. However, the quantity and type of stress throughout pregnancy remains poorly defined, and the magnitude of the association between stress, resilience, and hypertensive disorders of pregnancy (HDOP) remains poorly understood.

Study Design: Primary analysis of 2 prospective cohorts, 2017-2022. Patients were recruited < 28 weeks' and completed the Perceived Stress Scale (PSS, range 0-40; 'high' stress is ≥ 21), Everyday Stress Index (ESI, range 0-60; higher values = higher stress), and the Brief Resilience Scale (BRS, range 1-5; 'low' resilience is < 3) surveys. The primary outcome was plac-comps defined as hypertensive disorders of pregnancy ± birthweight < 10% for GA and sex, ± placental abruption). We evaluated whether survey scores in early pregnancy (< 24 weeks) were associated with the eventual development of plac-comps. Linear regression was used to evaluate whether survey results < 24 weeks assessing stress (by PSS, ESI, or both) and/or resilience were associated with the eventual development of plac-comps.

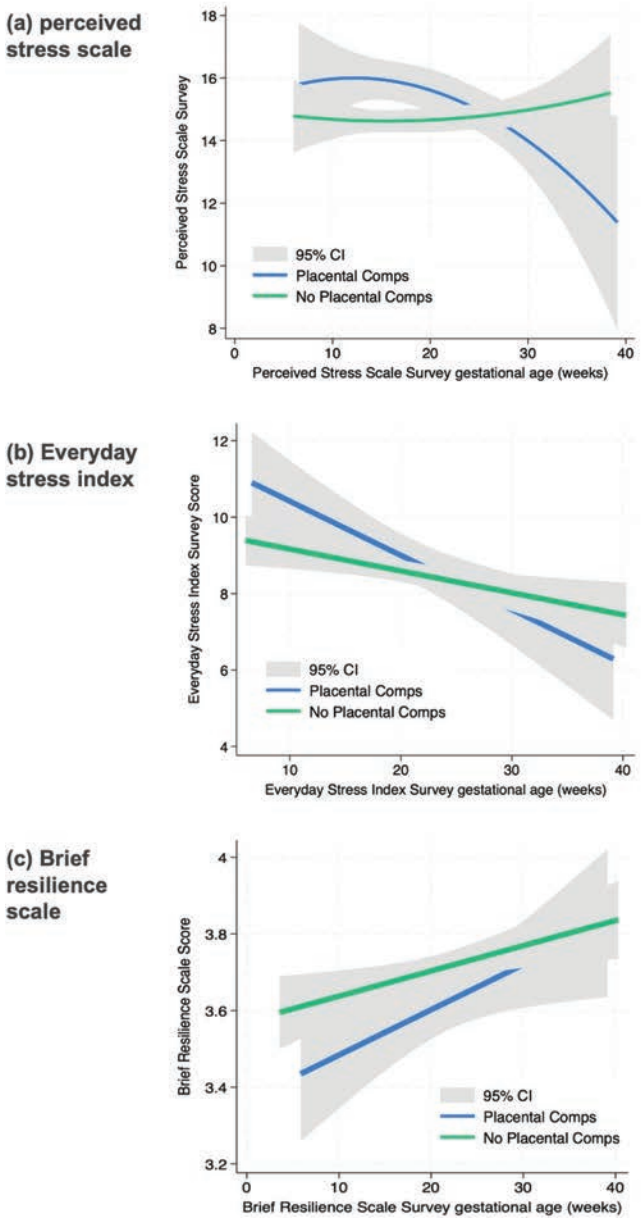
Results: 1,133 individuals met inclusion criteria; 267 (24%) had plac-comps. Cohort characteristics are shown in Table 1. In general, stress, as quantified by the PSS and ESI, tended to decrease with increasing gestational age, while resilience increased (Figure 1). Overall scores were similar for those with and without plac-comps. However, when considering survey results < 24 weeks, PSS scores were higher and BRS lower among those who developed plac-comps compared to those who did not. In regression models controlling for CHTN, pre-gestational DM, pre-pregnancy BMI, maternal race, and history of PTB, increased resilience (quantified by BRS < 24 weeks) was associated with a reduced odds of plac-comps (aOR 0.73, 95% CI 0.56, 0.95). Neither stress score was associated with plac-comps in regression models.

Conclusion: Overall, stress decreases and resilience increases throughout gestation. Increased resilience in early pregnancy is associated with reduced placentally-mediated adverse outcomes.

Table. Demographic and obstetric characteristics, stratified by those with and without plac-comps [defined as hypertensive disorders of pregnancy (HDOP), small for gestational age at birth (<10% for gestational age and sex), and/or placental abruption). All data presented as n(%) or as median (IQR), as applicable, unless otherwise noted.

Characteristic	Plac comps N=267	No plac comps N=866	P-value
Age, mean years ± SD	32.5 ± 5.0	32.9 ± 4.9	0.21
Black race	68 (26)	164 (19)	0.02
White race	172 (64)	619 (72)	0.03
Hispanic ethnicity	20 (8)	95 (11)	0.10
Pre-pregnancy BMI, mean kg/m² ± SD	31.3 ± 9.2	28.2 ± 7.8	<0.001
Pregestational diabetes mellitus	13 (5)	10 (1)	<0.001
Chronic hypertension	110 (41)	90 (10)	<0.001
Prior PTB <37 weeks	22%	17%	0.09
Everyday Stress Index			
• Completed <24 wks	200 (78)	661 (76)	0.634
• Median score <24 wks, IQR	9 (5, 15)	8 (4, 13)	0.069
Perceived Stress Scale			
• Completed <24 wks	209 (78)	662 (76)	0.534
• Median score <24 wks, IQR	16 (12, 20)	15 (11, 20)	0.038
• Score <24 weeks: 0-13 (low stress) 14-26 (mod stress) 27-40 (high stress)	69/209 (33) 130/209 (62) 10/209 (5)	253/662 (38) 383/662 (58) 26/662 (4)	0.376
Brief Resilience Scale			
• Completed <24 wks	166 (62)	521 (60)	0.557
• Median score <24 wks, IQR	3.5 (3.0, 4.0)	3.7 (3.2, 4.0)	0.010
• Score <3 ('low resilience') <24 wks	31/166 (18.7)	71/521 (13.6)	0.111

Figure 1. Fitted plots show the (a) perceived stress scale; (b) everyday stress index; and (c) brief resilience scale scores across gestation, stratified by placental complications.



45 | Microfluidic Device Successfully Replaces Traditional Models of Pregnancy Associated Drug Pharmacokinetic Studies

Ana Collins-Smith; Ananth Kammala; Lauren Richardson; Xiao-ming Wang; Ramkumar Menon
University of Texas Medical Branch, Galveston, TX

9:30 AM - 9:45 AM

Objective: Pregnant & lactating people remain therapeutic orphans. To mediate this problem, we evaluated drug propagation using a microphysiologic (MPS) model of the human maternal-fetal interface (FMi-PLA-OOC) with simulation software to see if this could serve as an alternative & more efficient approach to studying pharmacokinetics across the placental barrier during pregnancy surpassing the limitations of traditional placental perfusion systems & animal models.

Study Design: The humanized FMi-PLA-OOC is composed of 7-cell culture chambers & connected by microchannels containing seven different cells from the feto-maternal interface. A physiological dose of indomethacin (15µg/mL) was introduced into the decidual chamber to assess drug pharmacokinetics. Media & supernatants were collected at various time points & analyzed using mass spectrometry. A physiologically based pharmacokinetic (PBPK) pregnancy model was developed using Gastroplus & compared with placental perfusion studies, animal models, and clinical data from the literature.

Results: Cells in the FMi-PLA-OOC maintained viability, metabolism, & did not show cytotoxicity. The drug propagated & reached the placental layers in 4 hours and the fetal membrane cellular layers in 1 hour. Comparing maximum drug concentrations ratios in the fetus and mother (Cmax, fetal/Cmax, maternal) amongst the different platforms demonstrated: 0.45 (placental perfusion), 0.97 (pregnant humans), 0.77 (FMi-PLA-OOC), 0.88 (PBPK). The fold error of FMi-PLA-OOC & PBPK for Cmax ratios compared to human studies were 0.8 and 0.9, demonstrating an acceptable model.

Conclusion: The utilization of the innovative feto-maternal interface MPS model & PBPK simulation yielded data comparable to the current traditional & simulation approaches. Our humanized MPS model can determine other pharmacologic parameters (efficacy, toxicity, metabolism, absorption, excretion), making preclinical trials easier, cheaper, and faster and in compliance with the FDA Modernization Act 2.0.

A. Concentration of indomethacin that propagated across the FMi-PLA-OOC at 4 and 8 hours

FMi-PLA-OOC	4 hours (ng/mL)	8 hours (ng/mL)
Decidua	353794 ± 24099.5	323049.4 ± 827.6
Amnion layer	1232.5 ± 61.7	1197.6 ± 31.5
HuVEC	6.8 ± 26.0	20.6 ± 13.5
Percent transfer to fetal side	~ 0.3%	~ 0.4%

B. Comparison of results from the FMi-PLA-OOC and simulation model compared to placental perfusion and human models

	Placental Perfusion	Human Studies	FMi-PLA-OOC	Gastroplus (PBPK Simulation)
Fetal/maternal ratio [Cmax]	0.45	0.97	0.774	0.88
Cmax ratio Fold Error (study/human study)	0.46	1.0	0.80	0.90
Fetal/maternal ratio [AUC ratio]	0.267	Not listed	0.54	0.86

	Nonpregnant			Pregnant		
PK Parameter	Observed	Predicted	Fold Error	Observed	Predicted	Fold Error
Cmax (µg/mL)	1.3	1.6	1.2	1.02	0.795	0.8
Tmax (hr)	1.03	1.2	1.2	1.3	1.22	0.9
AUC (µg/ml*hr)	6.4	5.8	0.9	1.91	2.81	1.5

46 | Continuous Glucose Monitoring for Gestational Diabetes Diagnosis: A Comparative Effectiveness Randomized Control Trial (PRECISE)

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9:45 AM - 10:00 AM

Objective: Continuous glucose monitoring (CGM) offers innovative strategies to improve outcomes for gestational diabetes (GDM). We aimed to test the utility of new technology in the diagnosis of GDM compared to the 2-step method.

Study Design: Individuals with a singleton pregnancy, at 24-30 weeks gestation were randomly allocated to screening with either CGM (Dexcom G6) for 7 days or 2-step method after stratifying by BMI (≤ 40) and site (03/2023-04/2024). Individuals diagnosed with fetal anomalies or pregestational DM were excluded. Diagnosis of GDM was made by CGM if any of the following: Time above range (TAR) (≥140 mg/dL) ≥ 10%, mean glucose ≥ 130, or any glucose ≥ 200. GDM was diagnosed by 3-hour GTT for the routine group. Following GDM diagnosis, both groups received usual care. Primary outcome was a composite of adverse neonatal outcomes (LGA, shoulder dystocia, birth injury, need for IV/PO glucose, respiratory distress, and fetal/neonatal death). We utilized Bayesian statistics to estimate a sample size of 814 to have a posterior probability of 75% of any reduction of the primary outcome, assuming 90% power with a 30% reduction with CGM. Analysis was done with an intention-to-treat under a Bayesian framework with a neutral informative prior and with frequentist statistical analysis (NCT05430204).

Results: A total of 814 participants were randomized: 405 in the CGM group, and 409 in the 2-step method group. Groups were similar at baseline (Table 1). Primary outcome was unavailable for 34 (4.2%). GDM was diagnosed in 89 (22%) in the CGM group and 63 (15%) in the 2-step group. Primary neonatal outcome was similar between the groups (34% v. 29%; RR 1.13, 95% Credible interval 0.93-1.4, posterior probability 88%, Table 2). There were no differences in secondary outcomes. In a prespecified, secondary analysis, no difference in primary outcome among individuals treated for GDM was found (50% v. 37%; RR 1.13 95% CI 0.96-1.32).

Conclusion: In this RCT, the use of CGM for diagnosis of GDM was associated with an increased rate of GDM and similar rates of adverse outcomes compared to the 2-step method.

Table 1: Demographics and Pregnancy Characteristics

Characteristics	CGM n= 405	2-step method n= 409
Maternal age (years)	29.0 (25.0, 34.0)	29.0 (24.0, 33.0)
Race/Ethnicity		
Non-Hispanic White	77 (19)	59 (15)
Non-Hispanic Black	144 (36)	145 (36)
Hispanic	117 (29)	142 (35)
Insurance Status		
Government assisted	263 (65)	269 (66)
Nulliparous	124 (31)	136 (33)
BMI ≥ 30 (kg/m²)	215 (53)	245 (60)
Chronic hypertension	36 (9.3)	38 (9.7)
Family history of diabetes mellitus	180 (44)	168 (41)
Gestational diabetes in previous pregnancy	24 (5.9)	29 (7.1)
Gestational age at randomization (weeks)	26.0 (25.0, 27.0)	25.0 (25.0, 27.0)
1-hour GCT result	NA	113.0 (94.0, 135.0)
1-hour GCT ≥135	NA	94 (23)
Completion of 3-hour glucose tolerance test (yes or no)	NA	74 (73)
CGM TIR (60-140)	92.5 (85.0, 96.1)	NA
CGM glucose value ≥ 200	0.0 (0.0/0.0)	NA
CGM Mean glucose (≥ 130)	8.8 (4.2/18.6)	NA
CGM TAR (>140 mg/dL) ≥ 10% (%)	85 (26)	NA
Diagnosis of Gestational Diabetes	89 (22)	63 (15)
Medication for diabetes mellitus during pregnancy		
Oral	7 (2)	9 (2)
Insulin	21 (5)	8 (2)

Data are presented as number (percentage) or mean (SD: standard deviation) unless otherwise specified
CGM, continuous glucose monitoring; GCT, glucose challenge test; BMI, body mass index; GA, gestational age; NA, not available

Outcomes	CGM n= 392 (%)	2-step method n= 388 (%)	Relative Risk (95% CI)	p value
Primary composite outcome	130 (34)	114 (29)	1.05 (0.98, 1.14)	0.2
Large for gestational age (LGA)[a]	32 (8.3)	29 (7.4)	1.03 (0.91, 1.18)	0.6
Shoulder dystocia	5 (1.3)	3 (0.8)	1.14 (0.82, 1.60)	0.4
Birth Injury[c]	1 (0.3)	0 (0)	NC	
Need for IV/PO glucose	75 (20)	60 (15)	1.08 (0.98, 1.18)	0.1
Respiratory distress[e]	45 (12)	47 (12)	0.99 (0.89, 1.11)	0.9
Fetal or neonatal death[e]	2 (0.5)	2 (0.5)	1.00 (0.61, 1.65)	0.9
Secondary outcomes				
GA at time of delivery	38.6 (37.3, 39.3)	38.6 (37.4, 39.1)		
Preterm birth <37 GA	68 (18)	65 (17)	1.02 (0.93, 1.12)	0.7
Macrosomia (BW ≥4000 gm)	21 (5.4)	13 (3.3)	1.14 (0.96, 1.34)	0.1
NICU admission	69 (18)	74 (19)	0.98 (0.90, 1.08)	0.7
Hypoglycemia	87 (23)	68 (17)	1.09 (1.00, 1.19)	0.1
Neonatal hyperbilirubinemia[f]	32 (8.3)	33 (8.4)	1.00 (0.88, 1.13)	0.9
Maternal outcomes				
Hypertensive disorders of pregnancy antepartum[g]				
Gestational HTN	63 (16)	71 (18)	0.97 (0.88, 1.06)	0.5
Pre eclampsia with severe features	24 (6.2)	26 (6.6)	0.98 (0.85, 1.13)	0.8
Super imposed pre eclampsia	15 (3.9)	17 (4.3)	0.97 (0.81, 1.16)	0.7
Primary Cesarean Section	25 (6.4)	30 (7.7)	0.95 (0.83, 1.10)	0.5
Repeat Cesarean Section	92 (24)	76 (19)	1.07 (0.98, 1.17)	0.1
Vaginal Delivery	221 (57)	231 (59)	0.98 (0.91, 1.05)	0.6
Postpartum hemorrhage[h]	17 (4.4)	18 (4.6)	0.99 (0.84, 1.18)	0.9
Blood Transfusion	22 (5.8)	24 (6.2)	0.98 (0.85, 1.14)	0.8
Endometritis	6 (1.6)	4 (1.0)	1.11 (0.82, 1.51)	0.5
Wound complications[i]	1 (0.3)	1 (0.3)	1.01 (0.51, 2.01)	0.9
Diagnosis of Type 2 DM at 6-week PP visit[j]	2 (0.5)	1 (0.3)	1.18 (0.69, 2.02)	0.5

Data are presented as number (percentage). or mean (interquartile); CI, Confidence Interval; NC, non-contributory
[a]Large for gestational age defined as >90th percentile by Duryea et al. nomogram
[b]Shoulder dystocia is defined as the need for any extra maneuvers, other than gentle downward traction of the fetal head to deliver the fetal body after the fetal head has been delivered.
[c]Birth injury defined as skull, clavicular, and humerus fracture or brachial plexus injury
[d]Neonatal hypoglycemia is defined as ≤ 40mg/dL in the first 24 hours
[e]Respiratory distress is defined as at least 4 hours of respiratory support with supplemental oxygen, continuous positive airway pressure, or ventilation at the first 24 hours of life
[f]Fetal or neonatal death within 28 days of birth
[g]Neonatal hyperbilirubinemia is defined as the need for phototherapy
[h]Hypertensive disorder of pregnancy including gestational hypertension, preeclampsia with or without severe features, or superimposed preeclampsia with or without severe features per ACOG guidelines[20]
[i]Postpartum hemorrhage is defined as estimated blood loss of ≥1,000
[j]Wound complications are defined as wound dehiscence or infection
[j]Diagnosis of Type 2 DM through 75 gm, 2-hour glucose tolerance test

Oral Concurrent Session 4

Basic and Translational Science

Abstracts 47 – 56

FRIDAY
January 31, 2025
1:30 PM – 4:00 PM
Aurora Ballroom A

MODERATORS
Michael House, MD
Jamie O. Lo, MD

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Concurrent Session 4 – Basic and Translational Science

Friday, January 31, 2025 1:30 PM – 4:00 PM

47 | Novel Neural Extracellular Vesicle miRNA Biomarkers Identify Suboptimal Response to Cooling in Neonatal Encephalopathy

Sarah T. Mehl[1]; Baharan Fekry[1]; Lierni Ugartemendia[1]; Dhanashree Rajderkar[2]; Nikolay Bliznyuk[2]; Shaveka Gaskins[2]; Michael D. Weiss[3]; Laura Goetzl[1]
[1]*McGovern Medical School at UTHealth Houston, Houston, TX;* [2]*University of Florida, Gainesville, FL;* [3]*University of Florida College of Medicine, Gainesville, FL*

1:30 PM - 1:45 PM

Objective: Recent research has identified multiple circulating miRNA biomarkers that may predict neonatal brain injury following hypoxia-ischemia. We hypothesized that quantification of these miRNAs in CNS derived extracellular vesicles (EV) would result in more accurate prediction of subsequent brain injury given that total circulating markers represent miRNAs from multiple organ sources.

Study Design: CNS EVs were purified from serum samples from 35 neonates who underwent therapeutic hypothermia for NE using previously published methods. Neonates were subsequently categorized into 2 groups based on post warming MRI using the Barkovich scoring system: no/mild injury (n = 21) or moderate/severe injury (n = 14). The four most predictive circulating miRNAs were selected and quantified in CNS EVs using standard qPCR techniques at two time points after birth: 0-6 hours and 48 hours. Biomarker levels were compared between no/mild and moderate/severe injury using the Kruskal-Wallis test and ROC curves were constructed for individual and combined miRNAs.

Results: All miRNA biomarkers were significantly different between groups at 48 hours, but miRNAs 328-3p and 342-3p were the most effective at discriminating between the two clinical outcomes (Figure 1a, miRNAs 197-3p and 150-5p not shown). The combination of all 4 miRNAs resulted in an area under the curve of 0.96 (Figure 1b). However, miRNA 328-3p as a single marker had a similar performance (AUC 0.93) and may be a more cost-effective approach.

Conclusion: Predictive biomarkers are critically important in identifying neonates who will have residual neurologic injury following neonatal encephalopathy despite therapeutic hypothermia. Early identification would allow for early implementation of additional neuroprotective interventions in this subpopulation. We present data identifying 1 to 4 miRNAs that appear to be effective biomarkers at 48 hours. Further investigation is required to determine if CNS EV miRNAs are superior to circulating miRNAs in this clinical scenario.

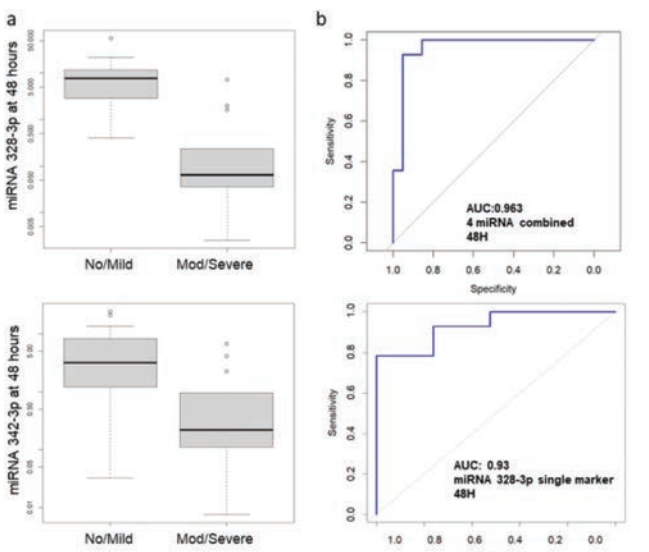


Figure 1. 1a. Median CNS EV miRNA content at 48 hours in neonates with no/mild NE vs moderate severe NE. Significance was determined by Kruskal Wallis testing ($p<0.0001$ for miRNA 328-3p; $p=0.003$ for miRNA 342-3p). 1b. Receiver operator curve (ROC) for the predictive performance of 4 EV miRNA biomarkers vs miRNA 328-3p as a single marker in discriminating between mild/no NE and moderate/severe NE on post warming MRI.

48 | 3D-Printed Humanized Feto-Maternal Interface Tests Exosomal Delivery of Anti-Inflammatory Interleukin-10 (IL-10) to Reduce Infection-Associated Inflammation

Leah Saylor[1]; Rahul Cherukuri[2]; Ananth Kammala[1]; Marc Ferrer[3]; Cristina Antich Acedo[3]; Arum Han[2]; Lauren Richardson[1]; Ramkumar Menon[1]

[1]*University of Texas Medical Branch, Galveston, TX;* [2]*Texas A&M University, College Station, TX;* [3]*National Center for Advancing Translational Sciences, National Institute of Sciences, Bethesda, MD*

1:45 PM - 2:00 PM

Objective: Spontaneous preterm birth (PTB) is linked to fetal inflammatory responses (FIR), typically caused by infections. Current treatments are limited because drugs often cannot cross the feto-maternal interface (FMi). This study uses New Approach Methods (NAMs), like extracellular vesicles (EVs) for drug delivery and a high-throughput 3D-printed organ-on-chip (OOC) model to test efficacy.

Study Design: Recombinant IL-10 was delivered in extracellular vesicles (eIL-10) via electroporation and through THP1 cells transfected with an IL-10 plasmid (tIL-10). A two-chambered 3D scaffold mimicking the feto-maternal interface was used for high-throughput screening. The scaffold, made from biocompatible polymer resin via 3D printing, features microchannels for fluidic communication and a mix of cells and gelatin methacrylate hydrogel in the lower chamber, with cell-specific medium in the upper chamber. We assessed cell viability (LDH), metabolic activity (AlamarBlue), and cytoskeletal markers (cytokeratin-18 and vimentin). Maternal infection was simulated using Lipopolysaccharide (LPS), and the efficacy of eIL-10 and tIL-10 (500ng/mL) in reducing inflammation was evaluated by measuring IL-6 and IL-8 concentrations at 6 and 24 hours.

Results: Our 3D-printed OOC FMi model supported cell growth, viability, and metabolic activity. LPS, eIL-10, and tIL-10 successfully moved between the interconnected chambers. LPS increased IL-6 ($p< 0.001$) and IL-8 ($p< 0.001$) in both decidua and amnion compared to controls. Co-treatment with IL-10, in any form, significantly reduced cytokines on both maternal ($p< 0.05$) and fetal sides ($p< 0.05$).

Conclusion: We developed a 3D-printed feto-maternal interface that effectively tested and showed that exosomal encapsulated IL-10 reduces FMi infectious inflammation. We propose two NAMs: (1) exosomal drug delivery and (2) a 3D-printed device for high-throughput drug screening. These approaches could significantly improve perinatal medicine by reducing inflammation that leads to preterm birth.

49 | Decoy Peptide to (pro)renin Receptor as a Potential Therapeutic Target for Preeclampsia: a Translational Study

Michelle Harris[1]; Ahmed F. Pantho[2]; Kelsey R. Kelso[1]; Jessica C. Ehrig[3]; Ram R. Kalagiri[1]; Niraj Vora[1]; Thomas J. Kuehl[2]; Steven R. Lindheim[1]; Mohammad N. Uddin[4]

[1]*Baylor Scott & White Health Temple Medical Center, Temple, TX;* [2]*Artemis Biotechnologies LLC, Temple, TX;* [3]*Baylor Scott and White Health, Temple, TX;* [4]*Baylor Scott & White Medical Center and Texas A&M School of Medicine, Temple, TX*

2:00 PM - 2:15 PM

Objective: Preeclampsia (preE), a syndrome of hypertension, proteinuria, and end organ damage, is a leading cause of maternal and fetal morbidity and mortality. Circulating levels of soluble (pro)renin receptor (PRR) and placental (pro)renin (PR) have been shown to be elevated in a preE rat model and preE human subjects with a decoy peptide based on this handle-region peptide (HRP) that can block binding of PR to PRR. The goal of this study was to develop and characterize HRP as an innovative treatment for preE and PRR as a novel biomarker for preE.

Study Design: The human extravillous cytotrophoblasts (CTBs) incubated with PRR in medium with the receptor-expressing CTBs followed by renin activity assay to determine the percent binding and activation of PRR. Renin activity assay was performed to determine the percent binding and activation of PRR. Pregnant female rats were randomly assigned to three pregnant groups: 1) NP: normal rats; 2) PDS: rats injected desoxycorticosterone acetate (DOCA) whose drinking water was replaced with saline; and 3) PDS-HRP: rats administered DOCA and saline and given HRP during pregnancy. Additionally, placental and blood samples were collected from pregnant women (40 NP and 30 preE) and analyzed by WB and IHC and s(P)RR ELISA in an IRB approved study.

Results: PR was activated by binding to PRR on the cell membrane of CTB cells, while HRP inhibited binding (100% vs 20%, $p< 0.05$) and activation of PRR (100% vs 30%, $p< 0.05$). HRP administration normalized blood pressure, proteinuria, and birth numbers in the DOCA preE rat model. The placental expression of PRR and soluble PRR were higher ($p< 0.05$) in human preE compared to NP women, respectively.

Conclusion: Our data suggests that increased expression of PRR in the placenta is associated with elevated levels of soluble PRR and is related to preE in the rat model and human subjects. Given HRP appears to inhibit binding of PR to PRR, its use may serve as a potential therapeutic intervention in preE.

Table. HRP normalizes proteinuria and pup numbers in DOCA model

Groups	Protein (mg/24h)	No. Pups	% Malfunctioned Pups
NP	2.8 ± 1.1	14.0 ± 1.8	0
PDS	5.7 ± 1.6 *	10.2 ± 1.5 *	16
NPM	6.4 ± 1.8 *	9.5 ± 1.3 *	18
PDS-HRP	2.6 ± 1.2	13.9 ± 1.4	0

50 | Longitudinal Changes in Epigenetic Aging in Pregnant Versus Non-Pregnant People: a Prospective Cohort Study

Danielle M. Panelli; Nicole Gladish; Nicola C. Perlman; Andres Cardenas; Katherine Bianco

Stanford University, Palo Alto, CA

2:15 PM - 2:30 PM

Objective: Higher parity has been linked with accelerated biologic aging, yet the direct effects of pregnancy itself on epigenetic aging biomarkers are unknown. We compared changes in epigenetic aging across gestation between pregnant and non-pregnant people.

Study Design: This was a prospective cohort of nulliparous people aged 18-50 years seeking obstetric or gynecologic care in 2020. Pregnant people were enrolled between 10 and 14 weeks gestation and age-matched to the next eligible non-pregnant person. Blood samples were collected at enrollment (Time 1) and again either on postpartum day 1 (pregnant) or approximately 7 months later (non-pregnant, Time 2). The primary outcome was biological age, determined from epigenetic clocks using Illumina EPIC Human Methylation BeadChips. Biologic ages at specific time points were compared using t-tests. Changes in biologic age over time were analyzed using mixed effects linear regression models, adjusting for confounders and interaction between time and pregnancy status. Results focus on the two strongest clocks: GrimAge (biologic age in years) and DunedinPACE [aging acceleration (≥ 1) or deceleration (< 1)].

Results: 75 people enrolled, of whom 61 (81.3%) completed both timepoints. While the sample interval differed by cohort, their chronologic ages were similar (Table 1). By Time 2, the pregnant cohort had an older GrimAge than the non-pregnant cohort [mean (SD) 56.7 (3.5) versus 52.9 (6.0) years, p = < 0.01). Additionally, DunedinPACE indicated faster aging in the pregnant cohort at Time 2 [1.2 (0.1) pregnant versus 1.0 (0.1) non-pregnant, p = < 0.001]. Significant interaction between time and pregnancy status was detected for both GrimAge (p< 0.01) and DunedinPACE (p< 0.01, Figure 1).

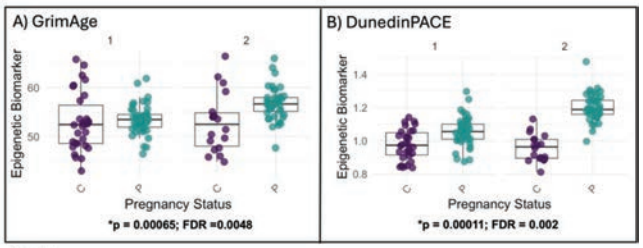
Conclusion: We found significant epigenetic aging acceleration in nulliparous pregnant people compared to their non-pregnant counterparts, highlighting gestation as a key period for epigenetic changes. Further characterizing these epigenetic aging trajectories may inform future interventions to improve maternal and child health.

Table 1. Demographics compared between pregnant and non-pregnant study participants, 2020-2021, N=75.

Characteristic	Pregnant N=45	Non-Pregnant N=30	p-value[a]
Mean chronologic age at Time 1 (years)	31.1 (3.4)	32.6 (7.4)	0.72
Mean chronologic age at Time 2 (years)	32.4 (3.4)	32.9 (7.0)	0.59
Mean body mass index at enrollment (kg/m^2)	23.1 (3.7)	24.9 (4.7)	0.12
Race			
Asian or Pacific Islander	19 (42.2%)	8 (25.7%)	
Black	2 (4.4%)	0	0.29
White	21 (46.7%)	19 (63.3%)	
Other or unknown	3 (6.7%)	3 (10.0)	
Hispanic ethnicity	5 (11.1)	2 (6.7)	0.70
Highest level of education			
Completed high school	3 (6.7%)	1 (3.3%)	
Completed college	10 (22.2%)	11 (36.7%)	0.20
Pursuing or completed higher degree	30 (66.7%)	14 (46.7%)	
Unknown or missing	2 (4.4%)	4 (13.3%)	
Spontaneous conception	39 (86.7%)	-	-
Comorbidity at time of enrollment			
None	24 (53.3%)	15 (50.0%)	0.81
Neurologic or psychiatric	9 (20.0%)	5 (16.7%)	0.77
Chronic hypertension	0	2 (6.7%)	0.16
Type 1 or 2 Diabetes	1 (2.2%)	0	1.00
Hypo- or hyperthyroid	5 (11.1%)	1 (3.3%)	0.39
Other	13 (29.9%)	11 (36.7%)	0.61
Enrolled prior to COVID-19 lockdown (March 17, 2020)	23 (51.1%)	18 (60.0%)	0.49
Number with both timepoints (%)	43 (95%)	18 (60%)	0.02
Mean number of days between Time 1 and Time 2	196.7 (12.6)	242.0 (50.7)	<0.01

[a] Shown as mean (standard deviation) for continuous variables and N (%) for categorical.
[b] Wilcoxon rank sum for continuous variables or Fisher's exact test for categorical.

Figure 1. Changes in selected biologic clocks over time in prospective cohort of pregnant (P) versus non-pregnant (C) people, 2020-2021



Legend:
GrimAge biologic clock is interpreted in years, similar to chronologic age.
DunedinPACE [(P)ace of (A)ging (C)alculated from the (E)pigenome] biologic clock reflects aging acceleration (≥1) versus deceleration (<1).
C = Control, non-pregnant.
P = Pregnant.
Time 1 = enrollment, Time 2 = postpartum day 1 or scheduled date approximately 7 months later in non-pregnant cohort.
P-values from the following mixed linear effects model: Biomarker ~ Pregnancy*Timepoint + Chronologic Age + Cell Types + (1|Participant).
FDR = correction for false discovery rate multiple testing.

51 | Lactobacillus Crispatus Mitigates Group B Streptococcus-Induced Inflammation in the Cervicovaginal Epithelium

Briana Ferguson; Aaron Loder; Lauren Anton; Kristin D. Gerson
University of Pennsylvania Perelman School of Medicine, Philadelphia, PA

2:30 PM - 2:45 PM

Objective: Group B *Streptococcus* (GBS) is a common vaginal microbe involved in adverse perinatal outcomes, including preterm birth, chorioamnionitis, and neonatal sepsis. Features of vaginal ecosystems may modify GBS pathogenicity. Previous work has shown that *Lactobacillus crispatus* (LC), a marker of reproductive health, mitigates proinflammatory cytokines in response to select vaginal pathogens. We sought to investigate the effect of LC on GBS-mediated inflammation in the cervicovaginal epithelium.

Study Design: We leveraged an *in vitro* epithelial-microbial coculture model. Ectocervical, endocervical, and vaginal epithelial cells were treated with 10^5 CFUs of LC for 24h. Cells were then treated with 10^4 CFUs of GBS clinical isolates (serotypes IA, III, and IV) for an additional 24h. Concentration of proinflammatory cytokine IL-8 was measured in cell culture media by ELISA. Cytotoxicity was assessed using LDH assays. Outcomes were compared by one-way ANOVA with correction for multiple comparisons. Microbial count (CFU/well) was measured on De Man-Rogosa-Sharpe and Granada agar plates to select for GBS growth.

Results: LC had no effect on IL-8 expression, while all GBS serotypes induced IL-8 across cells ($p < 0.05$ for all, Fig. 1). LC rescued GBS induction of IL-8 to near basal levels ($p < 0.05$ for all, Fig. 1). LC did not alter LDH in GBS-treated cells (data not shown), indicating that IL-8 reduction was not attributable to cell death. To test if immune mitigation occurred due to LC outcompeting GBS growth, we assessed microbial counts at the time of IL-8 measurement. LC did not alter the number of viable GBS colonies, and unexpectedly no live LC was detected (Table 1).

Conclusion: LC mitigates host inflammatory response to a vaginal microbe implicated in adverse pregnancy outcomes. Microbial competition does not appear to underlie this protective effect, suggesting that immune-mediated mechanisms are at play. Whether LC microbial components or secreted factors, such as metabolites, modify GBS-epithelial interactions warrants future

investigation. University of Pennsylvania Research Foundation Award (KDG)

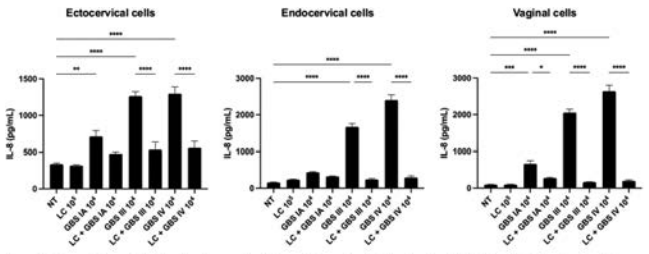


Figure 1. Concentrations of IL-8 in cell culture media of ectocervical, endocervical, and vaginal epithelial cells after treatment with three Group B *Streptococcus* (GBS) serotypes +/- pretreatment with *Lactobacillus crispatus* (LC). *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001

	Non-treated		LC + GBS IA		LC + GBS III		LC + GBS IV	
	LC	GBS	LC	GBS	LC	GBS	LC	GBS
Ectocervical	ND	ND	ND	10^9	ND	10^9	ND	10^9
Endocervical	ND	ND	ND	10^9	ND	10^9	ND	10^9
Vaginal	ND	ND	ND	10^9	ND	10^9	ND	10^9

Table 1. Microbial counts (CFU/well) of *Lactobacillus crispatus* (LC) and Group B *Streptococcus* (GBS) co-culture in the wells of ectocervical, endocervical, and vaginal epithelial cells. ND – not detected

52 | Expression of CD300E in Human Myometrium and its Impact on Parturition

Meera M. Thakkar[1]; William E. Ackerman, IV[1]; Guomao Zhao[1]; Zoe B. Strong[1]; Elizabeth Feoktistov[2]; Ekaterina Snegovskikh[2]; Catalin S. Buhimschi[1]; Irina A. Buhimschi[1]

[1]*University of Illinois at Chicago, College of Medicine, Chicago, IL;* [2]*University of Illinois at Chicago, Chicago, IL*

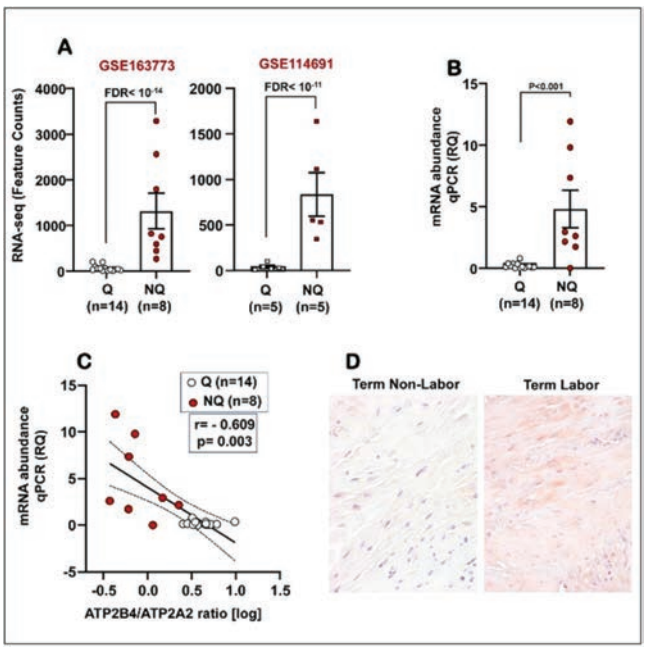
2:45 PM - 3:00 PM

Objective: CD300 glycoproteins are a newly identified family of 7 receptors with paired inhibitory and activating cellular functions. CD300 receptors have recently emerged as therapeutic targets. CD300E is expressed in myocardial smooth muscle and has been linked to cardiac arrythmia. Our novel study sought to examine if CD300E is expressed in the human myometrium and if its levels of expression vary in relationship to the uterine contractile status.

Study Design: RNA sequencing was performed on myometrial biopsies of 22 patients in the following clinical groups (dataset GSE163773): 1) spontaneous preterm birth (PTB) with clinical and/or histologic chorioamnionitis (HCA, n = 6, GA 29±3w); 2) PTB without labor (PTNL, n = 6, GA 29±3w); 3) term birth in absence of labor (TNL, n = 5, GA: 39±1w) and 4) spontaneous term labor (TL, n = 5, GA 40±1w). An external RNAseq dataset (GSE114691) was used for validation. The combined dataset comprised 20 term and 12 preterm samples further stratified by uterine contractile status as quiescent (Q, n = 19) and non-quiescent (NQ, n = 13). qPCR and immunohistochemistry (IHC) for CD300E were performed for confirmation.

Results: *CD300E* mRNA was significantly upregulated in NQ vs. Q myometrium in both datasets (Fig. **A**). This was confirmed by qPCR (Fig. **B**), which was strongly correlated with the RNAseq expression data in matched samples ($r = 0.8$, $p < 0.001$). Moreover, *CD300E* expression was significantly correlated with *ATP2B4*/*ATP2A2*, a previously characterized ratio of Ca^{2+} transporters genes used for molecular classification of myometrial contractile status (Fig. **C**), independent of GA, amniotic fluid culture results or membrane status. By IHC we validated CD300E was present in myometrial cells with a stronger labeling in labor (Fig. **D**).

Conclusion: CD300E is expressed in human myometrium and significantly upregulated in laboring myometrium. CD300E may prove to be future therapeutic targets for prevention of preterm birth.



53 | Personalized Models of fetal Brain Development as Biomarkers of Offspring Neurodevelopmental Outcomes After Maternal SARS-CoV-2

Lydia L. Shook; Liam T. McCrea; Olyvia Jasset; Steven D. Sheridan; Roy H. Perlis; Andrea G. Edlow

Massachusetts General Hospital, Boston, MA

3:00 PM - 3:15 PM

Objective: Maternal immune activation from viral infection in pregnancy is associated with adverse neurodevelopmental (ND) outcomes in offspring, mediated at least in part by *in utero* programming of fetal brain microglia resulting in aberrant synaptic pruning. We have shown the feasibility of using human cord blood mononuclear cells (CB-MNCs) to model the impact of maternal viral infection on fetal brain development. In a large cohort, we examined associations between CB-MNC models and offspring adverse ND outcomes at 3 years of age using linked electronic health records (EHR).

Study Design: CB-MNCs were selected from 119 unvaccinated individuals enrolled in a COVID-19 biorepository (April 2020 - August 2022): 74 with maternal SARS-CoV-2 infection in pregnancy (N = 38 1st or 2nd trimester infection, N = 36 3rd trimester infection) and 45 uninfected controls. We induced CB-MNCs to acquire microglia-like morphology and function (cord blood induced microglia or CB-iMG) using IL-34, GM-CSF, and serum withdrawal. CB-iMG phagocytosis of iPSc-derived neural synaptosomes-a proxy for microglial synaptic pruning behavior-was quantified using real-time pHrodo fluorescence-based imaging. ND outcomes of offspring at 3 years were determined using an EHR-based algorithm to identify ICD-10 codes associated with ND in an integrated statewide health system.

Results: CB-iMG exhibited typical microglial morphology and marker expression (Fig 1A). Synaptosome phagocytosis was greater ($p< 0.001$) in the CB-iMG of offspring exposed to 3rd trimester maternal SARS-CoV-2 with an adverse ND outcome (N = 6) compared to exposed offspring with no ND outcome (N = 30) (Fig 1B). Among unexposed offspring (N = 45), phagocytosis scores between groups were not significantly different. Phagocytosis in models derived from 1st and 2nd trimester infection did not differ significantly from controls.

Conclusion: Although additional validation is needed, personalized models using CB-MNCs available at birth show promise for identifying offspring at greatest ND risk after exposure to maternal viral infection *in utero*.

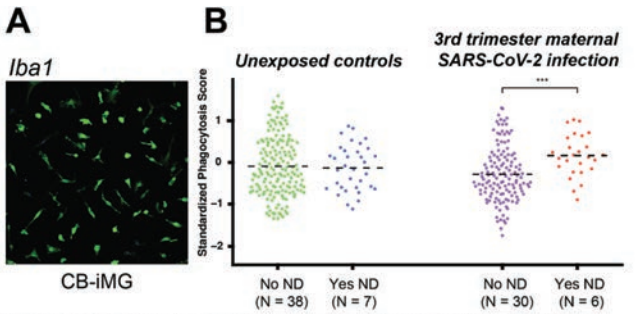


Figure 1. A. Cord blood induced microglia-like cells (CB-iMG), demonstrating ramified morphology and canonical microglia marker *Iba1* (green). B. Phagocytosis scores of CB-iMG from offspring exposed to 3rd trimester maternal SARS-CoV-2 infection (N=36) and unexposed controls (N=45) by presence or absence of neurodevelopmental diagnosis (ND) at 3 yrs of age. ***p<0.001. N=26-159 image fields per group.

54 | The Placental Vascular Transcriptome in Pregnancies Resulting in Low vs. Normal Birth Weight Neonates

Samantha Carson[1]; Morgan E. Wasickanin[1]; Emily Sheikh[1]; Hillary Kinsman[1]; Lydia Bettridge[1]; Katherine E. Free[1]; Jennifer Damicis[1]; Robert Walton[1]; Peter Napolitano[2]; Nicholas Ieronimakis[1]

[1]Madigan Army Medical Center, Tacoma, WA; [2]University of Washington, Seattle, WA

3:15 PM - 3:30 PM

Objective: Placental vascular dysfunction may be associated with fetal growth restriction (FGR). Although not all Low Birth Weight (LBW) neonates are identified as FGR in the prenatal period, it is believed that abnormal placental blood flow is a contributing factor. We hypothesize that molecular differences within placental vessels underly vascular impairment in LBW neonates without known FGR etiologies (e.g. genetic or other congenital anomalies). The objective of this pilot study was to compare the vascular transcriptome within placentas delivered from normal birth weight neonates to those born with LBW.

Study Design: Chorionic arterial and venous vessels were dissected from unlabored placentas delivered by cesarean (Figure 1). Vessels were stripped to remove the membrane and plate along with any blood. Gene expression analysis from normal (n = 8) and LBW neonates (n = 10) was performed using mRNA-seq. Alignment and differential gene expression (DEGs) analysis was conducted using Illumina's Dragen software. We considered DEGs significant based on a Benjamini-Hochberg FDR adjusted p-value of < 0.05.

Results: Between LBW vs. normal, 15,204 DEGs were identified in arteries and 14,667 in veins. Among these, 5 were significantly upregulated and 1 downregulated in LBW arteries (Figure 2). In LBW veins, 1 DEG was significantly upregulated (not shown). Notably, zinc finger protein (ZNF)365 was downregulated in LBW arteries while ZNF358 was upregulated in veins.

Conclusion: The vascular transcriptome in placental vessels from LBW neonates appears different from those with normal birth weights. Expression of ZNF365 is lower in the placental arteries of LBW baby's and ZNF358 is greater in placental veins of LBW babies. ZNF365 is involved in DNA repair and in colon cancer its correlated with poor prognosis. Little is known about ZNF358 but it may be related to vascular dysfunction. Further investigation is warranted to understand the role of these factors in regulating vascular function in relation to fetal growth.

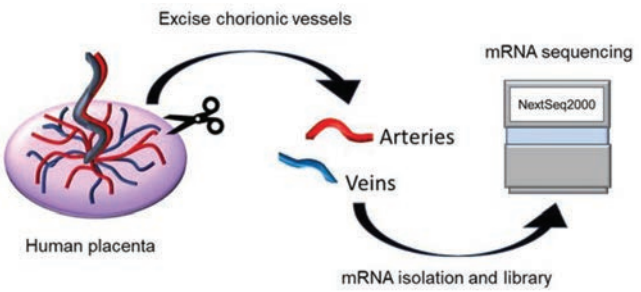


Figure 1. Experimental design illustration. Arteries and veins were excised from the chorionic plate of human placentas and processed for mRNA sequencing using an Illumina system.

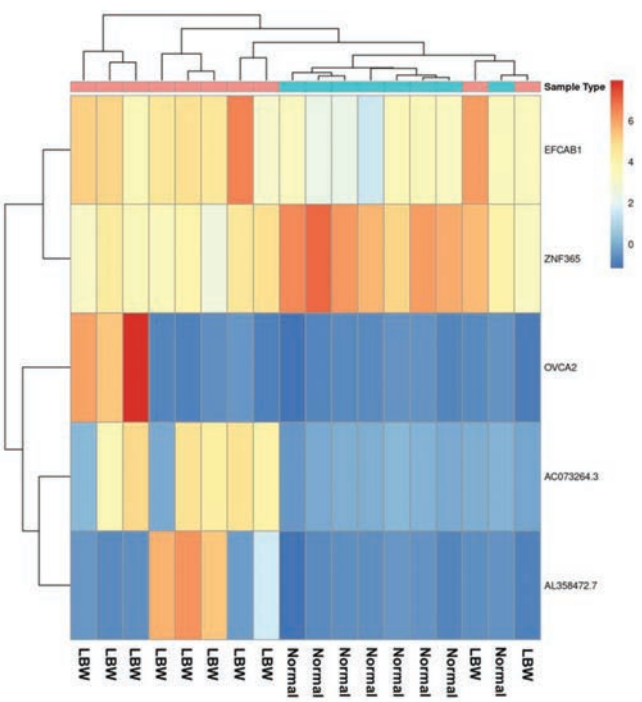


Figure 2. Hierarchically clustered heatmap from mRNA-seq comparing placental arteries from Low Birth Weight (LBW) and normal weight neonates. Represented are genes with adj p<0.05. Color intensities correspond to fold changes between LBW vs. normal samples, red for the upregulation and blue for downregulation of genes across individual placentas.

55 | Commonly Used Non-Steroidal Anti-Inflammatory Drug (NSAIDs) in Obstetrics & Associated Placental Cytotoxicity

Ana Collins-Smith
University of Texas Medical Branch, Galveston, TX

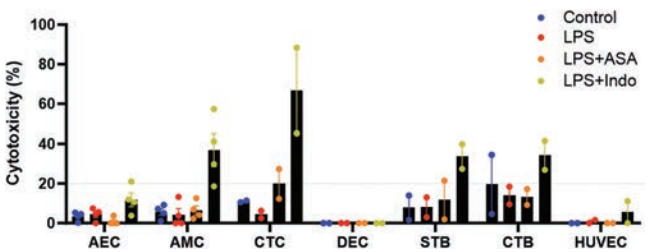
3:30 PM - 3:45 PM

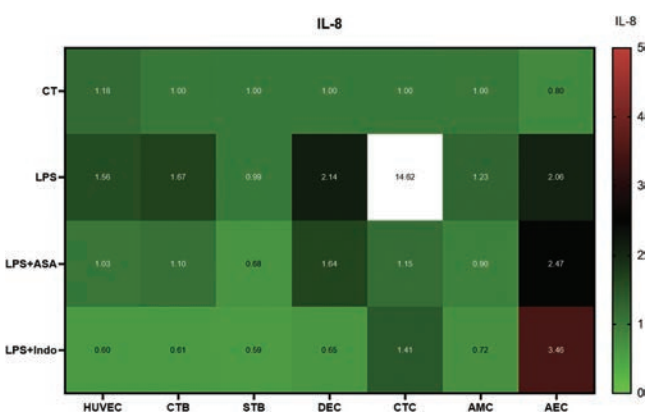
Objective: To determine if commonly used non-steroidal anti-inflammatory drugs have a cytotoxic effect and their ability to reduce inflammation at the cellular level of the feto-maternal interface.

Study Design: A microfluidic fetal membrane-placental feto-maternal interface on-chip (FMi-PLA-OOC) composed of seven different cell types was used to analyze the effects of cell cytotoxicity at the placental-maternal interface with therapeutic concentrations of commonly used NSAIDs in obstetrics. Therapeutic concentrations of aspirin (2µg/mL corresponding to 81mg) and indomethacin (15µg/mL) were applied to the FMi-PLA-OOC with the supernatants analyzed for LDH levels and cytokine levels in both a diseased state, non-diseased state (simulated with lipopolysaccharide (LPS)), and a diseased state with treatment of the NSAIDs.

Results: Cell cytotoxicity in the control group was approximately 20% in AEC, AMC, CTC, and STB cell lines. After application of LPS, the cell cytotoxicity increased in five cell types. Aspirin decreased cell death by approximately 84% in AEC & 48.7% in STB. While indomethacin increased cell death across all cell lines. A three-way ANOVA was conducted with p-value < 0.0001. Pro-inflammatory cytokine IL-8 was decreased with aspirin use.

Conclusion: Indomethacin demonstrates cell cytotoxicity at all layers of the feto-maternal interface. On the other hand, aspirin demonstrated an improvement in cell death in a diseased state which can support the continued use of aspirin for the promotion of placental angiogenesis. Aspirin also demonstrated a decrease in pro-inflammatory cytokines at the placental cellular level.





56 | Evaluating Semaglutide in Human Fetal Neural Stem Cells: Could Early Exposure Impact Neurodevelopment?

Morgan E. Wasickanin[1]; Samantha Carson[1]; Hillary Kinsman[1]; Katherine E. Free[1]; Jennifer Damicis[1]; Emily Sheikh[1]; Robert Walton[1]; Irina Burd[2]; Peter Napolitano[3]; Nicholas Ieronimakis[1]
[1]Madigan Army Medical Center, Tacoma, WA; [2]University of Maryland, Baltimore, MD; [3]University of Washington, Seattle, WA

3:45 PM - 4:00 PM

Objective: Semaglutide (Ozempic/Wegovy) use for diabetes and weight loss management has exploded, especially in reproductive age females. Due to its long half-life and possibility of crossing the placenta, discontinuation of use is recommended prior to conception. Anecdotally, unintentional pregnancies with semaglutide appear to be on the rise. Semaglutide may signal within the adult brain and reduce neuroinflammation, yet it remains unknown if this occurs in the fetal brain. We hypothesize semaglutide exposure early in pregnancy may impact neurodevelopment and/or infer anti-inflammatory properties. We examined if semaglutide alters the phenotype and proinflammatory response of human fetal derived neural stem cells (NSCs) *in-vitro*.

Study Design: Commercially available fetal NSCs (ReNcells) were exposed to either semaglutide or the vehicle. In parallel they were given PBS as a control or Interleukin-1 beta (IL-1B) to stimulate inflammatory responses. Cells were harvested 24-hours post exposure (n = 5-6 per condition) and examined for gene expression.

Results: The expression of genes associated with stem cell maintenance (NESTIN, SOX2) and neural differentiation (MAP2, GFAP) was not different with semaglutide exposure alone. The neuronal gene Beta-III-tubulin (TUBBIII) was significantly downregulated with semaglutide alone and in combination with IL-1B (Fig. 1A). Semaglutide did not impact the upregulation of proinflammatory genes by IL-1B. Though IL-1B exposure did downregulate the expression of the signaling receptor (GLP-1R), this was not related to semaglutide exposure (Fig. 1B).

Conclusion: Semaglutide impacts the NSCs phenotype by down-regulating TUBBIII. Beta-III-tubulin plays an important role in neurodevelopment and has been implicated across a spectrum of long-term brain disorders. The clinical significance of these findings are unclear but support the need for further research and careful monitoring in exposed offspring.

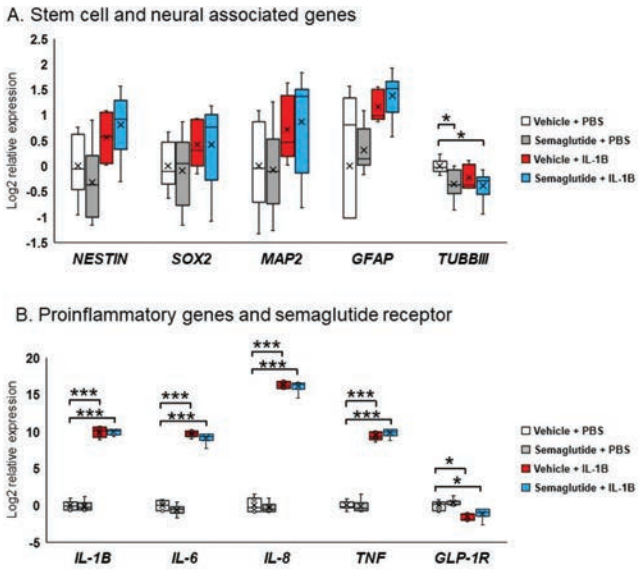


Figure 1. Box and whisker plots show gene expression results from Neural Stem Cells (NSCs) collected 24-hours following exposure to the vehicle or semiglutide in combination with PBS as a control or IL-1B to invoke inflammatory responses. For each treatment combination n=5-6 technical replicates were analyzed. Errors bars reflect the standard deviation, center lines within each box the medians, x's denote means. The horizontal axis specifies each gene examined, the vertical axis depicts the log2 relative expression normalized to *ribosomal protein 18s*. **Panel A.** Expression for stem cell (NESTIN and SOX2) and neural (MAP2, GFAP, TUBBIII) associated genes. * $p<0.05$ by student's *t* test. **Panel B.** Expression for proinflammatory genes (IL-1B, IL-6, IL-8, TNF) and the semiglutide signaling receptor (GLP-1R). * $p<0.05$ and * * * $p<0.0005$ by student's *t* test.

Oral Concurrent Session 5

Hypertension

Abstracts 57 – 66

FRIDAY
January 31, 2025
1:30 PM – 4:00 PM
Aurora Ballroom B

MODERATORS
Hyagriv Simhan, MD, MS
Alan T. Tita, MD, PhD

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Concurrent Session 5 – Hypertension

Friday, January 31, 2025 1:30 PM – 4:00 PM

57 | Myo-inositol Supplementation to Prevent Pregnancy Complications in Polycystic Ovary Syndrome: a Randomized Controlled Trial

Anne W.T. Van Der Wel[1]; Rebekka Bout-Rebel[2]; Chryselle M.C. Frank[3]; Ruben G. Duijnhoven[1]; Bo E. Van Bree[4]; Olivier Valkenburg[4]; Salwan Al-Nasiry[4]; Robbert H.F. van Oppenraaij[5]; Tatjana E. Vogelvang[6]; Michelle E.M.H Westerhuis[7]; Jan Peter de Bruin[8]; Hedwig P. van de Nieuwenhof[8]; Susanne C.J.P. Gielen[9]; Myrthe L. Bandell[10]; Mireille N. Bekker[11]; Maurice G.A.J. Wouters[1]; Velja Mijatovic[1]; Arie Franx[2]; Cornelis B. Lambalk[1]; Frank J.M. Broekmans[11]; Rebecca C. Painter[1]; Bart C.J.M. Fauser[12]; Joop S.E. Laven[2]; Bas B. van Rijn[13]; MYPP Investigator Group[2]

[1]Amsterdam UMC, location University of Amsterdam, Amsterdam, Noord-Holland; [2]Erasmus University Medical Center, Zuid-Holland; [3]St. Antonius Ziekenhuis, Utrecht; [4]Maastricht UMC+, Limburg; [5]Maasstad Ziekenhuis, Zuid-Holland; [6]Het Diakonessenhuis, Utrecht; [7]Catharina Ziekenhuis, Noord-Brabant; [8]Jeroen Bosch Ziekenhuis, Noord-Brabant; [9]Franciscus, Zuid-Holland; [10]Albert Schweitzer ziekenhuis, Zuid-Holland; [11]University Medical Center Utrecht, Utrecht; [12]University of Utrecht and University Medical Center Utrecht, Utrecht; [13]Eindhoven University of Technology, Noord-Brabant

1:30 PM - 1:45 PM

Objective: To assess whether daily myo-inositol supplementation reduces a composite of gestational diabetes mellitus, preeclampsia and/or preterm birth in pregnant persons with polycystic ovary syndrome.

Study Design: In this double-blind, multicenter randomized placebo controlled trial, pregnant persons with polycystic ovary syndrome received daily supplementation of 4 grams of myo-inositol, or matching placebo, from between 8 and 16 weeks gestation until delivery. The primary outcome was a composite of gestational diabetes mellitus, preeclampsia or preterm birth. Key secondary outcomes included obstetric, maternal and neonatal outcomes. The analysis was performed according to the intention-to-treat principle.

Results: A total of 464 individuals, recruited at 13 hospitals in the Netherlands, underwent randomization. Characteristics at baseline were similar between groups, except for a higher proportion of biochemical hyperandrogenism in the myo-inositol group (29.0% vs. 18.5% in the placebo group). Two-thirds (67.5%) of participants conceived after assisted reproductive technology. The primary outcome occurred in 56 out of 224 participants (25.0%) in the myo-inositol group and in 61 out of 228 participants (26.8%) in the placebo group (relative risk, 0.93; 95% confidence interval, 0.68 to 1.28; P = 0.67). No substantial between-group differences were observed for secondary outcomes, except for a higher incidence of primary caesarean section in the placebo group (11.6%, versus 5.9% in the myo-inositol group; relative risk 0.51; 95% confidence interval 0.27 to 0.97; P< 0.05). In the preplanned sub group analysis, no interactions were observed for participants with biochemical hyperandrogenism or obesity.

Conclusion: Myo-inositol supplementation in pregnant individuals with polycystic ovary syndrome does not appear to lower the incidence of a composite outcome of gestational diabetes mellitus, preeclampsia or preterm birth compared with placebo. (Funded by The Netherlands Organisation for Health Research and Development [project number 848016013]; Research with human participants [CCMO] ID NL67329.078.18)

58 | Nifedipine versus Labetalol for Treatment of Postpartum Hypertension: A Randomized Controlled Trial

Todd R. Lovgren[1]; Ruofan Yao[2]; Brendan D. Connealy[3]; Robert Bonebrake[1]; Hemant Satpathy[1]; Emily Patel[1]; Matthew Brady[1]; Joshua Dahlke[4]

[1]Nebraska Methodist Health System, Elkhorn, NE; [2]Loma Linda University Health, Loma Linda, CA; [3]Methodist Women's Hospital, Omaha, NE; [4]Nebraska Methodist Hospital, Elkhorn, NE

1:45 PM - 2:00 PM

Objective: Postpartum hypertensive disease is a significant cause of maternal morbidity and mortality, and the optimal treatment is uncertain. The purpose of this study was to determine if medication choice affects the incidence of postpartum readmission for hypertensive complications.

Study Design: This is a single institution, open-label randomized trial comparing nifedipine and labetalol for treatment of postpartum hypertension. Patients with at least two hypertensive blood pressures (>140 systolic or >90 diastolic) four hours apart during their admission for delivery were identified. Once enrolled, patients were randomized to nifedipine or labetalol, irrespective of any prior treatment. The primary outcome was readmission for postpartum treatment of hypertension. Clinical characteristics evaluated included, frequency of severe hypertension, acute treatment of hypertension during hospitalization, magnesium sulfate use, and hypertension within 12 hours of discharge. Trial Registration: NCT05309460

Results: During the study period, 3015 patients met inclusion criteria and 324 patients were enrolled and randomly allocated to nifedipine or labetalol. The labetalol group had a higher BMI (35.3 vs 33.5), later GA at delivery (38 vs 37 weeks) and higher prevalence of CHTN (n = 17 vs 7). After controlling for the significant clinical characteristics, the incidence of readmission was 88% lower in the nifedipine arm (1.2% vs 8.1%); aOR of 0.12 (95% confidence interval [CI] 0.026 to 0.57). The frequency of severe HTN, acute treatment of HTN during hospitalization, use of magnesium sulfate and HTN within 12 hours of discharge was similar between groups.

Conclusion: The primary outcome was statistically significant, representing a significant decrease in readmission in those taking nifedipine. Coupled with published observational studies demonstrating similar results, this study supports Nifedipine as the initial agent of choice in the ongoing management of hypertension in the postpartum period.

Table 1 Cohort Characteristics			
	Labetalol	Nifedipine	p value
N	161	162	
Maternal age	31.4 ± 4.9	31.1 ± 5.5	0.56
Gestational age at delivery	38 [37 - 39]	37 [36 - 38]	0.016
BMI	35.3 ± 6.7	33.5 ± 7.1	0.026
Race/Ethnicity			
Non-Hispanic White	145 (90.1)	149 (92.0)	0.41
Non-Hispanic Black	4 (2.5)	2 (1.2)	
Hispanic	3 (1.9)	3 (1.9)	
Asian	6 (3.7)	8 (4.9)	
Other	3 (1.9)	0	
Private insurance	140 (87.0)	142 (87.7)	0.85
Vaginal delivery	96 (59.6)	99 (61.1)	0.79
Twin pregnancy	7 (4.4)	13 (8.0)	0.17
Results presented as mean±SD, median[IQR], or N(%)			

Table 2 Clinical Features			
	Labetalol	Nifedipine	p value
N	161	162	
Chronic Hypertension	17 (10.6)	7 (4.3)	0.033
Preeclampsia (w/o SF)	60 (37.3)	64 (39.5)	0.68
Preeclampsia (w/ SF)	22 (13.7)	31 (19.1)	0.18
Superimposed preeclampsia	3 (1.9)	2 (1.2)	0.65
Severe hypertension	76 (47.2)	87 (53.7)	0.24
Acute treatment	38 (23.6)	39 (24.1)	0.92
Additional medications	10 (6.2)	18 (11.1)	0.12
Magnesium sulfate	38 (23.6)	44 (27.2)	0.46
HTN within 12hrs of discharge	62 (38.5)	57 (35.2)	0.54
Results presented as N(%)			

59 | Defining Postpartum Cardiovascular Physiology: Blood Pressure Trajectories in Patients at risk for New-Onset Postpartum Hypertension

Ukachi N. Emeruwa[1]; Minhazur R. Sarker[1]; Elizabeth Nicole Teal[1]; Marni B. Jacobs[2]; Louise C. Laurent[3]; Natalie A. Bello[4]; Timothy Wen[5]; Russell S. Miller[6]; Cynthia Gyamfi-Bannerman[1]
[1]University of California, San Diego, San Diego, CA; [2]University of California, San Diego Health, San Diego, CA; [3]University of California, San Diego Medical Center, La Jolla, CA; [4]Cedars Sinai Medical Center, Los Angeles, CA; [5]University of California, San Diego, Irvine, CA; [6]Columbia University Medical Center, New York, NY

2:00 PM - 2:15 PM

Objective: Though de novo postpartum hypertension (dnPPHTN) accounts for up to two thirds of PPHTN cases, the physiologic and pathophysiologic cardiovascular changes after delivery are poorly understood. We sought to define longitudinal PP blood pressure (BP) patterns in patients at risk for PPHTN.

Study Design: We analyzed data from a negative randomized trial (PMID 38641089) of 82 normotensive patients at high risk for dnPPHTN randomized to daily furosemide or placebo from PP day 1-5. BPs were monitored every 4-8 hours from delivery to discharge, then by Bluetooth-enabled remote monitoring twice-daily for 6 weeks. The primary goal of this secondary analysis was discovery of distinct patterns of longitudinal BP trajectories in the placebo group. Secondary goals included exploring differences in early PP BP trends between those who developed dnPPHTN and those remaining normotensive; and timing of peak BPs. Trends were assessed using local polynomial regression fitting. Linear mixed-effects models were used to examine temporal BP trajectories, including polynomial time effects, linear spline, and random intercepts and slopes. An interaction term for the time trend and dnPPHTN diagnosis was included.

Results: We included all 40 placebo participants from the parent trial, contributing 2235 PP BP readings. SBP and DBP rose until days 10 and 12 PP, respectively, before declining. Mean peak SBPs and DBPs were 120.7 ± 13.4mmHg and 81.0 ± 10.3mmHg. There were significant differences in BP trajectories between participants with (n = 3; 167 BP readings) and without (n = 37; 2068 BP measurements) dnPPHTN (**Figure 1**). Those with dnPPHTN had a significantly steeper rise in SBP preceding dnPPHTN diagnosis, which occurred at a median of 5 days [IQR 5,5.5 days]. SBPs rose by 1.6mmHg/day more to its PP day 9 peak in dnPPHTN compared to normotensive participants, while DBP rose by 0.3mmHg/day more and peaked later (PP day 14 vs 12) (**Table 1**).

Conclusion: Using innovative technology, we defined distinct trends in PP cardiovascular physiology that distinguish physiologic from pathophysiologic BP changes in patients at risk for dnPPHTN.

Figure 1. Blood pressure trajectories over time: Overall cohort and by group (de novo postpartum hypertension/normotensive)

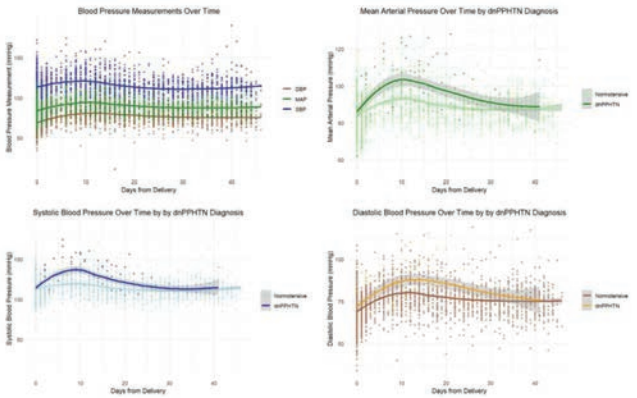


Table 1. Maximum blood pressures and daily rate of change: Overall cohort and by group (de novo postpartum hypertension/normotensive)

	Overall Cohort (n=2235 BP measurements)				dnPPHTN (n=167 BP measurements)				Normotensive (n=2068 BP measurements)			
	Peak, day	Mean ± SD, mmHg	Δ to peak, mmHg/day	Δ after peak, mmHg/day	Peak, day	Mean ± SD, mmHg	Δ to peak, mmHg/day	Δ after peak, mmHg/day	Peak, day	Mean ± SD, mmHg	Δ to peak, mmHg/day	Δ after peak, mmHg/day
SBP	10	120.7 ± 13.4	0.44	-0.61	9	136.8 ± 12.2	1.96	-2.67	9	119.2 ± 12.1	0.39	-0.52
DBP	12	81.0 ± 10.3	0.92	-0.97	14	87.9 ± 10.5	1.13	-1.36	12	80.2 ± 9.6	0.88	-0.91
MAP	11	94.1 ± 11.7	0.78	-0.86	10	103.5 ± 11.6	1.60	-1.91	11	93.1 ± 9.6	0.72	-0.77

All Δ are significant to p<0.001.

60 | Severe Systolic Hypertension and Adverse Maternal Outcomes

Yossi Bart[1]; Hector M. Mendez-Figueroa[2]; Farah H. Amro[1]; Baha M. Sibai[1]

[1]McGovern Medical School at UTHealth Houston, Houston, TX; [2]McGovern Medical School at UTHealth, Houston, TX

2:15 PM - 2:30 PM

Objective: Severe hypertension (sHTN) in pregnancy is associated with maternal morbidity. The specific role of sHTN based on isolated severe systolic blood pressure has not been well studied. We aimed to examine whether sHTN diagnosed by elevated systolic BP (SBP) alone is associated with adverse maternal outcomes.

Study Design: We conducted a secondary analysis of the Assessment of Perinatal Excellence (APEX) database. We included all the patients who had hypertension at the time of delivery, defined as SBP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg on two occasions at least 30 minutes apart. We excluded individuals with diastolic BP ≥ 110 mmHg. Our reference group were those with mild HTN, defined as: systolic BP 140-159 and/or diastolic BP 90-109. We had 3 comparison groups; group I: SBP 160-179, group II: SBP 180-199, and group III: SBP ≥ 200 mmHg. The primary outcome was defined as a composite of maternal outcomes, including hypertensive stroke, pulmonary edema, acute kidney injury, disseminated intravascular coagulation, cardiopulmonary arrest, and death. Poisson regression was applied to address possible confounders.

Results: Overall, 38,245 individuals met the inclusion criteria, of which 32,277 (84%) had mild HTN and 5,968 (16%) had severe systolic HTN. Of those, 3,790 (63%) had SBP 160-179, 1,903 (32%) had SBP 180-199, and 275 (5%) had SBP ≥ 200 mmHg. Higher SBP was associated with higher rates of advanced maternal age, obesity, preterm birth, and chronic HTN. Following adjustment, higher systolic BP was associated with higher rates of the composite outcome, driven mainly by higher rates of pulmonary edema and acute kidney injury. The relative risk for composite maternal outcome was 2.93 (95% CI 2.24-3.85) for SBP 160-179 mmHg, 3.92 (95% CI 2.88-5.33) for SBP 180-199, and 6.74 (95% CI 4.01-11.31) for SBP ≥ 200 mmHg. Further stratification to 10 mmHg intervals of SBP demonstrate the dose-dependent association with the composite outcome (Figure).

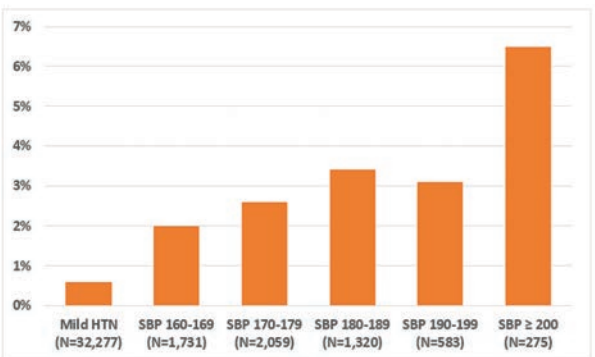
Conclusion: Compared to mild HTN, severe HTN diagnosed by SBP alone was associated with maternal morbidity in a dose-dependent fashion.

Table – The association between severe hypertension diagnosed by systolic blood pressure only and maternal outcomes

Outcomes	Group	N (%)	Adjusted RR [a] (95% CI)
Composite maternal outcome	Mild HTN	198 (0.6)	1.00
	SBP 160-179	88 (2.3)	**2.93 (2.24-3.85)**
	SBP 180-199	63 (3.3)	**3.92 (2.88-5.33)**
	SBP ≥ 200	18 (6.5)	**6.74 (4.01-11.31)**
Hypertensive stroke	Mild HTN	18 (0.1)	1.00
	SBP 160-179	5 (0.1)	2.30 (0.83-6.38)
	SBP 180-199	7 (0.4)	**6.26 (2.55-15.36)**
	SBP ≥ 200	1 (0.4)	5.96 (0.77-45.94)
Pulmonary edema	Mild HTN	56 (0.2)	1.00
	SBP 160-179	39 (1.0)	**3.93 (2.51-6.14)**
	SBP 180-199	24 (1.3)	**4.13 (2.42-7.05)**
	SBP ≥ 200	10 (3.6)	**10.90 (5.37-22.15)**
Acute kidney injury [b]	Mild HTN	116 (0.4)	1.00
	SBP 160-179	42 (1.1)	**2.64 (1.80-3.88)**
	SBP 180-199	30 (1.6)	**3.84 (2.49-5.92)**
	SBP ≥ 200	8 (2.9)	**5.82 (2.60-13.04)**
DIC	Mild HTN	21 (0.1)	1.00
	SBP 160-179	7 (0.2)	**2.66 (1.10-6.46)**
	SBP 180-199	2 (0.1)	0.72 (0.10-4.94)
	SBP ≥ 200	1 (0.4)	3.99 (0.54-29.34)
Cardiopulmonary arrest	Mild HTN	2 (0.0)	1.00
	SBP 160-179	0	-
	SBP 180-199	0	-
	SBP ≥ 200	1 (0.4)	-
Death	Mild HTN	3 (0.0)	1.00
	SBP 160-179	1 (0.0)	-
	SBP 180-199	0	-
	SBP ≥ 200	0	-

HTN, hypertension; SBP, systolic blood pressure; DIC, disseminated intravascular coagulation.
Bolded if significant.
[a] Adjusted to maternal age ≥ 35 years, obesity (defined as body-mass index ≥ 30 kg/m²), preterm birth (delivery before 37 weeks), and chronic hypertension.
[b] Acute kidney injury defined as post-partum creatinine ≥ 1.5.

Figure – The association between the systolic blood pressure and the composite outcome rate



P<0.01.
HTN, hypertension; SBP, systolic blood pressure.

61 | Postpartum Diuretics for Hypertensive Disorders of Pregnancy: A Systematic Review and Meta-Analysis

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2:30 PM - 2:45 PM

Objective: To systematically review postpartum use of diuretics to reduce persistent hypertension (HTN) among individuals with hypertensive disorders of pregnancy (HDP).

Study Design: A systematic review was conducted in MEDLINE, OVID, Scopus, World Health Organization International Clinical Trials Registry Platform, ClinicalTrials.gov and the Cochrane Central Register of Controlled Trials from inception to 4/2024 (PROSPERO CRD42021288277). Randomized controlled trials (RCTs) investigating postpartum use of diuretics in individuals with HDP were included. Clinical characteristics and outcome measures were extracted. The primary outcome was persistent HTN postpartum. Secondary postpartum outcomes were use of additional antihypertensive drugs, length of stay, readmission/emergency visits, and breastfeeding. Meta-analysis was performed using a random effects model to estimate treatment effects in terms of risk ratios (RR) or mean difference with 95% confidence interval (CI).

Results: Of 571 studies reviewed, eight RCTs with 1368 individuals (767 intervention, 771 control) met inclusion criteria. Interventions included furosemide (3 RCTs), torsemide (1 RCT), combined furosemide/antihypertensive drug (3 RCTs), and combined thiazide/angiotensin-converting enzyme inhibitor (1 RCT). There was a significant reduction in persistent HTN between intervention and control groups (4 RCTs, N = 955, RR 0.53, 95%CI 0.35-0.80, I^2 = 70%, Figure 1). The number needed to treat (NNT) to reduce persistent HTN was 4. There was no difference in the need for additional antihypertensives during admission (7 RCTs, N = 1209, RR 0.79, 95%CI 0.61-1.02, I^2 = 7%) or at the time of discharge (5 RCTs, N = 905, RR 1.00 95%CI 0.82-1.21, I^2 = 53%). There was no difference in length of stay, readmission/emergency visits, or breastfeeding between groups.

Conclusion: Diuretics were associated with a reduction in persistent HTN postpartum in individuals with HDP (NNT = 4). Heterogeneity in study interventions and outcomes suggests that the optimal postpartum dosing and timing of diuretics in HDP warrants further study.

Figure 1. Diuretic compared to control for prevention of persistent postpartum hypertension in hypertensive disorders of pregnancy.

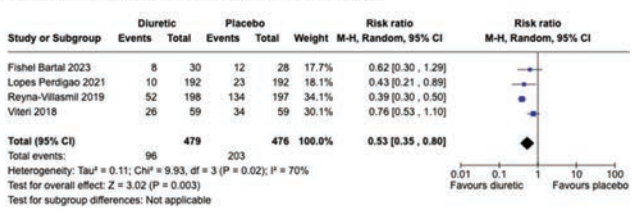

Table 1. Postpartum outcomes for diuretic use vs control.

Study (author, year, country)	Persistent hypertension*	Need for additional antihypertensive drugs during admission	Need for antihypertensive drugs at discharge	Length of stay (days)	Readmissions or emergency room visit	Breastfeeding problems
Ascarelli 2005 (USA)	NR	13/132 (10%) vs 17/132 (13%)	10/132 (8%) vs 14/132 (11%%)	NR	NR	NR
Dabaghi 2019 (Iran)	NR	12/45 (27%) vs 15/45 (33%)	12/45 (27%) vs 15/45 (33%)	NR	NR	NR
Fishel Bartal 2023 (USA)	8/30 (27%) vs 12/28 (43%)	14/31 (45%) vs 19/36 (53%)	31/31 (100%) vs 36/36 (100%)	4 (3-5) vs 3 (3-4)	0/30 (0%) vs 0/28 (0%)	NR
Lopes Perdigao 2021 (USA)	10/192 (6%) vs 23/192 (12%)	NR	40/192 (21%) vs 22/192 (11%)	2 (2–3) vs 2 (2–2)	9/192 (5%) vs 16/192 (8%)	4/192 (3%) vs 9/192 (6%)
Reyna-Villasmil 2019 (Venezuela)	52/198 (26%) vs 134/197 (68%)	11/225 (6%) vs 17/225 (9%)	NR	NR	NR	NR
Suganya 2024 (India)	NR	0/60 (0%) vs 13/60 (22%)	NR	NR	NR	NR
Veena 2017 (India)	NR	9/50 (18%) vs 13/50 (26%)	36/50 (74%) vs 41/50 (82%)	7.9d (no SD) vs 6.6d (no SD)	NR	NR
Viteri 2018 (USA)	26/59 (44%) vs 34/59 (58%)	19/59 (32%) vs 20/59 (34%)	NR	2.8 (2.2-3.9) vs 2.3 (2.0-3.2)	4/59 (7%) vs 2/59 (4%)	1/59 (2%) vs 0/59 (0%)
Standard Mean	-	-	-	4.1 vs 3.4	-	-
Studies total (intervention vs control)	4 studies, 96/479 (20%) vs 203/476 (43%)	7 studies, 78/602 (13%) vs 114/607 (19%)	5 studies 129/450 (29%) vs 128/455 (28%)	3 studies (282)	3 studies, 13/281 (5%) vs 18/279 (7%)	2 studies, 5/251 (2.0%) vs 9/251 (3.6%)
I^2	70%	7%	53%	87%	45%	19%
RR (95% Confidence interval)	**0.53 (0.35, 0.80)**	0.79 (0.61, 1.02)	1.00 (0.82, 1.21)	0.45 (-0.15, 1.05)	0.85 (0.27, 2.74)	0.64 (0.15, 2.76)

Data are presented as intervention vs control as n/N (percentage) or as mean ±standard deviation
Abbreviations: NR, not reported; vs, versus
Persistent hypertension was defined as the earliest postpartum time point reported across studies: 48 hours (Reyna-Villasmil), within 5 days or at time of discharge (Viteri), 7 days (Lopes Perdigao), and 7-10 days (Fishel Bartal).
Bolded if significantly different.

62 | Association of Preeclampsia with Long-Term Risk of Neurodegenerative Disorders

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2:45 PM - 3:00 PM

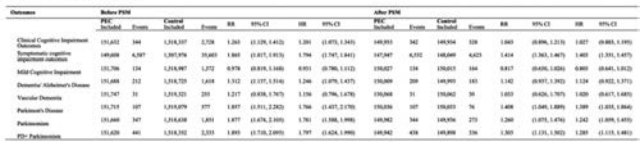
Objective: Preeclampsia (PE) is a common complication of pregnancy linked to increased lifetime risk of cardiovascular disease. The link between PE and development of adverse neurologic conditions is poorly understood. Our objective was to describe the rates of neurodegenerative disorders occurring 3 or more years following complications from PE compared to those without PE.

Study Design: We utilized the TriNetX database including diagnoses codes from 66 healthcare organizations to identify women 18+ years old with last birth between 1/2000-12/2023. PE was defined using ICD-10 codes occurring before delivery up until December 2020. The comparator group included pregnant women in the same period without PE diagnosis. After 1:1 propensity score matching (PSM) on age at index pregnancy, demographics, health utilization, comorbidities, depression, reproductive factors, and BMI, hazard ratios (HR) and 95% confidence intervals (CI) for cognitive disorders were estimated between the PE and comparator group using a Cox proportional hazard regression model. Cognitive outcomes were identified by ICD-10 codes and censored until one of the following conditions was met: 1) development of an outcome, 2) July 26, 2024, or 3) loss to follow-up in the system.

Results: The cohort included 163,296 pregnant women with PE and 1,647,539 without PE. In those with prior PE, 8,012 (4.9%) developed neurodegenerative outcomes, compared to 46,337(2.8%) in the control group. After PSM, the PE exposure group demonstrated an increased risk of symptomatic cognitive impairment outcomes (HR 1.4, CI 1.351-1.457), Parkinson's disease (HR 1.389, CI 1.035-1.864), Parkinsonism (HR 1.242, CI 1.059-1.455), and combined Parkinson's disease and Parkinsonism (HR 1.285, CI 1.115-1.481) compared to those without PE (Table 1).

Conclusion: Our findings show a higher risk of cognitive impairment, Parkinson's disease, and Parkinsonism in those with a history of PE. Obstetrical health is a window to lifelong neurocognitive health. This study supports enhanced surveillance and monitoring of neurodegenerative diseases.

Table 1. Event number, risk ratio and hazard ratio of neurodegenerative outcomes among women with preeclampsia compared to those without preeclampsia who had a delivery



63 | Comprehensive Blood Pressure Management to Improve Early Postpartum Blood Pressure Parameters: a Randomized Controlled Trial

Alexandra JD Phelps[1]; Loveis Jackson[1]; Lilly He[1]; Ashanti E. Griggs-Cooks[1]; Neha Dudipala[2]; Etoi Garrison[1]; Kathryn J. Lindley[1]; Soha S. Patel[1]; Julia C. Phillippi[3]; Megan Webb[1]; Sarah S. Osmundson[1]
[1]Vanderbilt University Medical Center, Nashville, TN; [2]Ohio State University College of Medicine, Columbus, OH; [3]Vanderbilt University School of Nursing, Nashville, TN

3:00 PM - 3:15 PM

Objective: To determine whether comprehensive vs clinician-directed blood pressure (BP) management and tight vs standard BP control improves BP parameters at 7-10 days postpartum.

Study Design: Postpartum patients with cHTN, gHTN, or preeclampsia were randomized to two interventions (four arms): 1) comprehensive BP management with remote monitoring, daily BP reporting, and algorithm-based treatment by an MFM-supervised nurse practitioner vs clinician-directed BP monitoring and 2) tight (goal BP < 140/90) vs standard (goal BP < 150/100) control. All participants received a BP cuff, directions how to monitor BPs twice daily, and instructions to attend an in-office BP check 7-10 days postpartum. The primary outcome was in-office BP check. Secondary outcomes included reporting any BPs either remote or in person, mean BPs, and the frequency of BPs > = 140/90 or > = 160/110 within 7-10 days postpartum.

Results: Between 5/9/2023 and 7/26/2024, 644 patients were eligible, 327 (51%) enrolled and were randomized, and 323 participants available for the final analysis after 4 withdrawals. Demographic and clinical characteristics of the population are presented in Table 1. Comprehensive management increased the frequency of attending an in-office, 7-10 day BP check compared to clinician management, but the results were not statistically significant (62% vs 51%, aOR 1.53 [0.94-2.50]). Comprehensive management significantly increased the frequency of reporting any BP either remote or in person (94% vs 85%, aOR 2.43 [1.05-5.63]). Findings did not vary by race or insurance status. Other secondary outcomes were not statistically significant and were unchanged after accounting for interaction between the two interventions.

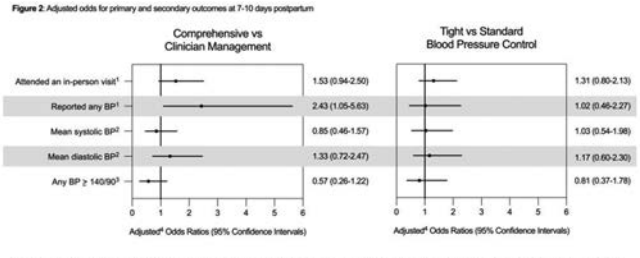
Conclusion: Compared to clinician-directed management, comprehensive BP management did not increase the frequency of attending an in-office BP check but did increase the frequency of reporting any BP between 7-10 days. These findings suggest a comprehensive program to intensely monitor BPs in the early postpartum period increases patient engagement with BP management.

Table 1: Clinical characteristics and blood pressure (BP) outcomes at 7-10 days postpartum

Management program	Comprehensive Management		Clinician Management		
Blood pressure goals	Tight BP Control	Standard BP Control	Tight BP Control	Standard BP Control	P for Interaction[5]
Sample Size	N=81	N=80	N=81	N=81	
Clinical Characteristics					
Age at delivery	30 (26-35)	30.0 (24-35)	30.0 (27-34)	29.0 (22-33)	–
Nulliparity	52 (64)	48 (60)	45 (56)	36 (44)	–
Black race self-identified	22 (27)	23 (29)	20 (25)	20 (25)	–
High school education or less	6 (7)	4 (5)	9 (11)	7 (9)	–
BMI[1] at delivery (kg/m^2)	34 (43)	31 (40)	25 (33)	42 (53)	–
Public health insurance	37 (32-44)	35 (31-41)	36 (30-46)	37.9 (33-46)	–
Antepartum HTN[2] medications	36 (44)	34 (43)	29 (36)	45 (56)	–
Chronic HTN	22 (27.2)	12 (15.0)	23 (28.4)	31 (38.3)	–
PreE[3] w/o severe features or gHTN	38 (47)	36 (45)	39 (48)	40 (49)	–
PreE[3] with severe features	31 (38)	28 (35)	26 (32)	35 (43)	–
Discharged on HTN[2] medications	31 (38)	34 (43)	35 (44)	39 (48)	–
Study Outcomes					
Attended an in-person visit[4]	54 (67)	45 (56)	43 (53)	40 (49)	–
Reported any BP[4]	76 (94)	75 (94)	70 (86)	68 (84)	–
Mean systolic BP	128 (120-137)	128 (124-136)	132 (125-138)	130 (122-140)	0.43
Mean diastolic BP	84 (78-90)	84 (78-89)	82 (78-90)	84 (78-90)	0.50
Any BP ≥140/90	23 (30)	22 (29)	26 (37)	27 (40)	0.77
Any BP ≥160/110	2 (3)	0 (0)	4 (6)	2 (3)	0.46

Comprehensive Management involved daily blood pressure (BP) reporting with advanced practice nurse (APRN) monitoring and physician supervision. Clinician monitoring was done by individual physicians or APRNs. Tight BP goal was <140/90. Standard BP goal was <150/100
All data are presented as n (%) or mean (interquartile range)
[1]BMI=Body Mass Index | [2]HTN=Hypertension | [3]PreE=Preeclampsia
[4]Outcomes not anticipated to vary based on BP control. No interaction term use
[5]Interaction between the two interventions, i.e. management approach and blood pressure controls

Figure 2: Adjusted odds for primary and secondary outcomes at 7-10 days postpartum



Comprehensive Management involved daily blood pressure (BP) reporting with advanced practice nurse (APRN) monitoring and physician supervision. Clinician monitoring was done by individual physicians or APRNs. Tight BP goal was <140/90. Standard BP goal was <150/100.
[1]Outcomes not anticipated to vary based on BP control and so no interaction term used in the logistic regression model.
[2]Proportional odds logistic regression including interaction between management and blood pressure control interventions
[3]Logistic regression including interaction between management and blood pressure control interventions
[4]Models adjusted for age, parity, chronic hypertension, race/ethnicity, insurance, discharged on hypertension medications, and type of hypertensive disorder of pregnancy in order to improve precision of the estimates.

64 | Hofbauer Cells May Mediate PE-Associated Placental Dysfunction via APOE Synthesis

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3:15 PM - 3:30 PM

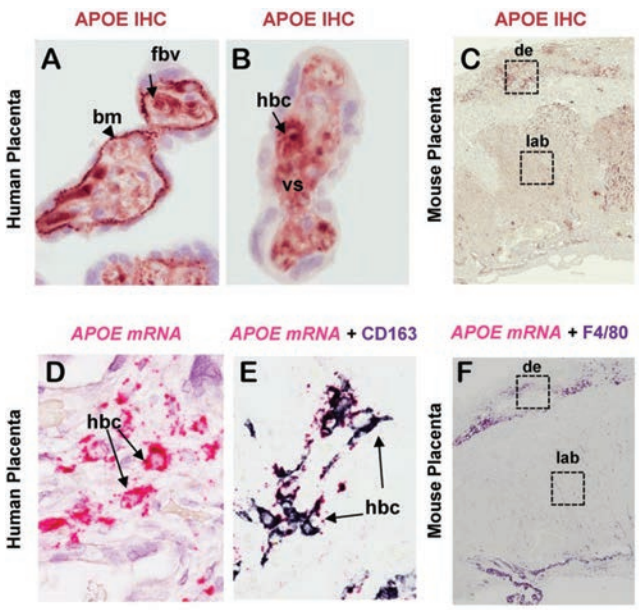
Objective: Preeclampsia (PE) was recently described as a protein misfolding disorder of pregnancy sharing pathophysiological processes with Alzheimer's disease (AD). Among these, amyloid-beta (Aβ) accumulation, characteristic for AD brain, was also identified in PE placenta. Apolipoprotein E (ApoE), a key lipid regulator synthesized in the brain by astrocytes, neurons, and microglia mediates Aβ accumulation and clearance. To our knowledge, in situ synthesis of ApoE mRNA by human placental cells has not been investigated. Herein, we aimed to identify ApoE producing cells in the human and mouse placenta.

Study Design: Immunohistochemistry (IHC) was performed on human placentas from pregnancies with (n = 10, GA: 30.6±3.3 wks) and without (n = 9, GA: 33.6±3.3 wks) PE. Placentas of humanized *ApoE* transgenic mice were also studied (n = 16

mice). Dual RNA in situ hybridization (ISH)+IHC was conducted to localize ApoE RNA relative to macrophage markers CD163 (human) and F4/80 (mouse). In transgenic mice, we also quantified F4/80 signal intensity after Reduced Uteroplacental Perfusion Pressure (RUPP), a validated surgical procedure that induces PE-like symptomatology. Control mice underwent sham procedures (n = 5-11/group).

Results: 1) In human placenta, IHC identified ApoE in fetal blood vessels (fbv), basement membrane (bm), villous stroma (vs) and Hofbauer cells (hbc) which stained conspicuously (Figs. A&B); 2) In mice, ApoE was diffusely present throughout the labyrinth (lab) and decidua (de) (Fig. C); 3) In human placenta, ApoE mRNA was selectively present in Hofbauer cells identified by co-expression of CD163 (Fig. D&E); 4) Similarly, in mice, ApoE mRNA co-localized with the macrophage marker F4/80 (Fig. F); 5) F4/80 expression decreased in response to RUPP in mouse placenta (p = 0.001 vs. sham).

Conclusion: Placental HBCs, which are known to share common embryologic origin with brain microglia, synthesize ApoE and may contribute to clearance or accumulation of misfolded proteins in the placenta and thus to PE pathogenesis.



65 | Impact on Severe Maternal Morbidity following Statewide Improvements in Hypertensive Disorders of Pregnancy Care Processes

Patrick Schneider[1]; Allison Stevens[2]; Alyssa Antonini[2]; Michelle Menegay[3]; Allison Lorenz[3]; Stephen Afflito[3]; Rashelle Ghanem[4]; Ryan Everett[5]; Justin R. Lappen[6]

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3:30 PM - 3:45 PM

Objective: Hypertensive disorders of pregnancy (HDP) are a major cause of severe maternal morbidity (SMM). While statewide quality improvement (QI) projects have significantly improved HDP care processes, their impact on SMM remain unclear.

Study Design: As part of a statewide QI project initiated during the COVID-19 pandemic, 30 maternity hospitals implemented an HDP care bundle which included timely treatment of severe hypertension (HTN) and subsequent care management. Monthly patient data was collected on all new cases of sustained severe HTN. Hospital SMM rates defined by CDC criteria were obtained from the state hospital association. Data were analyzed for periods before (10/2018-9/2020) and after (10/2020-9/2023) implementation. R (4.3.3) was used to conduct a controlled interrupted time series analysis. The primary outcomes were the difference in HDP SMM trends overall, by race, and Medicaid status at participating hospitals before/after bundle implementation. Secondary outcomes included the difference in HDP SMM trends overall, by race, and Medicaid-status at participating vs. non-participating hospitals and change in timely treatment of severe HTN among participating hospitals before/after bundle implementation.

Results: Timely treatment increased after bundle implementation (baseline 56.9% to 77.1%; p< 0.001). Though the increase in rates appeared attenuated, no statistically significant change in the overall, Black, and Medicaid HDP SMM rates before/after implementation were found (p = 0.43; 0.67; 0.82; Table 1). Similarly, no statistically significant change in the overall, Black, and Medicaid HDP SMM rates among participating vs. non-participating hospitals before/after implementation were found (p = 0.52; 0.30; 0.46; Figure 1).

Conclusion: In this statewide HDP QI project, no significant changes in HDP SMM rates were detected despite improvements in HDP care processes. While this demonstrates that improvements in HDP care processes may not be the sole driver of HDP SMM reductions, it supports further exploration of non-clinical and contextual factors impacting SMM, such as the COVID-19 pandemic.

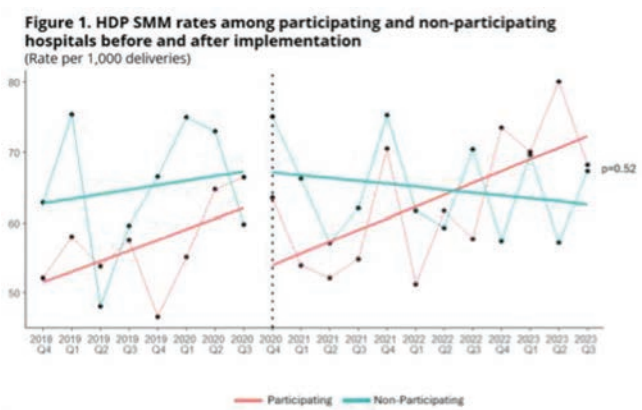

Table 1: Primary Outcome Measures - Trends in HDP SMM Rates at Participating Hospitals Pre/Post-Implementation

Primary Outcome Measures Among Participating Hospitals	p-value
HDP SMM rate trend pre/post-implementation	0.43
Black HDP SMM rate trend pre/post-implementation	0.67
White HDP SMM rate trend pre/post-implementation	0.40
Medicaid HDP SMM rate trend pre/post-implementation	0.82
Commercially-insured HDP SMM rate trend pre/post-implementation	0.26

66 | Adverse Outcomes During Delivery Hospitalizations Among Patients with an Intellectual or Developmental Disability Diagnosis

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3:45 PM - 4:00 PM

Objective: People with intellectual and developmental disabilities (IDD) have higher risk for obesity, diabetes, asthma, and cardiovascular disease. There is limited contemporary data on pregnancy outcomes in the setting of IDD. The objective of this study was to evaluate whether IDD is associated with adverse perinatal outcomes in a large national sample.

Study Design: Delivery hospitalizations to patients aged 15-54 were analyzed using the 2000-2021 Nationwide Inpatient Sample. Primary exposure of interest was IDD, defined using ICD9/ICD10 codes. Temporal trends in proportion of deliveries with IDD were analyzed with joint point regression to determine average annual percent change (AAPC) with 95% confidence intervals. Adjusted logistic regression models were performed for outcomes accounting for hospital, demographic, and clinical factors with IDD as the exposure of interest.

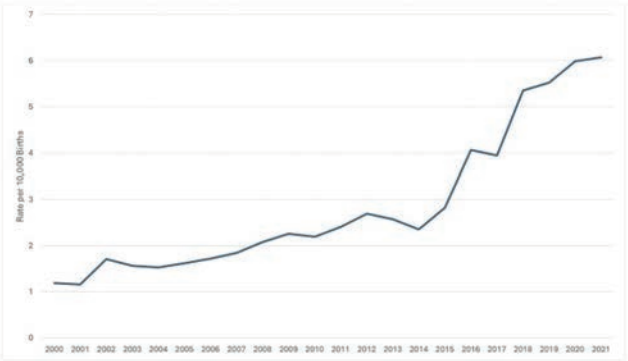
Results: Of 83.6 million births, 23,347 (0.03%) had an associated IDD diagnosis. Deliveries to patients with IDD increased from 1 per 10,000 in 2000 to 6 per 10,000 in 2021 (AAPC 7.7%, 95% CI: 1.0%-8.8%, p< 0.01). IDD deliveries were more likely to have a diagnosis of obesity (p< 0.01), asthma (p< 0.01), chronic hypertension (p< 0.01), pregestational and gestational diabetes (p< 0.01), or a mental health condition (p< 0.01). In adjusted analyses, IDD deliveries were more likely to have preterm birth at < 37 (aOR 1.5, 1.3-1.7), < 34 (aOR 1.7, 1.4-2.0), < 32 weeks (aOR 1.7, 1.4-2.1), cesarean delivery (aOR 1.6, 1.5-1.8), operative vaginal delivery (aOR 1.6, 1.4-1.8), non-transfusion severe maternal morbidity (aOR 1.7, 1.4-2.1), transfusion (aOR 1.34, 1.09-1.65), hypertensive disorders of pregnancy (aOR 1.2, 1.1-1.3), postpartum hemorrhage (aOR 1.2, 1.1-1.4), infection (aOR 1.2, 1.0-1.4), and stillbirth (aOR 2.3, 1.9-2.8). Likelihood of placental abruption and infection were not significantly different between groups.

Conclusion: IDD among delivery hospitalizations is increasing and is associated with adverse perinatal outcomes. Additional resources and surveillance may be warranted for patients with IDD to optimize outcomes.

Table. Unadjusted and adjusted models for adverse outcomes

	Intellectual and Developemenal Disability				Unadjusted model		Adjusted model	
	Absent		Present					
	N	%	N	%	OR	95% CI	aOR	95% CI
Gestational age at delivery								
<37 weeks	2,082,379	9.8%	1,870	17.5%	1.95	1.74, 2.17	1.49	1.33, 1.67
<34 weeks	580,555	2.7%	680	6.4%	2.42	2.04, 2.87	1.68	1.40, 2.01
<32 weeks	338,600	1.6%	420	3.9%	2.54	2.05, 3.14	1.71	1.37, 2.14
Cesarean delivery (exclude prior cesarean)	14,258,971	20.3%	6,448	32.0%	1.85	1.73, 1.98	1.64	1.53, 1.76
Operative vaginal delivery (among vaginal deliveries)					1.39	1.24, 1.56	1.62	1.44, 1.82
Severe maternal morbidity (excluding transfusion)	588,095	0.7%	459	2.0%	2.83	2.31, 3.47	1.74	1.42, 2.14
Transfusion	773,697	0.9%	445	1.9%	2.08	1.69, 2.56	1.34	1.09, 1.65
Hypertensive disorders of pregnancy	7,046,737	8.4%	3,334	14.3%	1.83	1.68, 1.98	1.25	1.14, 1.37
Postpartum hemorrhage	2,672,712	3.2%	1,030	4.4%	1.40	1.22, 1.61	1.22	1.06, 1.41
Placental abruption and/or antepartum hemorrhage	1,146,126	1.4%	415	1.8%	1.30	1.05, 1.62	1.03	0.83, 1.28
Chorioamnionitis and/or endometritis	2,549,284	3.1%	873	3.7%	1.24	1.06, 1.44	1.21	1.04, 1.41
Wound infection (among cesarean delivery)	217,973	0.8%	62	0.7%	0.79	0.46, 1.37	0.72	0.42, 1.24
Stillbirth	602,367	0.7%	547	2.3%	3.31	2.75, 3.99	2.31	1.91, 2.80

Figure. Proportion of pregnant patients with IDD over time



Oral Concurrent Session 6

Prematurity and Newborn

Abstracts 67 – 76

FRIDAY
January 31, 2025
1:30 PM – 4:00 PM
Aurora Ballroom CD

MODERATORS
Vincenzo Berghella, MD
Michelle Y. Owens, MD

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Concurrent Session 6 – Prematurity and Newborn

Friday, January 31, 2025 1:30 PM – 4:00 PM

67 | Azithromycin to Prevent Stillbirths and Infant Deaths in Mali: A 2x2 Factorial Placebo-Controlled Randomized Trial

Karen Kotloff[1]; Amanda J. Driscoll[1]; Fadima Haidara[2]; Lawrence Moulton[3]; Jason Bailey[1]; Ousmane Samake[2]; Tiecoura Bocoum[2]; Jane Juma[2]; Awa Traore[2]; Mamadou Diallo[2]; Collins Okello[2]; Uma Onwuchekwa[2]; Mamoudou Kodio[2]; Yuji Chen[1]; Emily Deichsel[1]; Matthew Finholt-Daniel[4]; Robert L. Goldenberg[5]; Fleesie Hubbard[1]; Rebecca Maguire[1]; Melissa Page[4]; David Plotner[4]; Milagritos Tapia[1]; Dilruba Nasrin[1]; Samba Sow[2]
[1]University of Maryland, School of Medicine, Baltimore, MD; [2]Centre pour le Développement des Vaccins, Mali, Bamako, Bamako; [3]Johns Hopkins, Bloomberg School of Public Health, Baltimore, MD; [4]RTI International, Durham, NC; [5]Columbia University School of Medicine, New York, NY

1:30 PM - 1:45 PM

Objective: To determine if oral azithromycin (AZ) delivered to pregnant women and infants in a high mortality setting reduces stillbirths and infant deaths up to 12 months, compared to placebo.

Study Design: We conducted a randomized 2x2 factorial placebo-controlled trial in 3 districts of Mali, West Africa, to evaluate the efficacy of 2 AZ regimens to prevent stillbirths and/or infant deaths. Pregnant women were recruited at antenatal care (ANC) visits and randomized 1:1:1:1 to one of 4 treatment arms: maternal and infant AZ (AA), maternal AZ and infant placebo (AP), infant placebo and maternal AZ (AP), or maternal and infant placebo (PP). They received up to 3 single 2g doses of AZ or placebo: upon enrolling at ≥14 weeks gestation, at the next routine ANC visit, and at delivery. Their infants received two single 20mg/kg doses of AZ or placebo at routine vaccination visits at approximately 6 and 14 weeks of age. The primary outcome for the maternal intervention was a composite of stillbirth and infant death to up 12 months of age. The primary outcome for the infant intervention was infant death from the time of the first infant dose up to 12 months of age.

Results: We enrolled 49,675 pregnant women between Sep 24, 2020, and Feb 27, 2023. The hazard ratio (HR) for stillbirths and infant deaths was 0.94 (95% CI 0.89, 1.00; p-value = 0.058) in the maternal AZ arms compared to the maternal placebo arms, and 0.90 (0.72, 1.12) for the infant mortality outcome comparing the infant AZ arms to placebo arms. In subgroup analyses, maternal AZ was associated with reduced stillbirth and infant deaths in women with height < 160 cm (0.87; 95% CI 0.79, 0.96) with parity ≥4 (0.86; 95% CI 0.78, 0.95), and for those in Kignan district (0.77; 95% CI 0.65, 0.90). In Kignan, stillbirths were reduced by 19% (risk ratio 0.80; 95%CI 0.65, 0.99) and neonatal deaths 0-27d by 40% (HR 0.60; 95%CI 0.43, 0.82).

Conclusion: Maternal AZ could reduce stillbirths and infant deaths if targeted to high-risk groups in high mortality settings. The benefit of AZ delivered to infants at routine vaccination visits is uncertain.

68 | The Effect of Metformin in Women Who Received Betamethasone on Maternal Hyperglycemia and Neonatal Hypoglycemia

Enav Yefet[1]; Manal Massalha[2]; Gil Talmon[1]; Aminet Labay[1]; Marian matanis[1]; Erez Sleman[1]; Rima nassra[1]; Maya Frank Wolf[3]; Inshirah Sgayer[4]; Lior Lowenstein[4]; Zohar Nachum[2]
[1]Tzafon Medical Center, Poriya, HaZafon; [2]Emak Medical Center, Afula, HaZafon; [3]Galilee Medical Center, Naharyia, HaZafon; [4]Galilee Medical center, Nahariya, HaZafon

1:45 PM - 2:00 PM

Objective: While betamethasone reduces complications of prematurity, it can cause maternal hyperglycemia and neonatal hypoglycemia. Metformin effectively treats maternal hyperglycemia and has been shown to decrease neonatal hypoglycemia in women with gestational diabetes mellitus.

This study examines metformin's impact on maternal hyperglycemia and neonatal hypoglycemia in preterm deliveries in women administered betamethasone.

Study Design: This multicenter, open-label, randomized controlled trial was conducted from 2020 to 2024 at three medical centers. Women with diabetes were excluded. Pregnant women receiving betamethasone between 24 and 36.5 weeks of gestation due to increased preterm delivery risk were randomly assigned

to either metformin (425 mg three times daily before meals and 850-1700 mg at 10 p.m.) or no treatment. The treatment lasted up to 48 hours following the first betamethasone dose. Capillary glucose was measured before meals (pre-prandial), 90 minutes after starting meals (post-prandial), and at 10 p.m.

Primary outcomes were the mean maternal daily glucose values and neonatal hypoglycemia in preterm deliveries. To show a reduction in neonatal hypoglycemia from 40% in the control group to 15% in the metformin group, 98 neonates were needed (two-tailed alpha = 0.05, power of 80%). To demonstrate a mean difference of 5 mg% with a 10 mg% standard deviation in daily glucose levels, 156 women were required (two-tailed alpha = 0.025, power of 80%).

Results: A total of 84 and 85 women in the metformin and control groups, respectively, were analyzed. Preterm neonates included 48 from the metformin group and 58 from the control group.

In the metformin group, mean maternal daily and postprandial glucose values were significantly lower than in the control group. The rate of neonatal hypoglycemia was lower in the metformin group compared to the control group (10 (21%) vs. 23 (40%), P = 0.037, relative risk 0.53, 95% CI 0.28-0.99). Mild adverse effects were reported by 14% of women.

Conclusion: Metformin is safe and effective in preventing steroid-induced maternal hyperglycemia and neonatal hypoglycemia.

Table: Study outcomes

Maternal outcomes			
	Metformin N=84	Controls N=85	P value
Mean daily glucose (mg%)	121±15	127±17	0.01
Mean pre-prandial daily glucose (mg%)	115±13	119±16	0.1
Mean postprandial daily glucose	129±22	138±26	0.009
%Abnormal glucose values at the daily glucose chart	66±24%	73±21%	0.1
%Abnormal pre-prandial glucose values at the daily glucose chart	83±27%	88±20%	0.42
%Abnormal postprandial glucose values at the daily glucose chart	43±35%	54±36%	0.052
Delivery week	36.0±3.2	35.7±3.1	0.6
Preterm delivery	42 (50%)	50 (59%)	0.25
Delivery type			
Delivery type: Spontaneous vaginal	47 (56%)	53 (62%)	0.12
Vacuum	1 (1%)	5 (6%)	
Cesarean delivery	36 (43%)	27 (32%)	
Maternal admission days (num)	6.5±6.2	7.3±8.1	0.88
Labor induction	26 (31%)	23 (27%)	0.58
Preterm neonatal outcomes			
	Metformin N=48	Controls N=58	
Neonatal hypoglycemia*	10 (21%)	23 (40%)	0.037
Gender: males	26 (54%)	32 (55%)	0.92
females	22 (46%)	26 (45%)	
Birth weight (g)	1991±545	2063±613	0.53
Apgar score at 1 minute	8.1±1.7	8.3±1.6	0.54
Apgar score at 5 minutes	9.3±1.3	9.5±0.7	0.98
Apgar score at 5 minutes<7	1 (2%)	0 (0%)	0.45
Cord pH	7.3±0.1	7.3±0.1	0.91
Cord pH<7	2 (4%)	3 (6%)	1
Overall neonatal admission days	22.5±23.1	18.5±16.7	0.7
NICU admission	32 (67%)	44 (76%)	0.3
Maximal bilirubin (mg%)	11.1±2.5	11.2±2.5	0.95
Hyperbilirubinemia	32 (67%)	42 (72%)	0.52
Phototherapy	28 (58%)	39 (67%)	0.34
Head circumference (cm)	30.2±2.4	30.8±2.4	0.31
Transient tachypnea of the newborn	3 (6%)	1 (2%)	0.33
Respiratory distress syndrome	6 (13%)	7 (12%)	0.95
Ventilatory support	15 (31%)	17 (29%)	0.83
Supplemental oxygen	14 (29%)	10 (17%)	0.14
Chronic lung disease	3 (6%)	2 (3%)	0.66
Intraventricular hemorrhage	3 (6%)	2 (3%)	0.66
Neonatal sepsis	2 (4%)	1 (2%)	0.59
Hypocalcemia	0 (0%)	3 (5%)	0.25
Hypomagnesemia	0	0	
Polycythemia	0	0	
Malformations	1 (2%)	2 (3%)	0.84

Values are presented as mean ± SD or number (percent)
*Defined as blood glucose less than 40mg% during the first day of life.
There were 6 and 7 pairs of twins in the metformin and control groups, respectively.
NICU, neonatal intensive care unit
Adjustment for multiplicity of the primary outcomes was made using the method described by Holm

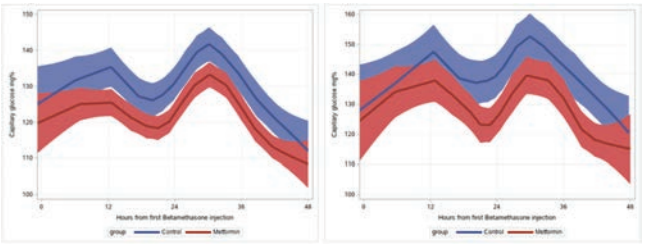


Figure. **Capillary glucose following the first Betamethasone injection.**
LOESS smooth curve (smoothing parameter 0.4) with 95% confidence interval of the mean daily capillary (left panel) and postprandial (right panel) glucose values in the metformin and control groups since the first Betamethasone injection.

69 | Fully Quantitative Cervical Remodeling: Race Group Differences Responsibilities and Cautions

LeAnn A. Louis[1]; Sarah M. Dwyer[1]; Methodius G. Tuuli[2]; Adam K. Lewkowitz[2]; Julie Tumbarello[1]; Emily Dively, BSN[3]; Madeline Felske[1]; Wendy Sparks[1]; Anita M. Malone[1]; Peinan Zhao[4]; Molly J. Stout[5]

[1]University of Michigan Hospital, Ann Arbor, MI; [2]Women & Infants Hospital of Rhode Island and Alpert Medical School of Brown University, Providence, RI; [3]Washington University School of Medicine, St. Louis, MO; [4]Washington University, St. Louis, MO; [5]University of Michigan Medical Center, Ann Arbor, MI

2:00 PM - 2:15 PM

Objective: We aimed to examine fully quantitative cervical tissue stiffness patterns in pregnancy by race groups across 3 academic centers.

Study Design: We invented fully quantitative cervical elastography (FQ-CES), which yields a numeric value of cervical tissue stiffness (Young's modulus) and allows comparison within and across patients over time.

This is a prospective longitudinal cohort of singleton pregnancies at 3 academic centers. We measured FQ-CES in all trimesters in asymptomatic individuals. We defined starting cervical stiffness and softening rate over pregnancy by term and preterm birth (PTB) in the total cohort and across race groups using mixed regression models. Race was self-reported.

Results: 380 individuals were included. Those with PTB start pregnancy with softer cervixes (29.2% lower Young's modulus, p = 0.03). Among Black individuals, the cervix started firmer (33.5% higher Young's modulus in the first trimester, p = 0.03) and had a faster softening rate (8.0% vs 6.5% per week, p = 0.002) compared to non-Black individuals. Within those with PTB, Black individuals start pregnancy with firmer cervixes compared to non-Black individuals (240% higher in Young's modulus, p = 0.01) meaning that even with a firmer cervix Black individuals still had increased risk for PTB.

Conclusion: PTB differentially affects minoritized populations. While those with PTB generally start pregnancy with softer cervixes, racial differences exist, with Black individuals starting firmer and softening faster. This may be due to racial differences in environmental factors and their impact on the pathway to PTB. If normative values were defined from the total cohort, estimates could underestimate risk in Black individuals (starting pregnancy firmer, placing them in a lower risk category). While differential interpretation of screening and diagnostic tests has perpetuated racism and risk in minoritized groups, we caution that overlooking differences mediated by racism and related

factors may have unintended consequences of underestimating risk in at risk groups.

Center	Black Race	Non-Black Race
University of Michigan (n=198)	85.4% (169)	14.6% (29)
Washington University in St. Louis (n=145)	62.1% (90)	37.9% (55)
Brown University (n=37)	83.8% (31)	16.2%(6)

70 | Neonatal Outcomes After Caesarean Versus Vaginal Birth: Population-based Cohort Study of Extremely Preterm Breech Singletons

Yanchen Wang[1]; Pasqualina Santaguida[1]; Sameer Parpia[1]; Fabiana Bacchini[2]; Prakeshkumar S. Shah[3]; Kellie Murphy[3]; K. S. Joseph[4]; Sandesh Shivananda[5]; Sarah D. McDonald[1]
[1]McMaster University, Hamilton, ON; [2]Canadian Premature Babies Foundation, Toronto, ON; [3]University of Toronto, Toronto, ON; [4]School of Population and Public Health, University of British Columbia, Vancouver, BC; [5]University of British Columbia, Vancouver, BC

2:15 PM - 2:30 PM

Objective: To determine the association of Caesarean (versus vaginal) birth with neonatal outcomes among extremely preterm breech singletons admitted into a neonatal intensive care unit.
Study Design: This retrospective population-based cohort study included all breech singletons between 23 and 27 weeks' gestation, who received active resuscitation and were admitted to one of 30 level-III neonatal intensive care units within the Canadian Neonatal Network from 2010 to 2022. We excluded outborn singletons and those with major congenital anomalies. The primary outcome was a composite of neonatal death, birth trauma, or severe neurological complications. The primary analysis to compare those born by Caesarean section versus vaginally was carried out using a generalized estimating equation based Poisson regression model with propensity score and instrumental variable analyses as sensitivity analyses.
Results: Of the 3332 extremely preterm breech singletons included in the study population, 2778 (83.4%) were born by Caesarean section. The adjusted incidence of the neonatal composite outcome was 26% following Caesarean section, versus 34% following vaginal birth (adjusted relative risk [aRR]: 0.77, 95% confidence interval [CI]: 0.63, 0.95). The reduction in the neonatal outcome following Caesarean section persisted after propensity score matching (aRR: 0.69, 95% CI: 0.53, 0.89) and instrumental variable analysis (aRR: 0.81, 95% CI: 0.67, 0.98). In the subgroup of singletons receiving optimized perinatal care (including antenatal corticosteroids, magnesium sulfate, and deferred cord clamping), the adjusted reduction in the neonatal composite outcome was 0.63 (95% CI: 0.41, 0.98), and in those without optimized perinatal care (aRR: 0.80, 95% CI: 0.63, 1.01).
Conclusion: Most (83%) extremely preterm breech singletons were born by Caesarean section with an associated reduction in mortality/serious morbidity. This association was robust and consistently observed in analyses addressing potential confounding through different methods, and in those receiving optimized care or not.

Table 1. Association of neonatal mortality/serious morbidity with Caesarean section among extremely preterm breech singletons who received active resuscitation

Neonatal composite outcome [a]	Incidence (95% confidence interval %)		Adjusted relative risk (95% confidence interval)
	Vaginal birth group	Caesarean section group	
Primary analyses			
Univariable analysis [b]	262/554 (47.3%)	651/2778 (23.4%)	0.50 (0.42, 0.58)
Multivariable Poisson regression [c]	**33.7%** (22.5%, 50.6%)	**26.1%** (18.1%, 37.6%)	**0.77 (0.63, 0.95)**
Sensitivity analyses			
Propensity score matching [d]	**30.3%** (13.7%, 67.2%)	**20.9%** (9.4%, 46.4%)	**0.69 (0.53, 0.89)**
Instrumental variables analyses [e]	**32.6%** (21.7%, 48.9%)	**26.4%** (18.5%, 37.5%)	**0.81 (0.67, 0.98)**
Subgroup analyses [c]			
Optimized perinatal care [f]	**34.2%** (20.8%, 56.2%)	**21.5%** (14.4%, 32.2%)	**0.63 (0.41, 0.98)**
Non-optimized perinatal care	32.5% (19.2%, 54.8%)	25.9% (16.6%, 40.4%)	0.80 (0.63, 1.01)

Footnote of Table 1

[a] **The neonatal composite outcome** was defined as neonatal mortality, birth trauma (including intracranial hemorrhage, subarachnoid hemorrhage, subdural hemorrhage, or other birth injuries), or severe neurological complications (including grade 3 or higher intraventricular hemorrhage or cystic periventricular leukomalacia)
[b] **The crude incidence** was reported. **Crude relative risk** was predicted by univariable Poisson regression estimated by the generalized estimating equations.
[c] **Adjustment for pre-specified confounders** including year at birth, age in pregnant patients, assisted reproductive technology, nulliparity, diabetes in pregnant patients, hypertensive disorders in pregnant patients, preterm premature rupture of membranes, clinical chorioamnionitis, antenatal corticosteroids, antenatal magnesium sulfate, intrauterine growth restriction, gestational age at birth, deferred cord clamping, and infant sex.
[d] **Exposed and unexposed groups were matched** by propensity score, which was estimated using logistic regression with Caesarean section as the dependent variable and pre-specified confounders as independent variables (including year at birth, age in pregnant patients, nulliparity, diabetes in the pregnant patients, preterm premature rupture of membranes, antenatal magnesium sulfate, gestational age at birth, infant sex, and deferred cord clamping). **Multivariable Poisson regression** was used after further adjustment for assisted reproductive technology, hypertensive disorders in pregnant patients, clinical chorioamnionitis, antenatal corticosteroids, and intrauterine growth restriction.
[e] **Multivariable Poisson regression using generalized estimating equations approach** was used after control for the mode of birth, the hospital rate of Caesarean section among extremely preterm breech singletons **(instrumental variable)**, and the pre-specified confounders.
[f] **Optimized perinatal care** was defined as inborn singletons who received all three following antenatal interventions: antenatal corticosteroids, magnesium sulfate, and deferred cord clamping.

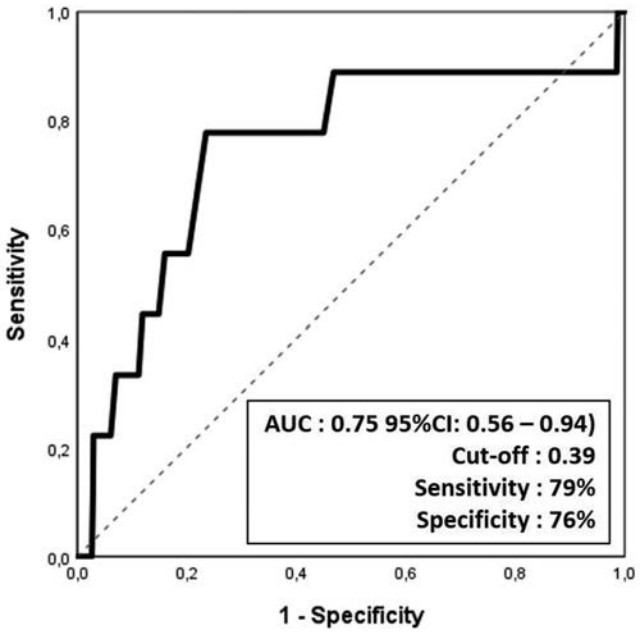
71 | The Role of Cervical Elastography for the Prediction of Spontaneous Preterm Birth

Anne-Sophie Lafortune[1]; Louise Ghesquiere[2]; Paul Guerby[3]; Marie-Laurence Côté[1]; Genevieve Marcoux[4]; Annie Beaudoin[4]; Emmanuel Bujold[1]
[1]Université Laval, PQ; [2]Université de Lille, Lille, Nord-Pas-de-Calais; [3]Université de Toulouse, Midi-Pyrenees; [4]CHU de Québec, CHU de Québec, PQ

2:30 PM - 2:45 PM

Objective: Cervical elastography is a tool for the prediction of spontaneous preterm birth (sPTB). We aimed to estimate its role in addition to cervical length (CL) in low-risk pregnancies.
Study Design: We performed a prospective study including nulliparous participants who underwent transvaginal ultrasound at 20-23 weeks. Among those with CL >25 mm, stiffness of the cervix using strain elastography was evaluated using the following parameters: internal os strain (IOS), external os strain (EOS), and the hardness ratio (HR). Operators and patients remained blinded to the results. Receiver operator characteristics (ROC) curves along with non-parametric statistical analyses were used to estimate the predictive values of each parameter.
Results: Among 991 eligible participants with CL >35mm, 32 (3.2%) had sPTB including 9 (0.9%) with sPTB before 35 weeks. Among all parameters, we observed that EOS was highly associated with sPTB< 35 weeks (p< 0.001; figure) with an optimal cut-off of 0.39, along with a HR< 40% (p = 0.01) and CL< 35 mm (p = 0.02). The combination of a CL< 35mm and EOS >0.39 was associated with a greater risk of sPTB (RR: 5.5; 95%CI: 1.6–18.5) and mainly sPTB< 35 weeks (RR: 12.6; 95%CI: 1.4–112; p< 0.01).

Conclusion: Mid-trimester cervical elastography (EOS and HR) is highly associated with the risk of sPTB and particularly sPTB< 35 weeks when CL is >25 mm. Its use in addition to CL should be rapidly considered in clinical practice.



72 | Corticosteroids and Neonatal Hypoglycemia among Pregnant Individuals with Diabetes: Effect of Gestational Age at Delivery

Ruby Lin; Cande V. Ananth; Todd J. Rosen; On behalf of the MOMPOD Consortium
Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ

2:45 PM - 3:00 PM

Objective: While antenatal steroids have been linked to neonatal hypoglycemia (NNH) among pregnant patients with diabetes, the impact of gestational age is unclear. We hypothesize that ACS for fetal lung maturity for patients with pregestational and early gestational diabetes is associated with a higher risk of NNH, but early preterm delivery < 34 weeks mediates this risk.

Study Design: This is a secondary analysis of MOMPOD, a multicenter, a randomized control trial of 831 pregnant patients with preexisting T2DM or diabetes diagnosed before 23 weeks gestation treated with insulin alone or insulin and metformin. All participants exposed to ACS were compared to those who were not. The primary outcome was NNH defined as blood glucose < 40 mg/dl or need for IV dextrose treatment. We undertook a causal mediation analysis to disentangle the effects of steroids on neonatal hypoglycemia that operate through early preterm delivery (< 34 weeks) versus the effect that is independent of early preterm delivery. We estimated the confounder-adjusted relative risk (RR) with a 95% confidence interval (CI) through log-binomial regression models.

Results: Of the 765 patients with available data, 115 received ACS. Two-thirds (68%, n = 78) of those who received ACS had NNH compared to 42% (n = 273) of those who did not receive ACS (Table 1). ACS exposure was associated with a 1.82-fold (95% CI 1.40-2.51) increased risk of NNH. 82% of this increased risk of NNH associated with corticosteroid exposure was mediated through delivery at < 34 weeks (Table 2).

Conclusion: ACS exposure is associated with a 1.8-fold adjusted risk of NNH, but the majority of this effect is mediated through preterm delivery < 34 weeks. Efforts to design secondary clinical interventions and protocols to reduce the burden of NNH associated with ACS exposure among neonates < 34 weeks born to pregnant patients with diabetes would be of benefit.

Table 1: Neonatal Hypoglycemia and Gestational age characteristics

	Corticosteroids (n=115)	No Corticosteroids (n=650)
Neonatal hypoglycemia*	78/115 (68%)	273/650 (42%)
<34 weeks	42/63 (67%)	12/16 (75%)
≥34 weeks	35/50 (70%)	258/628 (41%)
Gestational age at birth, median (IQR), wk	33.2 (30.9-34.6)	37.5 (37.0-38.7)
Delivery at <34 weeks	63/115 (54%)	16/650 (2%)

*Gestational age data was missing for 8 patients

Table 2: Association between antenatal corticosteroids and risk of neonatal hypoglycemia: mediation effects by preterm delivery <34 weeks

	Relative risk (95% confidence interval)			Proportion mediated (%)
	Total Effect	Natural direct effect	Natural indirect effect	
Unadjusted	1.82 (1.40-2.51)	1.26 (0.84-2.72)	1.45 (0.70-2.04)	69
Adjusted	1.81 (1.38-2.45)	1.14 (0.72-2.05)	1.59 (0.77-2.21)	82

*Adjusted for age, BMI, treatment with insulin with or without metformin, pregestational vs early gestational diabetes, HgbA1c early in pregnancy, and total daily insulin dose at the end of pregnancy

73 | Pro-inflammatory Vaginal Cytokines, Early PTB, and Infectious Morbidity in Patients with Asymptomatic Cervical Shortening

Tracy A. Manuck; On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units (MFMU) Network
University of North Carolina, Chapel Hill, NC

3:00 PM - 3:15 PM

Objective: There is a critical need to improve risk-stratification of individuals with an asymptomatic short cervical length (CL).

Study Design: Secondary analysis of a multicenter, unmasked RCT of pessary vs. usual care, 2017-2021. Participants with singleton pregnancies, an asymptomatic CL ≤20mm (16+0-23+6 wks), no prior PTB, and a vaginal swab at enrollment were included. 12 cytokines were quantified using a Luminex assay. The primary outcome was PTB < 35 wks. Secondary outcomes were PTB < 32, < 28, and < 24 wks and maternal (chorio) and neonatal (sepsis ± pneumonia) infectious morbidity. Each cytokine was classified as 'high' or 'low' using a numeric cut point that optimized the sensitivity and specificity for PTB < 35 wks. A pro-inflammatory cytokine score was calculated for each patient by adding +1 point per ***high* pro**-inflammatory (IL-1**α**, IL-1β, IL-2, IL-6, IL-8, GM-CSF, TNF-**α**, VEGF) and +1 point per ***low* anti**-inflammatory (IL-1RA, IL-4, IL-10, G-CSF) cytokine. Data were analyzed by logistic regression; AUC analyses evaluated outcome prediction of clinical-only, cytokine-only, and clinical+cytokine models.

Results: 531 of 544 RCT participants met inclusion criteria; 37% had PTB < 35 wks; 7% had maternal and 22% had neonatal infectious morbidity. Cytokines were collected at a median 21.7 (IQR 20.7, 23.0) wks. Cytokine scores ranged 1-9 [median 4, IQR (3,5)] and were higher for those with PTB < 35 wks vs. >35 wks (4.7 vs. 4.0, p< 0.001). In regressions, the composite cytokine score was associated with PTB < 35, < 32, < 28, and < 24 wks and maternal and neonatal infectious morbidity. Outcome prediction in clinical+cytokine models did not statistically improve vs.

clinical-only models (Table). In Kaplan-Meier analysis, higher cytokine scores were associated with earlier delivery (Figure; log-rank $p< 0.001$).

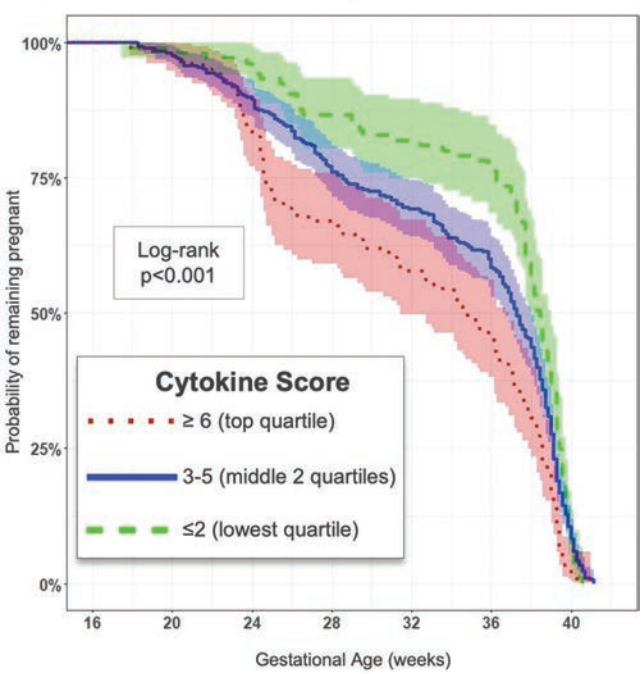
Conclusion: A mid-trimester pro-inflammatory vaginal cytokine milieu is associated with PTB and infectious morbidity in patients with asymptomatic short CL. Non-invasive vaginal cytokine quantification may be an additional way to identify which individuals have pathologic vs. incidental CL shortening.

Table. Clinical-only, cytokine-only, and clinical+cytokine prediction models for each primary and secondary outcome. Shown are the Area Under the Receiver Operating Curve (AUC), unadjusted odds ratios (OR), and adjusted OR (aOR) as appropriate, together with 95% confidence intervals (CI). All models including cytokine data show the increased odds (OR or aOR, as appropriate) of each outcome per 1-point increase in the composite pro-inflammatory cytokine score. Clinical + cytokine models did not statistically improve the prediction of any of the evaluated outcomes compared to clinical-only models (all p>0.05).

Outcome		Clinical-only* models	Cytokine-only models		Clinical* + Cytokine models	
		AUC (95% CI)	OR (95% CI)	AUC (95% CI)	aOR (95%CI)	AUC (95%CI)
PTB or fetal demise	< 24+0 weeks	0.87 (0.82, 0.91)	1.24 (1.07, 1.45)	0.62 (0.54, 0.69)	1.29 (1.07, 1.57)	0.89 (0.84, 0.92)
	<28+0 weeks	0.78 (0.74, 0.83)	1.18 (1.06, 1.32)	0.59 (0.53, 0.65)	1.18 (1.04, 1.34)	0.79 (0.74, 0.84)
	<32+0 weeks	0.76 (0.71, 0.80)	1.21 (1.09, 1.34)	0.60 (0.55, 0.65)	1.20 (1.07, 1.35)	0.77 (0.72, 0.81)
	<35+0 weeks	0.77 (0.73, 0.81)	1.24 (1.12, 1.37)	0.61 (0.56, 0.66)	1.25 (1.12, 1.41)	0.78 (0.74, 0.82)
Maternal infectious morbidity (chorioamnionitis)		0.67 (0.58, 0.76)	1.24 (1.04, 1.49)	0.62 (0.54, 0.70)	1.23 (1.02, 1.48)	0.69 (0.61, 0.77)
Neonatal infectious morbidity (sepsis ± pneumonia)		0.68 (0.63, 0.74)	1.18 (1.05, 1.32)	0.58 (0.52, 0.64)	1.16 (1.03, 1.31)	0.69 (0.63, 0.74)

* Models containing clinical factors adjusted for cervical length at screening (in mm), GA at randomization (weeks, considered continuously), progesterone use at the time of vaginal swab collection (yes/no), and initial pregnancy BMI (kg/m^2, considered continuously).

Figure. Kaplan-Meier survival curve, evaluating the probability of remaining pregnant by mid-trimester pro-inflammatory composite cytokine score. Individuals are grouped by cytokine score quartile [lowest quartile (score ≤ 2) vs. middle two quartiles (score 3-5) vs. highest quartile (score ≥6)]. Log-rank p<0.001.



74 | Comparison of Polyester Fiber versus Polypropylene Suture Materials in Physical-Exam Indicated Transvaginal Cerclages

Daniel J. Martingano[1]; Amanda F. Francis Oladipo[2]; Marwah Al-Dulaimi[3]; Sandra Kumwong[4]; Andrea Ouyang[5]; Lauren Cue[6]; Ashley Nguyen[3]; Shailini Singh[7]; Alexander Ulfers[8]; Mark Rebolos[3]; Kristin Cohen[9]; Donald Morrish[3]; Iffath A. Hoskins[10]; Francis X. Martingano[11]

[1]St. John's Episcopal Hospital-South Shore and William Carey University College of Osteopathic Medicine, Far Rockaway, NY; [2]Hackensack University Medical Center, Hackensack, NJ; [3]St. John's Episcopal Hospital-South Shore, Far Rockaway, NY; [4]Touro College of Osteopathic Medicine-Harlem Campus, New York, NY; [5]William Carey University, Hattiesburg, MS; [6]Rutgers University and the Jersey City Medical Center, Jersey City, NJ; [7]AtlantiCare Regional Medical Center, Pamona, NJ; [8]Walter Reed National Military Medical Center, Bethesda, MD; [9]RWJBarnabas Health - Trinitas Regional Medical Center, Elizabeth, NJ; [10]Albert Einstein College of Medicine - Montefiore Medical Center, New York, NY; [11]NYU Grossman School of Medicine - NYU Brooklyn, New York, NY

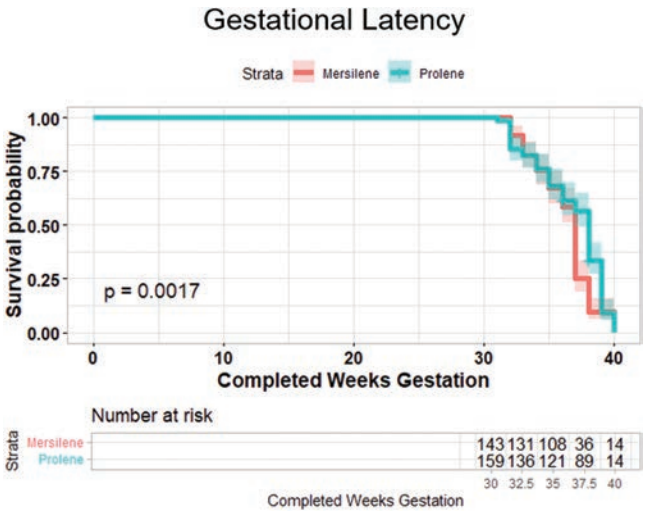
3:15 PM - 3:30 PM

Objective: Polyester fiber (Mersilene) and polypropylene (Prolene) suture materials are the most common type used when performing transvaginal physical-exam indicated cerclages, yet there is insufficient evidence regarding their comparative effectiveness in prolonging gestational latency. This study sought to determine and compare this effectiveness in pregnancies requiring a physical-exam indicated transvaginal cerclage using either Mersilene or Prolene suture material.

Study Design: We conducted a multi-center, prospective observational study from 7/2022 to 7/2024 comparing all pregnancies complicated by cervical insufficiency requiring physical-exam indicated transvaginal cerclage at a gestational age range of 160/7 to 236/7 weeks. Patients with multiple gestations, prior vaginal progesterone, and concurrent antibiotic administration apart from perioperative use were excluded. All patients received perioperative cefazolin and postoperative indomethacin. The primary outcomes included completed weeks gestation at time of delivery, early-preterm (306/7–336/7 weeks), late-preterm (340/7–366/7 weeks), early-term (370/7–386/7 weeks), and full term deliveries (390/7–406/7), as respective, discrete events.

Results: The study included 302 patients with 143 receiving Mersilene and 159 receiving Prolene. Demographic factors were not significantly different. Kaplan-Meier survival analysis noted increased gestational latency in patients receiving Prolene (p = 0.002, Figure 1). Patients receiving Mersilene had higher rates of early-preterm deliveries (46.4% v. 29.3%, p = 0.001) with a 21% increased risk in confounder adjusted models (RR = 1.21, 95% CI 1.01-1.39, p = 0.021) and lower rates of full-term deliveries (10.5% v. 31.1%, p = 0.003) with a 11% decreased likelihood in confound adjusted models (RR = 0.89, 95%CI 0.81-0.98, p = 0.004). Rates of late-preterm and early-term deliveries were not significantly different.

Conclusion: Prolene suture may be a more beneficial choice of suture material for improving gestational latency with physical-exam indicated transvaginal cerclages.



75 | Antimuscarinic Receptor Blockade Reduces Uterine Muscle Contractions Potentially Providing A Novel Treatment For Preterm Labor

Anthony G. Visco[1]; Zachary Visco[2]; Chad Grotegut[3]; Cristina Linde[4]; Timothy Westfall[4]; Friederike Jayes[5]
[1]NinoMed, LLC, Chapel Hill, NC; [2]University of North Carolina, Chapel Hill, NC; [3]Wake Forest University, Wake Forest, NC; [4]Reprocell, Beltsville, MD; [5]Duke University, Durham, NC

3:30 PM - 3:45 PM

Objective: The bladder and the uterus have striking physiologic and anatomic similarities. Anticholinergic medications are commonly used to treat "overactive bladder" by targeting muscarinic receptors. The uterus also contains M2 and M3 muscarinic receptors; however, current management of preterm labor does not target these receptors. We assessed whether muscarinic blockade with oxybutynin reduces both spontaneous and oxytocin-induced uterine muscle contractions.

Study Design: Longitudinal strips of uterine muscle from pregnant rats (17-19 days gestation) were mounted on isometric test apparatuses to directly measure uterine muscle contractions. The effect of oxybutynin on both spontaneous and on oxytocin-induced (1nM) uterine muscle contractility was tested. We measured both the area under the curve (integral) and frequency of the uterine muscle contractions with cumulatively higher concentrations of oxybutynin (100nM, 300nM, 1uM, 3uM, 10uM, 30uM, 100uM) compared to water vehicle control. Measurements are presented as % of baseline. Two-Way ANOVA with Dunnett's post hoc test was performed.

Results: Uterine muscle strips harvested from pregnant rats consistently showed spontaneous muscle contractions. Oxybutynin, at concentrations ≥10μM, resulted in a statistically significant decrease in both spontaneous uterine muscle strength (integral) and contraction frequency compared to vehicle controls. (See Figures 1 and 2).

Oxytocin-induced uterine muscle contractions were also affected by oxybutynin. At concentrations ≥10μM, uterine muscle strength (integral) was reduced ($p < 0.01$), but no difference was observed in contraction frequency compared to controls. (Data not shown).

Conclusion: Oxybutynin significantly reduces spontaneous uterine muscle strength (integral) and contraction frequency. It reduces oxytocin-induced uterine muscle strength (integral) but not contraction frequency. Antimuscarinic blockers warrant future clinical investigation and may represent an exciting new paradigm in the treatment of preterm labor and "overactive uterus".

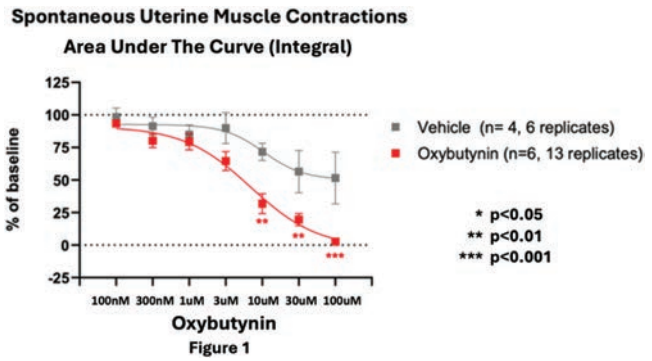


Figure 1

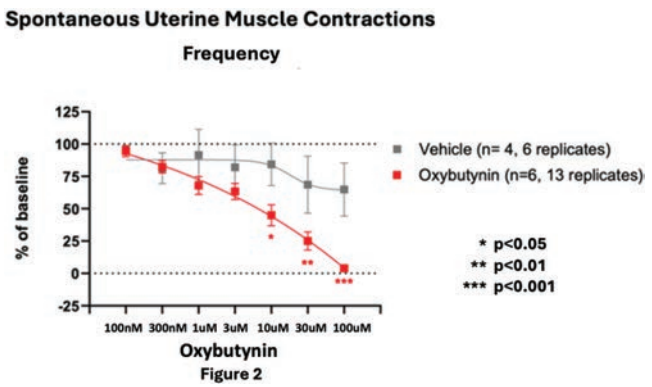


Figure 2

76 | Vaginal Microbiota as a Predictor of Preterm Birth: a Prospective Cohort Study

Laura Lesimple[1]; Jessica Rousseau Rousseau[1]; Luce Landraud[1]; Céline Plainvert[1]; Nathalie Grall[1]; Francois Goffinet[2]; Pierre-Yves Ancel[1]; Christophe Pannetier[3]; Laurent Mandelbrot[4]; Asmaa Tazi[1]
[1]Assistance Publique Hôpitaux de Paris, Paris, Ile-de-France; [2]Université Paris Cité, Inserm, Centre for Research in Epidemiology and StatisticS (CRESS), Obstetrical Perinatal and Pediatric Epidemiology Research Team (EPOPé), Paris, Ile-de-France; [3]Assistance Publique Hôpitaux de Paris, Paris, Rhone-Alpes; [4]Hôpital Louis Mourier, APHP, Université Paris Cité, Colombes, Ile-de-France

3:45 PM - 4:00 PM

Objective: To identify microbiota signatures of preterm labor and premature rupture of membranes (PPROM).

Study Design: A prospective cohort study in Paris, France. Four groups were enrolled, a control group and 3 groups at risk of intrauterine infection or preterm birth: prelabor rupture of membranes at term, preterm labor, and PPROM. Vaginal swabs were collected at admission and were analyzed using culturomics. The main outcome was preterm birth.

Results: 2476 women were enrolled, including 1068 controls, 477 with prelabor rupture of membranes at term, 495 with

preterm labor, and 436 with PPROM. Several vaginal microbiota signatures were identified as correlated with pregnancy outcome. In multivariable analysis adjusted for maternal and obstetrical risk factors, lactobacilli depletion and enterobacteria were risk factors for preterm birth, especially in singleton pregnancies (aOR 1.54, 95% CI 1.05-2.28 and aOR 1.62, 95% CI 1.11-2.36, respectively, figure). Additionally, preterm labor was associated with lactobacilli depletion (aOR 1.49, 95% CI 1.08-2.06), enterobacteria (aOR 1.86, 95% CI 1.36-2.53) and G. vaginalis (aOR 4.62, 95% CI 1.86-13.34); PPROM with lactobacilli depletion (aOR 2.04, 95% CI 1.49-2.80) and enterobacteria (aOR 2.38, 95% CI 1.74-3.24). Prelabor rupture of membranes at term was associated with enterobacteria (aOR 1.97, 95% CI 1.46-2.65) and Gardnerella vaginalis (aOR 5.19, 95% CI 2.22-13.78).

Conclusion: In this large cohort, *G. vaginalis* was associated with preterm labor and prelabor rupture of membranes at term, while lactobacilli depletion and enterobacteria were risk factors for PPROM and preterm birth. The supports the need for further studies of adapted antibiotics and probiotics to restore a healthy microbiota for preventing preterm birth.

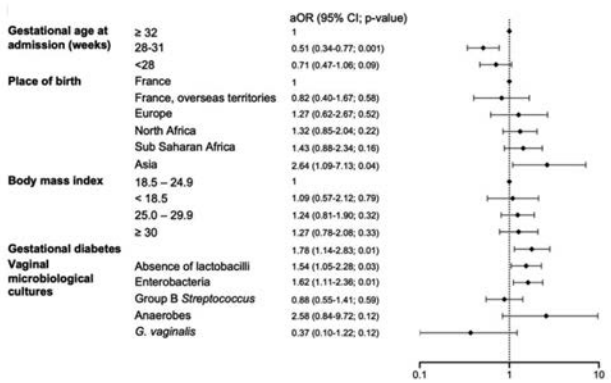


Figure. Multivariable analysis of risk factors for preterm birth in women admitted for preterm labor or preterm premature rupture of membranes in singleton pregnancies.
aOR : Adjusted odds ratios

Oral Concurrent Session 7

Diabetes

Abstracts 77 – 85

SATURDAY
February 1, 2025
8:00 AM – 10:15 AM
Aurora Ballroom A

MODERATORS
Christina M. Scifres, MD
Lynn M. Yee, MD, MPH

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Concurrent Session 7 – Diabetes

Saturday, February 1, 2025 8:00 AM – 10:15 AM

77 | Does Large for Gestational Age and/or Polyhydramnios Warrant Rescreening for Gestational Diabetes Mellitus?

Henry Lesser; A. Dhanya Mackeen; David Chromey, II; Amanda J. Young; Celia Gray; Michael J. Paglia
Geisinger Medical Center, Danville, PA

8:00 AM - 8:15 AM

Objective: Gestational diabetes mellitus (GDM) screening is often repeated in the 3rd trimester when large for gestational age (LGA) and/or polyhydramnios is diagnosed. We aimed to assess whether patients who did not rescreen in the 3rd trimester had any worse outcomes when compared to those that did.

Study Design: This is a retrospective cohort study from 1/1/11-3/1/24 of term, singleton pregnancies diagnosed with LGA and/or polyhydramnios after a normal GDM screen at 24-30 weeks. Patients with diabetes mellitus, fetal growth restriction, or fetal anomalies were excluded. Non-inferiority analyses were conducted to compare outcomes of individuals who underwent rescreening with those who did not. Noninferiority was established if the lower limit of the one-sided 95% confidence interval (CI) for the event rate in the 'did not rescreen' group did not exceed the relative margin of error from the event rate in the 'did rescreen' group. The lower bound of the 95% CI and corresponding p-values were reported. A p-value of < 0.05 was considered significant.

Results: 1693 pregnancies were included: 1317 did not rescreen and 376 rescreened. In patients that rescreened, 13.6 % were diagnosed with GDM, of which 22% required medication. Outcomes were not worse for those who did not rescreen than those that did rescreen for birthweight (BW) (3758.8g vs 3813.6g p< 0.01), BW ≥4000 (31.9% vs. 34.1%, p< 0.01), obstetric anal sphincter injuries (3.2% vs. 2.1%, p< 0.01), preeclampsia (3.6% vs 5.3%, p< 0.01), neonatal intensive care unit admission (7.6% vs 7.4%, p< 0.01), or GDM in future pregnancies (2.3% vs. 2.4%, p< 0.01).

Conclusion: Patients that did not rescreen for GDM following the diagnosis of LGA and/or polyhydramnios in the 3rd trimester did not have worse birth outcomes than those that did rescreen. This may demonstrate that despite diagnosing GDM in the 3rd trimester, there is insufficient time to intervene and change outcomes and therefore rescreening all patients with LGA and/or polyhydramnios may not be beneficial.

Table 1: Maternal and neonatal outcomes for all patients by no repeat screen versus rescreen

	Complete Rescreen		Margin of Error (%)	Lower Bound of 95% Confidence Interval[1]	Non-Inferiority P-value[1]
	No (N=1317)	Yes (N=376)			
Birthweight (grams), mean (std)	3758.8 (471.8)	3813.6 (478.4)	-170g	129.6	<0.01[2]
Birthweight (grams)			-5.0	-0.03	<0.01[2]
≥4000	410 (31.9)	128 (34.1)			
<4000	874 (68.1)	247 (65.9)			
OASIS tears	27 (3.2)	5 (2.1)	-2.5	-0.89	<0.01
Shoulder dystocia	69 (5.2)	23 (6.1)	-2.5	-3.06	0.11
GDM	0 (0.0)	51 (13.6)			Not Appropriate
A1GDM	---	40			
A2GDM	---	11			
Uterotonic	154 (11.7)	56 (14.9)	-5.0	-6.37	0.21
Maternal blood transfusion	35 (2.7)	4 (1.1)	-5.0	0.15	<0.01
Wound complications	4 (0.3)	1 (0.3)	-5.0	-0.48	<0.01
Preeclampsia	48 (3.6)	20 (5.3)	-5.0	-3.56	<0.01
Induction of Labor	690 (52.4)	211 (56.1)	-5.0	-8.53	0.33
Cesarean Delivery	528 (41.1)	168 (44.8)	-5.0	-8.45	0.32
Stillbirth	3 (0.2)	0 (0.0)	-2.5	-0.18	<0.01
NICU admission	98 (7.6)	28 (7.5)	-2.5	-2.41	0.04
Neonatal Hypoglycemia	73 (5.5)	38 (10.1)	-5.0	-6.94	0.38
Future GDM	30 (2.3)	9 (2.4)	-5.0	-1.56	<0.01
Future Type II Diabetes	16 (1.2)	8 (2.1)	-5.0	-2.05	<0.01

Data is described using frequencies and percents unless otherwise noted, n (%).
OASIS: obstetric anal sphincter injury
GDM: Gestational diabetes mellitus
A1: diet-controlled
A2: medication-controlled
NICU: Neonatal intensive care unit
[1] Lower Bound of 95% Confidence interval and respective p-value are from a least square means estimate from a mixed model using the reported margin of error as the test value.
[2]Birthweight has been adjusted for gestational age at delivery.
[3]GDM has been adjusted for history of GDM.

78 | Breastfeeding Patterns Among Parturients with Diabetes: A secondary Analysis of the MOMPOD Randomized Clinical Trial

Minhazur R. Sarker[1]; Marni B. Jacobs[2]; Kim Boggess[3]; Ashley N. Battarbee[4]; Gladys (Sandy) A. Ramos[1]
[1]University of California, San Diego, San Diego, CA; [2]University of California, San Diego Health, San Diego, CA; [3]University of North Carolina, Chapel Hill, NC; [4]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL

8:15 AM - 8:30 AM

Objective: Insulin resistance is associated with decreased milk supply in those lactating. Metformin is hypothesized to increase breast milk production by presumptively improving insulin resistance, suggesting use in pregnancy may increase breastfeeding (BF) success. We aimed to determine the association between metformin use for treatment of preexisting type 2 diabetes mellitus (T2DM) or DM diagnosed in early pregnancy (early DM) and BF patterns.

Study Design: This was a planned secondary analysis of the MOMPOD randomized controlled trial of metformin versus placebo in insulin treated T2DM or early DM. We included parturients who delivered a living neonate, received at least one dose of study treatment, endorsed an intention to BF, and completed a BF survey. BF intentions and BF outcomes were collected utilizing a BF questionnaire at 24-30 weeks and 30 days postpartum (PP) respectively. The primary outcome was immediate BF, defined as any BF on PP day 1-3. Secondary outcomes included time to milk production, exclusive or partial BF at 30 days PP, breast size and issues with BF. Baseline characteristics and outcomes were compared using either chi-square, t-test, or Wilcoxon tests, as appropriate.

Results: Among the 794 women randomized and receiving medication in the primary trial, 378 (47.6%) met inclusion criteria with 194 (51.3%) in metformin and 184 (49.7%) in placebo groups. There were no significant differences in baseline demographics (Table 1). Immediate BF was comparable between groups (91.1% vs 88.9%, p = 0.53) and there was no difference in time to milk production (Table 2). Thirty days PP, BF was lower in both groups but there was no difference between metformin and placebo groups (76.0% vs 66.7%, p = 0.11). There were also no differences in partial or exclusive BF, in breast cup or bra size, or issues with BF (Table 2).

Conclusion: Our data suggest no association between metformin use and BF patterns in those with T2DM or early DM. Antepartum metformin should not be recommended to improve BF success. Further studies should focus on methods to improve sustained BF in this population.

Table 1. Demographics of the study groups

	Metformin n = 194 (51.3%)	Placebo n = 184 (49.7%)	p-Value
Maternal Age, mean (SD)	32.9 (5.2)	33.6 (5.9)	0.28
Maternal Body Mass Index, mean (SD)	36.4 (7.5)	37.0 (9.4)	0.53
Nulliparity, n %	14 (8.7)	25 (15.7)	0.06
Parity, median (IQR)	2 (1, 3)	2 (1, 3)	0.75
Pre-existing Diabetes, n %	143 (73.7)	135 (73.4)	0.94
Gestational age at randomization, mean (SD)	16.8 (3.4)	16.9 (3.7)	0.77
Gestational age at Delivery, mean (SD)	37.2 (2.3)	37.0 (2.1)	0.27
Mode of Delivery, n %			0.70
Vaginal Delivery (including vacuum or forceps assistance)	67 (34.7)	67 (36.6)	
Cesarean Delivery	126 (65.3)	116 (63.4)	
Birthweight, mean (SD)	3131.0 (695.7)	3240.1 (754.4)	0.15
Admission to NICU	65 (33.5)	78 (42.4)	0.08
NICU Length of Stay, median (IQR)	9 (3, 29)	7 (3, 15)	0.51

Table 2. Breastfeeding Outcomes associated with Metformin

	Metformin n = 194 (51.3%)	Placebo n = 184 (49.7%)	p-Value
Any Immediate Breastfeeding in the Hospital	143 (91.1)	128 (88.9)	0.53
Actively Breastfeeding at Postpartum Visit	92 (76.0)	80 (66.7)	0.11
Weeks at breastfeeding cessation, mean (SD)	3.0 (2.4)	2.5 (1.5)	0.32
Currently Breastfeeding			0.84
No	48 (34.3)	49 (37.7)	
Yes, exclusive	22 (15.7)	19 (14.6)	
Yes, partial	70 (50.0)	62 (47.7)	
Time (days) for Milk to Develop			0.55
1 day or less	36 (25.7)	29 (22.0)	
2 days	26 (18.6)	28 (21.2)	
3 days	30 (21.4)	27 (20.5)	
4 days	18 (12.9)	18 (13.6)	
More than 4 days	28 (20.0)	23 (17.4)	
Milk never came in	2 (1.4)	7 (5.3)	
Issues with Breastfeeding*			
Contribution of Neonatal Latching to Breastfeeding Success			0.49
Not at all important	14 (29.8)	21 (38.9)	
Not very important	2 (4.3)	5 (9.3)	
Somewhat important	8 (17.0)	6 (11.1)	
Very important	23 (48.9)	22 (40.7)	
Contribution of Maternal Supply to Breastfeeding Success			0.97
Not at all important	11 (23.4)	13 (24.5)	
Not very important	2 (4.3)	3 (5.7)	
Somewhat important	7 (14.9)	6 (11.3)	
Very important	27 (57.4)	31 (58.5)	
Breast cup size, mean (SD)**			
Breast cup size before pregnancy	3.6 (1.5)	3.5 (1.3)	0.39
Breast cup size postpartum	3.8 (1.7)	3.7 (1.4)	0.68
Bra size (cm)			
Bra size before pregnancy	38.5 (3.5)	38.8 (3.9)	0.55

*Responses only obtained for subjects who stopped breastfeeding or used formula for supplementation (n=47 and n=54 for treatment and control, respectively)
**Standard breast cup size was converted to quantitative variable (A = 1, B = 2, C = 3, D = 4, DD/E = 5, DDD/F = 6)

79 | Predicting Future Diabetes: Impact of Abnormal Pregnancy OGTT Patterns

Yael Winter Shafran[1]; Tal Schiller[2]; Alena Kirzhner[2]; Edi Vaisbuch[2]
[1]Kaplan Medical Center and REALIFE Research Group, Rehovot, HaMerkaz; [2]Kaplan Medical Center, Rehovot, HaMerkaz

8:30 AM - 8:45 AM

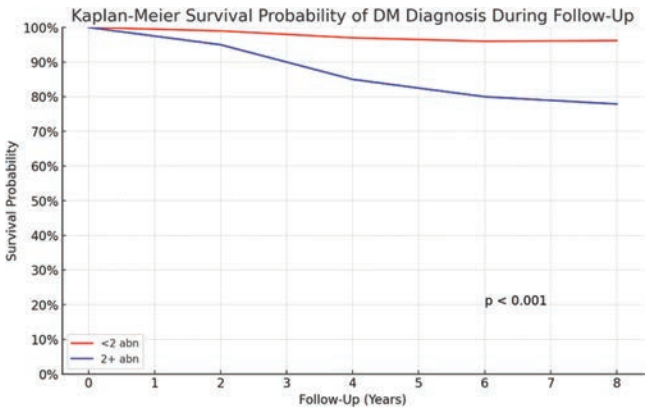
Objective: Evidence suggests that glucose challenge tests during pregnancy can predict long-term metabolic abnormalities. We evaluated the predictive value of Oral Glucose Tolerance Test (OGTT) patterns during pregnancy for future diabetes mellitus (DM) development.

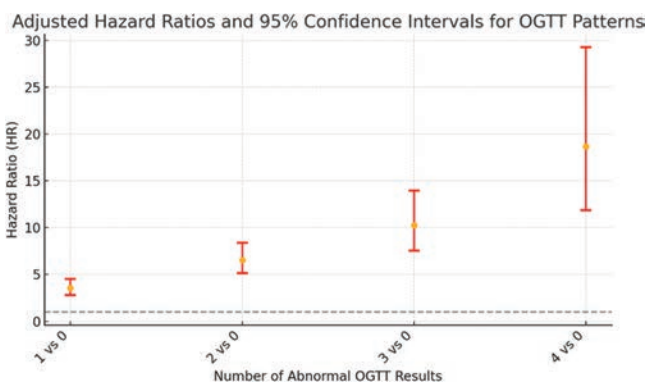
Study Design: This retrospective cohort study included pregnant people who performed a 100-gram OGTT. Those with pre-existing diabetes, recent diabetic medication or steroid use, and incomplete OGTT results were excluded. The predictive value of the OGTT for future DM was assessed using a large healthcare system database, with a follow-up of at least 8 years. Two models were analyzed, one comparing two or more abnormal results to less than two abnormal results in OGTT and the second analyzing the predictive value by the number of abnormal results and the "location" of a single abnormal result (i.e. fasting, one-hour, two-hour, and three-hour post glucose ingestion).

Results: Of the 10,372 individuals identified, 8,157 met the inclusion criteria. Those with a pathological OGTT were older, more obese, and had higher rates of hypertension and dyslipidemia. During follow-up, 22.1% of people with $^{3}2$ abnormal results

developed DM compared to only 3.8% in the group with < 2 abnormal results (HR 5.22, 95% CI 4.33-6.30). Compared to those with all four results normal, the hazard ratio (HR) for developing DM with one, two, three, or four abnormal results were 3.45 (95% CI 2.77-4.53), 6.55 (95% CI 5.12-8.36), 10.26 (95% CI 7.54-13.96), and 18.63 (95% CI 11.87-29.25), respectively. Among people with only one abnormal result, abnormal fasting glucose showed the highest risk (HR 4.01, 95% CI 2.7-5.92).

Conclusion: This study demonstrates that even one abnormal result (with the fasting glucose posing the highest risk) in the 100-gram OGTT is a risk factor for the future development of DM. The risk further increases with each additional abnormal result. These findings underscore the importance of postnatal follow-up and early modifiable interventions even for individuals with one abnormal OGTT result to potentially mitigate future DM risks.





80 | Effect of Breastfeeding on the Early Postpartum Lipid Profile in Women with Gestational Diabetes Mellitus

Harumi Kanzawa[1]; Hiroshi Yamashita[1]; Ichiro Yasuhi[2]
[1]NHO Nagasaki Medical Center, Omura City, Nagasaki; [2]NHO Nagasaki Medical Center, Omura-City, Nagasaki

8:45 AM - 9:00 AM

Objective: Women with a history of gestational diabetes mellitus (GDM) are at high risk for developing type 2 diabetes and metabolic syndrome. Although breastfeeding is recognized as effective in preventing these diseases, its effect on postpartum lipid metabolism remains unclear. This study aimed to investigate the association between breastfeeding and early postpartum lipid profiles in Japanese women with GDM.

Study Design: This prospective cohort study included singleton pregnant women with GDM enrolled during pregnancy. An oral glucose tolerance test (OGTT) was conducted at 6 to 9 weeks postpartum. Fasting lipid profiles, including total cholesterol (T-cho), triglycerides (TG), high-density lipoprotein (HDL), and low-density lipoprotein cholesterol (LDL-cho) levels, were measured. Breastfeeding intensity was categorized into six levels, from exclusive breastfeeding (Level 1) to formula feeding only (Level 6). Breastfeeding of 80% or more (Levels 1-3) was defined as high-intensity breastfeeding (HIB). Adjusted odds ratios (aOR) of hypertriglyceridemia (≥150 mg/dL) and hyper LDL cholesterolemia (≥140 mg/dL) were calculated.

Results: A total of 501 participants underwent a OGTT at 7.3 weeks postpartum. Lipid levels were T-cho 210 ± 33 mg/dL, TG 73 ± 49 mg/dL, HDL 72 ± 17 mg/dL, and LDL 127 ± 30 mg/dL. Breastfeeding intensity levels were 55%, 14%, 9%, 10%, 10%, and 3% from Levels 1 to 6, respectively, resulting in 77% for HIB. All lipids, except T-cho, were significantly associated with breastfeeding intensity (**Table**). Compared to women with non-HIB, those who engaged in HIB showed significantly lower prevalence of hypertriglyceridemia and hyper LDL cholesterolemia, with aORs of 0.21 (95% CI: 0.11-0.40) and 0.48 (0.31-0.76), respectively.

Conclusion: Breastfeeding significantly improved the early postpartum lipid profiles of women with GDM as breastfeeding intensity increased.

Table: The Association Between Breastfeeding Intensity and the Early Postpartum Lipid Profile in Women with GDM

Breastfeeding intensity level	Level 1 (n=274)	Level 2 (n=71)	Level 3 (n=44)	Level 4 (n=49)	Level 5 (n=50)	Level 6 (n=13)	P value
T-cho (mg/dL)	209 ± 34	214 ± 34	210 ± 30	212 ± 31	221 ± 35	208 ± 59	0.29
TG (mg/dL)	65 ± 39	73 ± 48	84 ± 63	105 ± 63	133 ± 80	110 ± 50	<0.0001
HDL-cho (mg/dL)	75 ± 17	73 ± 18	67 ± 17	66 ± 15	61 ± 13	60 ± 15	<0.0001
LDL-cho (mg/dL)	124 ± 32	129 ± 27	130 ± 26	132 ± 31	140 ± 32	137 ± 45	0.018

T-cho, total cholesterol; TG, triglycerides; HDL, high-density lipoprotein; LDL, low-density lipoprotein cholesterol

81 | Rates of Risk Appropriate Postpartum Care within Six Months after Delivery

Jennifer F. Culhane; Anna Denoble; Olivia Paoletti; Caitlin Partridge; Lisbet S. Lundsberg
Yale School of Medicine, New Haven, CT

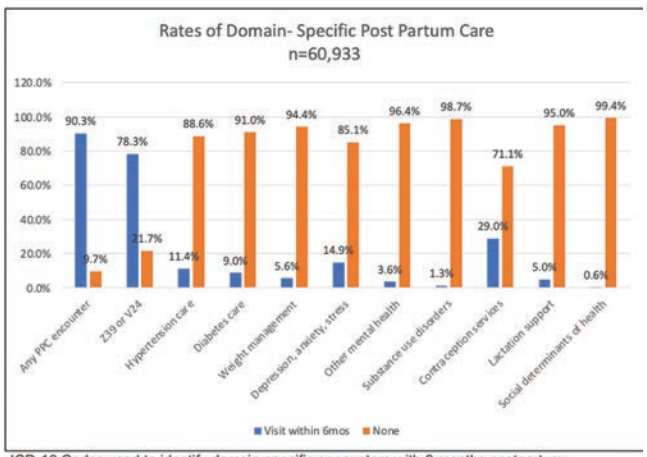
9:00 AM - 9:15 AM

Objective: Pregnancy is a "stress test", providing a window into future health risk. Enthusiasm for postpartum (PP) care (PPC) to mitigate maternal mortality and long-term adverse health outcomes is growing. We aimed to evaluate domain-appropriate 6-month PPC utilization by maternal antenatal risk factors.

Study Design: This was a retrospective study of delivery admissions occurring at a health system from 2013-2023 with evidence of ≥1 prenatal care visit. All encounters from delivery through 6-months PP were identified. Iterative review of PP encounters among random samples of 10,000 patients allowed selection of ICD-10 codes associated with PPC and 11 condition-based care domains. PPC rates were calculated by 1) any encounter, 2) traditional PPC (Z39 or V24), and 3) domain-specific PPC (Figure). Patients with risk factors (chronic hypertension (cHTN), hypertensive disorders of pregnancy, type 1 or 2 diabetes, gestational diabetes, depression/anxiety, and substance use disorder (SUD)) were identified based on ICD-10 codes. Rates of domain-appropriate PPC by risk factors were compared using Chi-square tests.

Results: N = 60,933 were included. 90% of patients had any encounter within 6 months PP and 78% had a traditional PPC visit (Figure). Across specific domains, 6-month PPC rates ranged from 0.6% for problems with social determinants of health (e.g. inadequate housing, lack of adequate foods, extreme poverty) to a high of 29.0% for contraception care. Exploring rates of domain-specific PPC by maternal risk factors, cHTN had the highest rate of appropriate PPC follow-up (54.5%), while patients with SUD had the lowest (16.6%) (Table). With the exception of cHTN, < 50% of patients with antenatal risk factors obtained domain appropriate PPC within 6 months of delivery.

Conclusion: Although we observed high rates of PPC overall, care specific to maternal risk factors was lacking, with rates mostly under 50%. Care for depression/anxiety and SUD treatment was particularly low. Major improvements are needed if PPC is to be a target to combat increasing rates of maternal mortality and improve health over the life course.



ICD-10 Codes used to identify domain-specific encounters with 6 months postpartum:
Traditional postpartum care: Z39, V24
Hypertension: I10, I11, I12, I13, I15, I67, O10, O11, O13, O14, O15, O16, R03, Z01.3, Z01.31
Diabetes: O24, O99.81, E10, E11, E13, E88.819, R73, T85614A, T85633, T85694A, Z13.1, Z46.81, Z79.4, Z96.41
Weight Management: E66, R63.5, Z68.3x, Z68.4, Z71.3
Depression/Anxiety: O90.6, F32, F33, F34, F41, F43, F53, Z13.31, Z13.32
Other Mental Health: O99.345, F30, F31, F40, F42, F44, F45, F48, F29, R45.86, Z13.39, F39, F60, F20, F50
SUD: F10, F11, F12, F13.2, F14, F15, F16, F18 and F19
Contraception Services: Z97.5 Z30, Z31, T83.3
Lactation Support: O91, O92, N61.0
Social determinants: Z59.0, Z59.1, Z59.4, Z59.5, Z59.6, Z59.7, Z59.8, Z59.9, Z62, Z63.79

Table: Domain Appropriate Care Rates in the Six Months Postpartum by Maternal Antenatal Risk Status

	Any postpartum care		Traditional postpartum care		Domain-specific care*	
Maternal Antenatal Risk Factor	YES	NO	YES	NO	YES	NO
Chronic hypertension					**Hypertension**	
YES (N=5,606, 9.2%)	93.8%	6.2%	80.7%	19.3%	54.4%	45.6%
NO	89.9%	10.1%	78.0%	21.0%	7.1%	92.9%
Type 1 or 2 diabetes					**Diabetes**	
YES (N=2,493, 4.1%)	88.7%	11.4%	71.8%	28.2%	48.8%	51.2%
NO	90.3%	9.7%	78.6%	21.5%	7.3%	92.7%
Gestational diabetes					**Diabetes**	
YES (N=7,892, 13.3%)	83.0%	17.0%	68.7%	31.3%	47.5%	52.5%
NO	91.4%	8.6%	79.7%	20.3%	3.3%	96.7%
HDP					**Hypertension**	
YES (N=11,604, 19.0%)	92.5%	7.5%	79.6%	20.4%	45.4%	54.6%
NO	89.8%	10.3%	78.0%	22.0%	3.4%	96.6%
Depression/anxiety					**Depression/anxiety**	
YES (N=14,922, 24.5%)	92.5%	7.5%	79.8%	20.2%	31.8%	68.2%
NO	89.6%	10.3%	77.8%	22.3%	9.4%	90.6%
Substance use disorder					**Substance use disorder**	
YES (N=4,337, 7.1%)	85.5%	14.2%	66.7%	33.3%	16.6%	83.4%
NO	90.6%	9.4%	79.2%	20.9%	0.1%	99.9%

HDP: Hypertensive disorders of pregnancy
*All bivariate comparisons were significant at p<0.0001

82 | Metformin Use in Pregnancy Decreases Neonatal Fat Free Mass

Claire E. Jensen[1]; Ashley N. Battarbee[2]; Kim Boggess[1]; Kjersti M. Aagaard[3]; On behalf of the MOMPOD Consortium

[1]University of North Carolina, Chapel Hill, NC; [2]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL; [3]Boston Children's Hospital, Division of Fetal Medicine and Surgery, Boston, MA; HCA Healthcare and HCA Healthcare Research Institute, Nashville, TN; HCA Texas Maternal Fetal Medicine, Houston, TX; Baylor College of Medicine and Texas Children's Hospital, Houston, TX, Boston, MA

9:15 AM - 9:30 AM

Objective: Murine and primate models treated with maternal metformin exhibit fetal bioaccumulation, leading to reduced muscle and retroperitoneal fat mass with fetal growth restriction. In clinical trials, maternal metformin use during pregnancy results in smaller neonates with reduced LGA risk, alongside a variable increased risk for SGA births. We hypothesized that the observed decreased prevalence of LGA births with maternal metformin use during pregnancy results from reduced accumulation of fetal fat free mass (FFM, i.e., muscle accretion) rather than diminished adiposity.

Study Design: Secondary analysis of a large multicenter RCT (MOMPOD) of metformin 1000mg BID vs. placebo in singleton pregnancies at 11-23 weeks with insulin-treated early diabetes or pre-existing T2DM. We included all participants who took ≥ 1 dose of study drug and had neonatal anthropometry. Multivariable linear regression estimated the association between metformin use and neonatal FFM and evaluated for effect modification by key covariates.

Results: Of n = 794 participants, 437 (55%) completed comprehensive neonatal anthropometry. They were demographically similar to the full cohort and balanced between treatment groups. Mean FFM was 2786 g (SD 408.15g, 86.2% of birth weight). FFM was 81.8g less in neonates exposed to metformin (95% CI -157.59, -4.56). The association between metformin exposure and FFM did not vary by neonatal sex, maternal race/ethnicity, pregestational diabetes diagnosis, nor excess maternal weight gain (Table 1). There was a trend toward effect modification by duration of exposure (Figure 1), indicating that the metformin-associated decline in muscle accretion increased with gestational age (p = 0.21).

Conclusion: Metformin is associated with lower neonatal muscle accretion, measured as FFM. Our finding of decreased FFM among metformin-exposed neonates adds to the mounting evidence raising concern for transplacental transfer and bioaccumulation in the fetus, which may restrict healthy physiologic growth patterns and potentially increase risk for adverse long-term cardiometabolic outcomes.

Table 1: Mean Fat Free Mass (g) by Metformin Use and Stratified Analyses

	Metformin + Insulin (SD) (n=227)	Placebo + Insulin (SD) (n=210)	Mean Difference (95% CI)**	p-value
Primary Outcome				
Fat free mass	**2747 (397)**	**2828 (416)**	**-81.08 (-157.51,-4.46)**	**0.038**
Stratified Analyses				
Neonatal sex			-2.37 (-79.22, 74.48)	0.952
Male	2734 (416)	2843 (441)		
Female	2759 (381)	2810 (385)		
Maternal race/ethnicity			25.47 (-24.24, 75.19)	0.315
Non-Hispanic White	2854 (330)	2883 (383)		
Non-Hispanic Black	2635 (420)	2709 (418)		
Hispanic	2795 (399)	2898 (401)		
Other	2625 (237)	2969 (297)		
Pre-pregnancy diagnosis of Type 2 diabetes on medication	2727 (415)	2821 (434)	-60.94 (-150.65, 28.77)	0.183
Excess Maternal Weight Gain*	2690 (487)	2977 (500)	0.91 (-2.16, 3.98)	0.562
Birthweight centiles			**334.03 (316.17, 351.88)**	**<0.001**
25%	**2237 (196)**	**2166 (256)**		
50%	**2665 (156)**	**2612 (134)**		
75%	**2907 (133)**	**2924 (127)**		

*Excess maternal weight gain was defined as >25 lbs. for pts with pre-pregnancy BMI <30 and >20 lbs. for pts with BMI > 30 (CDC)
** Unadjusted linear regression with mean difference in estimated fat free mass, as well as 95% confidence intervals for mean. No adjusted analyses were performed due to no significant confounders in bivariable analysis.

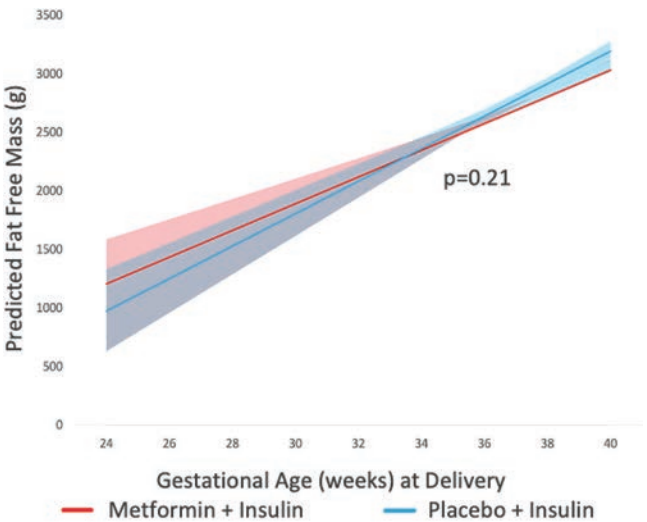


Figure 1: Interaction between Estimated Fat Free Mass and Gestational Age at Delivery. Metformin-associated decline in muscle accretion may increase with gestational age.

83 | Interaction between Metformin and Baseline Insulin Requirements on Neonatal Outcomes in Pregnancies with Type-2 Diabetes

Kevin S. Shrestha[1]; Claire E. Jensen[2]; Kim Boggess[2]; Gladys (Sandy) A. Ramos[3]; Ashley N. Battarbee[4]
[1]University of Alabama at Birmingham, Birmingham, AL; [2]University of North Carolina, Chapel Hill, NC; [3]University of California, San Diego, San Diego, CA; [4]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL

9:30 AM - 9:45 AM

Objective: Metformin did not improve composite neonatal morbidity among insulin-treated preexisting type 2 diabetes (T2D) in two recent RCTs. Although metformin reduced insulin requirements in the MiTy trial, there was no difference observed in the MOMPOD trial. Given trial heterogeneity, we aimed to determine if baseline insulin requirements modified the effect of metformin on neonatal outcomes.

Study Design: Secondary analysis of the MOMPOD trial, an RCT of metformin versus placebo in insulin-treated T2D or diabetes diagnosed in early pregnancy. Our primary outcome was the composite of neonatal complications from the parent trial (Table). Total daily dose (TDD) of insulin at randomization was evaluated as an effect modifier of the relationship between metformin and the primary outcome using a likelihood ratio test with p< 0.10 as significant. To further investigate effect modification, we evaluated the association between metformin and outcomes among subgroups with TDD < 30U, >60U, and >90U using multivariable Poisson regression with robust error variance and ordinary least squares regression.

Results: Of the 794 participants included, the median baseline TDD was 62 units (IQR 35, 88). There was significant interaction between metformin and TDD in relation to the primary outcome (Figure). In subgroup analyses of TDD< 30, metformin was associated with lower risk of composite neonatal outcome, LGA, neonatal fat mass, preterm birth, and NICU admission (Table). However, there were no differences in outcomes with metformin vs placebo among participants with TDD >60, with exception for smaller increase in insulin TDD during pregnancy (Table). Findings were similar for participants with TDD >90U.

Conclusion: The effect of metformin on neonatal outcomes in the MOMPOD trial cohort differed by baseline insulin requirements. Contrary to our hypothesis, metformin was associated with fewer adverse neonatal outcomes among those with low, not high, TDD. Further studies are needed to confirm our findings and evaluate the reason why metformin is beneficial for pregnancies with low insulin requirements.

Figure. Interaction between metformin and baseline insulin requirements in relation to composite neonatal outcome

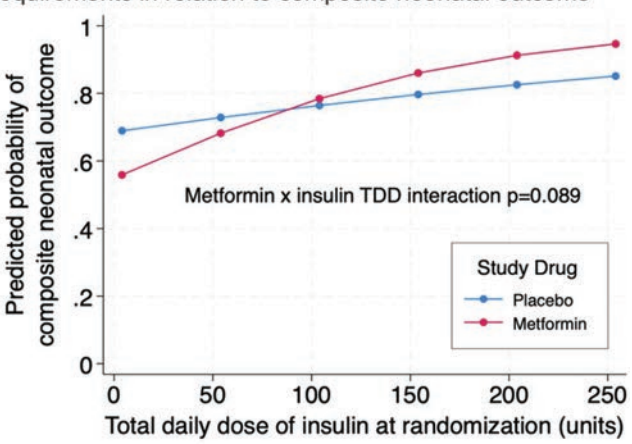


Table. Primary and secondary outcomes by metformin use among subgroups of persons with baseline total daily dose of insulin <30 units and >60 units

	Persons with Insulin TDD <30U			Persons with Insulin TDD >60U		
	Metformin (n=79)	Placebo (n=76)	Adjusted RR or mean difference (95% CI)*	Metformin (n=205)	Placebo (n=200)	RR or mean difference (95% CI)†
Composite primary outcome‡	**44 (55.7)**	**55 (72.6)**	**0.76 (0.59-0.98)**	152 (74.2)	155 (77.5)	0.96 (0.86-1.07)
Fetal and neonatal death	1 (1.3)	1 (1.4)	0.82 (0.08-8.6)	7 (3.5)	8 (4.2)	0.83 (0.31-2.25)
Preterm birth	**13 (17.1)**	**24 (32.9)**	**0.50 (0.28-0.90)**	75 (38.1)	74 (39.8)	0.96 (0.74-1.23)
Neonatal hypoglycemia	25 (32.9)	33 (47.8)	0.69 (0.46-1.03)	85 (45.0)	86 (48.6)	0.93 (0.74-1.15)
UA pH <7.05	0	2 (4.6)	–	6 (4.9)	6 (4.6)	1.06 (0.35-3.20)
Shoulder dystocia	1 (1.3)	2 (2.7)	0.46 (0.06-3.64)	1 (0.5)	4 (2.2)	0.23 (0.03-2.09)
Hyperbilirubinemia	14 (18.4)	16 (22.9)	0.75 (0.40-1.42)	50 (25.6)	52 (28.4)	0.90 (0.65-1.26)
LGA	**18 (23.1)**	**33 (44.0)**	**0.55 (0.34-0.90)**	52 (26.1)	67 (34.7)	0.75 (0.56-1.02)
SGA	4 (5.1)	5 (6.7)	0.80 (0.24-2.68)	12 (6.0)	15 (7.8)	0.76 (0.37-1.62)
Low birth weight	10 (12.8)	14 (18.7)	0.66 (0.32-1.36)	42 (21.2)	43 (22.3)	0.95 (0.65-1.39)
Cesarean delivery	47 (61.8)	42 (57.5)	1.05 (0.80-1.38)	131 (66.5)	126 (66.7)	0.98 (0.85-1.13)
NICU admission	**16 (20.3)**	**30 (40.0)**	**0.47 (0.28-0.80)**	93 (45.8)	92 (46.5)	0.99 (0.80-1.22)
Neonatal fat mass (kg)	**0.45±0.20**	**0.56±0.23**	**-0.10 (-0.19 to -0.01)**	0.45±0.23	0.49±0.23	-0.05 (-0.11 to 0.02)
Maternal GWG (kg)	6.3±7.1	7.4±6.8	-1.3 (-3.6 to 1.0)	10.0±8.0	9.9±7.5	0.1 (-1.4 to 1.7)
Change in insulin TDD during pregnancy (units)	14 (0, 32)	17 (4, 39)	1 (-20 to 20)	**14 (0, 56)**	**30 (8, 74)**	**-13 (-26 to -1)**

*Poisson regression with robust error variance and ordinary least squares regression, adjusted for nulliparity (differed in bivariable analysis with p<0.05).
†Poisson regression with robust error variance and ordinary least squares regression (no adjustment for confounders given no imbalances noted in bivariable analysis)
‡Composite primary outcome includes fetal and neonatal death, preterm birth, neonatal hypoglycemia, UA pH <7.05, shoulder dystocia, hyperbilirubinemia, LGA, SGA, and low birthweight
GWG, gestational weight gain

84 | The Placental Transcriptome in Pregnancies Complicated by A2 Gestational Diabetes Mellitus

Morgan E. Wasickanin[1]; Samantha Carson[1]; Hillary Kinsman[1]; Lydia Bettridge[1]; Katherine E. Free[1]; Jennifer Damicis[1]; Emily Sheikh[1]; Robert Walton[1]; Peter Napolitano[2]; Nicholas Ieronimakis[1]
[1]Madigan Army Medical Center, Tacoma, WA; [2]University of Washington, Seattle, WA

9:45 AM - 10:00 AM

Objective: Adverse obstetric and fetal outcomes are increased in pregnancies complicated with A2 gestational diabetes mellitus (A2GDM) compared to non-diabetic pregnancies. Placental dysfunction is thought to be attributed to some of the complications in A2GDM, yet the underlying molecular mechanisms remain unknown. We hypothesized that transcriptional differences in human placentas from A2GDM pregnancies may relate to tissue dysfunction. To test our hypothesis, we compared the transcriptome within placentas delivered from A2GDM versus uncomplicated pregnancies.

Study Design: Intervillous biopsies were dissected from unlabored placentas delivered by cesarean. The extracted RNA was depleted for both adult and fetal globin transcripts prior to transcriptional analysis by mRNA-seq (n = 10/condition). Alignment and differential gene expression (DEGs) analysis was conducted using Illumina's Dragen software. DEGs were considered statistically significant based on a cut-off adjusted p-value of < 0.05 using Benajamini-Hochberg false discovery rate correction.

Results: Between A2GDM versus uncomplicated placentas 14,825 DEGs were identified. Among these 1092 had a p < 0.05. When p-values were adjusted, the following 3 DEGs were significantly upregulated with A2GDM: AC068547.1, MMRN1, and ZNF780A (Figure 1).

Conclusion: The intervillous transcriptome in placentas from pregnancies complicated by A2GDM appears different than those from uncomplicated pregnancies. AC068547.1, a gene that codes for the calcium voltage-gated channel auxiliary subunit beta 4 (CACNB4) protein, was upregulated in a subset of placentas from A2GDM pregnancies. MMRN1 and ZF780A, proteins that function in coagulation and transcription regulation respectively, were more consistently upregulated in A2GDM samples. Further investigation is warranted to understand the role of these factors in placentas complicated by gestational diabetes mellitus.

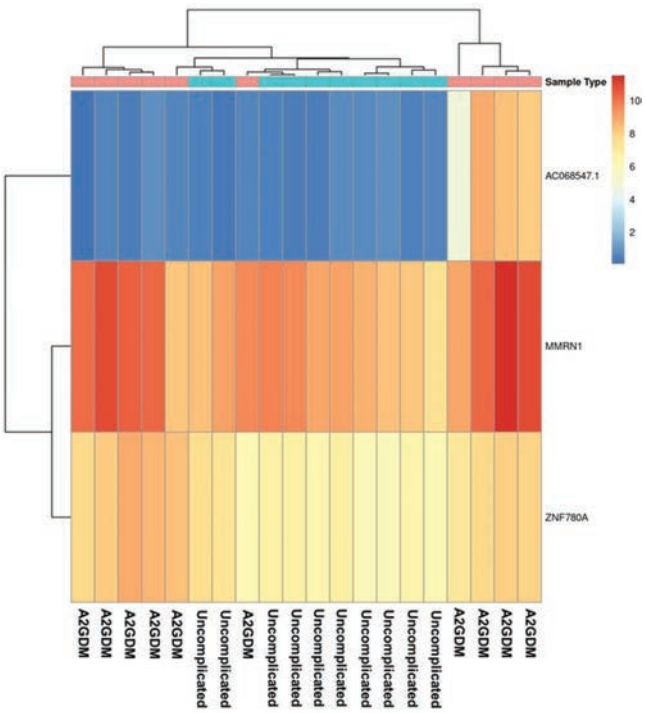


Figure 1. Hierarchically clustered heatmap from the mRNA-seq comparison of intervillous samples from A2GDM and uncomplicated placentas (n=10/condition). Represented are genes with FDR adjusted p<0.05. Color intensities correspond to fold changes between A2GDM vs. uncomplicated samples, red for the upregulation and blue for downregulation of genes across individual placentas.

85 | Childhood Sexual and Emotional Maltreatment are Associated with Increased Gestational Weight Gain

NATALIE E. POLIEKTOV[1]; Mariana Rocha[1]; Kaitlyn Stanhope[2]; Lauren Holt[1]; Alicia Smith[1]; Vasiliki Michopoulos[1]; Suchitra Chandrasekaran[3]
[1]Emory University School of Medicine, Atlanta, GA; [2]Rollins School of Public Health, Atlanta, GA; [3]Emory University, Atlanta, GA

10:00 AM - 10:15 AM

Objective: Gestational weight gain (GWG) is associated with adverse metabolic outcomes (AMO) for a mother & infant. Prior research suggests an association between maternal childhood trauma (CT) and increased GWG; however, little is known about how different domains of CT (e.g., sexual abuse (SA), emotional abuse (EA) & physical abuse (PA)) influence GWG. We aimed to study the association between CT & its domains with GWG.

Study Design: This is a prospective longitudinal cohort study investigating associations between trauma exposure & pregnancy

outcomes at an urban safety net hospital. CT was assessed using the Childhood Trauma Questionnaire (CTQ), a validated measure of 5 trauma domains, as a continuous score & dichotomized as CT (CTQ score >/ = 35) or no CT (CTQ score < 35). Adult trauma was assessed using the Traumatic Experiences Inventory. Weight & body mass index (BMI) were recorded during each trimester. Excessive GWG (EGWG) was defined as GWG exceeding BMI-based recommendations from ACOG. Multivariable linear regression and logistic regression were performed controlling for maternal age, pre-pregnancy BMI, & gestational age at delivery.

Results: N = 335 subjects were enrolled in the study. CTQ total, SA, & EA scores were positively correlated with increased GWG *(b = 0.24, 95% CI 0.02-0.46, p = 0.033; b = 0.07, 95% CI 0.01-0.1, p = 0.034; b = 0.06, 95% CI 0.00-0.12, p = 0.049, respectively)* (Figure 1). Mean GWG was 9 pounds (lb) higher in those with SA vs. no SA *(30.5 lb vs. 21.5 lb)* whereas mean GWG was 4 lb higher in those with EA vs. no EA *(27.5 lb vs. 23.4 lb)*. Further, there was 1.5-fold higher odds of having EGWG with CT vs. no CT *(OR 1.47, 95% CI 0.94–2.33, p = 0.092).* Childhood PA & adult trauma were not associated with GWG.

Conclusion: Using detailed trauma exposure measures, our data indicate that childhood SA & EA, but not PA or adult trauma, are associated with increased GWG during pregnancy. Further research is needed to understand the complex interactions between specific domains of trauma exposure & AMO in order to improve maternal & infant health.

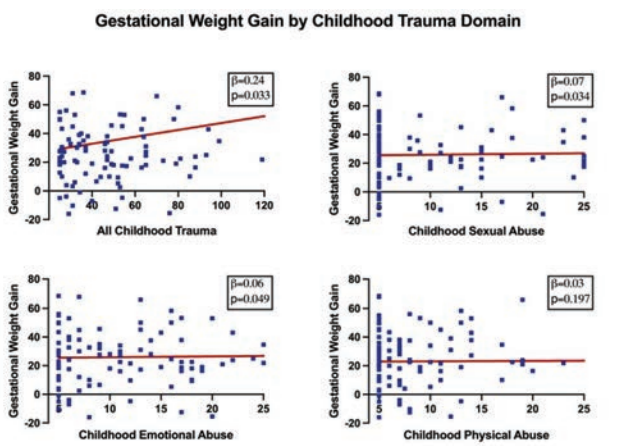


Figure 1. Gestational weight gain (lbs) by childhood trauma domain (points measured by the Childhood Trauma Questionnaire). Beta coefficients and p-values listed correspond to multivariable linear regressions controlling for maternal age, pre-pregnancy body mass index, and gestational age at delivery.

Oral Concurrent Session 8

Fetus and Fetal Intervention

Abstracts 86 – 94

SATURDAY
February 1, 2025
8:00 AM – 10:15 AM
Aurora Ballroom B

MODERATORS
Juan Gonzalez, MD, MS, PhD
Bettina Paek, MBA, MD

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Concurrent Session 8 – Fetus and Fetal Intervention

Saturday, February 1, 2025 8:00 AM – 10:15 AM

86 | Innovative Transcardiac Access to the Fetal Cerebral and Pelvic Arteries for Diagnosis and Treatment

Michael A. Belfort[1]; Emma Van Den Eede[2]; Karen Chen[3]; Carolyn A Altman[3]; Timo Krings[4]; Peter T Kan[5]; Tomohiro Arai[2]; Wasinee Tianthong[2]; Walter Coudyzer[6]; Caitlin D. Sutton[3]; Samuel G G. McClugage, III[3]; William E Whitehead[3]; Magdalena Sanz Cortes[1]; Larry H Hollier[3]; Jan A. Deprest[2]; Luc De Catte[6]; Luc Joyeux[3]; Thierry Huisman[3]
[1]Texas Children's Hospital and Baylor College of Medicine, Houston, TX; [2]My FetUZ Fetal Research Center, Universitary Hospital Leuven, Leuven, Vlaams-Brabant; [3]Baylor College of Medicine and Texas Children's Hospital, Houston, TX; [4]University Health Network, ON; [5]UTMB, Houston, TX; [6]Universitary Hospital Leuven, Leuven, Vlaams-Brabant

8:00 AM - 8:15 AM

Objective: Direct femoral and carotid access is not possible in fetuses, limiting options for prenatal treatment of high flow life-threatening anomalies (Vein of Galen Malformation, sacrococcygeal teratoma). Direct fetal cardiac puncture is used for intra-uterine transfusion and fetal valvuloplasty. We hypothesized that direct cardiac catheterization would enable access to the fetal arterial system for diagnosis/treatment. Aim: develop a fetal sheep model to study feasibility and safety prior to human trials.

Study Design: 5 ewes at 120 days' gestation (30-week human equivalent) with 8 fetuses, underwent laparotomy with uterine exteriorization. Using ultrasound guidance (US) an 18G needle was placed through the uterine wall into the fetal heart via the apex of the left ventricle, and positioned under the aortic valve. A glidewire was advanced into the aortic arch. The needle was replaced with a 4F dilator. A 1.3F microcatheter was advanced over the glidewire into the aortic arch, and under fluoroscopy to (i) just proximal to the rete mirabile (vessel meshwork supplying the Circle of Willis) via the common carotid and internal maxillary arteries, or (ii) down the descending aorta to the femoral artery. N-butylcyanoacrylate glue was then deposited occluding the target vessel. Sacrifice occurred 30 minutes after occlusion with CT and MRI assessment followed by autopsy (Fig1).

Results: All fetuses tolerated the procedure and survived 30 minutes. Intraoperative digital subtraction angiography and postmortem high-resolution CT showed on-target glue delivery in 7/8 (88%) cases. Postmortem MRI confirmed absence of focal brain and pelvis/limb ischemia/hemorrhage (Fig2).

Conclusion: This study demonstrates, in fetal lambs, feasibility/safety of a new procedure using direct cardiac catheterization (US guided) to access the arterial circulation in the brain and pelvis (fluoroscopy guided). This paves the way for other multiple-method imaging guided procedures, including devascularization of high-flow lesions, diagnostic blood sampling, biopsy, and drug and cell delivery and represents a new space for fetal research/therapy.

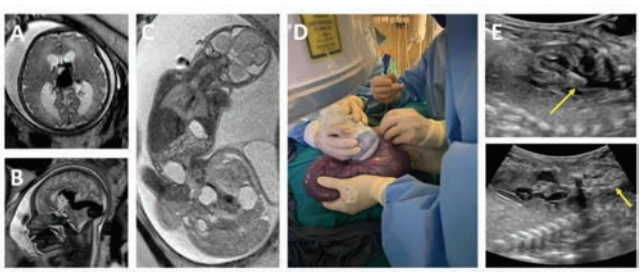
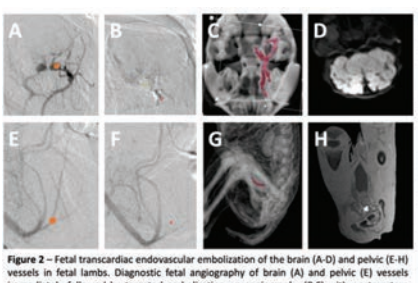


Figure 1 – Human target populations: severe fetal vein of Galen malformation (A-B) and high-risk sacrococcygeal teratoma (C). Intraoperative images in the fetal lamb model: fetal cardiac access under ultrasound guidance (D) with the needle tip (arrow) positioned in the left ventricle under the aortic valve (E) followed by advancement of the flexible sheath (arrow) through the aortic valve terminating in the ascending aorta and aortic arch (F).



Intraoperative outcomes	Median (SEM)
Gestational Age at procedure (days)	120 (0)
Weight at harvesting (g)	2250 (350)
Duration of fetal cardiac access (m:s)	22:49 (08:51)
Time to final positioning of the microcatheter (m:s)	08:00 (04:28)
Total fluoroscopy time (m:s)	08:02 (03:38)
Total X-ray exposure (Gy/cm²)	31.3 (23.2)
Cumulative contrast dose (mL)	21.0 (7.7)
Fetal heart rate - prior to cardiac puncture (/min)	126 (12)
- after embolization (/min)	121 (16)
- 10 min after embolization (/min)	125 (36)
- 20 min after embolization (/min)	132 (14)
- 30 min after embolization (/min)	120 (17)
Pericardial effusion requiring drainage (number; %)	2/8 (25%)
Fetal resuscitation (number; %)	3/8 (38%)
Successful target embolization on postmortem CT (n; %)	7/8 (88%)
Non-target embolization on postmortem CT (number; %)	0/8 (0%)
Hemorrhage or ischemia on postmortem MRI (number; %)	0/8 (0%)

Figure 2 – Fetal transcardiac endovascular embolization of the brain (A-D) and pelvic (E-H) vessels in fetal lambs. Diagnostic fetal angiography of brain (A) and pelvic (E) vessels immediately followed by targeted embolization on angiography (B,F) with postmortem confirmation of absence of non-target embolization on CT scan (C,G) and absence of hemorrhagic or ischemic complications on MR imaging (D,H). Table (I).

87 | Predicting Outcomes in Congenital Diaphragmatic Hernia with Discordant Fetal MRI and Ultrasound Prognostic Indices

Lamia A. Alamri[1]; Jason Gien[1]; Payton Moody[1]; Blair W. Weikel[2]; Mariana Meyers[1]; Michael V. Zaretsky[1]; Sarkis C. Derderian[1]; Henry L. Galan[3]
[1]University of Colorado, School of Medicine, Aurora, CO; [2]University of Colorado, School of Medicine and Colorado Fetal Care Center, Aurora, CO; [3]University of Colorado, School of Medicine, Children's Hospital of Colorado, Aurora, CO

8:15 AM - 8:30 AM

Objective: Prognosis and management of prenatally diagnosed congenital diaphragmatic hernia (CDH) is reliant on ultrasound (US) observed-to-expected lung-to-head ratio (O/E LHR) and MRI indices (percent predicted lung volume; PPLV). These indices can conflict with one another (e.g. severe by MRI and moderate by US, or vice versa), creating a clinical dilemma. Our objective was to determine whether discordant prognostic indices are more predictive of a moderate or a severe case.

Study Design: This retrospective study included all severe and moderate CDH cases managed at a single fetal care center from 2012-2023. Severe parameters were defined as a MRI PPLV < 15% and U/S O/E LHR value < 25%. Discordant MRI and US indices (DIS) were defined as either one falling into the severe category and the other into the moderate category, and they were grouped together. Concordant Severe (CSev) and Concordant Moderate (CMod) were defined as MRI and US both falling into the severe or moderate category, respectively. The primary outcome was extracorporeal membrane oxygenation (ECMO) use. Categorical and continuous variables were compared using chi-square or Fisher's exact tests or Wilcoxon rank sum test as appropriate. Differences between groups were assessed with pair-wise comparisons and a Bonferroni correction ($p < 0.017$).

Results: Of 82 CDH cases, 27 were in the DIS group, 36 in the CMod group and 19 in the CSev group. Primary and secondary outcomes are shown in the Table 1a. ECMO use was similar for DIS (78%) and CSev (95%) groups, and both were significantly higher (Table 1b) than the CMod group (45%). Survival was highest and mechanical ventilation was lowest in the CMod group (Table 1 & Figure 1). Duration on ECMO and hospital length of stay were similar among all groups.

Conclusion: Discordant prenatal MRI and US CDH indices can lead to uncertainty and affect optimal patient counseling and management. Our results suggest that MRI and US modalities which show discordant CDH prognostic indices, predict a severe CDH phenotype.

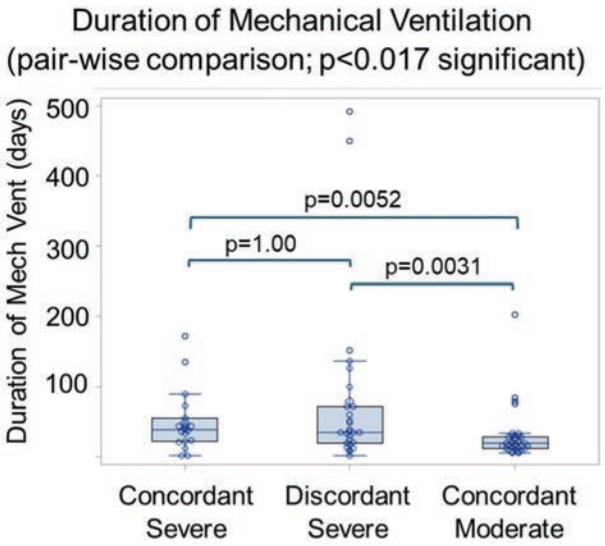


Table 1a. Characteristics of patients by CDH severity, n = 82

	DIS (n = 27)	CMod (n = 36)	CSev (n = 19)	p-value
APGAR 1	3 [3, 4]	5 [4, 6]	4 [2, 5]	**0.0033**
APGAR 5	6 [5, 7]	7 [7, 8]	6 [5, 7]	**0.0232**
ECMO	21 (78%)	15 (42%)	18 (95%)	**<0.0001**
ECMO Cannulation Time Hours	4 [1, 8]	15 [7, 34]	1 [1, 2]	**0.0003**
GA at Delivery	37 [36, 38]	38 [37, 38]	38 [35, 38]	**0.0105**
Lived/Died	16(59%)/11(41%)	34 (94%)/2(6%)	8 (42%)/11(58%)	**<0.0001**
PH Severity				**0.0361**
0	6 (38%)	13 (38%)	0	
1	5 (31%)	18 (53%)	5 (63%)	
2	3 (19%)	3 (9%)	2 (25%)	
3	2 (13%)	0	1 (13%)	
Time on iNO	50 [22, 89]	26.5 [20, 34.5]	39 [17, 73]	**0.0452**
Time on Mechanical Ventilation	35 [19, 72]	19 [11.5, 28.5]	39 [22, 55]	**0.0024**
Time on non-invasive support	38.5 [14, 56]	14 [7.5, 30.5]	51 [35, 114]	**0.0088**
Time on ECMO	16 [10, 25]	13 [9, 17]	21 [10, 26]	0.3797
Chronic lung disease				**0.0157**
0	1 (6%)	7 (21%)	1 (13%)	
1	7 (44%)	22 (65%)	2 (25%)	
2	3 (19%)	2 (6%)	4 (50%)	
3	5 (31%)	3 (9%)	1 (13%)	
Days to initial repair	2.5 [2, 5]	4 [2.5, 7]	2 [2, 2]	**0.0007**
Weight (kg)	2.99 [2.5, 3.0]	3.1 [2.9, 3.3]	2.7 [2.5, 3.0]	**0.0009**
Length-of-Stay	86 [37, 152]	60.5 [42, 83.5]	67 [37, 164]	0.3509
Size of Defect C/D	26 (96%)	21 (58%)	17 (89%)	**0.0006**

Categorical variables compared using chi-square or Fisher's exact tests, as appropriate for sample size, and continuous variables were compared using Wilcoxon rank sum test. Values significant at p<0.05 are bolded.

Table 1b. Pairwise comparisons of patient characteristics

	DIS vs. CMod p-value	DIS vs. CSev p-value	CMod vs. CSev p-value
APGAR 1	**0.0014**	0.9151	0.0235
APGAR 5	**0.0132**	0.9242	0.0417
ECMO	**0.0042**	0.2125	**0.0001**
ECMO Cannulation Time Hours	**0.0093**	0.0613	**0.0002**
GA at Delivery	**0.0026**	0.3031	0.1392
Lived/Died	**0.0006**	0.2515	**<0.0001**
PH Severity	0.0940	0.2133	0.0278
Time on iNO	**0.0131**	0.2994	0.2801
Time on Mechanical Ventilation	**0.0031**	1.0000	**0.0052**
Time on non-invasive support	0.0409	0.3223	**0.0081**
Time on ECMO	0.2537	0.8879	0.2050
Chronic lung disease	0.0592	0.3490	0.0172
Days to initial repair	0.0346	0.1198	**0.0001**
Weight	**0.0085**	0.4949	**0.0005**
Length-of-Stay	0.1282	0.5694	0.6709
Size of Defect C/D	**0.0009**	0.5607	0.0299

Categorical variables compared using chi-square or Fisher's exact tests, as appropriate for sample size, and continuous variables were compared using Wilcoxon rank sum test. A Bonferroni correction was applied to adjust for multiple-testing. Values significant at p<0.017 are bolded.

88 | Tracking Twin Growth from Start to Finish in 3D

Jessica L. Gleason[1]; Zhen Chen[2]; Rajeshwari Sundaram[2]; Kathryn A. Wagner[3]; Daniel He[4]; Wesley Lee[5]; Roger Newman[6]; Seth Sherman[7]; Edward Chien[8]; Robert Gore-Langton[7]; Luis F. Goncalves[9]; Katherine L. Grantz[1]
[1]Epidemiology Branch, NICHD-NIH, Bethesda, MD; [2]National Institute of Child Health and Human Development, Bethesda, MD; [3]Massachusetts College of Pharmacy and Health Sciences, Boston, MA; [4]The Prospective Group, Fairfax, VA; [5]Baylor College of Medicine, Houston, TX; [6]Medical University of South Carolina, Columbia, SC; [7]The Emmes Company, Rockville, MD; [8]Cleveland Clinic, Cleveland, OH; [9]Phoenix Children's Hospital, Phoenix, AZ

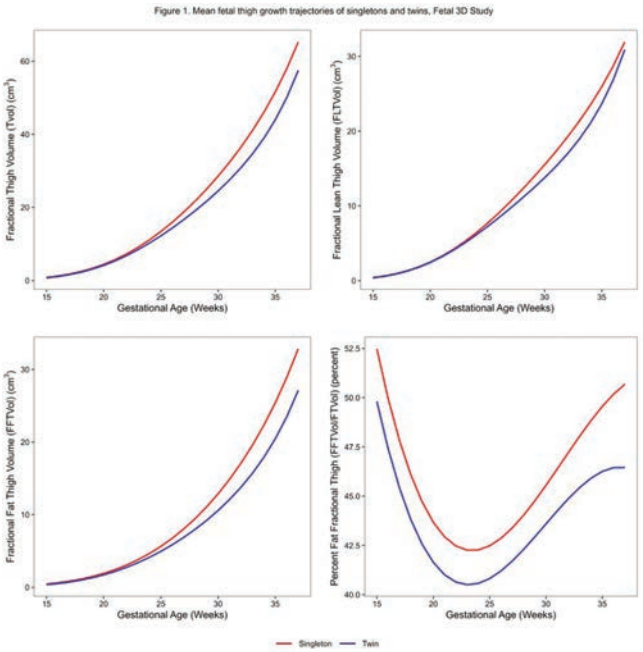
8:30 AM - 8:45 AM

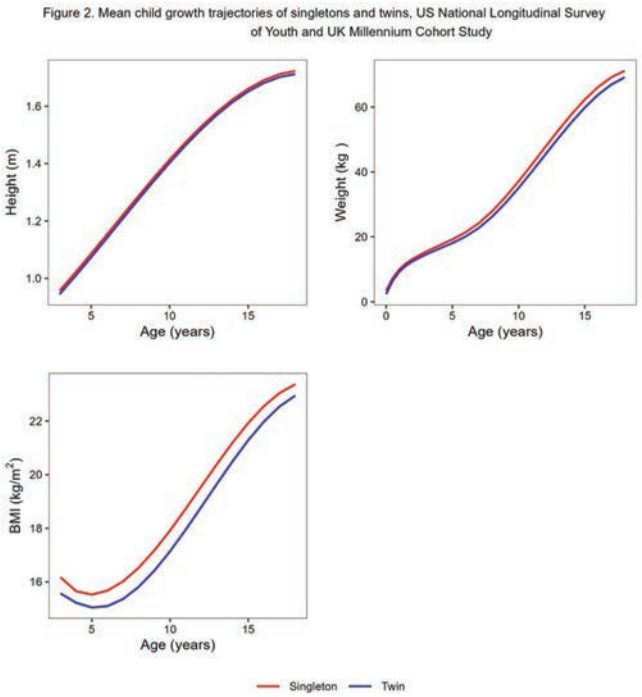
Objective: An emerging paradigm attributes 3rd trimester deceleration in fetal growth in uncomplicated twin pregnancies to a normal evolutionary adaptive process rather than pathologic growth restriction. However, long-term studies tracking child growth are needed since growth restriction in singletons is associated with increased risk for obesity and cardiometabolic dysfunction later in life. Few such studies exist, and none continue through adolescence or have evaluated fetal fat body composition which may provide important insights.

Study Design: In the NICHD-Fetal 3D Study (n = 2919), we compared marginal means of total, fat, and lean fractional thigh volumes between twins and singletons between 15-37 weeks' gestation (wks) estimated from linear mixed models. Additionally, in US and UK nationally representative prospective datasets (n = 30,854), we similarly compared growth trajectories of twins and singletons between 0-18 years (y) and estimated adjusted risk ratios (aRR) of obesity overall and at different stages of development, based on typical ages of puberty for boys and girls.

Results: *In utero*, twins had smaller thigh volumes beginning at 15 wks (difference = -0.12 cm^3; 95% CI -0.16, -0.08) through 37 wks (difference = -7.8 cm^3; CI -11.9, -3.8), with 2.7-4.2% less thigh fat (15-37 wks) and less lean tissue by 0.18-1.85 cm^3 (23-37 wks) than singletons (Figure 1). From birth through age 18y, twins never catch up to singletons, remaining consistently 1 cm shorter, 1-2 kg lighter, and a lower BMI (Figure 2). Accordingly, twins' risk of obesity was 25% lower between age 3-18y; 27% lower (aRR = 0.73; CI 0.54, 0.99) before puberty, 29% lower (aRR = 0.71; CI 0.51, 0.99) during puberty, and 10% lower (aRR = 0.90; CI 0.55, 1.04) after puberty.

Conclusion: Twins had proportionally less fat tissue accumulation *in utero* compared to singletons starting at 15 weeks and were not at an increased risk of childhood obesity. Rather, twins had shorter stature and were thinner through age 18y. Persistent differences in twin size across gestation and through age 18y supports the concept of an early adaptive programming mechanism.





89 | Proteomic Analysis of Monochorionic Pregnancies with twin-to-twin Transfusion Syndrome and Selective Fetal Growth Restriction

Jessian L. Munoz; Cara Buskmiller; Ahmed A. Nassr; Magdalena Sanz Cortes; Michael A. Belfort; Roopali V. Donepudi
Texas Children's Hospital and Baylor College of Medicine, Houston, TX

8:45 AM - 9:00 AM

Objective: One third of monochorionic twin pregnancies are complicated by twin-to-twin transfusion syndrome (TTTS) and/or selective fetal growth restriction (sFGR). While standard treatment of TTTS is fetoscopic laser photocoagulation (FLP),

concomitant sFGR results in greater rates of fetal demise and adverse pregnancy outcomes. Our objective was to characterize the molecular pathophysiology of TTTS, sFGR and the relationship when both are present.

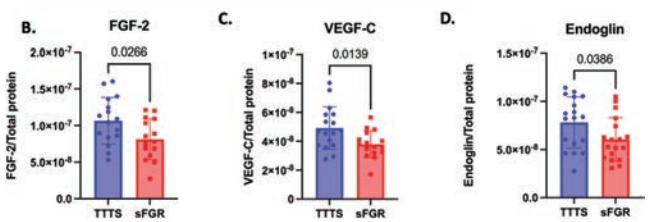
Study Design: This study was a prospective cohort analysis at our Fetal Center from 2022-2024. Maternal plasma specimens and amniotic fluid samples were collected from patients undergoing FLP for TTTS with and without sFGR. Amniotic fluid total protein was assessed by Bradford assay and quantitative proteomic pathway analysis was performed using the Luminex platform. Maternal plasma proteins were then analyzed by ELISA to assess for possible circulating biomarkers.

Results: Amniotic fluid specimens were analyzed from 36 subjects (18 isolated TTTS and 18 TTTS + sFGR). No differences were noted in gestational age of FLP. Proteomic analysis (figure 1) showed significant downregulation of Fibroblast Growth Factor (FGF-2, p = 0.02), Endoglin (Eng, p = 0.04) and Vascular Endothelial Growth Factor C (VEGF-C, p = 0.01) in pregnancies complicated by TTTS with sFGR when compared to isolated TTTS. No differences were noted in other vascular or growth factors. Pathway interaction analysis revealed a linear relationship among these proteins in neovascularization and cell growth pathways. Maternal plasma proteomic analysis showed no difference in protein expression among groups.

Conclusion: In this cohort of monochorionic pregnancies complicated by TTTS and TTTS with sFGR, the pro-vascular and pro-growth pathway of FGF-2/Endoglin/VEGF was significantly downregulated, suggesting these may contribute to the sFGR pathology beyond TTTS. These findings were limited to the amniotic cavity and not identified in maternal circulation. Further research on the downstream molecular mechanism of this proteomic pathway may provide additional targets to assess and treat underlying pathology.

A.

Factor	Isolated TTTS (n=18)	TTTS + sFGR (n=18)	p-value
Age (years)	30.9 ± 5.8	30.1 ± 4.8	0.64
BMI (kg/m²)	29.9 ± 6.6	30.2 ± 8.9	0.94
Gestation age at diagnosis	18.7 [17.4, 22.4]	19.2 [16.7, 21.3]	0.58
Gestational age at FLP	18.9 [17.4, 22.5]	19.2 [17.1, 21.4]	0.67



90 | Chronotropic Rescue Prior to Cord Clamping in Fetal Complete AV Block and Severe Bradycardia

Samantha Holmes[1]; Emily Bucholz[1]; Camila Londono-Obregon[1]; Jason Gien[1]; Nicholas Behrendt[1]; Michael V. Zaretsky[1]; Henry L. Galan[2]; Bettina Cuneo[3]

[1]University of Colorado, School of Medicine, Aurora, CO; [2]University of Colorado, School of Medicine, Children's Hospital of Colorado, Aurora, CO; [3]University of Arizona, Tucson, AZ

9:00 AM - 9:15 AM

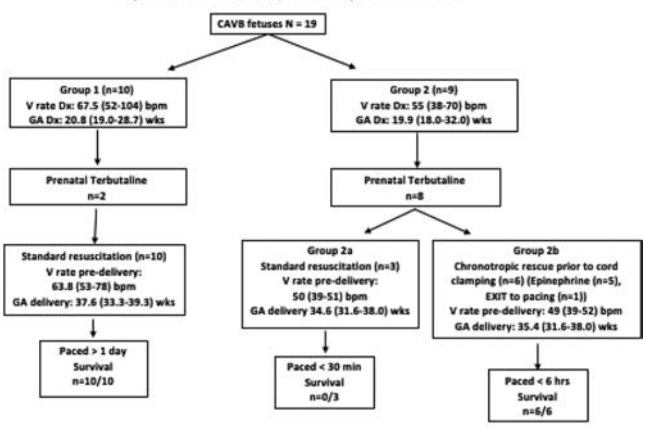
Objective: Fetal complete AV block (CAVB) occurs in 2% of pregnancies with Anti-Ro antibodies or inherited arrhythmias. Only about 10% have a ventricular (V) rate of < 50 beats per minute (bpm) but case mortality rate is 42%. We hypothesized that survival of fetal CAVB with V ≤52 bpm prior to delivery would improve with chronotropic rescue using epinephrine (epi) or ventricular pacing at or after cesarean delivery and prior to cord clamping.

Study Design: Single center retrospective series of fetal CAVB divided into 2 groups based on V rate at time of delivery. Group 1 consists of V rates > 52bpm receiving standard delivery room (DR) resuscitation at delivery. Group 2 consists of V rates ≤52 bpm receiving either standard resuscitation or chronotropic rescue prior to cord clamping and delivery. Maternal, fetal and neonatal medical records and echocardiograms were reviewed for atrial/ventricular rates, cardiac function and survival or demise. We calculated median for both groups.

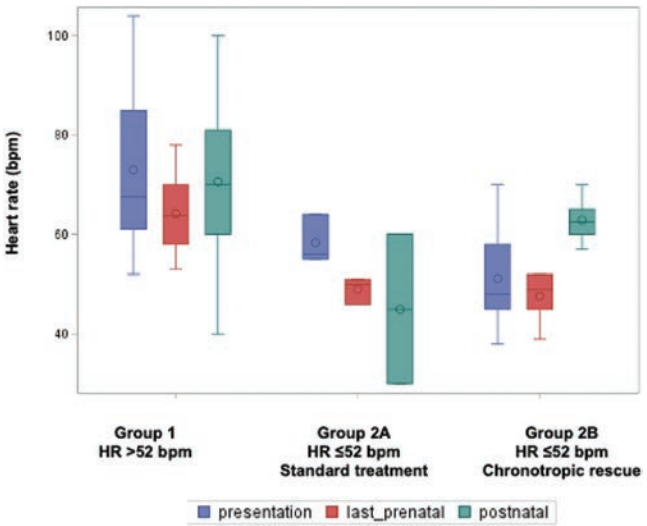
Results: From 2013-2024, 19 fetal CAVB subjects (10 in group 1, 9 in group 2), 18 with maternal Anti-Ro antibodies and one with an inherited arrhythmia, were delivered (Figure 1). Group two delivered and presented at an earlier gestational age (GA), had lower V rates at presentation and received more in utero terbutaline than in group one. All in group one survived after standard DR resuscitation. In group 2a, three died after standard DR resuscitation and pacing within 30 minutes of birth because of pulseless electrical activity: their V rates decreased 50 (39-51) bpm and cardiac function became severely depressed after cord clamping. In group 2b, 6/6 survived after receiving high dose epinephrine (n = 5) or EXIT to pacing prior to cord clamping (n = 1); their V rate increased 63 (57-70) bpm and cardiac function was normal after cord clamping (Figure 2). All with chronotropic rescue were successfully paced at < 6 hours.

Conclusion: Chronotropic rescue prior to cord clamping may improve survival by increasing V rate and maintaining cardiac function in CAVB with ventricular rates ≤52 bpm and a history of in utero terbutaline treatment.

Figure 1. Flow chart of CAVB patient management and survival



Data for FHR and GA data are shown as median (range).
FHR, fetal heart rate; GA Dx, gestational age at diagnosis; bpm, beats per minute
Standard resuscitation: resuscitation per NRP guidelines



91 | Impact of a Synthetic Amniotic Fluid Upon Fetal Lung Development

Stephanie Finoti[1]; Braxton Forde[2]; Samuel Martin[3]; Marc Oria[1]; Jose L. Peiro[4]
[1]University of Cincinnati, Cincinnati, OH; [2]University of Cincinnati College of Medicine, Cincinnati, OH; [3]Cincinnati Children's Hospital Medical Center, Cincinnati, OH; [4]Cincinnati Children's Fetal Care Center, Cincinnati, OH

9:15 AM - 9:30 AM

Objective: Serial amnioinfusions in the setting of anyhydramnios seek to promote fetal lung development, however these procedures can be fraught with complications, and the fluid infused (Normal Saline-NS or Lactated Ringer's-LR) is not designed for the in-utero environment. We previously designed a synthetic amniotic fluid (Amnio-well - AW), which minimizes reactive oxygen species damage to the amniotic membrane. Given the interplay between the amniotic fluid and fetal lungs, we sought to evaluate the impact of AW on fetal lung development.

Study Design: At E17.5, pregnant rats underwent laparotomy to amniotic fluid replacement with either NS, LR, AW, or AW plus epidermal and fibroblast growth factor (AW++), with sham surgery as a control. Fetal lungs were harvested at E20.5. Histology was evaluated by H&E staining, using morphometric measurement of fractional airspace to estimate growth. Gene expression for surfactant A, B, and C (SP-A, SP-B, SP-C) was compared between groups via reverse transcriptase PCR and immunofluorescence. Inflammatory gene panels were run to identify patterns in abnormal inflammation in the various treatment groups.

Results: Fetal lungs from NS and LR were noted to have increased edema, macrophage infiltration, and decreased airspace ($p < 0.001$) (Figure 1). When evaluating surfactant expression, there was increased SP-B, SP-C expression with AW relative to control, significantly decreased SP-A, SP-B, SP-C expression with both NS and LR, and mildly decreased SP-A, SP-B, SP-C with AW++ (Figure 2). Inflammatory gene profiling revealed marked alterations in histamines, annexins, phospholipase, and immune cell recruitment in NS and LR, indicating abnormal cell membrane integrity (Figure 2). The closest profile to control was AW, with altered gene expression in 10/94 genes (9 upregulated, 1 downregulated), vs 41 genes with NS (22 up, 19 down), 33 with LR (14 up, 19 down), and 12 with AW++ (10 up, 2 down).

Conclusion: A synthetic amniotic fluid leads to decreased lung inflammatory profiles and improved surfactant expression compared to commercially available fluids when used for amnioinfusion.

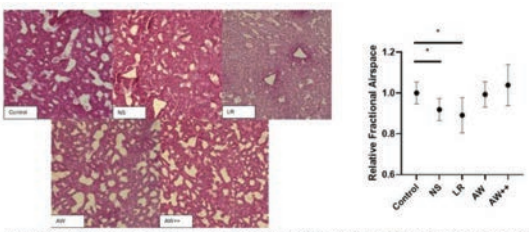


Figure 1. H&E staining of fetal lung tissue at E20.5 at 10x. Increased tissue edema and macrophage/neutrophil infiltration. Decreased relative airspace is noted in NS and LR relative to control, a finding not seen with AW and AW++.

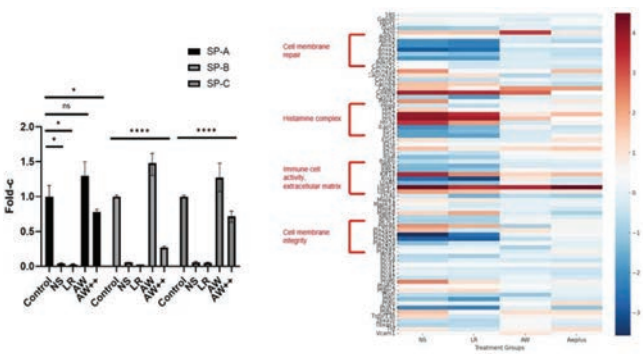


Figure 2. Gene expressions for Surfactant A, B, and C and inflammatory profiles of the various treatment groups. There was significantly decreased SP-A, SP-B, and SP-C expression in lungs exposed to NS and LR. SP-A, SP-B, and SP-C expression in lungs exposed to AW++ was also decreased relative to control, and SP-B, SP-C only were increased relative to control with AW.

92 | Effect of Very Preterm Delivery on Outcomes Following in-Utero Spina Bifida Repair

Michael V. Zaretsky[1]; Virginia Lijewski[1]; Jagruti Anadkat[2]; Kelly A. Bennett[3]; Yair J. Blumenfeld[4]; Christopher Q. Buchanan[5]; Caitlin M. Clifford[6]; Timothy Crombleholme[7]; Samer Elbabaa[8]; Stephen P. Emery[9]; William H. Goodnight[10]; Hanmin Lee[11]; Joseph B. Lillegard[12]; Foong-Yen Lim[13]; Francois Luks[14]; Jena L. Miller[15]; Ueli Moehrlen[16]; Julie Moldenhauer[17]; Anita J. Moon-Grady[11]; Mauro Schenone[18]; Aimen F. Shaaban[19]; KuoJen Tsao[20]; Tim Van Mieghem[21]; Amy J. Wagner[22]; On behalf of the fMMC Consortium sponsored by NAFTNet
[1]University of Colorado, School of Medicine, Aurora, CO; [2]Washington University School of Medicine, St. Louis, MO; [3]Vanderbilt University Medical Center, Nashville, TN; [4]Children's Hospital at Stanford, Palo Alto, CA; [5]St. Louis Fetal Care Institute, St. Louis, MO; [6]University of Michigan Medical Center, Ann Arbor, MI; [7]Connecticut Children's Fetal Care Center, Hartford, CT; [8]Orlando Health Arnold Palmer Hospital for Children, Orlando, FL; [9]University of Pittsburgh, Pittsburgh, PA; [10]University of North Carolina at Chapel Hill, Chapel Hill, NC; [11]University of California, San Francisco, San Francisco, CA; [12]Midwest Fetal Care Center, Minneapolis, MN; [13]Cincinnati Children's Hospital, Cincinatti, OH; [14]Fetal Treatment Program of New England, Providence, RI; [15]Johns Hopkins Medicine, Baltimore, MD; [16]Children's Hospital Zurich, Zurich; [17]Children's Hospital of Philadelphia, Philadelphia, PA; [18]Mayo Clinic, Rochester, MN;

[19]*Chicago Institute for Fetal Health, Chicago, IL;* [20]*McGovern Medical School at the University of Texas Health Science Center at Houston (UTHealth) University of Texas Health Science Center, Houston, TX;* [21]*Mount Sinai Hospital and University of Toronto, Toronto, ON;* [22]*Children's Hospital of Wisconsin Fetal Concerns Center, Milwaukee, WI*

9:30 AM - 9:45 AM

Objective: In-utero fetal spina bifida repair decreases the risk for ventriculoperitoneal shunt (VP shunt) placement, reverses hindbrain herniation, and improves motor function with a higher likelihood of independent ambulation. The goal of this project was to assess pregnancy and neonatal outcomes among individuals who delivered very preterm (< 30 weeks of gestation (wk)) from the fMMC Consortium Registry sponsored by the North American Fetal Therapy Network (NAFTNet).

Study Design: The NAFTNet fMMC registry includes prospectively collected data from 2011 to 2024. Three cohorts of patients were categorized by gestational age (GA) of delivery and compared: < 30 wk, 30-34 wk, and > 34 wk. Comparisons between groups for maternal and delivery outcomes were completed for the entire cohort and then analyzed for those with available shunt data. Chi-square or Fisher's exact tests were used to compare categorical variables, and Kruskal-Wallis tests were used to compare continuous variables. p-values < 0.05 were considered significant.

Results: A total of 1,213 patients were available for analysis (< 30 wk n = 111, 30-34 wk n = 323, >34 wk n = 779). Overall mortality was 2.2%, 85% of which occurred in the < 30 wk cohort (Table 1) in which perinatal mortality was 21%. Latency from fetal surgery to delivery averaged 2.6 wks for the < 30 wk group. Rates of abruption, chorioamnionitis, and spontaneous labor were higher compared to later GA cohorts. Neonatal morbidity was also significantly higher for sepsis, apnea, respiratory distress, patent ductus arteriosus, and periventricular leukomalacia in the < 30 wk cohort. VP shunt data was available for 677 patients (< 30 wk n = 53, 30-34 wk n = 186, >34 wk n = 438). A similar rate of VP shunt placement was seen between GA groups (Table 2).

Conclusion: Very preterm birth following in-utero spina bifida repair results in significant perinatal mortality and neonatal morbidity. Despite very preterm birth, the reduction in VP shunt rates, a benefit of in utero repair, appears to be preserved. Further data is required to analyze the impact on ambulation and developmental outcomes.

Total Cohort	Overall N=1,213	GA <30 wks (n=111)	GA 30-34 wks (n=323)	GA >34 wks (n=779)	
	n(%)	n(%)	n(%)	n(%)	p-value
Maternal/Pregnancy Outcomes					
Membrane seperation	173 (14.3)	17 (15.3)	77 (23.8)	79 (10.1)	**<0.01**
Pulmonary edema	18 (1.5)	0 (0.0)	4 (1.2)	14 (1.8)	0.31
Oligohydramnios	200 (16.5)	12 (10.8)	77 (23.8)	111 (14.3)	**<0.01**
Placental abruption	54 (4.5)	13 (11.7)	27 (8.4)	14 (1.8)	**<0.01**
Gestational diabetes	86 (7.1)	5 (4.5)	24 (7.4)	57 (7.3)	0.54
Chorioamnionitis	65 (5.4)	25 (22.5)	27 (8.4)	13 (1.7)	**<0.01**
Preeclampsia/gest hypertertension	356 (29.4)	32 (28.83)	93 (28.79)	231 (29.7)	0.95
Rupture of membranes	382 (31.5)	52 (46.9)	190 (58.8)	140 (18.0)	**<0.01**
Spontaneous onset of labor	283 (23.3)	50 (45.1)	114 (35.3)	119 (15.3)	**<0.01**
Blood transfusion	13 (1.1)	5 (4.5)	5 (1.6)	3 (0.4)	**<0.01**
Status of Hysterotomy					**<0.01**
Intact	731 (69.7)	81 (90.0)	204 (75.8)	446 (64.6)	**<0.01**
Thin	257 (24.5)	6 (6.7)	54 (20.1)	197 (28.6)	**<0.01**
Focal or area of dehiscence	58 (5.5)	3 (3.3)	11 (4.1)	44 (6.4)	0.25
Complete dehiscence	3 (0.3)	0 (0.0)	0 (0.0)	3 (0.4)	0.46
Perinatal mortality	27 (2.2)	23 (20.7)	3 (0.9)	1 (0.1)	**<0.01**
GA age at delivery (wk, median, IQR)	35.3 (33.3-36.9)	27.1 (25.9-28.9)	32.9 (32.6-33.7)	36.2 (35.4-37.0)	**<0.01**
GA age at death (wk, median, IQR)	25.9 (24.7-28.7)	25.8 (24.6-26.3)	31.7 (30.1-33.9)	37.4 (37.4-37.4)	**<0.01**

With Available Shunt Data	Overall N=677	GA <30 wks (n=53)	GA 30-34 wks (n=186)	GA >34 wks (n=438)	
	n(%)	n(%)	n(%)	n(%)	p-value
Neonatal/Infant Outcomes					
Shunt placement	281 (42.7)	23 (45.1)	73 (41.0)	185 (43.1)	0.73
Location of fourth ventricle					**0.04**
Normal	283 (79.4)	15 (71.4)	68 (70.4)	200 (83.8)	**0.01**
Low	30 (8.3)	2 (9.5)	11 (11.2)	17 (7.1)	0.44
At foramen magnum	17 (4.7)	0 (0.0)	8 (8.2)	9 (3.7)	0.13
Below foramen magnum	27 (7.5)	4 (19.1)	10 (10.2)	13 (5.4)	**0.04**
Epidermoid cyst	31 (4.6)	0 (0.0)	7 (3.8)	24 (5.5)	0.16
Surgery for tethered cord	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Chiari decompression surgery	5 (0.7)	0 (0.0)	2 (1.1)	3 (0.7)	0.71
Shunt infection	9 (3.2)	0 (0.0)	2 (2.7)	7 (3.8)	0.61
Birthweight (g, median, IQR)	2500 (2050-2910)	1010 (830-1210)	2020 (1750-2220)	2770 (2480-3040)	**<0.01**
GA at birth (wk, median, IQR)	35.6 (33.3-36.9)	27.4 (26.4-29.1)	32.8 (31.4-33.7)	36.5 (35.4-37.0)	**<0.01**
Dehiscence at fetal repair site					0.58
Intact	595 (93.3)	45 (95.7)	157 (91.8)	393 (93.6)	
Dehiscence	43 (6.7)	2 (4.3)	14 (8.2)	27 (6.4)	
Apnea	252 (37.2)	46 (86.8)	113 (60.8)	93 (21.2)	**<0.01**
Respiratory distress syndrome	181 (26.7)	41 (77.4)	76 (40.9)	64 (14.6)	**<0.01**
Pneumothorax	19 (2.8)	3 (5.7)	8 (4.3)	8 (1.8)	0.1
Patient ductus arteriosus	33 (4.9)	19 (35.9)	9 (4.8)	5 (1.1)	**<0.01**
Sepsis	36 (5.3)	15 (28.3)	10 (5.4)	11 (2.5)	**<0.01**
Necrotizing enterocolitis	2 (0.3)	1 (1.9)	0 (0.0)	1 (0.20	0.08
Periventricular leukomalacia	15 (2.2)	3 (5.7)	8 (4.3)	4 (0.9)	**<0.01**
Foot deformity	231 (34.1)	18 (34.0)	59 (31.7)	154 (25.2)	0.71

93 | In-Utero Ventriculosubgaleal Shunt Placement - a Fetal Lamb Model of Induced Hydrocephalus

Shohra Qaderi[1]; Weston Northam[1]; Soner Duru[2]; Eyal Krispin[3]; Syril James[4]; Jose L. Peiro[5]; Braxton Forde[6]; Hamidreza Forourtan[7]; Ramen H. Chmait[8]; Scott A. Shainker[9]; Cassandra R. Duffy[9]; Nikan Zargarzadeh[1]; Ali Javinani[1]; Arthur Nedder[10]; Brittany Pattison[10]; lana Vasung[10]; Ryne A. Didier[10]; Michaela K. Farber[11]; Sebastian Seifert[12]; Darren B. Orbach[10]; P. Ellen Grant[10]; Benjamin C. Warf[10]; Yves Ville[13]; Alireza A. Shamshirsaz[14]

[1]Boston Children's Hospital, Harvard Medical School, Boston, MA; [2]*Cincinnati Children's Hospital, Cincinnati, OH;* [3]*Harvard Medical School, Boston, MA;* [4]*Hôpital Necker-Enfants Malades, Paris, Ile-de-France;* [5]*Cincinnati Children's Fetal Care Center, Cincinnati, OH;* [6]*University of Cincinnati College of Medicine, Cincinnati, OH;* [7]*Laparoscopy research center, Shiraz, Fars;* [8]*Keck School of Medicine, University of Southern California, Los Angeles, CA;* [9]*Beth Israel Deaconess Medical Center, Boston, MA;* [10]*BCH, Boston, MA;* [11]*BWH, Boston, MA;* [12]*Brigham & Women's Hospital, Boston, MA;* [13]*University and Necker-Enfants Malades Hospital, Paris, Ile-de-France;* [14]*Boston Children's Hospital, Brigham and Women's Hospital, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA*

9:45 AM - 10:00 AM

Objective: Irreversible brain damage due to congenital hydrocephalus may be improved with prenatal intervention. While ventriculosubgaleal shunting (VSGS) is commonly performed postnatally in premature infants, in-utero placement is unexplored.

For the first time, we evaluate the feasibility of VSGS in-utero using a lamb model.

Study Design: Hydrocephalus was induced in 14 fetal lambs by injecting 1.5 mL of BioGlue® into the cisterna magna (Fig 1a-1d) between days 80-90 of gestation. Ten to 16 days later, ultrasound was performed to confirm hydrocephalus. Afterward, VSGS was placed by creating a subgaleal pocket (Fig 1e), inserting a standard ventricular catheter (Fig 1f), tunnelling under the scalp (Fig 1g), and securing with a silk suture (Fig 1h), with the other end in a lateral ventricle (Fig 1i). Near term, the ewes were sacrificed. Hysterotomy was performed to extract the lambs. Lambs were evaluated through gross inspection, and postmortem MRI was performed. Neuropathology is pending.

Results: Ten ewes with 14 fetuses underwent hydrocephalus induction (median 86 days) by either hysterotomy (2/14) or transuterine (12/14) methods. Two fetuses were macerated, but hydrocephalus was confirmed in 11/12 surviving fetuses (3 severe, 4 moderates, 4 mild). A VSGS was successfully placed in all 12 (median 104 days) (Fig 1e-1h). One with severe hydrocephalus died after the procedure, 3 were aborted and 1 was macerated at hysterotomy. All 7/14 lambs that survived to near term showed scalp healing (Fig 1l). All 7 VSGS remained under the scalp without migration (Fig 1j-1k) (Table 1). Postmortem MRI showed improved hydrocephalus in 4/7 cases (Table 1).

Conclusion: Prenatal placement of VSGS proved feasible in this animal model. The procedure resulted in a 50% fetal loss, which may be due to procedural factors or stress from repeated procedures. Improved hydrocephalus occurred in 57% of survivors. To improve success, future studies will investigate the efficacy and safety of VSGS using less invasive approaches, including fetoscopic placement of VSGS.

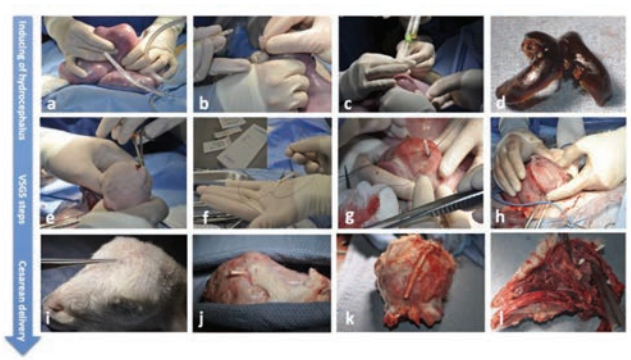


Figure 1: Steps involved in inducing hydrocephalus: placing the head of the fetus in favorable position and fixing it (a), finding the cisterna magna and placing the catheter (b), inserting the BioGlu (c). The BioGlu casting the shape of the ventricles, as seen after harvesting the head (d). The VSGS was implanted by creating a subgaleal pocket (e), inserting a standard ventricular catheter tunneled under the scalp (f-g), and suturing it (h). In gross examination after the hysterotomy, skin healing was observed (i) and shunt position under the scalp was confirmed (j-k). Gross inspection for brain injury/ hemorrhage and the two ends of the shunt placement (k,l).

Sheep No	GA at the time of shunt	Twin/Singleton	Method (Hysterotomy /mini hysterotomy)	Shunt placement during (minutes)	Pre-shunt Ventricle sizes (Normal/Mild/Moderate/Severe)	Right frontal/Left frontal	Type of shunt (catheter or reservoir)	Size of the pocket on scalp (cm)	shunt placement successful (yes/NO)	Post-shunt ventricles sizes	Note
499	104	Twin	Hysterotomy	18	Mild	Right frontal	catheter	4	Yes	Normal	Evaluated upon delivery
			Hysterotomy	15	Mild	Left frontal	catheter	4	Yes	Normal	Evaluated upon delivery
955	99	Singleton	Hysterotomy	10	Moderate	Right frontal	catheter	4	Yes	Moderate	Evaluated upon delivery
617	99	Singleton	Hysterotomy	13	Moderate	Left frontal	catheter	4-5	Yes	Normal	Evaluated upon delivery
409	94	Singleton	Hysterotomy	8	Normal	Right frontal	catheter	4-5	Yes	Normal	Evaluated upon delivery
968	95	Singleton	Mini Hysterotomy (2-3 cm)	10	Severe	Right frontal	catheter	4	Yes	Normal	Evaluated upon delivery
890	107	Twin	Hysterotomy	10	Mild	Right frontal	catheter	5	Yes	Severe	Evaluated upon delivery
			Hysterotomy	10	Severe	Right frontal	catheter	4	Yes	-	Macerated
577	105	Singleton	Hysterotomy	8	Mild	Right frontal	catheter	4	Yes		Abortion - 40 days after shunt placement
300	95	Twin	Mini Hysterotomy (2-3 cm)	8	Moderate	Right frontal	catheter	4	Yes		Abortion - 23 days after shunt placement
			Mini Hysterotomy (2-3 cm)	10	Moderate	Right frontal	catheter	4	Yes		
254	104	Singleton	Hysterotomy	15	Severe	Right frontal	reservoir	4	Yes		Baby passed away right after shunt placement
58	98	Twin	Babies were macerated before shunt placement								

Table 1: Summary of shunt placement procedures and outcomes. The first six sheep (Tag 499-890) underwent hysterotomy and fetuses were evaluated upon delivery. Sheep with Tag 577-300 experienced abortion after shunt placement. One case (Tag 254) passed away immediately after shunt placement, possibly due to severe hydrocephalus. Additionally, case 58 was found to be macerated during the hysterotomy for shunt placement.

94 | Role of Placental Superficial Anastomoses in Twin-Twin Transfusion Syndrome (TTTS)

Ramen H. Chmait[1]; Lisa M. Korst[2]; Arlyn Llanes[1]; Kristine R. Rallo[1]; Andrew H. Chon[3]; Martha A. Monson[4]; Ruben A. Quintero[5]

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10:00 AM - 10:15 AM

Objective: To test whether the type and number of superficial anastomoses [arterio-arterial (AA) and veno-venous (VV)] were associated with twin survival.

Study Design: This is a post hoc analysis of data collected in the Sequential Trial, a randomized controlled trial (RCT) comparing the sequential and selective laser techniques for TTTS patients at 16-26 gestational weeks. Patients received either the original (selective) or a modified selective (sequential) laser surgery, in which arteriovenous (AV) anastomoses with unidirectional blood flow from donor to recipient are laser-ablated first, followed by ablation of AV anastomoses from recipient to donor. This theoretically allows for a net intraoperative blood transfer from the hypervolemic recipient to the hypovolemic donor twin. Those with only 1 AA (AA-1) vs 2 or more AA (AA-2) were identified, and we tested for association for twin survival at birth.

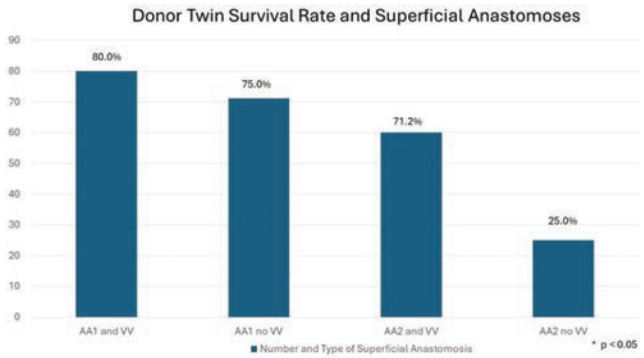
Results: Of 642 patients in the RCT, 466 (72.6%) had AV anastomoses only (donor survival 90.3%) and 176 (27.4%) had both AV and superficial anastomoses (donor survival 70.5%) ($P < .0001$). Of the 176 with superficial anastomoses, 112 (63.6%) had AA only, 40 (22.7%) had both AA and VV, and 24 (13.6%) had VV only. For the 152 patients who had at least 1 AA, donor survival differed based on type and number of superficial anastomoses (Figure). In logistic regression models for donor survival controlling for surgical technique, donor critical abnormal Dopplers, and donor middle cerebral artery peak systolic velocity multiples of the median $\geq$1.5, patients with AA-2 vs AA-1 were less likely to have donor survival (OR 0.26 [0.08-0.81], $P = .0206$). Specifically, patients with 2 or more AA and no VV were at risk (Table). The presence of fetal growth restriction was non-contributory. No differences in recipient survival were noted.

Conclusion: The type and number of superficial anastomoses was associated with donor but not recipient twin survival after laser surgery for TTTS. Poor donor twin survival was associated

with presence of AA, particularly in cases lacking a corresponding VV.

Table. Results of a logistic regression model for donor survival by arterio-arterial (AA) anastomosis group (n=152), after controlling for surgical technique, Quintero stage, the presence of donor critical abnormal Dopplers, and preoperative donor middle cerebral artery peak systolic velocity multiples of the median >=1.5. Reference group: 1 AA and at least 1 venovenous (VV) anastomosis.

AA anastomosis group	Odds Ratio (95% Confidence Interval)	*P*-value
AA1 and no VV	0.37 (0.11-1.28)	.1147
AA2 and VV	0.31 (0.05-1.91)	.2064
AA2 and no VV	0.02 (0.00-0.25)	.0018



Oral Concurrent Session 9

Medical Complications

Abstracts 95 – 104

SATURDAY
February 1, 2025
8:00 AM – 10:30 AM
Aurora Ballroom CD

MODERATORS
Washington Clark Hill, MD
Meredith Rochon, MD

PREGNANCY

ABSTRACTS OPEN ACCESS

Oral Concurrent Session 9 – Medical Complications

Saturday, February 1, 2025 8:00 AM – 10:30 AM

95 | Prevention Of Methamphetamine Use among Postpartum People (PROMPT): A Pilot Randomized Controlled Trial

Marcela C. Smid[1]; Jasmin E. Charles[1]; Amanda A. Allshouse[2]; Stephanie Castro[1]; Grace Humiston[1]; Elysha Cash[2]; Adam G. Gordon[2]; Kristi Carlston[1]; Marie Gibson[1]; Gerald Cochran[1]
[1]University of Utah Health, Salt Lake City, UT; [2]University of Utah, Salt Lake City, UT

8:00 AM - 8:15 AM

Objective: In the US, methamphetamine use disorder (MUD) is a leading contributor to postpartum deaths. Our objective was to determine feasibility, safety, and preliminary estimate of efficacy of oral micronized progesterone, a neurosteroid with effects on reward-reinforcement brain circuitry, to reduce postpartum methamphetamine use (MU).

Study Design: We conducted a double-blind, randomized controlled trial of people with MUD within 12 weeks postpartum comparing oral micronized progesterone to placebo. We excluded those with MU within 4 weeks of enrollment, severe depression/anxiety symptoms or suicidality at screening, taking sedating medications, or < 2 weeks medication for opioid use disorder (MOUD). Block randomization occurred 1:1 stratified for opioid use disorder (OUD). Weekly study visits assessed MU, defined as self-reported MU or positive urine toxicology, and MU craving. The primary outcome was feasibility, defined as enrollment of 80% planned sample (n = 32/40). Safety was assessed by number of adverse events (AEs) between treatment arms. Preliminary estimate of efficacy was determined by MU and craving scores. Logistic regression accounting for time was used to assess change in craving scores by arms, adjusting for confounders.

Results: From November 2021 to January 2024, 253 individuals were screened and 34/46 eligible individuals enrolled and randomized (74%) with 88% retention. At baseline, demographics and craving scores were similar between arms (Table 1). AEs did not differ by arm. For MU, there was no difference between groups by intent to treat (11% vs 0%, p = 0.49) or as treated (6% vs 6%, p = 0.99). Craving reduced for both arms, with a larger, but not significant, decrease in progesterone group (Table 2, Model 1). There was a significant interaction by OUD or MOUD, with progesterone increasing cravings for those without OUD and with OUD taking buprenorphine but reducing cravings for those with OUD taking methadone (Models 5, 6).

Conclusion: Promising results of this feasibility and safety trial inform the design of a multi-center trial of progesterone for prevention of postpartum MU.

Table 1. Demographic, baseline assessments and serious adverse events by randomization arm (n=34)

	All (N=34)	Progesterone (N=18)	Placebo (N=16)	p-value
Demographics				
Age (years)*	31.9± 4.9	30.8 ± 4.1	33.3 ± 5.4	0.15
Body mass index at baseline*	29.7± 7.3	29.48 ± 7.5	29.90 ± 7.4	0.86
Race (self-reported)				
American Indian/Alaska Native	1 (2.9)	1 (5.6)	0 (0.0)	0.34
Asian	1 (2.9)	1 (5.6)	0 (0.0)	0.34
Black	3 (8.8)	3 (16.7)	0 (0.0)	0.09
Native Hawaiian /Pacific Islander	1 (2.9)	1 (5.6)	0 (0.0)	0.34
White	32 (94.1)	16 (88.9)	16 (100)	0.17
Hispanic or Latino (self-reported)	9 (26.5)	6 (33.3)	3 (18.8)	0.34
Weeks Postpartum				
1-4	16 (47.1)	10 (55.6)	6 (37.5)	0.5
5-8	10 (29.4)	5 (27.8)	5 (31.3)	
9-12	8 (23.5)	3 (16.7)	5 (31.3)	
Housing				
Homeless/shelter/vehicle	1 (2.9)	1 (5.6)	0 (0.0)	0.43
Residential treatment facility	16 (47.1)	7 (38.9)	9 (56.3)	
Home on own or with others	17 (50.0)	10 (55.6)	7 (43.8)	
Opioid use disorder	14 (41.2)	8 (44.4)	6 (37.5)	0.68
Buprenorphine /	8 (23.5)	5 (27.8)	3 (18.8)	0.825
Methadone	6 (17.6)	3 (16.7)	3 (18.8)	
Baseline Assessments				
Stimulant craving (SCQ-Brief)	18.6±8.4	18.39 ± 7.4	18.75 ± 9.6	0.904
EPDS*	4.8±3.6	5.06 ± 3.8	4.50 ± 3.4	0.65
GAD 7*	2.9±3.1	3.39 ± 3.4	2.38 ± 2.8	0.35
Adverse Events				
Any adverse event (AE)	27 (79.4)	14 (77.8)	13 (81.3)	0.99
Any serious adverse event (SAE) "†	4 (11.8)	3 (16.7)	1 (6.3)	0.60

Abbreviations: SCQ Stimulant Craving Questionnaire; EPDS Edinburgh Postpartum Depression Scale, GAD 7 Generalized Anxiety Disorder 7
* Mean ± standard deviation
† All serious adverse events were deemed unrelated to study drug.

Table 2: Change in methamphetamine craving comparing progesterone to placebo

Model*	Change in methamphetamine craving score	p
1	-1.10 (-2.38, 0.19)	0.09
2	0.37 (-1.03-1.76)	0.60
3	1.55 (0.11-3.00)	0.04
4: OUD	0.14 (-1.73, 2.01)	0.88
4: No OUD	3.29 (1.23, 5.34)	0.003
4	*p-value for interaction*	0.02
5: no OUD	3.25 (1.21-5.28)	0.003
5: Buprenorphine	3.01 (0.49-5.52)	0.02
5: Methadone	-3.40 (-6.25--0.54)	0.02
5	*p-value for interaction*	0.001
6: no OUD	1.20 (-0.84-3.23)	0.24
6: Buprenorphine	2.80 (0.41-5.19)	0.02
6: Methadone	-7.75 (-10.79--4.71)	<.001
6	*p-value for interaction*	<.001

Abbreviation: OUD opioid use disorder
*Model parameterization detail:
1. adjusted for baseline craving, and time
2. (1) + baseline BMI, and time postpartum
3. (2) + OUD, housing
4. (3) + interaction between arm and OUD.
5. (2) + housing + 3-category medication for OUD (no OUD, buprenorphine, methadone) + interaction between Medication for OUD & progesterone
6. Model 5 with the addition of depression and anxiety as independent variables

96 | Postpartum VTE risk by CHA2DS2-VASc Score in Patients with Atrial Fibrillation or Flutter During Pregnancy

Virginia Y. Watkins[1]; Miriam L. Estin[2]; Sarah C. Snow[1]; Cary C. Ward[1]; Marie-Louise Meng[1]; Jerome J. Federspiel[1]
[1]Duke University School of Medicine, Durham, NC; [2]Duke university School of Medicine, Durham, NC

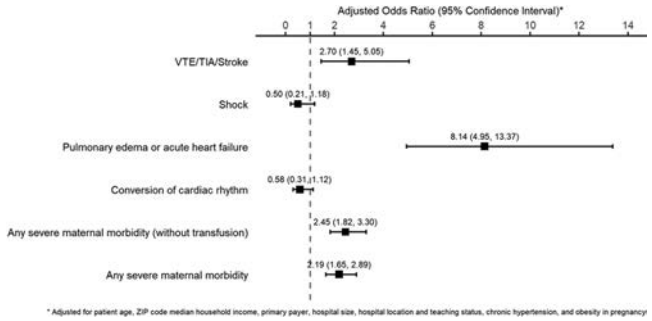
8:15 AM - 8:30 AM

Objective: In nonpregnant individuals with atrial fibrillation (AF) or flutter (AFL), the CHA_2DS_2-VASc score guides candidacy for anticoagulation (AC), with AC commonly recommended for a score $\geq$2. Whether the CHA_2DS_2-VASc score can guide AC candidacy in pregnant populations with AF/AFL is unclear. In this study, we determined whether rates of postpartum venous thromboembolism (VTE), transient ischemic attack (TIA), and cerebrovascular accident (CVA) among patients with a history of AF/AFL differ based on CHA_2DS_2-VASc < 2 and $\geq$2.

Study Design: This retrospective cohort study used the 2016-2021 National Readmissions Database to identify patients with a diagnosis of AF/AFL on delivery hospitalization encounter. The primary outcome was rates of VTE/TIA/CVA during delivery hospitalization or within 42 days following hospital discharge. Secondary outcomes included rates of severe maternal morbidity (SMM) and cardiovascular-related SMM. CHA_2DS_2-VASc scores were calculated for each patient at the index hospitalization and scores compared as < 2 and $\geq$2. After adjusting for facility characteristics and obesity, weighted logistic regression analyses were used to produce relationships between groups.

Results: The cohort consisted of 3,574 delivery hospitalizations with AF/AFL, corresponding to a national estimate of 6,816. Of those, 5,178 (76.0%) had a CHA_2DS_2-VASc < 2 and 1,638 (24.0%) had a CHA_2DS_2-VASc $\geq$2. After adjusting for facility and patient characteristics, patients with a CHA_2DS_2-VASc $\geq$2 were more likely to experience an acute VTE/TIA/CVA (3.9% vs 1.5%, aOR 2.09 [1.17, 3.73]), SMM (23.5% vs 11.4%, aOR 2.00 [1.59, 2.51]), and pulmonary edema or acute heart failure (11.4% vs 1.3%, aOR 7.56 [4.85, 11.78]). No association was observed between CHA_2DS_2-VASc score and conversion of cardiac rhythm or shock.

Conclusion: Pregnant patients with a history of AF/AFL and a CHA_2DS_2-VASc score $\geq$2 are significantly more likely to experience a VTE/TIA/CVA following delivery than those with a CHA_2DS_2-VASc < 2. CHA_2DS_2-VASc score at delivery should be considered when determining appropriate candidates for postpartum VTE prophylaxis.



97 | A Technology Enabled Solution for Perinatal Mental Health Collaborative Care Models: A Randomized Controlled Trial

Emily S. Miller[1]; David Mohr[2]; Dinah Williams[3]; Melissa Shikany[2]; Tracy Walsh[2]; Nathan W. Winquist[2]; Zara Mir[2]; Elizabeth L. Gray[2]; Shannon R. Smith[2]; Charles Krause[2]; Lara M. Baez[2]; Madhu C. Reddy[4]
[1]Women & Infants Hospital of Rhode Island and Alpert Medical School of Brown University, Providence, RI; [2]Northwestern University Feinberg School of Medicine, Chicago, IL; [3]Women and Infants Hospital of Rhode Island, Providence, RI; [4]University of California, Irvine, Irvine, CA

8:30 AM - 8:45 AM

Objective: Myriad barriers obfuscate optimal care for perinatal mood and anxiety disorders (PMADs). Collaborative care models (CCMs) integrate mental health into primary care. While CCM offer a promising approach to improving PMAD care, implementation challenges persist, suggesting a need for innovative solutions such as technology-enabled services (TES) to optimize care delivery.

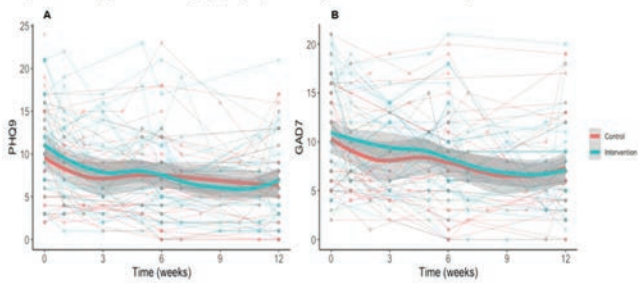
Study Design: Randomized controlled trial (RCT) comparing the impact of a TES to treatment as usual within a CCM on PMAD symptoms. The TES included a cognitive behavioral therapy skills-based mobile app adapted to the perinatal context with adjunctive SMS-based coaching. Individuals were eligible to participate in the RCT if they were pregnant or within 3 months postpartum, experiencing ongoing symptoms of PMADs, enrolled in a CCM, and owned a smart phone. The primary and principal secondary outcomes were depression (PHQ9) and anxiety (GAD7) symptoms, respectively, measured serially over the 12-week intervention. PMAD symptom trajectories were analyzed via generalized linear mixed modeling and as symptom response (50% reduction in symptoms from baseline) and remission (PHQ9 and GAD7 < 4). Satisfaction and engagement with the TES were measured using the Satisfaction Index-Mental Health and TWente Engagement with Ehealth Technologies Scale, respectively.

Results: Of the 75 women enrolled, 38 were randomized to the TES. Depression [β = -0.24 (95% CI -0.45, -0.03)] and anxiety [β = -0.24 (95% CI -0.46, -0.03)] symptom improvement were

identified in the total study sample, but no differences were observed between groups in depression [β = -0.06 (95% CI -0.06, 0.17)] or anxiety [β = -0.06 (95% CI -0.30, 0.19)] symptoms (Figure 1). Response and remission analyses identified no differences across groups (Table 1). Satisfaction was high but not different between groups whereas participant engagement was higher in the TES group at the mid-point evaluation.

Conclusion: Utilization of a TES to support CCM implementation led to increased engagement in perinatal mental health care but did not result in significant improvements in PMAD symptoms.

Depression (A) and anxiety (B) symptom trajectories stratified by randomization arm



Depression and anxiety response, treatment satisfaction and engagement stratified by randomization arm

	Treatment as Usual	TES	p-value
Depression			
Response	16 (43%)	20 (53%)	0.4
Remission	17 (46%)	12 (32%)	0.2
Anxiety			
Response	13 (35%)	21 (55%)	0.08
Remission	12 (32%)	12 (32%)	0.9
Treatment Satisfaction (SIMH)			
Week 6	62 (50-67)	58 (47-68)	0.9
Week 12	60 (52-66)	62 (47-68)	0.6
Treatment Engagement (TWEETS)			
Week 6	26 (22-32)	38 (30-43)	0.007
Week 12	27 (24-36)	35 (28-42)	0.2

TES = Technology Enabled Solution; SIMH = Satisfaction Index-Mental Health; TWEETS = TWente Engagement with Ehealth Technologies Scale

Response: 50% reduction in symptoms from baseline
Remission: PHQ9 and GAD7 < 5

98 | Risk of Severe Maternal Morbidity Among Pregnant People with Colorectal Cancer using a Population Database

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8:45 AM - 9:00 AM

Objective: Colorectal cancer is among the top three leading causes of new cancer diagnosis as well as cancer death for females in the United States. The purpose of this study was to determine the odds of severe maternal morbidity (SMM) in patients with colorectal cancer in pregnancy using TriNetX, a research network containing real-time data from 93 health care organizations and > 131 million patients.

Study Design: This retrospective cohort study queried TriNetX from inception to 8/2024 for subjects 12-55 years with a pregnancy diagnosis. Two cohorts were derived: (1) individuals with an active diagnosis of colorectal cancer 1 year prior to, or up to 1 month after, first instance of pregnancy and (2) those without a history of any cancer type in pregnancy. Cohorts were propensity score matched 1:1 by demographics and comorbidities by TriNetX built-in analysis tools. SMM was defined as CDC's 21 indicators and corresponding ICD-10 codes. The primary outcome was odds ratio (OR) between cohorts of composite SMM occurring up to 1 year after first instance of pregnancy. Secondary outcomes were odds of individual indicators of SMM. All statistical analyses were conducted in the TriNetX platform.

Results: After propensity score matching, 7570 individuals were included in each cohort (Table). Subjects with colorectal cancer in pregnancy had significantly higher odds of composite SMM with OR 4.43 (95% confidence interval (CI) 3.77-5.22, p< 0.001) compared to those without cancer history in pregnancy. The odds of disseminated intravascular coagulation (DIC) were highest (OR 4.29, 95% CI 3.38-5.43), followed by acute respiratory distress syndrome (ARDS) (OR 3.73, 95% CI 3.12-4.46) and hysterectomy (OR 3.03, 95% CI 1.66-5.56).

Conclusion: Patients with colorectal cancer in pregnancy have more than four-fold increased odds of composite SMM compared to those without cancer history, with considerably higher risk of DIC, ARDS and hysterectomy.

TABLE. Severe maternal morbidity (SMM) in pregnant people with colorectal cancer

SMM Indicator	Rate of SMM		Odds Ratio	95% Confidence Interval (lower limit, upper limit)	p value
	Colorectal Cancer in Pregnancy (n=7570)	Pregnancy without Cancer History, (n=7570)			
Composite	17.2%	4.5%	4.43	(3.77, 5.22)	<0.001
Acute myocardial infarction	1.5%	0.9%	1.71	(1.25, 2.35)	0.001
Aneurysm and dissection	0.7%	0.3%	2.59	(1.54, 4.34)	<0.001
Acute renal failure	1.5%	0.8%	1.97	(1.42, 2.72)	<0.001
Acute respiratory distress syndrome	8.9%	2.6%	3.73	(3.12, 4.46)	<0.001
Amniotic fluid embolism	0%	0%	~	~	N/A
Cardiac arrest/ventricular fibrillation	0.4%	0.2%	1.72	(0.96, 3.08)	0.064
Conversion of cardiac rhythm	0.1%	0.1%	1.00	(0.42, 2.40)	0.999
Disseminated intravascular coagulation	5.5%	1.3%	4.29	(3.38, 5.43)	<0.001
Blood transfusion	0.8%	0.7%	1.04	(0.72, 1.51)	0.839
Eclampsia	0.2%	0.2%	1.32	(0.65, 2.65)	0.439
Heart failure/arrest during surgery or procedure	0.0%	0.0%	~	~	N/A
Puerperal cerebrovascular disorders	5.0%	1.8%	2.89	(2.33, 3.58)	<0.001
Pulmonary edema/acute heart failure	1.6%	0.9%	1.68	(1.24, 2.29)	0.001
Severe anesthesia complications	0%	0%	~	~	N/A
Sepsis	1.7%	0.8%	2.08	(1.53, 2.82)	<0.001
Shock	0.9%	0.6%	1.64	(1.11, 2.42)	0.012
Sickle cell disease with crisis	0.0%	0.0%	~	~	N/A
Air and thrombotic embolism	1.9%	0.6%	2.99	(2.14, 4.19)	<0.001
Hysterectomy	0.6%	0.2%	3.03	(1.66, 5.56)	<0.001
Temporary tracheostomy	0.1%	0.1%	1.00	(0.42, 2.40)	0.998
Ventilation	0.3%	0.3%	0.90	(0.48, 1.67)	0.734

99 | Impact of Breastfeeding on Estimated Risk of Postpartum Cardiovascular Disease

Christine P. Field[1]; William A. Grobman[1]; Jiqiang Wu[1]; Anna Palatnik[2]; Mark B. Landon[1]; Denise Scholtens[3]; William Lowe[3];

Nilay S. Shah[4]; Jami Josefson[3]; Sadiya S. Khan[5]; Kartik K. Venkatesh[1]
[1]The Ohio State University, Columbus, OH; [2]Medical College of Wisconsin, Milwaukee, WI; [3]Northwestern University, Northwestern University/Chicago, IL; [4]Northwestern University, Chicago, IL; [5]Northwestern University Feinberg School of Medicine, Chicago, IL

9:00 AM - 9:15 AM

Objective: To determine whether breastfeeding is associated with the estimated risk of long-term atherosclerotic cardiovascular disease (ASCVD) as assessed 10-14 years after delivery.

Study Design: This is a secondary analysis of the prospective Hyperglycemia and Adverse Pregnancy Outcome Follow-up Study (HAPO FUS). The exposure was any breastfeeding (yes/no). The primary outcomes were estimated ASCVD risk (composite of fatal and non-fatal coronary heart disease and stroke) over the subsequent 10- and 30-year time periods measured separately. The Framingham Risk Score was used to calculate ASCVD risk 10-14 years after delivery. ASCVD risk was calculated as a continuous percentage. Multivariable linear regression models were used and adjusted for baseline covariates: field center, age, BMI, height, smoking and alcohol use, parity, and time from delivery to ASCVD risk assessment. Secondarily, we examined whether the association between breastfeeding and ASCVD varied by gestational diabetes mellitus (GDM) status (effect modification).

Results: Of 4,540 assessed individuals, the median age was 30.6 years at baseline. Over three-fourths (79.7%) of individuals reported breastfeeding in this multi-site international cohort, which did not vary by GDM status (79.5% vs 81.0%). At 10-14 years after delivery (median 11.6 years), individuals who had breastfed had a lower estimated risk of ASCVD over the subsequent 10 years (adj. Beta: -0.13; 95% CI: -0.25, -0.02) as well as over the subsequent 30 years (adj. Beta: -0.36; 95% CI: -0.66, -0.05). The association between breastfeeding and estimated ASCVD risk varied significantly by GDM status (interaction p< 0.01): the protective effect of breastfeeding for estimated ASCVD risk was over 5-fold greater for individuals with GDM (TABLE).

Conclusion: Individuals who breastfed-and particularly those with prior GDM-had a lower estimated risk of long-term ASCVD. These findings suggest the beneficial impact of breastfeeding for long-term maternal cardiovascular health, especially among those with GDM.

Table. Association between breastfeeding and estimated 10- and 30-year risk of ASCVD

	ASCVD estimated risk[1]	Unadjusted analysis[2]	Adjusted analysis[2,3]
	Age-adjusted Least Square Mean (SE)	Beta coefficient (95% CI)*	Beta coefficient (95% CI)*
10-year estimated ASCVD risk			
Overall			
Breastfeeding			
No	2.5 (0.1)	Ref	Ref
Yes	2.3 (0.0)	-0.13 (-0.26, 0.01)	-0.13 (-0.25, -0.02)
By GDM status (interaction p=0.004)			
No GDM + breastfeeding	2.1 (0.0)	-0.09 (-0.21, 0.04)	-0.09 (-0.20, -0.02)
Yes GDM + breastfeeding	3.1 (0.1)	-0.50 (-1.06, 0.06)	-0.52 (-0.98, -0.05)
30-year estimated ASCVD risk			
Overall			
Breastfeeding			
No	6.9 (0.1)	Ref	Ref
Yes	6.2 (0.1)	-0.45 (-0.81, -0.08)	-0.36 (-0.66, -0.05)
By GDM status (interaction p=0.003)			
No GDM + breastfeeding	5.8 (0.1)	-0.34 (-0.67, -0.01)	-0.25 (-0.54, 0.03)
Yes GDM + breastfeeding	8.7 (0.3)	-1.42 (-2.97, 0.13)	-1.33 (-2.53, -0.14)

[1]Atherosclerotic cardiovascular disease (ASCVD) estimated risk calculated using Framingham Risk Score.
[2]Linear regression was used.
[3]Models adjusted for maternal variables at oral glucose tolerance test during pregnancy: study field center, age (continuous), BMI (continuous), smoking status (yes/no), alcohol use (yes/no), parity (0, >1), and time in years from delivery to ASCVD risk assessment (continuous).
*Interpreted as the difference in ASCVD risk (%) for those who breastfed. For the primary analysis, those who breastfed had an ASVCD estimated risk that was 0.13% lower than those who did not breastfeed.

100 | Intravenous Ferumoxytol versus Oral Ferrous Sulfate for Iron-Deficiency Anemia in Pregnancy: A Randomized Controlled Trial

Irogue I. Igbinosa; Stephanie A. Leonard; Ijeoma Iweakogwu; Elizabeth B. Sherwin; Caroline Berube; Deirdre J. Lyell
Stanford University, Palo Alto, CA

9:15 AM - 9:30 AM

Objective: Iron deficiency anemia (IDA) affects 1 in 10 pregnancies in the U.S. and contributes to maternal and neonatal morbidity. However, the most effective route for iron supplementation in pregnancy is debated. Our objective was to assess the effectiveness of intravenous (IV) ferumoxytol vs. oral ferrous sulfate on hemoglobin (Hb) for the treatment of IDA in pregnancy.

Study Design: We conducted a randomized controlled trial of IV ferumoxytol vs. oral ferrous sulfate. Pregnant women 24-34 weeks' gestation with IDA (ferritin < 30ng/dL or transferrin saturation < 20%, and Hb < 11g/dL) were eligible; hereditary anemias or malabsorptive disorders were excluded. Patients were computer block randomized: 1) Hb 9-10.9 g/dL received either Ferumoxytol (510mg) or ferrous sulfate (325mg); 2) Hb 7-8.9g/dL received Ferumoxytol (1020mg) or ferrous sulfate (650mg). The primary outcome was change in Hb from enrollment to week 4. We estimated that 80 patients were needed, assuming an effect size of 0.5 g/dL, 90% power, 5% type I error rate, and loss to follow-up rate of 20%. Secondary outcomes included change in Hb by 8 weeks, anemia resolution, and postpartum Hb. Intention-to-treat (ITT) analyses were conducted using Wilcoxon rank sum and Fisher's exact tests.

Results: Of the 80 enrolled patients, 40 were randomized to oral ferrous sulfate and 40 to IV ferumoxytol. Except for the distribution of BMI categories, baseline characteristics were similar between groups (Table 1). Treatment with IV ferumoxytol resulted in a greater change in Hb at a 4-week follow-up than oral ferrous sulfate (median 1.05 (Q1-Q3 0.68-1.70) vs 0.40 (Q1-Q3 0.10-0.80), p< 0.001) (Table 2). The IV ferumoxytol group also had greater change at 8 weeks (median 1.80 (Q1-Q3 1.23-2.48) vs 0.70 (Q1-Q3 0.20-1.28), p< 0.001), greater anemia resolution (37/40 (93%) vs. 26/40 (65%), p = 0.005), and postpartum Hb (median 10.25 (Q1-Q3 9.28-10.90) vs 9.65 (Q1-Q3 8.85-10.05), p = 0.013) (Table 2).

Conclusion: Treatment of IDA with IV ferumoxytol improved hemoglobin at delivery and reduced the prevalence of anemia to a greater extent than oral ferrous sulfate.

Table 1. Baseline Demographics and Pregnancy Characteristics				
	N	Oral iron, N = 40[1]	IV iron (ferumoxytol), N = 40[1]	p-value[3]
Age of participant (y)[2]	80	34.00 (30.75, 35.50)	32.00 (29.00, 35.00)	0.17
Race/Ethnicity	80			0.69
Hispanic/Latine		11 (27.50%)	11 (27.50%)	
NH Asian or Pacific Islander		11 (27.50%)	12 (30.00%)	
NH Black or African American		2 (5.00%)	4 (10.00%)	
NH White		12 (30.00%)	12 (30.00%)	
Other/Unknown		4 (10.00%)	1 (2.50%)	
Insurance	80			0.99
Private		33 (82.50%)	33 (82.50%)	
Public		7 (17.50%)	7 (17.50%)	
Gestational Age at Enrollment (wk.)[2]	80	30.50 (29.00, 32.00)	30.00 (29.00, 32.25)	0.77
BMI (kg/m²) Category	75			0.049
Underweight (<18)		0 (0.00%)	3 (7.89%)	
Normal weight (18-24.9)		24 (64.86%)	14 (36.84%)	
Overweight (25-29.9)		8 (21.62%)	11 (28.95%)	
Obese (>=30)		5 (13.51%)	10 (26.32%)	
Parity	80			0.99
Primiparous		22 (55.00%)	23 (57.50%)	
Multiparous		18 (45.00%)	17 (42.50%)	
Hypertensive disorder of pregnancy	80	6 (15.00%)	8 (20.00%)	0.77
Pregestational Diabetes	80	1 (2.50%)	2 (5.00%)	0.99
Gestational Diabetes	80	4 (10.00%)	6 (15.00%)	0.74
Mode of Delivery	80			0.30
Vaginal delivery		14 (35.00%)	8 (20.00%)	
Operative delivery		24 (60.00%)	30 (75.00%)	
Cesarean section		2 (5.00%)	2 (5.00%)	
Gestational age at delivery (weeks)[2]	80	39.00 (38.75, 39.00)	39.00 (38.00, 39.00)	0.62

[1]n (%) [2] Median (Q1, Q3)) [3]Wilcoxon rank sum test for continuous variables; Fisher's exact test for categorical variables

Table 2. Intention to Treat Hemoglobin Values by Treatment Group				
	N	Oral iron, N = 40[1]	IV iron (ferumoxytol), N = 40[1]	P-value[3]
Enrollment				
Hemoglobin (g/dL)	80	10.30 (10.00, 10.60)	10.35 (9.90, 10.60)	0.94
Anemia Severity[2]	80			0.99
7.0-8.9 g/dL		1 (2.50%)	0 (0.00%)	
9.0-10.9 g/dL		39 (97.50%)	40 (100.00%)	
Primary Outcome				
Week 4				
Change from Enrollment	75	0.40 (-0.10, 0.80)	1.05 (0.68, 1.70)	<0.001
Hemoglobin (g/dL)	75	10.90 (9.95, 11.15)	11.45 (10.90, 12.00)	<0.001
Secondary Outcomes				
Week 8				
Change from Enrollment	36	0.70 (0.20, 1.28)	1.80 (1.23, 2.48)	<0.001
Hemoglobin (g/dL)	36	11.30 (10.70, 11.60)	11.55 (11.40, 12.28)	0.037
Delivery Admission				
Change from Enrollment	80	0.90 (0.28, 1.70)	1.55 (0.88, 1.93)	0.018
Hemoglobin (g/dL)	80	11.30 (10.45, 12.05)	11.55 (11.30, 12.23)	0.053
Anemia Resolution[2]	80			0.005
No (<11)		14 (35.00%)	3 (7.50%)	
Yes (>=11)		26 (65.00%)	37 (92.50%)	
1-day Post-partum				
Hemoglobin (g/dL)	80	9.65 (8.85, 10.05)	10.25 (9.28, 10.90)	0.013

[1]Median (Q1, Q3) [2]n(%) [3]Wilcoxon rank sum test for continuous variables; Fisher's exact test for categorical variables

101 | Neurodevelopmental Outcomes of 3-year-old Children of Mothers with SARS-CoV-2 Infection in Pregnancy

Lydia L. Shook; Victor Castro; Laura Ibanez-Pintor; Roy H. Perlis; Andrea G. Edlow
Massachusetts General Hospital, Boston, MA

9:30 AM - 9:45 AM

Objective: Large epidemiologic studies have demonstrated an increased risk for neurodevelopmental diagnoses (ND) after maternal viral infection in pregnancy. We previously reported an increased risk of ND in offspring exposed to SARS-CoV-2 *in utero* up to 18 months after birth. We sought to determine whether increased risk of offspring ND after maternal SARS-CoV-2 infection persisted at 3 years of age.

Study Design: Retrospective cohort study of live offspring of all mothers who delivered between March 1, 2020 and May 31, 2021 at 8 hospitals across 2 health systems in Massachusetts. The exposure of interest is a positive SARS-CoV-2 PCR during pregnancy. The primary outcome is electronic health record documentation of one or more ICD-10 diagnostic codes corresponding to ND in offspring. Linear regression models were constructed adjusting for race/ethnicity, insurance status, hospital type, maternal age, and preterm birth.

Results: The cohort included 18,124 live births including 861 (4.8%) with maternal SARS-CoV-2 in pregnancy-Table 1. In regression models, maternal SARS-CoV-2 was associated with a statistically significant elevation in risk for offspring ND at 3 years (139/861 [16.1%] exposed vs 1653/17,263 [9.6%] unexposed); adjusted odds ratio (aOR) 1.30 [95% CI 1.06-1.58]; P = .01 - Figure 1. The most common NDs were speech/language and motor function disorders. In sex-stratified models, effects were larger in males (aOR 1.38 [1.06-1.77]; p = .01) compared to females (aOR 1.20 [0.86-1.64]; p = .3). Effect was larger in 3rd-trimester exposure (aOR 1.36 [1.06-1.71]; p = .01) vs 1st and 2nd trimester exposures (aOR 1.15 [0.83-1.58]; p = .38).

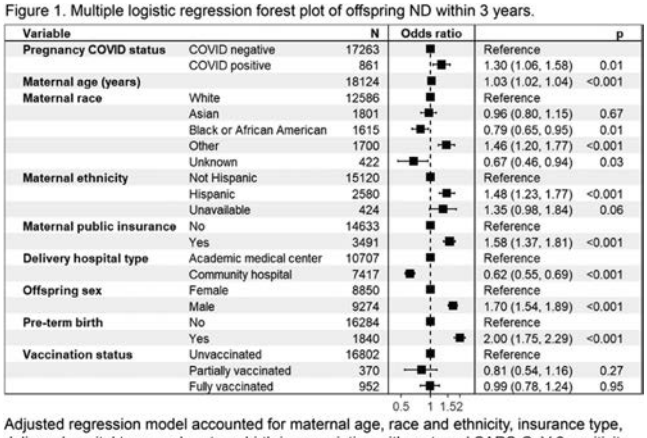
Conclusion: In this large cohort, maternal SARS-CoV-2 infection was associated with significantly increased risk for ND among 3-year-old children, with a stronger impact on male compared to female offspring and greater effects noted after 3rd-trimester exposure. Larger cohorts and longer-term follow-up with more ND accrued will be required to reliably estimate risk and examine impact of trimester of infection and prior vaccination.

Table 1. Cohort sociodemographic and clinical characteristics.

Characteristic	Maternal SARS-CoV-2 negative, N = 17,263	Maternal SARS-CoV-2 positive N = 861	*p-value
Maternal age (yrs)	33 (30, 36)	32 (28, 35)	<0.001
Maternal race			<0.001
Asian	1,754 (10%)	47 (5.5%)	
Black or African American	1,478 (8.6%)	137 (16%)	
Other	1,468 (8.5%)	232 (27%)	
Unknown	380 (2%)	42 (5%)	
White	12,183 (71%)	403 (47%)	
Maternal hispanic ethnicity	2,250 (13%)	330 (38%)	<0.001
Maternal public insurance	3,078 (18%)	413 (48%)	<0.001
Delivery hospital type			<0.001
Academic medical center	10,093 (58%)	614 (71%)	
Community hospital	7,170 (42%)	247 (29%)	
Offspring male sex	8,828 (51%)	446 (52%)	0.72
Preterm birth	1,724 (10.0%)	116 (13%)	<0.001
Unvaccinated	15,954 (92%)	848 (98%)	<0.001
Trimester of infection			
1st	NA	66 (8.0%)	
2nd	NA	226 (27%)	
3rd	NA	533 (65%)	

N (%) or median (IQR). *Chi-square test or Wilcoxon rank sum test.

Figure 1. Multiple logistic regression forest plot of offspring ND within 3 years.



Adjusted regression model accounted for maternal age, race and ethnicity, insurance type, delivery hospital type, and preterm birth in association with maternal SARS-CoV-2 positivity.

102 | Maternal Gestational Weight Gain in GLP-1 Agonist Exposed and Unexposed Patients

Nishita Pondugula[1]; Jennifer F. Culhane[1]; Lisbet S. Lundsberg[1]; Caitlin Partridge[1]; Audrey A. Merriam[2]
[1]Yale School of Medicine, New Haven, CT; [2]Yale New Haven Hospital, New Haven, CT

9:45 AM - 10:00 AM

Objective: To understand the effect of GLP-1 agonist use in the year prior to conception on gestational weight gain (GWG).

Study Design: All patients delivering between 2014-2024 with evidence of GLP-1 exposure in the year prior to conception were identified through electronic medical record (EMR) query with hand review to confirm exposure. GLP-1 exposed patients were classified by indication for GLP-1: 1) pregestational diabetes mellitus (PGDM) or 2) weight management (WM) for increased body mass index (BMI). Control groups for each indication cohort were identified from 2021-2022 delivery EMR data. PGDM controls were patients with pregestational DM1 or DM2 managed with medication other than GLP-1 agonist in the year prior to conception. WM controls were a stratified random sample of patients without PGDM not on antihyperglycemic medication in the year prior to conception with BMIs between 30 < 40 kg/m^2 (n = 100) and ≥40 kg/m^2 (n = 100). Demographic and clinical characteristics and obstetrical outcomes were compared. Logistic regression was employed to assess the crude (OR) and adjusted odds ratios (aOR) for GWG controlling for covariates significant in bivariate tests at < 0.05.

Results: 246 patients had GLP-1 exposure in the year prior to conception. Of these, 104 were exposed for PGDM and 142 for WM. 175 PGDM controls were identified from the two years of EMR data interrogated. Random sampling yielded 200 WM controls.

Bivariate tests for race/ethnicity, pre-pregnancy BMI, and chronic hypertension identified significant differences between exposed and unexposed patients in the PGDM cohort. For the WM cohort, exposed and unexposed patients had significant differences in PCOS diagnosis, gestational weight gain, and HDP. Within the PGDM group, GLP-1 agonist exposure did not significantly affect GWG (Table 2). Those exposed to a GLP-1 in the WM cohort had significantly decreased risk of GWG below recommendations (aOR = 1.32 (0.71-2.48)).

Conclusion: GLP-1 agonist use in the year prior to conception decreases risk of GWG under recommendations, which may reflect rebound weight gain during pregnancy after GLP-1 cessation.

Table 1. Bivariate Comparisons between GLP-1 Exposed and Unexposed patient for the two GLP-1 indication Cohorts

	Pre-Gestational Diabetes Mellitus				Weight Management			
	Total	GLP-1 Exposure			Total	GLP-1 Exposure		
Patient Characteristics	N (%) N=279 (100%)	No N=175 (62.7%)	Yes N=104 (37.3%)	P-value	N (%) N=342 (100%)	No N=200 (58.5%)	Yes N=142 (41.5%)	P-value
Age ≥35 yo	116 (41.6)	71 (25.5)	45 (16.1)	0.66	84 (24.6)	43 (12.6)	41 (12.0)	0.12
Public Insurance	155 (55.6)	99 (35.5)	56 (20.1)	0.66	176 (51.5)	100 (29.2)	76 (22.2)	0.52
Parity								
Nulliparous	95 (34.3)	58 (20.9)	37 (13.4)	0.73	119 (34.8)	71 (20.8)	48 (14.0)	0.75
Multiparous	182 (65.7)	115 (41.5)	67 (24.2)		223 (65.2)	129 (37.7)	94 (27.5)	
Race/ethnicity								
Hispanic	86 (30.8)	61 (21.9)	25 (9.0)	0.003	105 (30.7)	55 (16.1)	50 (14.6)	0.55
Black	81 (29.0)	37 (13.3)	44 (15.8)		89 (26.0)	54 (15.8)	35 (10.2)	
White	84 (30.1)	57 (20.4)	27 (9.7)		133 (38.9)	81 (23.7)	52 (15.2)	
Asian	19 (6.8)	15 (5.4)	4 (1.4)		5 (1.5)	4 (1.2)	1 (0.3)	
Other	9 (3.2)	5 (1.8)	4 (1.4)		10 (2.9)	6 (1.8)	4 (1.2)	
Pre-Pregnancy BMI (N=254) ≥30 kg/m^2	182 (71.7)	90 (35.4)	93 (36.2)	<0.0001				
Polycystic Ovary Syndrome (PCOS)	71 (25.5)	42 (15.1)	29 (10.4)	0.47	64 (18.7)	20 (5.9)	44 (12.9)	<0.0001
Chronic Hypertension	140 (50.2)	77 (27.6)	63 (22.6)	0.007	104 (30.4)	55 (16.1)	49 (14.3)	0.17
Obstetrical Outcomes								
Large for Gestational Age	83 (30.6)	56 (20.7)	27 (10.0)	0.32	40 (11.8)	23 (6.8)	17 (5.0)	0.84
Fetal Growth Restriction	23 (8.2)	15 (5.4)	8 (2.9)	0.80	19 (5.6)	13 (3.8)	6 (1.8)	0.37
Maternal Gestational Weight Gain[1]								
Under recommended	59 (23.3)	38 (15.0)	21 (8.3)	0.55	103 (30.2)	77 (22.6)	26 (7.6)	0.0003
Recommended	59 (23.3)	36 (14.2)	23 (9.1)		59 (17.3)	32 (9.4)	27 (7.9)	
Over recommended	135 (53.4)	76 (30.0)	59 (23.3)		179 (52.5)	91 (26.7)	88 (25.8)	
Pre-Term Birth	85 (30.7)	55 (19.9)	30 (10.8)	0.67	39 (11.4)	20 (5.9)	19 (5.6)	0.33
Gestational Diabetes Mellitus					69 (20.2)	45 (13.2)	24 (7.0)	0.20
Hypertensive Disorders of Pregnancy	136 (48.8)	93 (33.3)	43 (15.4)	0.06	108 (31.6)	75 (21.9)	33 (9.7)	0.005

[1] Maternal gestational weight gain categories determined by patient's pre-pregnancy BMI based on the American College of Obstetricians and Gynecologists' 2013 Committee Opinion *Weight Gain During Pregnancy*, reaffirmed in 2023.

Table 2. Crude and Adjusted Odds Ratios (OR) for Maternal Gestational Weight Gain (GWG) Among Patients with Pre-Gestational Diabetes Mellitus and Patients with Increased BMI with and without Exposure to GLP-1 Agonists in the Year Prior to Pregnancy

	IOM GWG Below recommendations (vs meeting recommendations)		IOM GWG Above recommendations (vs meeting recommendations)	
GLP-1 exposure	OR	aOR	OR	aOR
Pre-Gestational Diabetes (N=279)				
No	REF	REF	REF	REF
Yes	0.87 (0.41-1.83)	0.79 (0.35-1.77)*	1.2 (0.65-2.27)	1.37 (0.70-2.67)*
Weight Management (N=342)				
No	REF	REF	REF	REF
Yes	0.40 (0.20-0.79)	0.40 (0.19-0.82)**	1.15 (0.64-2.07)	1.32 (0.71-2.48)**

*Adjusted for race/ethnicity, HDP, and cHTN.
**Adjusted for HDP and PCOS.

103 | Placental Pathology Findings by Timing and Amount of Maternal Cannabis Exposure

Shilpa S. Tummala[1]; Amanda A. Allshouse[2]; Gwendolyn A. McMillin[1]; Jessica M. Comstock[2]; Elizabeth S. Doughty[2]; Robert M. Silver[2]; Torri D. Metz[2]
[1]University of Utah Health, Salt Lake City, UT; [2]University of Utah, Salt Lake City, UT

10:00 AM - 10:15 AM

Objective: We aimed to evaluate the association between the timing and amount of maternal cannabis use and placental abnormalities associated with insufficiency.

Study Design: We conducted a secondary analysis of individuals enrolled in the nuMoM2b study. Maternal cannabis use was identified by urine immunoassay for delta-9-tetrahydrocannabinol (THC-COOH) and confirmed by liquid chromatography-mass spectrometry. Exposure was categorized as only 1st trimester or

ongoing into 2nd or 3rd trimester. In a secondary analysis, cumulative exposure was calculated using quantitative THC-COOH values across serial urine samples. Outcomes for above-median and below-median exposure were compared. The primary outcome was a composite of maternal vascular malperfusion from placental pathology, including retroplacental clot or hematoma, infarction, accelerated villus maturation, syncytial knots, and decidual hemorrhage. Secondary outcomes were fetoplacental weight ratio, fetal vascularization, or chorioamnionitis. Multivariable modeling adjusted for maternal age, hypertension, diabetes, and nicotine use.

Results: Placental pathology was available for 179 participants who used cannabis. Of these, 73 (41%) had only 1st-trimester exposure, and the rest had ongoing exposure. Maternal cannabis use in late pregnancy compared with early was not associated with pathologic findings of maternal vascular malperfusion (Table). The median cumulative exposure to THC-COOH across pregnancy was 332 ng/mL (Figure). Above-median cumulative exposure was not associated with maternal malperfusion (Table). There were no differences in secondary outcomes.

Conclusion: Maternal cannabis use in late pregnancy was not associated with changes in placental vascularization suggestive of insufficiency when compared with 1st-trimester use alone. Differences in cumulative exposure to cannabis during pregnancy may not correlate with abnormalities in placental vascularization. Further studies are needed to understand the pathophysiology underlying maternal cannabis exposure, placental pathology, and fetal growth restriction.

Figure. Cumulative THC-COOH exposure

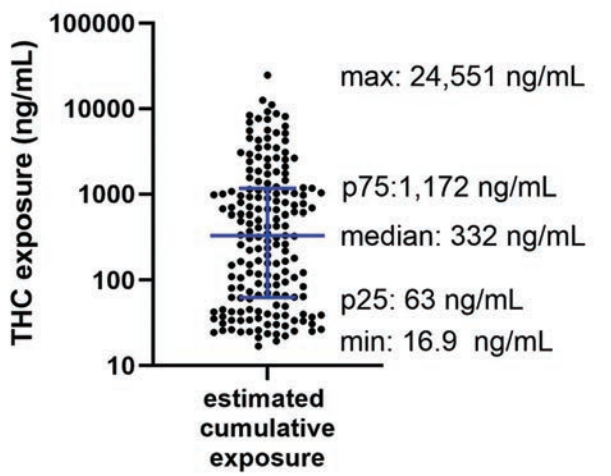


Table. Primary and Secondary Outcomes from Placental Pathology Reports

Outcome	Timing of exposure			Amount of exposure		
	Late	Early only	P-value	Higher	Lower	P-value
	N=106	N= 73		N=90	N= 89	
Maternal vascular malperfusion	27 (27.8)	21 (31.8)	0.584	23 (26.7)	25 (32.5)	0.424
Fetal vascular malperfusion	38 (38.0)	19 (27.9)	0.176	30 (35.3)	27 (32.5)	0.705
Chorioamnionitis	35 (60.3)	31 (72.1)	0.22	28 (60.9)	38 (69.1)	0.387
Fetal Placental Weight Ratio	6.4 (6.1- 6.7)	6.5 (6.0- 7.1)	0.823	6.4 (6.1- 6.8)	6.5 (6.0- 6.9)	0.932

Values reported as frequency (column percent) or geometric mean and 95% confidence interval

104 | The Impact of a Facilitated Postpartum-to-Primary Care Transition on Care Utilization within One Year Postpartum

Arlin Delgado[1]; Pichliya Liang[1]; Tierra Bender[1]; Kaitlyn E. James[1]; Alaka Ray[1]; Ishani Ganguli[2]; Jessica L. Cohen[3]; Mark A. Clapp[1]

[1]Massachusetts General Hospital, Boston, MA; [2]Brigham and Women's Hospital, Boston, MA; [3]Harvard T.H. Chan School of Public Health, Boston, MA

10:15 AM - 10:30 AM

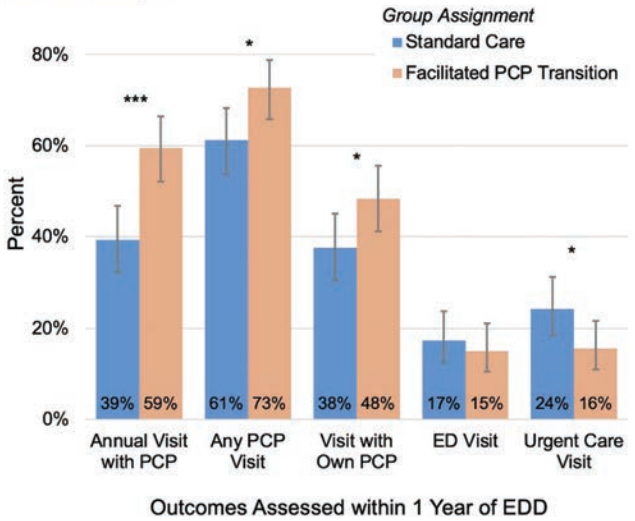
Objective: Postpartum to primary care transitions are important for individuals with ongoing care needs after pregnancy, but there are many barriers to effective transitions in practice. This study's objective was to assess if an intervention, which increased PCP visits within four months postpartum by 2-fold, had a sustained impact on PCP visits and reduced unscheduled care utilization in the first year postpartum.

Study Design: This was a planned secondary analysis of an RCT of a behavior economics-informed intervention, including default visit scheduling, nudge reminders, and tailored messaging, designed to increase PCP engagement within 4 months postpartum versus standard care. The primary outcome in this secondary analysis was receiving an "annual exam" by a PCP within 1 year postpartum. Other outcomes included visits for any reason with a PCP, urgent care visits, and ED visits. Outcomes were compared between the groups with chi-square testing. Odds ratios with and without adjustment for original randomization strata with robust standard errors were reported.

Results: 360 patients were randomized in the original trial (176 control, 184 intervention). 75.4% had anxiety/depression, 19.5% had preexisting/gestational diabetes, and 16.1% had chronic/pregnancy-related hypertension. Figure 1 shows the outcome comparisons between the two groups. Table 1 lists the unadjusted and adjusted odds and demonstrates that the intervention increased all measures of PCP visits within the first year postpartum, including an increased odds of 2.78 (95% CI 1.75, 4.40) for receipt of an annual exam by a PCP.

Conclusion: An intervention designed to facilitate the postpartum-to-primary care transition among individuals with chronic conditions resulted in higher rates of PCP visits within the first year after delivery compared with standard care. There were no differences in urgent care or ED visits, though the comparisons may be underpowered. This relatively low-resource intervention may be an effective strategy for transitioning postpartum individuals' care back to their PCP.

Figure 1: Rates of the Primary and Secondary Outcomes related to Care Utilization between the Standard Care and Facilitated PCP Transition Groups



*Level of Significance: * p<0.05, ** p<0.01, *** p<0.001*

Table 1: Unadjusted and Adjusted Odds Ratios of the Primary and Secondary Outcomes comparing the Facilitated PCP Transition to the Standard Care Group

Outcomes	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)*
Primary		
Annual Exam Visit with a PCP	***2.26 (1.48, 3.47)***	***2.77 (1.75, 4.40)***
Secondary		
Visit for Any Reason with Any PCP	***1.69 (1.08, 2.64)***	***1.91 (1.20, 3.04)***
Visit for Any Reason with Own PCP	***1.55 (1.02, 2.38)***	***1.74 (1.12, 2.69)***
Emergency Department Visit	0.84 (0.48, 1.49)	0.81 (0.46, 1.44)
Urgent Care Visit	***0.57 (0.34, 0.98)***	0.59 (0.34, 1.01)

Odds ratios are reported for the Facilitated PCP Transition Group in reference to the Standard Care Group.

** Logistic regression models adjusted for the two randomization strata: 1) any primary care visit within the prior 3 years and 2) receipt of prenatal care at the main hospital campus vs. satellite clinic.*

Poster Session 1

Abstracts 105–384

THURSDAY
January 30, 2025
10:30 AM – 12:30 PM

PREGNANCY

ABSTRACTS OPEN ACCESS

Poster Session 1

Thursday, January 30, 2025 10:30 AM – 12:30 PM

105 | Maternal Anemia and Fetal Heart Rate Tracing Abnormalities in Labor: Associated Neonatal and Maternal Outcomes

Aaron W. Roberts[1]; Rachel L. Wiley[2]; Kristen A. Cagino[3]; Claudia J. Ibarra[4]; Shareen Patel[4]; Christina Cortes[4]; Khalil M. Chahine[4]; Natalie L. Neff[5]; Kimen S. Balhotra[4]; Tala Ghorayeb[4]; Holly Flores[6]; Fabrizio Zullo[7]; Hector M. Mendez-Figueroa[4]; Suneet P. Chauhan[8]

[1]McGovern Medical School at UTHealth Houston, Houston, TX; [2]University of California, San Diego, San Diego, CA; [3]UT Houston, Houston, TX; [4]McGovern Medical School at UTHealth, Houston, TX; [5]McGovern Medical School at UT Health, Houston, TX; [6]University of Texas Health Science Center, Houston, TX; [7]University of Rome La Sapienza, Rome, Lazio; [8]Delaware Center of Maternal-Fetal Medicine at Christiana Care, Delaware, DE

10:30 AM - 12:30 PM

Objective: To investigate the relationship of maternal anemia in labor before delivery with abnormal fetal heart rate tracing characteristics (FHRT) and composite neonatal and maternal adverse outcomes (CNAO/CMAO).

Study Design: FHRTs of all deliveries over a 15-month period at a level IV center were reviewed by physicians blinded to maternal and neonatal outcomes. In 20-minute segments, the last hour of available FHRT was analyzed. Term, singleton, non-anomalous deliveries who underwent a trial of labor were included. Anemia was defined as hematocrit < 30% at admission. Each FHRT feature was independently categorized as present if noted greater than 50% of the time in the hour before delivery. The primary outcome was the rate of CNAO or CMAO, with secondary outcomes including rates of FHRT abnormalities as defined by ACOG. The chi-square test was used to compare groups, with p-value < 0.05 considered significant.

Results: Of 5,160 consecutive deliveries, 3,166 (61%) met the inclusion criteria, of which 391 (14.1%) had anemia. There were no differences in oxytocin induction/augmentation rate or neuraxial anesthesia. Anemia was not associated with an increased proportion of any individual FHRT features. There was an increase in CMAO (6.8 vs 15.1%; p < 0.001), driven by an increase in the rate of blood transfusion (1.7 vs 11.5%; p < 0.001). Anemia was not independently associated with increased CNAO, or umbilical artery pH < 7.0. There was a lower rate of cesarean delivery for abnormal FHRT (9.6% vs 6.4%; p = 0.04).

Conclusion: Anemia in labor was not associated with any individual FHRT abnormalities or ACOG FHT Category. There was no change in CNAO, but there was an increased rate of CMAO driven by higher rates of maternal blood transfusion. Our findings provide additional support to other studies that found that maternal anemia was not associated with adverse neonatal outcomes.

Table 1 Intrapartum Characteristics

	No Anemia (N=2775)	Anemia[1] (N=391)	p-value
Gestational Age			0.115
37-38.6 weeks	1454 (52.4%)	216 (55.2%)	
39-40.6 weeks	1286 (46.3%)	166 (42.5%)	
>41 weeks	35 (1.3%)	9 (2.3%)	
Labor Management			
Induction/Augmentation of Labor	1536 (55.4%)	212 (54.2%)	0.674
Neuraxial Anesthesia	2520 (98.4%)	346 (97.5%)	0.128
Fetal Heart Rate Tracing			
Fetal Tachycardia	96 (3.5%)	7 (1.8%)	0.082
Variability			
Absent	5 (0.2%)	2 (0.5%)	0.192
Minimal	357 (12.9%)	41 (10.5%)	0.184
Moderate	2336 (84.2%)	334 (85.4%)	0.527
Marked	14 (0.5%)	3 (0.8%)	0.506
Accelerations	1766 (63.6%)	245 (62.7%)	0.706
Early Decelerations	2663.0 (96.0%)	369.0 (94.4%)	0.144
Variable Decelerations	1646.0 (59.3%)	244.0 (62.4%)	0.244
Late Decelerations	2372.0 (85.5%)	338.0 (86.4%)	0.610
Prolonged Decelerations			
> 2 min to 6 min	71 (2.6%)	8 (2.0%)	0.543
> 6 min to < 10 min	2 (0.1%)	1 (0.3%)	0.269
Combinations of Decelerations			
Variable (+) Late	1347 (48.5%)	172 (44.0%)	0.092
Variable (+) Late (+) Prolonged	1463 (52.7%)	186 (47.6%)	0.056
Decelerations >50% of Contractions	881 (31.7%)	115 (29.4%)	0.352
ACOG Classification*			
Category I	818 (29.5%)	130 (33.2%)	0.127
Category II	1925 (69.4%)	255 (65.2%)	0.097
Category III	5 (0.2%)	3 (0.8%)	0.065

Data presented as N (%). Chi-square or Fisher Exact test used where appropriate.
Bolded if significantly different
[1]Anemia defined as Hematocrit < 30% at the time of admission for labor
*ACOG, American College of Obstetricians and Gynecologists (based on Practice Bulletins # 106 and # 116)
Each FHRT feature was counted if time spent during the last hour before delivery was ≥50%

Table 2: Perinatal Outcomes

	No Anemia (N=2775)	Anemia[1] (N=391)	p value
Cesarean for Arrest of Labor	275 (9.9%)	33 (8.4%)	0.358
Cesarean for NRFHT	266 (9.6%)	25 (6.4%)	**0.041**
Umbilical artery pH <7.0	1475 (99.1%)	206 (99.5%)	0.561
Neonatal Composite[3]	45 (1.6%)	4 (1.0%)	0.369
5 Minute APGAR < 7	24 (0.9%)	3 (0.8%)	
Intubation	14 (0.5%)	0 (0.0%)	
Seizures	2 (0.1%)	1 (0.3%)	
Bronchopulmonary Dysplasia	0	0	
Intraventricular Hemorrhage	0 (0.0%)	1 (0.3%)	
Necrotizing Enterocolitis	1 (0.0%)	0 (0.0%)	
Neonatal Sepsis	7 (0.3%)	0 (0.0%)	
Birth Injury or Palsy	7 (0.3%)	0 (0.0%)	
Hypoxic Ischemic Encephalopathy	4 (0.1%)	0 (0.0%)	
Neonatal Death	1 (0.0%)	0 (0.0%)	
Maternal Composite	190 (6.8%)	59 (15.1%)	**< 0.001**
EBL ≥ 1000mL[3]	2626 (94.8%)	369 (94.4%)	
Transfusion	48 (1.7%)	45 (11.5%)	
Endometritis	23 (0.8%)	6 (1.5%)	
Surgical Site Infection	8 (0.3%)	0 (0.0%)	
Deep Vein Thrombosis	1 (0.0%)	0 (0.0%)	
ICU Admission	9 (0.3%)	2 (0.5%)	
Maternal Death	0	0	

Data presented as N (%)
Bolded if significantly different
[1]Anemia defined as Hematocrit < 30 at the time of admission for labor
[2]Data available for 1488 and 207 patients respectively
[3]Data available for 2771 and 391 patients respectively
FHRT, fetal heart rate tracing; EBL: estimated blood loss

106 | Hemodynamic Monitoring of Aortic and Mitral Stenosis in Pregnancy

Abra Guo[1]; Katelyn M. Tessier[2]; Connor Demorest[3]; Selma Carlson[4]; Bethany Sabol[2]; Sarah A. Wernimont[2]; Jessica Schultz[5]
[1]University Of Minnesota Medical Center, University of Minnesota Medical Center, MN; [2]University of Minnesota, Minneapolis, MN; [3]Masonic Cancer Center, University of Minesota, University of Minnesota/Minneapolis, MN; [4]University of Minnesota Medical Center/ Minneapolis VA Healthcare System, University of Minnesota Medical Center, MN; [5]University of Minnesota Medical Center, Minneapolis, MN

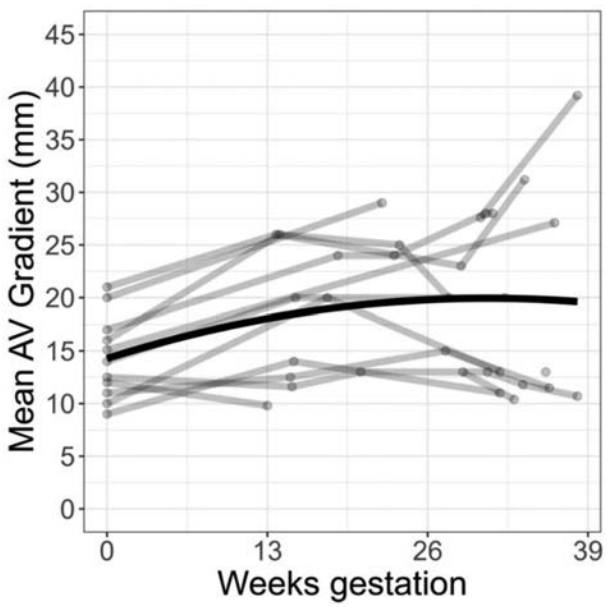
10:30 AM - 12:30 PM

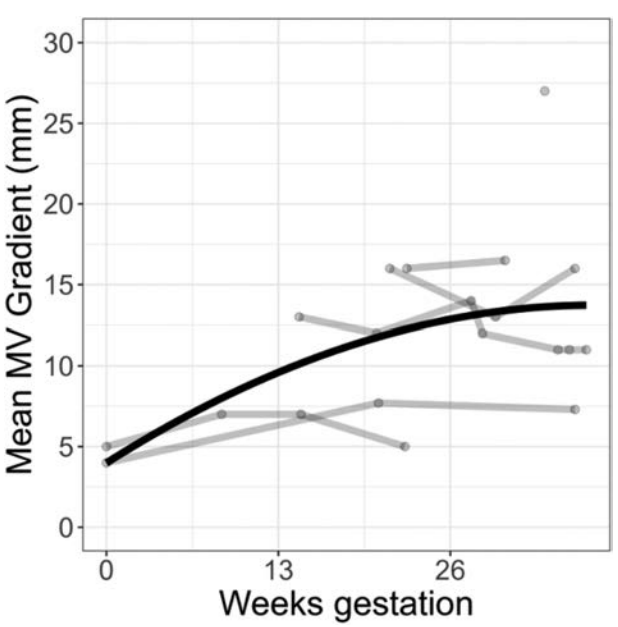
Objective: Valvular heart disease accounts for one-third of heart disease in pregnant individuals with stenotic valvular lesions, particularly left-sided lesions, increasing the risk of adverse maternal outcomes. A major challenge is the lack of normative data describing the echocardiographic changes in this population throughout pregnancy. We sought to establish how peak velocity and mean gradient across stenotic native aortic and mitral valves change with increased hemodynamic volumes throughout pregnancy.

Study Design: This was a single-center retrospective cohort study using a large community-academic health outcomes database. Individuals with aortic and mitral valve stenosis who had at least one echo during pregnancy were identified via ICD-10 diagnosis and procedures codes from an access-protected database of pregnant patients who received care at our center between 2012 and 2023. Mean gradients were identified from transthoracic echocardiogram data throughout pregnancy. Clinical characteristics and differences in gradients were compared within the groups.

Results: Twenty-three patients were identified; 16 with aortic stenosis (AS) and 7 with mitral stenosis (MS). Clinical characteristics were similar amongst groups. The medians of aortic valve mean gradients (mmHg) were as follows: pre-pregnancy (14), second trimester (20), third trimester (13). The medians of peak aortic velocity (m/s) were as follows: pre-pregnancy (2.5), second trimester (3.0), third trimester (2.8). The medians of mitral valve mean gradients (mmHg) were as follows: pre-pregnancy (4.5), first trimester (7.0), second trimester (12.5), third trimester (12.0). No patients in this cohort progressed in degree of severity during pregnancy with most achieving term delivery (median gestational age at birth 38.64 (37.68, 39.51).

Conclusion: To our knowledge this is the first retrospective investigation of longitudinal changes in valve hemodynamics in pregnant patients with native valve stenosis. We demonstrate that peak velocity and mean gradient across native aortic and mitral valves increase in a predictable manner during pregnancy.





107 | Pregnancy Outcomes in Patients with type-2 Diabetes Treated with Semaglutide: A Multi-Center Observational Cohort Study

Emily N. Adams[1]; Ernie Shippie[2]; Ahizechukwu C. Eke[3]
[1]Johns Hopkins University, Baltimore, MD; [2]Vizient Center for Advanced Analytics, Chicago, Illinois, Vizient Center for Advanced Analytics, Chicago, IL; [3]Johns Hopkins University School of Medicine, Baltimore, MD

10:30 AM - 12:30 PM

Objective: Patients with type-2 diabetes face higher risks of adverse pregnancy outcomes, including preeclampsia, preterm birth, and neonatal complications. Semaglutide, a GLP-1 receptor agonist, is effective for managing hyperglycemia in type-2 diabetics, but its safety and efficacy during pregnancy are underexplored. This study evaluates pregnancy outcomes in patients with type-2 diabetes treated with Semaglutide compared to controls.

Study Design: This multi-center observational cohort study used data from 192 hospitals in 38 US states, sourced from the Vizient Clinical Database. We included pregnant individuals with type-2 diabetes who delivered between January 2021 and April 2024. The primary outcome was preterm birth, with secondary outcomes including hypertensive disorders, intrahepatic cholestasis, and neonatal outcomes. We performed standard tests and multivariable logistic regression to adjust for confounders, yielding adjusted odds ratios (aOR) as the measure of treatment effect.

Results: The cohort included 4,606,975 pregnancies, with 8,060 patients (0.2%) exposed to Semaglutide and 4,598,915 controls. At study entry, the mean maternal age was 29.5 years (IQR 25.9-34.3) for the Semaglutide group and 30.3 years (IQR 24.8-33.9) for controls–*Table 1*. Most patients (63.4%) identified as Black. Patients exposed to Semaglutide were 26% less likely to deliver preterm (aOR 0.74, 95% CI 0.67-0.81; P< .001). Conversely, patients exposed to Semaglutide were more likely to develop preeclampsia (aOR 1.16, 95% CI 1.11-1.23; P< .001), HELLP syndrome (aOR 1.88, 95% CI 1.38-2.56; P< .001) and eclampsia (aOR 2.74, 95% CI 2.17-3.47; P< .001) compared to those unexposed to Semaglutide during pregnancy–*Table 2*.

Conclusion: In pregnant patients with type-2 diabetes, exposure to Semaglutide was associated with reduced risk of preterm birth but increased risks of preeclampsia, HELLP syndrome, and eclampsia. This underscores the need for prospective validation and careful monitoring of patients exposed to Semaglutide in pregnancy.

Table 1: Pregnancy outcomes according to Semaglutide use in pregnancy in women with type 2 diabetes

Variable	Semaglutide use in pregnancy (n = 8,060)	Non-Semaglutide use in pregnancy (n = 4,598,915)	P-value
GA at delivery in weeks (mean, SD)	37.1 (3.27)	37.3 (3.42)	<.001
Preterm birth, n (%)	467 (5.8)	291,011 (6.3)	.049
Pre-eclampsia, n (%)	2,193 (27.2)	740,654 (16.1)	<.001
Pregnancy induced hypertension, n (%)	1,458 (18.1)	603,167 (13.1)	<.001
Eclampsia, n (%)	72 (0.9)	8,246 (0.2)	<.001
HELLP syndrome, n (%)	41 (0.5)	15,553 (0.3)	.008
Cholestasis of pregnancy, n (%)	413 (5.1)	117,500 (2.6)	<.001
Oligohydramnios, n, (%)	382 (4.7)	150,787 (3.3)	<.001
Polyhydramnios, n (%)	478 (5.9)	174,542 (3.8)	<.001
Placenta abruption, n (%)	202 (2.5)	82,366 (1.8)	<.001
AST (median, Q1, Q3)	19.6 (14.5, 29.4)	20.4 (16.0, 28.5)	<.001
ALT (median, Q1, Q3)	18.0 (12.6, 33.3)	18.0 (12.6, 27.9)	0.06
Serum creatinine (median, Q1, Q3)	0.64 (0.53, 0.78)	0.63 (0.49, 0.79)	0.35
Mode of delivery, n (%) - Vaginal delivery - Cesarean delivery	 4,360 (54.1) 3700 (45.9)	 2,317,589 (50.4) 2,281,326 (49.6)	<.001
Stillbirth, n (%)	137 (1.7)	81,997 (1.8)	0.57

Table 2: Univariable and multivariable logistic regression models

	Univariable logistic regression			Multivariable logistic regression		
	Odds Ratio (OR)	95% confidence interval	P value	Adjusted Odds Ratio (aOR)	95% confidence interval	P value
Preterm birth	0.91	0.83, 0.99	0.04	0.74	0.67, 0.81	<.001
Gestational HTN	1.46	1.38, 1.55	<.001	0.97	0.92, 1.03	0.30
Pre-eclampsia	1.94	1.85, 2.05	<.001	1.16	1.11, 1.23	<.001
HELLP syndrome	1.51	1.10, 2.05	<.001	1.88	1.38, 2.56	<.001
Eclampsia	5.02	3.97, 6.33	<.001	2.74	2.17, 3.47	<.001
Intrahepatic cholestasis	2.06	1.87, 2.27	<.001	1.05	0.96, 1.17	0.26
Placental abruption	1.41	1.23, 1.62	<.001	1.07	0.94, 1.24	0.29

Models were adjusted for maternal age, gestational age at study entry, obesity at baseline, pre-gestational diabetes, and chronic hypertension.

108 | Leveraging Machine Learning Models to Identify Predictors of RSV Immunization During the 2023-24 Season

Ethan Litman; Tina Yi Jin Hsieh; Anna M. Modest; Kathleen Clarke; Melissa Dzinoreva; Valerie Perrinez; Esther Apraku Bondzie; Lydia Gallup; Eleanor Schonberg; Marjorie Rowe; K'ara locke; Oluwaseyi Oginni; Robert Jones; Chloe Zera; Ai-ris Y. Collier
Beth Israel Deaconess Medical Center, Boston, MA

10:30 AM - 12:30 PM

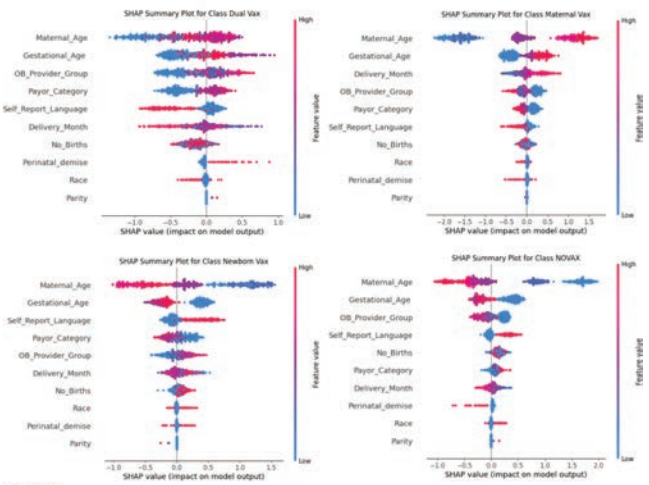
Objective: In 2023, the FDA approved maternal RSVpreF vaccines and infant nirsevimab immunization for prevention of infant respiratory syncytial virus (RSV) disease. This study aims to use unsupervised machine learning to identify key predictors of RSV immunization.

Study Design: Maternal-infant dyad demographic and clinical data was obtained from the electronic medical record. RSV immunization status was abstracted from a state-wide database. The outcome variables were RSV immunization status (maternal, infant, dual, or unvaccinated). Predictors were maternal age, gestational age at birth, delivery month, obstetric provider group, payor category, parity, self-reported race, language, perinatal demise, infant number, and sex. Eleven machine learning classification models (logistic regression, LASSO, RIDGE, Random Forest, SVM Radial and Linear, XGBoost, BNB, MLP, KNN, Catboost) were compared using the AUC-ROC One vs Rest (OvR) score. SHAP analysis was employed to identify the most important features.

Results: 1899 births (1940 live born infants) from September 2023 to January 2024 were included. The Catboost model demonstrated the best performance (AUC-ROC OvR score: 0.75). Maternal age, gestational age, provider group, delivery month, and language ranked highest in SHAP summary plots (Figure 1). Higher maternal age and gestational age were associated with maternal vaccination; lower maternal and gestational age were associated with infant immunization and unvaccinated status. Maternal vaccination was more likely later in the season. Private practice was associated with maternal/dual vaccination, while community or academic practices were associated with infant immunization. English speakers were more likely to receive maternal vaccination, whereas non-English speakers were more likely to receive newborn or no immunization.

Conclusion: Results from this model suggest that increasing vaccine availability in all practice settings throughout the season and providing language-concordant education could improve equitable implementation of RSV immunization.

Figure. SHAP beeswarm summary plots - feature importance for dual, maternal, infant, or no vaccination



Footnotes:

1. OB Provider group (low-high): Private - Community - Academic Practice
2. Payor category (low-high): Commercial - Government
3. Delivery Month (low-high): September - October -November - December - January
4. Self-reported languages (low-high): "English speaker" -"non-English: speaker

109 | Leveraging Machine Learning to Identify Predictors of Passive and Active Influenza Immunity in Infants

Tina Yi Jin Hsieh; Catherine Jacob-Dolan; Alejandra Waller-Pulido; Samuel Nangle; Eleanor Schonberg; Valerie Perrinez; P. Alejandra Barrero-Castillero; Ai-ris Y. Collier
Beth Israel Deaconess Medical Center, Boston, MA

10:30 AM - 12:30 PM

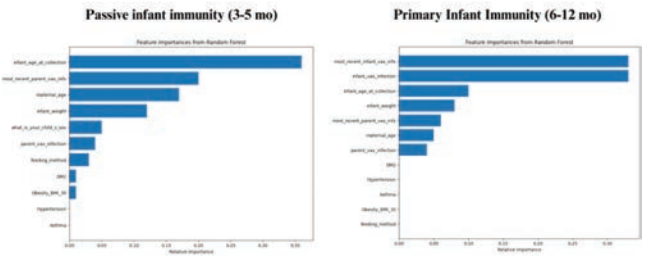
Objective: The optimal conditions for inducing durable infant immunity to influenza virus are unclear. This study aims to identify predictors of infant serum influenza antibodies using unsupervised machine learning.

Study Design: We enrolled infants for serial infant capillary blood collection. Samples collected at 3-5 months of age (prior to pediatric influenza vaccine recommendation) were used to study passive immunity from maternal antibody transfer. Samples collected at 6-12 months (age when pediatric vaccines recommended) were used to evaluate infant immunity after vaccination or natural infection. Serum IgG antibodies specific to influenza A and B virus were quantified using an electrochemiluminescence assay. Thirteen covariates, including maternal and infant health and demographic data, vaccine and infection history were obtained by self-report. Continuous variables were imputed using a random forest imputer and normalized with the Yeo-Johnson method. Machine-learning models (Random Forest, boosted tree, RIDGE, LASSO linear regression) were compared using mean squared error values, and predictors were identified with the best-performing model based on the mean decrease in impurity.

Results: Twenty-three infant serum samples at 3-5 months and 57 serum samples from 6-12 months were analyzed. The Random Forest model had the lowest mean squared error. Top predictors for passive immunity included: infant age, days since the last maternal influenza vaccination/infection, maternal age, and infant weight. Predictors for later infant immunity included: days since the last infant influenza vaccination/infection, total number of infant vaccinations/infections, infant age, infant weight, and days since the last parent vaccination/infection.

Conclusion: Unsupervised machine-learning techniques can be utilized to identify clinical factors for early and late infant immunity. Future studies should integrate more longitudinal samples to develop a more comprehensive understanding of flu immunity and evaluate for maternal antibody inhibition.

Figure. Feature Importance plot by Mean Decrease in Impurity for the Random Forest Model



110 | Expectant Management of Diet Controlled Gestational Diabetes Mellitus

Alesha M. White[1]; Donald D. McIntire[1]; Anne M. Ambia[2]; Elaine L. Duryea[1]
[1]*University of Texas Southwestern Medical Center, Dallas, TX;* [2]*University of Texas Southwestern, Dallas, TX*

10:30 AM - 12:30 PM

Objective: Gestational diabetes is one of the most common diseases in pregnancy and is associated with increased maternal and neonatal morbidity. There is not enough data to support or discourage a specific delivery time for patients with diet controlled gestational diabetes mellitus (A1GDM). Our objective was to compare differences in outcomes for patients with A1GDM based on increasing gestational age.

Study Design: This is a retrospective cohort study that included deliveries of singleton live born term infants to patients with A1GDM. Diagnosis and treatment of A1GDM, including expectant management until 42 wks, was uniform. Delivery and neonatal outcomes for patients with A1GDM were compared with advancing gestational age and were then compared to the non-diabetic population. Neonates with known anomalies were excluded from analysis of neonatal outcomes. The Mantel-Haenszel and Breslow-day tests were used for statistical analysis.

Results: 4467 patients with A1GDM at 39 wks or greater delivered between November 2010 and February 2024. The rate of primary cesarean delivery (CD) increased with increasing gestational age ($p < 0.001$). Rates of forceps delivery, 3rd and 4th degree lacerations and shoulder dystocia demonstrated a worsening trend with advancing gestational age but did not reach significance. Neonatal outcomes were not significantly different. When compared to non-diabetic patients, all examined outcomes were increased in the A1GDM cohort except for forceps deliveries, hyperbilirubinemia and TTN (Table). The rates of increase for each outcome were not substantially higher in the A1GDM cohort when compared to non-diabetics, except in the case of primary CD (Breslow-day $p = 0.03$).

Conclusion: In patients with A1GDM and advancing gestational age, there are increased risks for the mother and neonate when compared to non-diabetics. The rate at which these risks increase is not more rapid than in patients without diabetes, except in the case of rate of primary CD. Although expectant management does

not result in a greater overall incremental risk, delivery at 39 wks may be associated with lower rates of CD.

Table. Delivery and Neonatal Outcomes based on advancing gestational age in patients with diet controlled gestational diabetes (A1GDM)

Outcome	Gestational age at delivery in weeks				
	39 weeks N = 2,456	40 weeks N = 1,376	≥41 weeks N = 635	p-value*	OR*
Repeat CD	911 (37.1)	88 (6.4)	21 (3.3)	<0.001	1.40 (1.09,1.18)
Primary CD^	264 (17.1)	217 (16.8)	152 (24.8)	<0.001	1.26 (1.14,1.38)
Fetal distress^	103 (6.7)	104 (8.1)	70 (11.4)	<0.001	1.13 (0.99,1.29)
Presentation^	42 (2.7)	15 (1.2)	16 (2.6)	0.01	1.32 (1.13, 1.55)
FTP^	69 (4.5)	75 (5.8)	50 (8.1)	<0.001	0.84 (0.66,1.07)
Other^	50 (3.2)	23 (1.8)	16 (2.6)	0.05	1.91 (1.53,2.40)
Vaginal delivery^	1281 (82.9)	1071 (83.2)	462 (75.2)	<0.001	--
Forceps*	38 (3.0)	48 (4.5)	24 (5.2)	0.05	1.22 (1.0,1.49)
3rd or 4th degree laceration*	32 (2.5)	28 (2.6)	18 (3.9)	0.27	1.33 (1.04,1.69)
Shoulder dystocia*	19 (1.5)	24 (2.2)	14 (4.0)	0.11	2.33 (1.76, 3.10)
Brachial plexus injury	8 (0.3)	11 (0.8)	2 (0.3)	0.10	1.85 (1.17, 2.93)
Clavicular fracture	36 (1.5)	35 (2.5)	13 (2.0)	0.06	1.37 (1.09, 1.72)
Hyperbilirubinemia	56 (2.3)	25 (1.8)	8 (1.3)	0.22	0.91 (0.74,1.13)
Hypoglycemia	98 (6.7)	63 (7.4)	31 (9.0)	0.33	--
TTN	11 (0.5)	5 (0.4)	7 (1.1)	0.08	1.28 (0.85,1.93)

Data reported as n (%). *CD* Cesarean Delivery; *TTN* transient tachypnea of the newborn; *FTP* Failure to progress.
*p-value comparing A1GDM outcomes based on gestational age
^Adjusted odds ratio comparing all term A1GDM to term non-diabetic patients, OR adjusted for age, nulliparity, race and body mass index
*denotes denominator representing patients without repeat CD (n = 3,447)
*denotes denominator representing patients only with vaginal deliveries (n= 2,814)

111 | Outcomes in Prenatally Suspected Focal Placenta Accreta

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10:30 AM - 12:30 PM

Objective: Placenta Accreta Spectrum (PAS) is associated with increased maternal morbidity and mortality and is the leading cause of peripartum hysterectomy. Morbidity has been shown to correlate with PAS severity. The purpose of this study is to describe the outcomes in cases of prenatally suspected focal placenta accreta.

Study Design: This is a retrospective cohort study evaluating focal accreta cases between 2020-2024. Focal accreta was defined as less than 25 mm by the greatest dimension of invasion on magnetic resonance imaging, an established threshold for hysterectomy. Delivery and neonatal outcomes were evaluated for the entire group and then compared between patients who delivered at less than 37 weeks and at or greater than 37 weeks to evaluate optimal delivery timing. Prior to 2022, there was no standardized timing for delivery of these cases. In 2022, we standardized delivery of focal accreta to ≥37 weeks.

Results: Of 29 focal accreta cases, 14 (48%) delivered <37 weeks and 15 (52%) delivered ≥37 weeks. Twenty-one (72%) had postpartum hemorrhage (PPH), 8 (28%) received a transfusion. Twenty-one (72%) deliveries were scheduled. Six (21%) met FIGO clinical criteria for PAS. Hysterectomy was performed in 2 (7%) cases and 4 (14%) cases required oversewing of the placental bed. Pathology was negative in 25 (89%) patients. Median APGARs at 1 minute were 8 (8-8); no neonate had a pH < 7; and median birthweight was 2910g (2780-3055g). Six (21%) infants were admitted to the NICU. When comparing patients delivering <37 weeks to those delivered ≥37 weeks, there were no differences in maternal outcomes. Neonatal length of stay was longer for those delivered <37 weeks (p = 0.031) (Table).

Conclusion: Patients with prenatally suspected focal accreta had favorable delivery and neonatal outcomes. Delivery at 37 weeks can safely be considered in cases of focal placenta accreta.

Table. Maternal and Neonatal Outcomes in Cases of Focal Placental Accreta

	All deliveries N = 29	<37 weeks N = 14	≥ 37 weeks N = 15	P-value*
Delivery Outcomes				
Previa	19 (66)	11 (79)	8 (53)	0.245
Uterine incision				
Transverse	10 (34)	6 (43)	4 (27)	0.450
Vertical	19 (66)	8 (57)	11 (73)	
Hysterectomy	2 (7)	0 (0)	2 (13)	0.483
Placental bed oversewn	4 (14)	2 (14)	2 (13)	>0.999
Gynecologic Oncology involvement	11 (38)	5 (36)	6 (40)	0.812
EBL (mL)	1500 (1000-1750)	1375 (1062-1688)	1500 (1125-1625)	0.754
PPH	21 (72)	10 (71)	11 (73)	>0.999
Products transfused				
PRBCs	7 (88)	4 (100)	3 (75)	>0.999
WB	1 (12)	0 (0)	1 (25)	>0.999
Platelets	1 (12)	0 (0)	1 (25)	>0.999
Plasma	4 (50)	2 (50)	2 (50)	>0.999
Postpartum LOS >3 days	2 (7)	1 (7)	1 (7)	>0.999
Pathology				
Negative	25 (89)	13 (100)	12 (80)	>0.999
BPMF	1 (4)	0 (0)	1 (7)	
Grade 3A	1 (4)	0 (0)	1 (7)	
Grade 3E	1 (4)	0 (0)	1 (7)	
Neonatal Outcomes				
Gestational Age (weeks)	37 (33-38)	36 (33-36)	37 (37-38)	< 0.001
Birthweight (grams)	2910 (2780-3055)	2848 (2705-2911)	3027 (2862-3120)	0.067
NICU	6 (21)	4 (29)	2 (13)	0.390
CPAP/Vent	1 (3)	1 (7)	0 (0)	0.483
Neonatal LOS	4 (4-5)	4 (4-12.8)	4 (4-4)	**0.031**

Data reported as N (%), median (interquartile range), and median (range) for gestational age.
*P-value is a comparison of delivery before and after 37 weeks; *EBL* estimated blood loss; *PPH* postpartum hemorrhage (defined as >1000cc at any delivery); *WB* Whole blood; *LOS* length of service; *NICU* neonatal intensive care unit; *CPAP* continuous positive airway pressure.

112 | PPAR Gamma Involvement in Trophoblast Cell Differentiation and Placenta Development

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10:30 AM - 12:30 PM

Objective: To investigate the role of peroxisome proliferator-activated receptor gamma (PPARG) in invasive extravillous trophoblast (EVT) cell development and establishment of the uterine-placental interface.

Study Design: PPARG expression was evaluated in rat and human placentation sites at different time points using in situ hybridization. PPARG expression was assessed by RT-qPCR in human trophoblast stem (TS) cells in stem and EVT states. Human TS cell development was investigated following PPARG silencing with short hairpin RNAs. Global and specific cell lineages utilizing the Cre-LoxP system were used to investigate the physiology of PPARG at the placentation site and in the invasive trophoblast cell lineage of the rat placenta.

Results: PPARG transcripts were expressed in the EVT cell column and increased in abundance following differentiation of human TS cells to EVT cells. PPARG knockdown impaired human TS cell differentiation to EVT cells. In the rat, PPARG transcripts were localized primarily to trophoblast cells within the uterine-placental interface and the labyrinth zone. In addition, PPARG positive cells within the uterine-placental interface co-localized with cells expressing transcripts for Prl7b1, an invasive trophoblast cell marker. Global PPARG disruption in the rat resulted in prenatal lethality. Conditional disruption of PPARG in the invasive trophoblast cell lineage of the rat has been established and is under evaluation.
Conclusion: PPARG is a conserved driver of placentation and the invasive EVT cell lineage.

113 | Outcomes in Symptomatic Versus Asymptomatic Cesarean Scar Pregnancy

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10:30 AM - 12:30 PM
Objective: Aim was to examine outcomes in patients who were symptomatic at initial diagnosis of cesarean scar pregnancy (CSP), compared to those who were asymptomatic.
Study Design: This is a retrospective analysis of all patients who had a CSP at a tertiary referral academic institution from 2010-2013. We excluded patients who elected to continue the pregnancy after counseling. Symptomatic patients (vaginal bleeding, abdominal/pelvic pain) at initial CSP diagnosis, were compared to asymptomatic patients. Primary outcome was complete resolution of CSP not requiring hysterectomy. Secondary outcomes were use of minimally invasive interventions (ultrasound-guided feticide and/or transcervical balloon catheter), time to bHCG and sonographic resolution, need for secondary interventions for persistent bleeding, and other intervention-related complications (including infection, hemorrhage and blood transfusion).
Results: Of 110 patients diagnosed with CSP during the study period, 15 (13.6%) elected to continue the pregnancy and were excluded. Of the 95 patients included: 33 (34.7%) were symptomatic, 91% with vaginal bleeding and 9% with pelvic pain, whereas 62 (65.3%) were asymptomatic. Symptomatic patients were less likely to have a live CSP compared to asymptomatic (42.4% versus 66.1%, $p = 0.03$) and more likely to be of Hispanic race (66.7% versus 35.5%, $p = 0.01$). Groups were similar for sac location within the scar niche and level of color Doppler. Similarly, there was no difference between the two groups in rate of CSP resolution, complications, use of interventional therapies, and time to bHCG and sonographic resolution.
Conclusion: Patients who were symptomatic at the time of CSP diagnosis were more likely to have a failed CSP. However, no differences were seen in rate of therapeutic interventions as well as rate and time to complete resolution.

114 | Subsequent Pregnancy Outcomes in Patients with a History of Cesarean Scar Pregnancy

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10:30 AM - 12:30 PM
Objective: We aimed to report on the reproductive outcomes of patients with a history of cesarean scar pregnancy (CSP) who retained their fertility.
Study Design: A retrospective review of CSP cases treated at a tertiary academic center from 2010 to 2023. Cases treated with hysterectomy or electing pregnancy continuation leading to placenta accreta spectrum (PAS) and hysterectomy were excluded. Reproductive follow-up data was recorded for patients who retained their fertility. The primary outcome evaluated was the recurrence of CSP or PAS. Secondary outcomes included rates of live birth, postpartum hemorrhage (defined as >1L blood loss), preterm delivery, and uterine rupture.
Results: Out of 111 CSP cases identified, 92 qualified for the study. Among these, 37 patients (40.2%) had 54 subsequent pregnancies. The average maternal age was 32.9 ± 0.8 years. The average inter-pregnancy interval following the CSP was 16.6 ± 2.4 months. Elective pregnancy termination occurred in 5.5% of cases. The recurrence rate for CSP and PAS combined was 5.8%. Early pregnancy loss occurred in 18 (35.3%) subsequent pregnancies, with an overall live birth rate of 64.7%. Spontaneous preterm birth occurred in 9.6% of cases, and 29.0% experienced postpartum hemorrhage during repeat cesarean delivery. One patient (3.1%) suffered a uterine rupture at 28 weeks' gestation.
Conclusion: Patients with a history of CSP have a 5.8% risk for recurrent CSP or PAS, which underscores the need for early ultrasound assessment in these cases. The live birth rate in pregnancies after CSP is 64.7%.

115 | Intrapartum Glucose Metrics and Associated Neonatal Adverse Outcomes Among People with GDM

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10:30 AM - 12:30 PM
Objective: Hyperglycemia is a risk factor for adverse neonatal outcomes. However, the role of glycemic control during labor for the risk of adverse neonatal outcomes is not well understood among people with gestational diabetes (GDM). Therefore, we sought to compare continuous glucose monitoring (CGM) metrics between laboring GDM pregnancies complicated by adverse neonatal outcomes compared to those without complications.
Study Design: Secondary analysis of pregnant people with GDM randomized to using CGM versus capillary blood glucose (CBG) for management of GDM. We compared participants whose pregnancies were complicated by a significant neonatal outcome as defined by a composite including ≥1 of the following: hypoglycemia, hyperbilirubinemia, respiratory distress syndrome

or NICU admission to determine if there are glycemic differences during labor as characterized by CGM metrics. Pregnancy-specific glycemic range in labor was defined by 70-110, 70-120, and 70-140 mg/dL. The intrapartum period was defined starting midnight on the day of admission and until delivery time or eight hours prior to delivery. We excluded those with a scheduled cesarean and those without CGM data during labor.

Results: Of the 111 in the primary trial, 62 were included in the analyses; 62.9% underwent induction of labor (IOL) and 80.6% delivered vaginally. The cohort with adverse neonatal outcomes spent less time-in-range (TIR) and more time-above-range (TAR) compared to those with no adverse neonatal outcome, with a statistically significant difference between groups for glycemic range 70-120 mg/dL. The mean glucose for those with adverse neonatal outcomes was higher than those without (Table 1).

Conclusion: In this study, we found that patients with a composite adverse neonatal outcome spent less time in range, more time above range, with a higher mean glucose in labor than those without a composite adverse outcome. These findings help inform future evidence-based protocols for glycemic targets in labor for those with GDM, suggesting tighter glycemic control and more time spent in range may mitigate adverse neonatal outcomes.

Table 1. Association between continuous glucose monitoring parameters stratified by composite adverse neonatal outcome (neonatal hypoglycemia, hyperbilirubinemia, respiratory distress syndrome, NICU admission).

	Adverse neonatal outcome (n=21)	No adverse neonatal outcome (n=41)	P
% Time-in-range			
70-110 mg/dL	50.9 ± 24.1	70.6 ± 19.0	0.003
70-120 mg/dL	62.6 ± 23.3	80.2 ± 15.4	0.004
70-140 mg/dL	78.3 ± 23.4	88.6 ± 12.0	0.071
Time-in-range >90%			
70-110 mg/dL	0 (0.0)	4 (9.8)	0.290
70-120 mg/dL	1 (4.8)	16 (39.0)	0.006
70-140 mg/dL	7 (33.3)	26 (63.4)	0.033
% Time-above-range			
≥ 110 mg/dL	38.0 ± 24.2	21.2 ± 22.1	0.011
≥ 120 mg/dL	26.3 ± 18.5	11.6 ± 15.8	0.004
≥ 140 mg/dL	10.6 ± 10.6	3.2 ± 7.2	0.007
% Time-below-range			
<70 mg/dL	11.1 ± 24.0	8.3 ± 11.5	0.612
Mean glucose	104.0 ± 19.2	95.8 ± 13.4	0.090

p-values from two-sample t-test and Fisher's exact test

116 | Amplifying the Experience: a Qualitative Analysis of Black Birthing People'S Experiences Within a Doula Program

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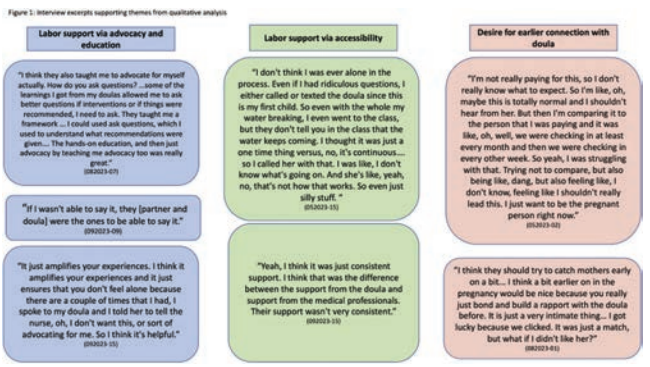
10:30 AM - 12:30 PM

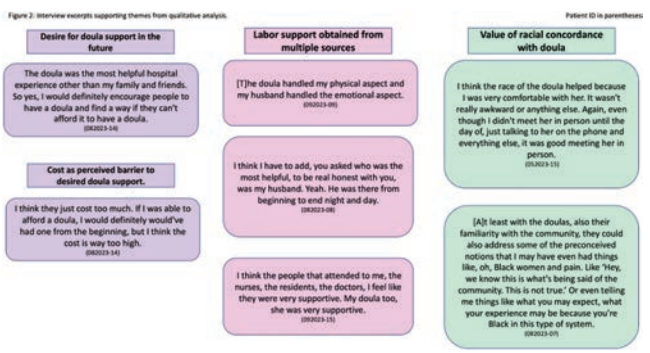
Objective: This qualitative study aimed to understand Black birthing people's support and experiences during labor after being paired with a doula through a program within an urban academic medical system.

Study Design: We recruited patients who participated in a program that pairs nulliparous self-identified Black birthing people with community doulas in the third trimester. Patients were eligible if they were >18 years old, delivered within the academic medical center within a year prior to the interview, and were successfully paired with a doula through the program. This study was exempt after IRB review. One on one semi-structured interviews (n = 10) were preformed virtually after consent was obtained. Interview questions probed general birth experience, interactions with the doulas, and role of racial concordance among doulas. Interviews were recorded and transcribed. We used a combination of deductive and inductive approaches to group coded excerpts into emergent themes.

Results: All participants where nulliparous Black birthing people. The median age was 29.5 (range 28-40) and all were privately insured. Themes that emerged were: labor support through advocacy and education, labor support through presence and accessibility, desire for earlier connection with doula, desire for doula support in the future, labor support from multiple sources, value of racial concordance with doula, and cost as perceived barrier to desired doula support. Example quotes for each theme are listed in figures 1 and 2.

Conclusion: Overall, Black birthing people paired through a system wide program had positive experiences with racially concordant doulas and identified multiple methods of labor and antenatal support from various groups in addition to their paired doula. Many desired increased labor education and contact with their doulas earlier and more frequently, and the rare negative experiences were related to ability to develop a patient-doula relationship. Programs to increase access to doulas should aim to optimize the amount of covered doula meetings and quality of doula care.





117 | Evaluation of Evidence-Based, Plain Language Marijuana Health Education

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10:30 AM - 12:30 PM

Objective: To assess the impact of patient education on perceived safety of marijuana use in pregnancy and breastfeeding, intended future marijuana use, and perception of stigmatizing language.

Study Design: An evidence-based, plain language one-page handout was created to educate patients regarding marijuana use in pregnancy. Patient feedback was gathered to determine if the material was perceived as helpful or stigmatizing. Patients were identified through self-reported use or a positive urine test in pregnancy. Pre- and post-intervention surveys gauged perceived safety of marijuana use during pregnancy and breastfeeding. Perceived stigmatizing language was assessed post-intervention. Demographics were collected. Wilcoxon signed-rank tests assessed pre- and post-intervention perceptions of marijuana use safety for significant differences.

Results: Twenty-two patients consented into the study and completed the intervention and surveys. After the intervention, a significantly higher percentage of patients disagreed that fetal exposure to marijuana was safe (Table 1). However, perceptions of maternal risks and breastfeeding success with marijuana use did not change significantly. Post-intervention, 50.0% of patients indicated less likelihood of using marijuana in future pregnancies and 71.4% felt the education made them feel the provider was "on their team." The majority (90.9%) found the education helpful and 72.7% learned something new (Figure 1).

Conclusion: Though statistically significant differences were only noted around perceptions of fetal risk and marijuana use, consideration for decreased marijuana use in future pregnancies and feelings of destigmatization were promising. It seems possible to provide non-stigmatizing education addressing potential dangers of marijuana use to maternal and infant health, which is becoming more important as providers address higher self-reported marijuana use during pregnancy in our communities.

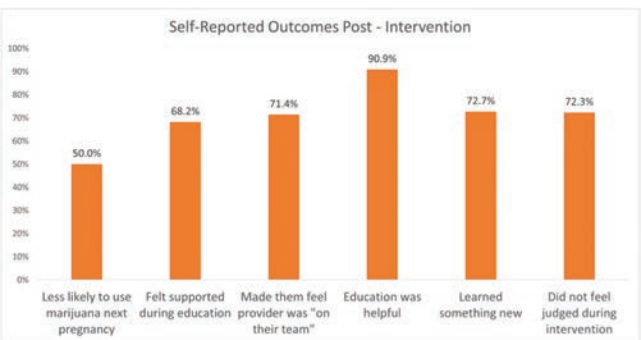

Table 1. Survey responses pre- and post-marijuana health education intervention regarding maternal risk, fetal risk, and breastfeeding

	Pre-Intervention Median (IQR)[A] (Percent Strongly Disagree/Disagree)	Post-Intervention Median (IQR)[A] (Percent Strongly Disagree/Disagree)	p-value[B]
Using marijuana while pregnant....			
... is safe for my health.	4.00 (3.75, 5.00) (18.2%)	4.50 (2.00, 5.00) (27.3%)	.443
... is safe for my unborn baby's health.	4.00 (3.00, 4.00) (18.2%)	3.75 (2.00, 4.00) (27.3%)	**.026**
...poses no threats to my unborn baby's long-term health.	4.00 (3.00, 5.00) (13.6%)	3.00 (2.00, 4.00) (36.4%)	**.013**
Using marijuana while breastfeeding....			
...has no effect on my breastmilk supply.	2.50 (2.00, 4.25) (50.0%)	2.00 (2.00, 4.00) (54.5%)	.208
...is safe for my baby's health.	3.00 (2.00, 4.25) (27.3%)	3.00 (2.00, 4.00) (40.9%)	.258

[A] Six-point Likert scale answer choices were as follows: (1) strongly disagree, (2) disagree, (3) slightly disagree, (4) slightly agree, (5) agree, (6) strongly agree.

[B] Differences in survey answers pre vs. post intervention were assessed using Wilcoxon signed-rank tests with an alpha <0.05 for significance.

118 | Technical and Maternal Factors Associated with Fetal Anatomic Survey Completion in Higher Bmi Groups

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10:30 AM - 12:30 PM

Objective: To describe the proportion of completed fetal anatomic survey (FAS) at first attempt in patients with Body Mass Index (BMI) ≥40 kg/m^2, and to identify maternal and sonographic factors affecting FAS completion rates.

Study Design: A retrospective single academic center study that included pregnant individuals with singleton gestation, presenting for a detailed FAS in 2019-2023 between 17 and 25 weeks' gestation and are ^{3}18yo with BMI^{3}40 kg/m^2. Maternal and sonographic characteristics were compared between three BMI groups, 40-45.9, 46-49.9, and ≥50 kg/m^2, using adjusted and unadjusted analyses.

Results: A total of 574 patients met inclusion criteria with 53% at BMI 40-45.9, 26% at BMI 46-49.9, and 21% at BMI ≥50. The groups did not differ in gestational age at detailed FAS, placental location, fetal position, machine type, duration of scan, time of day and sonographer experience (Table 1). Completion of the anatomy at first attempt for all BMI groups was less than 50%, with significant reduction as BMI category increased ($p < 0.001$ for all comparisons). The number of suboptimal anatomic systems did not differ between BMI groups, with the heart being the most common suboptimal system followed by spine and extremities (Table 1). The rate of fetal anomalies was 2%. After controlling for gestational age at anatomic survey, sonographer experience, placental location, fetal position, type of ultrasound machine, and time of day the scan was done, higher BMI remained significantly associated with lower rates of anatomy completion (aOR of 0.57, 95% CI 0.37-0.88 for BMI 45-49.9, and aOR of 0.34, 95% CI 0.20-0.56 for BMI≥50, both compared with BMI 40-44.9).

Conclusion: Anatomy scan completion rates were low among individuals with BMI ≥40 kg/m2 and progressively decreased among BMI 45-49 and BMI ≥50. This could lead to potential delays in diagnosing fetal anomalies, necessitating alternative strategies such as advanced imaging technology, specialized

training, pre-scan preparation and patient education, to ensure comprehensive prenatal care for individuals with higher BMIs.

Table 1: Demographic and Sonographic Characteristics

	BMI 40.0-45.9 kg/m² n=305	BMI 46.0-49.9 kg/m² n=151	BMI ≥50.0 kg/m² n=118	P value
Demographic characteristics				
Age (y)	32.26 ± 5.0	31.43 ± 4.4	31.54 ± 4.7	0.04
Gestational age at the anatomic survey (weeks)	20.65 ± 2.8	20.81 ± 3.2	20.70 ±2.5	0.59
Nulliparous, n (%)	65 (21.3)	45 (29.8)	26 (22.0)	0.07
Race/Ethnicity, n (%)				0.01
Black	111 (36.3)	56 (37.1)	69 (58.4)	
Hispanic	22 (7.2)	8 (5.3)	3 (2.5)	
White	161 (52.7)	77 (50.1)	40 (33.9)	
Other	10 (6.6)	10 (6.6)	6 (5.1)	
Pre pregnancy BMI (kg/m²)	41.73 ± 2.6	46.59 ± 2.2	54.84 ± 7.4	<0.001
BMI at anatomy scan (kg/m²)	42.35 ± 1.4	47.19 ± 1.6	55.91 ± 7.6	<0.001
Sonographic characteristics				
Placenta, n (%)				0.77
Anterior	139 (45.4)	62 (41.1)	44 (37.3)	
Fundal	17 (5.5)	10 (6.6)	4 (3.4)	
Posterior	140 (45.9)	74 (49.0)	65 (55.1)	
Other	9 (2.9)	5 (3.3)	5 (4.2)	
Fetal position				0.69
Breech	76 (24.9)	26 (17.2)	30 (25.4)	
Cephalic	145 (47.5)	80 (52.9)	54 (45.7)	
Transverse	19 (6.2)	7 (4.6)	7 (5.9)	
Unstable lie	65 (21.3)	38 (25.1)	27 (22.8)	
Sonographer years of experience	22.3 ± 12.3	22.7 ± 12.1	21.9 ± 12.2	0.67
Machine unit				0.56
GE	203 (66.6)	101 (66.9)	73 (61.9)	
Philips	102 (33.4)	50 (33.1)	45 (38.1)	
Time of scan				0.49
AM	149 (48.8)	83 (54.9)	65 (55.1)	
PM	156 (51.2)	68 (45.1)	53 (44.9)	
Duration of scan (min)	42 ± 13	42 ± 14	39 ± 14	0.25
Completed Survey at first attempt, n(%)	133 (43.6)	48 (31.8)	26 (22.0)	**<0.001**
Proportion of anatomy completion by gestational age, n(%)				
17	0/2 (0)	0/1 (0)	0/1 (0)	
18	5/23 (21.7)	2/11 (18.1)	0/9 (0)	0.59
19	47/104 (45.2)	14/46 (30.4)	7/36 (19.4)	0.03
20	66/120 (55.0)	24/64 (37.5)	15/48 (31.2)	0.31
21	7/15 (46.7)	7/12 (58.1)	3/11 (27.2)	0.22
22	5/10 (50.0)	2/3 (66.7)	0/4 (0)	0.41
23	0/5 (0)	1/2 (50)	-	0.09
24	1/4 (25)	1/1 (100)	1/1 (100)	0.78
25	2/3 (66.7)	-	0/1 (0)	0.25
Gestational age at repeat scan to complete the anatomic survey (weeks)	24.8 ± 4.1	24.6 ± 4.0	24.9 ± 3.5	0.21
Completed survey at first re-scan, n(%)	107 (64.0)	68 (68.0)	54 (62.8)	0.83
Number of additional scans needed to complete anatomy	1 (1,2)	1 (1,2)	2 (1,3)	0.37
Anatomy never completed, n (%)	15 (4.9)	8 (5.3)	7 (5.9)	0.99
Number of suboptimal systems	4 (2,5)	4 (3,5)	4 (3,5)	0.91
Suboptimal structures, n (%):				
Head	43 (25.0)	25 (24.2)	34 (36.7)	
Face	54 (31.4)	25 (24.2)	20 (21.7)	
Heart	161 (93.6)	79 (76.7)	78 (84.7)	
Abdomen	38 (22.1)	22 (21.3)	14 (15.2)	
Spine	70 (40.1)	41 (39.8)	47 (51.1)	
Extremities	98 (56.9)	35 (33.9)	42 (45.6)	
Genitalia	10 (17.2)	7 (6.7)	6 (6.5)	
Number of fetal anomalies identified, n (%)	9 (2.9)	3 (1.9)	1 (0.8)	0.41

Table 2: Association between BMI and completion of the anatomic survey at first attempt

BMI category	OR 95% CI	aOR* 95% CI
40-44.9 (kg/m²)	ref	ref
45-49.9 (kg/m²)	**0.60 (0.39-0.91)**	**0.57 (0.37-0.88)**
≥50 (kg/m²)	**0.36 (0.22-0.59)**	**0.34 (0.20-0.56)**

*Adjusted for ultrasound unit type, time of day for scan, gestational age, sonographer experience, placental and fetal positions.

119 | Maternal Outcomes in the Postpartum Period by Timing of Diagnosis of Hypertensive Disorder of Pregnancy

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10:30 AM - 12:30 PM

Objective: We sought to assess whether intrapartum or new-onset postpartum hypertensive disorders of pregnancy (HDP) are associated with similar maternal outcomes as HDP with antepartum onset.

Study Design: This cohort study uses data from our institution's remote blood pressure (BP) management program. Included individuals delivered between 9/2019-4/2024, were enrolled in our remote monitoring program at the time of delivery and had no pre-pregnancy HTN. We compared outpatient BP measures, need for initiation of post-discharge anti-hypertensive medications and care utilization outcomes between individuals with antepartum HDP and those with intrapartum or postpartum HDP first diagnosed during the delivery hospitalization.

Results: Of 7071 individuals with HDP, 1045 (15%) had new-onset intrapartum or postpartum HDP and 6026 (85%) had antepartum HDP. Compared to those with antepartum HDP, individuals with intrapartum or postpartum HDP had similar rates of severe HTN after hospital discharge (13.9% vs. 13.7%; $p = 0.87$). Overall, individuals with antepartum HDP were more likely to require anti-hypertensive medications at any point postpartum (46.5% vs. 32.7%; $p < 0.001$) compared with those with intrapartum or postpartum HDP. However, outpatient initiation of anti-hypertensive medications was equally likely across groups. Rates of ER visits (12.7% vs. 11.4%; $p = 0.22$) and postpartum readmissions (5.1% vs. 5.1%; $p = 0.98$) were similar among individuals with intrapartum and postpartum HDP compared to those with antepartum HDP, respectively.

Conclusion: Hypertension with onset intrapartum or postpartum is often dismissed or attributed to other etiologies. Our data suggest that individuals with intrapartum and postpartum-onset HDP have similar rates of severe HTN, post-discharge medication initiation and care utilization in the postpartum period as individuals with antepartum HDP and highlights the importance of ongoing BP monitoring after hospital discharge in these individuals.

Table. Demographic and obstetric characteristics by timing of onset of hypertensive disorder of pregnancy (HDP).

	Antepartum HDP n=6026	Intra- or post-partum HDP n=1045	p value
Age, years	29.9 (5.5)	30.4 (5.8)	0.01
Race			
Non-Hispanic White	4734 (78.6%)	729 (69.8%)	
Non-Hispanic Black	926 (15.4%)	246 (23.5%)	<0.01
Asian	240 (4.0%)	40 (3.8%)	
Other	126 (2.1%)	30 (2.9%)	
Early pregnancy BMI (kg/m²), median [IQR]	28.4 [24.1, 34.3]	27.7 [23.2, 33.5]	0.005
Gestational weight gain (lbs.), median [IQR]	31.0 [20.6, 41.4]	29.8 [19.3, 38.6]	0.001
Insurance type			
Commercial	4016 (66.6%)	598 (57.2%)	
Public	1914 (31.8%)	428 (41.0%)	<0.01
Other	96 (1.6%)	19 (1.8%)	
Gestational diabetes	599 (9.9%)	104 (10.0%)	0.99
Preterm birth	1202 (19.9%)	142 (13.6%)	<0.001
Infant birthweight (grams)	3048.5 (661.4)	3225.9 (617.1)	<0.001
Cesarean section	2402 (39.9%)	401 (38.4%)	0.36
Maternal length of stay postpartum (days), median [IQR]	2.2 [1.8, 3.0]	2.1 [1.7, 2.7]	<0.001
Maximum inpatient postpartum SBP (mmHg)	151 (18)	148 (17)	<0.001
Maximum inpatient postpartum DBP (mmHg)	100 (15)	98 (14)	0.004
Maximum outpatient postpartum SBP (mmHg)	143 (13)	142 (15)	<0.001
Maximum outpatient postpartum DBP (mmHg)	94 (9)	93 (11)	0.004

Data are mean (SD) unless otherwise specified.
BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure

Table. Clinical outcomes by timing of onset of hypertensive disorder of pregnancy (HDP).

	Antepartum HDP n=6026	Intra- or post-partum HDP n=1045	p value
Any anti-hypertensive medication	2799 (46.5%)	342 (32.7%)	
Inpatient initiation	1422 (23.6%)	46 (4.4%)	<0.001
Outpatient initiation post-discharge	1377 (22.9%)	296 (28.4%)	
Severe hypertension after hospital discharge (home BP ≥ 160/110 mmHg)	836 (13.9%)	143 (13.7%)	0.87
Postpartum Emergency Room visit	688 (11.4%)	133 (12.7%)	0.22
Postpartum hospital readmission	307 (5.1%)	53 (5.1%)	0.98

BP: blood pressure

120 | Understanding and Addressing Antenatal Depression Management in the High Risk Obstetrics Care Setting

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10:30 AM - 12:30 PM

Objective: Maternal fetal medicine specialists are uniquely poised to manage mental health in high-risk pregnancies given the compounded effects of depression on maternal and fetal outcomes. However, without supportive systems in place, effective care is difficult to achieve. We characterized depression screening and management practices to inform policy change for perinatal depression care.

Study Design: Retrospective cohort study evaluating pregnancy episodes from a single academic high-risk obstetrics clinic between 1/2021-12/2023. Primary outcome was percentage of patients screened for depression during pregnancy. Secondary outcomes were frequencies and categories of interventions provided for patients with a positive PHQ-9(≥10) screen. Frequencies and percentages calculated to describe patient characteristics and management for pregnancy episodes. All analyses were performed using IBM SPSS Statistics (Version 27).

Results: 5,313 patients met initial study criteria; only 1,421(26.7%) patients had any PHQ-9 screen during pregnancy; of 1,421, 74(5.2%) patients had positive screenings, for a total of 76 unique pregnancy episodes (Figure 1). Of these 76 episodes, 81.6%(n = 62) had a pre-existing mental health diagnosis, including 27.6%(n = 21) with a history of pregnancy-related mood disorder (Table 1). Interventions were provided in 65.8%(n = 50) of pregnancies. Antidepressants were started in 14.5%(n = 11) of pregnancies; of that group, 54.5%(n = 6) and 90.9%(n = 10) did not have a validated screening completed before starting medication and during follow-up, respectively.

Conclusion: Current practice suggests gaps in utilization of validated screening tools to manage depression during pregnancy, which does not reflect standard of care outlined by the American College of Obstetricians and Gynecologists (ACOG). Our study revealed a concerning low rate of depression screening and suboptimal practices regarding antidepressant use in this high-risk population. An evidence-based collaborative care model has emerged as a potential solution to address gaps and align current practice with ACOG guidelines.

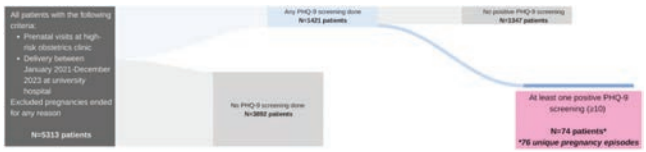

Table 1: Patient Characteristics Prior, During, and After Pregnancy

Patient History	*n*	*%*
Pre-existing mental health diagnoses	62/76	81.6%
None	14/76	18.4%
Depression	51/76	67.1%
Anxiety	50/76	65.8%
Bipolar Disorder	11/76	14.5%
Post-traumatic stress disorder	16/76	21.1%
Obsessive Compulsive Disorder	2/76	2.6%
Substance Use Disorder	7/76	9.2%
ADHD	13/76	17.1%
Borderline Personality Disorder	2/76	2.6%
History of pregnancy related mood disorder	21/76	27.6%
History of psychiatric hospitalization	11/76	14.5%
History of interpersonal violence	22/76	28.9%
Documented social drivers of health		
None	48/76	63.2%
Financial	20/76	26.3%
Housing/utilities	5/76	6.6%
Transportation	3/76	3.9%
Food	2/76	2.6%
Not documented	4/76	5.3%
Prenatal Care		
Limited prenatal care (<5 total prenatal visits or entry to care >20 weeks' gestation)	6/76	7.9%
Transferred to MFM from other prenatal care	17/76	22.4%
Labor & Delivery		
Insurance at delivery		
None or self-pay	2/76	2.6%
Medicaid	55/76	72.4%
Medicare	1/76	1.3%
Private	23/76	30.3%
Mode of delivery		
Vaginal	46/76	60.5%
Cesarean section	30/76	39.5%
Delivery complications (any)	42/76	55.3%
Premature delivery <37 weeks	16/76	21.1%
Postpartum Care		
Postpartum visit attendance		
Yes	64/76	84.2%
Positive EPDS	33/64	51.6%
Non-positive EPDS	27/64	42.2%
Done but score not reported	4/64	6.3%
No	12/76	15.8%

121 | Impact of Obesity Class on Severe Maternal Morbidity in Pregnancies with Postpartum Hemorrhage

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10:30 AM - 12:30 PM

Objective: Prior studies have reported a need for more doses of uterotonic agents when managing postpartum hemorrhage in patients with obesity. We sought to evaluate the association between obesity severity on postpartum hemorrhage interventions and associated severe maternal morbidity (SMM).

Study Design: We conducted a retrospective cohort study including all singleton gestations among women who delivered at a safety net quaternary care center from January 2019-December 2021. Medical charts were reviewed for clinical and sociodemographic data. Patients with multiple gestation or incomplete data

were excluded. Obstetric hemorrhage was defined as quantitative blood loss ≥1000 mL in vaginal or cesarean deliveries. CDC severe morbidity indicators and nonsurgical and surgical hemorrhage interventions were assessed. There were three comparative groups based on prepregnancy BMI: BMI ≤29kg/m^2 (Group 1), 30-39 kg/m^2 (Group 2), and ≥ 40kg/m^2 (Group 3). The data were analyzed using chi-square, student's t-test, Kruskal-Wallis, and logistic regression where appropriate. $p < 0.05$ was significant.

Results: During the study period there were 18,937 deliveries and 393 met criteria for inclusion in this analysis. Within the study cohort, 57.0% (n = 224) were in Group 1, 28.0% (n = 111) in Group 2, and 14.8% (n = 58) in Group 3. Patients in each group were similar in demographic characteristics but were more likely to have hypertensive disease (Table 1). After controlling for confounding variables, obesity class (OR. 0.7[95% CI 0.5-1.0]) was not associated with an increased odds of SMM. Higher admission hemoglobin (OR 0 .7 [95%CI .65-.9] was protective against SMM. In contrast, preterm delivery (OR 2.3 [95%CI 1.3-4.4] and number of hemorrhage risk factors (OR1.5 [95%CI 1.2-1.9]) were associated with a higher odds of SMM.

Conclusion: In this cohort of patients managed with a standardized hemorrhage management protocol, obesity severity was not associated with severe maternal morbidity.

Table 1: Patient Demographics by Obesity Group

	Group 1 BMI ≤29kg/m^2 (N=224)	Group 2 BMI 30-39 kg/m^2 (N=111)	Group 3 BMI ≥ 40kg/m^2 (N=58)	P value
Ethnicity				.316
Hispanic	77 (34.4)	46 (41.4)	18 (33.3)	
Non-Hispanic	147 (65.6)	65 (58.6)	30 (66.7)	
Hypertensive disease	18 (8.0)	25 (22.5)	22 (37.9)	<.001
Diabetes	9 (4.0)	7 (6.3)	7 (12.1)	.065
Preterm Delivery	35 (15.6)	21 (18.9)	8 (13.8)	.643
Mode of Delivery				.073
Vaginal	63 (28.1)	26 (23.4)	8 (13.8)	
Cesarean	161 (71.9)	111 (76.6)	50 (86.2)	

122 | Reexamining a Paradigm of Maternal Syphilis Management when Fetal Ultrasound Findings are Present

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10:30 AM - 12:30 PM

Objective: To characterize pregnancies with abnormal ultrasound findings of congenital syphilis and compare management and outcomes among pregnancies with and without ultrasound findings following current management protocols.

Study Design: Retrospective chart review of maternal syphilis cases diagnosed after 20 weeks from 2021 through 2023 at a large public hospital with uniform management of maternal syphilis, including 24 hours of fetal monitoring following initial benzathine penicillin dose if abnormal ultrasound was documented. A detailed fetal evaluation for congenital syphilis included assessment of placentomegaly, polyhydramnios, hepatomegaly, ascites, and elevated MCA systolic velocity. We compared demographics, syphilis stage, RPR titers, delivery outcomes, and neonatal outcomes among individuals with and without an abnormal detailed ultrasound prior to initiation of treatment.

Results: 97 individuals diagnosed after 20 weeks had a detailed ultrasound for congenital syphilis prior to treatment. Of those, 43 (44%) had abnormal findings, most commonly placentomegaly (63%) or hepatomegaly (53%). Syphilis stage and RPR titer were not associated with abnormal findings. Substance use disorder was prevalent in both groups. Consistent with our practice, individuals with abnormal findings were more likely to have received treatment with fetal monitoring on L&D. Despite being more likely to have monitoring, gestational age at delivery and cesarean rates were similar in both groups. There were no cases of stillbirth. Neonatal outcomes, including NICU admission and syphilis treatment, were not significantly different.

Conclusion: Delivery for fetal indication during maternal syphilis treatment remains a rare event, even in the setting of abnormal sonographic findings. Even in high resource settings, the added value of detailed ultrasound or prolonged fetal monitoring may not outweigh the benefit of immediate treatment initiation in pregnancy.

Table 1: **Demographics and Clinical Characteristics of Maternal Syphilis Cases**

Demographics	*Abnormal US Findings (n =43)*	*Normal US Findings (n=54)*	*P-value*
Prenatal care visits (#)	7 (3-8)	7 (4-10)	0.37
GA at 1st Visit (weeks)	29 (22.5-32.5)	27 (22.5-31)	0.35
Stage of Syphilis			0.45
Early latent	8 (19)	7 (13)	
Latent unknown	35 (81)	47 (87)	
RPR titer			0.25
<1:8	15 (35)	14 (26)	
>1:8	18 (42)	19 (35)	
NR	10 (23)	21 (39)	
Substance Use Disorder	15 (35)	10 (19)	0.07
EGA at RPR	29.3 (26.4-33)	28.4 (24.2-30.7)	0.13
EGA at delivery	39 (38-39)	39 (38-40)	0.12
EGA <37 weeks	7 (16)	3 (6)	0.10
Cesarean delivery	17 (40)	25 (46)	0.50
Cesarean for fetal indication	0 (0)	7 (13)	0.02
Location of Bicillin #1			<0.001
L&D	34 (79)	11 (20)	
Clinic	9 (21)	42 (78)	
Other	0 (0)	1 (2)	
Adequate treatment			0.45
<30 days prior to delivery	15 (35)	15 (28)	
>30 days prior to delivery	28 (65)	39 (72)	
Neonatal Outcomes			
Birthweight (grams)	3065 (2776-3445)	3260 (2892-3440)	0.36
Birthweight <2000 grams	1 (2)	2 (4)	>0.99
SGA	4 (9)	5 (9)	>0.99
5-minute Apgar <4	0 (0)	2 (4)	0.50
Cord pH <7	5 (12)	1 (2)	>0.99
NICU admission	17 (40)	19 (35)	0.61
Neonatal LOS	11 (4-11)	5 (3-11)	0.29
Neonatal Syphilis treatment			0.31
Bicillin IM x 1 dose	19 (44)	31 (56)	
IV Penicillin x10 days	24 (56)	24 (44)	

Data reported at N (%), median (interquartile range), and mean (SD) as appropriate

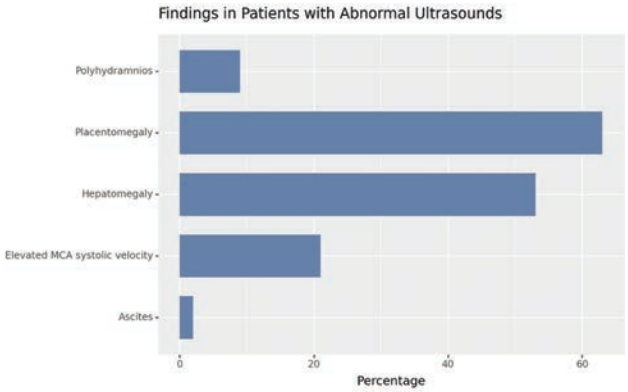

Figure 1: Frequency of ultrasound findings suggestive of congenital syphilis among pregnancies diagnosed after 20 weeks of gestation. MCA, Middle cerebral artery. Elevated MCM systolic velocity defined as MCA systolic velocity (cm/s) >1.5 multiple of the median (MoM) for gestational age.

123 | Outcomes Associated with Subsequent Diagnosis of Gestational Diabetes Following a Pregnancy Without Gestational Diabetes

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10:30 AM - 12:30 PM

Objective: Gestational diabetes (GDM) affects more than 200,000 people annually in the U.S., with prevalence continuing to rise. GDM is associated with adverse perinatal outcomes. We sought to assess how a new diagnosis of GDM after a pregnancy without GDM impacts perinatal outcomes.

Study Design: This was a retrospective cohort study of pregnant persons in California between 2008-2020 with two births that were both singleton, non-anomalous, gestational ages 23-42 weeks. Included persons did not have pre-existing or gestational diabetes during an index pregnancy. We assessed perinatal outcomes associated with development of GDM in a subsequent pregnancy compared to those who did not develop GDM. Statistical analyses were performed utilizing chi squared and multivariable logistic regression with a p-value of 0.05.

Results: There were 849,908 people that met inclusion criteria, of which 58,403 (6.9%) had GDM in a subsequent pregnancy. New GDM in a subsequent pregnancy was associated with increased rates of hypertensive disorder (4.8% vs 10.5%, $p < 0.001$), preterm delivery < 37 weeks (5.4% vs 7.8%, $p < 0.001$), maternal ICU admission (0.07% vs 0.13%, $p < 0.001$) and severe maternal morbidity (0.9% vs 1.2%, $p < 0.001$). Cesarean delivery was higher among those that had no history of cesarean delivery (7.2% vs 11.5%, $p < 0.001$) and there were lower rates of operative vaginal delivery (3.9% vs 3.6%, $p = 0.009$). Neonatal outcomes were also worse with GDM in the subsequent pregnancy, including macrosomia (10.5% vs 12.3%, $p < 0.001$), APGAR < 7 at 5 minutes (0.6% vs 0.7%, $p < 0.001$), neonatal ICU admission (8.1% vs 9.2%, $p < 0.001$), and respiratory distress syndrome (0.8% vs 1.2%, $p < 0.001$).

Conclusion: We found that GDM diagnosis in a subsequent pregnancy without prior GDM is associated with a higher rate of adverse outcomes. Our findings impact inter-pregnancy diabetes prevention, affect perinatal counseling, and clarify focus for maternal intervention for those with new GDM. Future studies should assess whether prevention of the interval development of GDM among a population without a prior diagnosis may improve pregnancy outcomes.

Table 1. Outcomes of pregnant people with gestational diabetes in a subsequent pregnancy

	No GDM N=791,505	GDM N=58,403	p	aOR (95% CI)*
Hypertensive disorder	37,784 (4.8%)	6,107 (10.5%)	<0.001	1.78 (1.72-1.84)
Preterm delivery				
<37 weeks	42,811 (5.4%)	4,579 (7.8%)	<0.001	1.47 (1.42-1.52)
<32 weeks	3,646 (0.5%)	313 (0.5%)	0.010	1.09 (0.97-1.24)
Cesarean delivery (CD)				
No history of CD	41,701 (7.2%)	4,536 (11.5%)	<0.001	1.44 (1.39-1.49)
History of CD	186,722 (89.5%)	17,290 (90.7%)	<0.001	1.01 (0.95-1.06)
Third- or fourth-degree perineal laceration**	6,215 (1.1%)	459 (1.3%)	0.008	1.06 (0.96-1.17)
Operative vaginal delivery**	22,031 (3.9%)	1,332 (3.6%)	0.009	0.89 (0.84-0.94)
Maternal ICU admission	583 (0.07%)	77 (0.13%)	<0.001	1.51 (1.18-1.94)
Severe maternal morbidity	7,213 (0.9%)	707 (1.2%)	<0.001	1.15 (1.06-1.25)
Macrosomia (≥4000 grams)	82,849 (10.5%)	7,201 (12.3%)	<0.001	0.98 (0.96-1.01)
APGAR <7 at 5 minutes	4,768 (0.6%)	432 (0.7%)	<0.001	1.15 (1.04-1.28)
Neonatal ICU admission	64,126 (8.1%)	5,399 (9.2%)	<0.001	1.18 (1.14-1.22)
Respiratory distress syndrome	6,514 (0.8%)	706 (1.2%)	<0.001	1.38 (1.27-1.50)
Stillbirth***	188 (0.1%)	12 (0.12)	0.726	1.04 (0.57-1.88)
Neonatal death	637 (0.1%)	46 (0.1%)	0.888	1.05 (0.76-1.44)
Infant death	1,430 (0.2%)	90 (0.2%)	0.143	0.90 (0.72-1.13)

GDM, gestational diabetes; aOR, adjusted odds ratio; CI, confidence interval; ICU, intensive care unit
**Multivariable analyses adjusted for race/ethnicity, age, educational attainment, body mass index, insurance type, parity, prenatal care attendance, chronic hypertension, preterm delivery, mode of delivery, history of cesarean delivery, difference in BMI between pregnancies, macrosomia in the index pregnancy, hypertensive disorder in the index pregnancy*
***Just among vaginal deliveries*
****Numbers from 2016-2020 as stillbirth data unavailable prior*

124 | Outcomes Among Low-Risk Term Multiparous Births in California Pre- and Post-Arrive Trial Publication

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10:30 AM - 12:30 PM

Objective: Following publication of the ARRIVE trial, term pregnancy management has changed for all patients. Although the ARRIVE trial included only nulliparous patients, its results may have been extrapolated to multiparous patients. Therefore, we assessed the differences in obstetric management and outcomes pre- and post-ARRIVE trial publication among multiparous patients who would have otherwise fit study criteria.

Study Design: This was a retrospective cohort study of singleton, non-anomalous, low-risk multiparous patients between 39-42 weeks of gestation in California. We excluded patients with a prior cesarean delivery, chronic hypertension, diabetes, breech presentation, advanced maternal age, oligohydramnios, polyhydramnios, and placental conditions requiring cesarean delivery. The pre- and post-ARRIVE trial publication cohorts were two years before and after 2018, 2016-2017 and 2019-2020, respectively. We assessed utilization of induction of labor and clinically relevant maternal and neonatal outcomes in the overall cohort, then stratified by week of gestation. Chi squared and multivariable logistic regression were used for statistical analyses.

Results: There were 149,214 births in 2016-2017 and 118,653 births in 2019-2020 that met our inclusion criteria. In the post-ARRIVE trial publication time period, induction of labor increased (24.2% vs. 29.5%, $p < 0.001$) and cesarean deliveries decreased (5.2% vs. 4.9%, $p < 0.001$). There were lower rates of NICU admission (7.3% vs. 6.3%, $p < 0.001$) and respiratory distress syndrome (0.25% vs. 0.21%, $p = 0.018$). The adjusted odds of stillbirth were significantly lower at 39 weeks of gestation (aOR 0.52, 95% CI 0.48-0.96).

Conclusion: In this study, we found increased utilization of induction of labor and decreased rates of cesarean delivery, NICU admission, and respiratory distress syndrome pre- and post-publication of the ARRIVE trial. There was also a reduction in stillbirth at 39 weeks' gestation. These results demonstrate that

similar to nulliparas, a trend of increased delivery at 39 and 40 weeks' gestation may improve perinatal outcomes in multiparas.

Table 1. Perinatal outcomes among low-risk multiparous patients pre- and post-ARRIVE trial publication.

	2016-2017 (n=149,214)	2019-2020 (n=118,653)	p	aOR (95% CI)*
Overall cohort				
Induction of labor	24.2%	29.5%	<0.001	1.30 (1.28-1.32)
Cesarean delivery	5.2%	4.9%	<0.001	0.91 (0.88-0.95)
NICU admission	7.3%	6.3%	<0.001	0.85 (0.82-0.87)
RDS	0.25%	0.21%	0.018	0.79 (0.67-0.94)
Stillbirth	0.06%	0.05%	0.051	0.67 (0.48-0.96)
39 weeks				
Induction of labor	20.2%	26.2%	<0.001	1.39 (1.35-1.42)
Cesarean delivery	5.6%	5.1%	<0.001	0.88 (0.84-0.93)
NICU admission	7.4%	6.2%	<0.001	0.83 (0.80-0.87)
RDS	0.25%	0.18%	0.004	0.70 (0.55-0.89)
Stillbirth	0.07%	0.04%	0.050	0.52 (0.31-0.87)
40 weeks				
Induction of labor	23.2%	28.7%	<0.001	1.32 (1.28-1.36)
Cesarean delivery	4.4%	4.2%	0.099	0.93 (0.88-0.99)
NICU admission	7.5%	6.6%	<0.001	0.86 (0.82-0.90)
RDS	0.25%	0.24%	0.721	0.89 (0.69-1.16)
Stillbirth	0.06%	0.06%	0.866	0.97 (0.56-1.66)
41 weeks				
Induction of labor	48.7%	53.0%	<0.001	1.18 (1.12-1.24)
Cesarean delivery	6.1%	6.2%	0.891	0.97 (0.87-1.08)
NICU admission	6.2%	5.3%	0.002	0.83 (0.74-0.93)
RDS	0.28%	0.27%	0.843	0.95 (0.57-1.58)
Stillbirth	-	-	-	-

Adjusted odds ratio, aOR; confidence interval, CI; neonatal intensive care unit, NICU; respiratory distress syndrome, RDS
**Analyses adjusted for race/ethnicity, age, body mass index, insurance type, prenatal care attendance*
- Stillbirth n at 41 weeks too small for calculations

125 | Development of Physiologically Based Pharmacokinetics Model of Aspirin in Pregnancy

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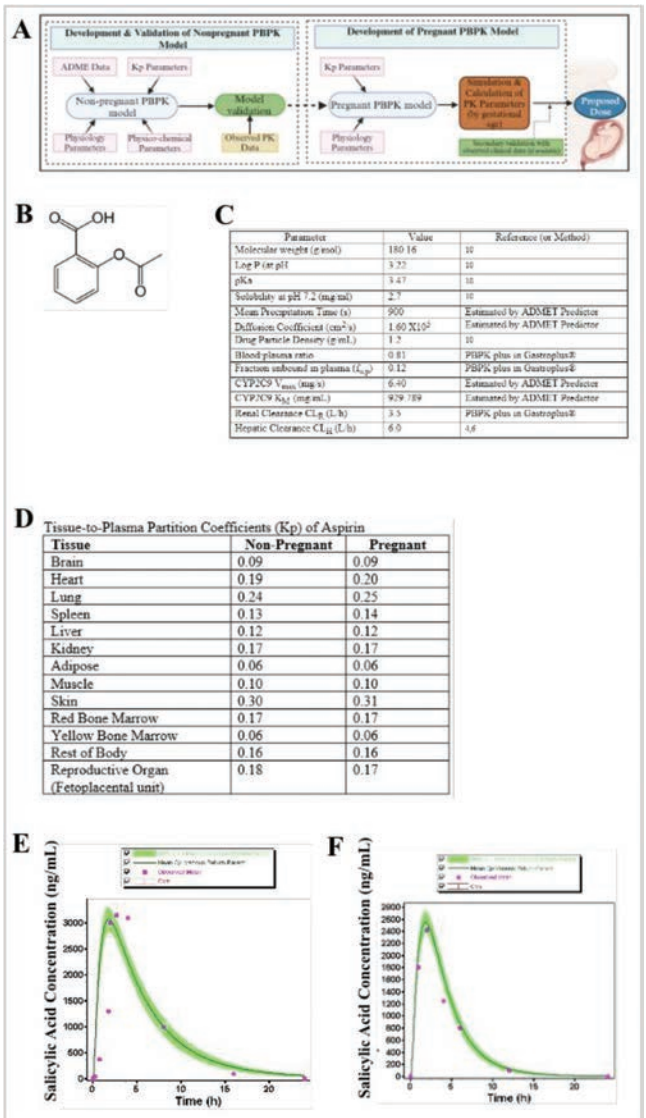
10:30 AM - 12:30 PM

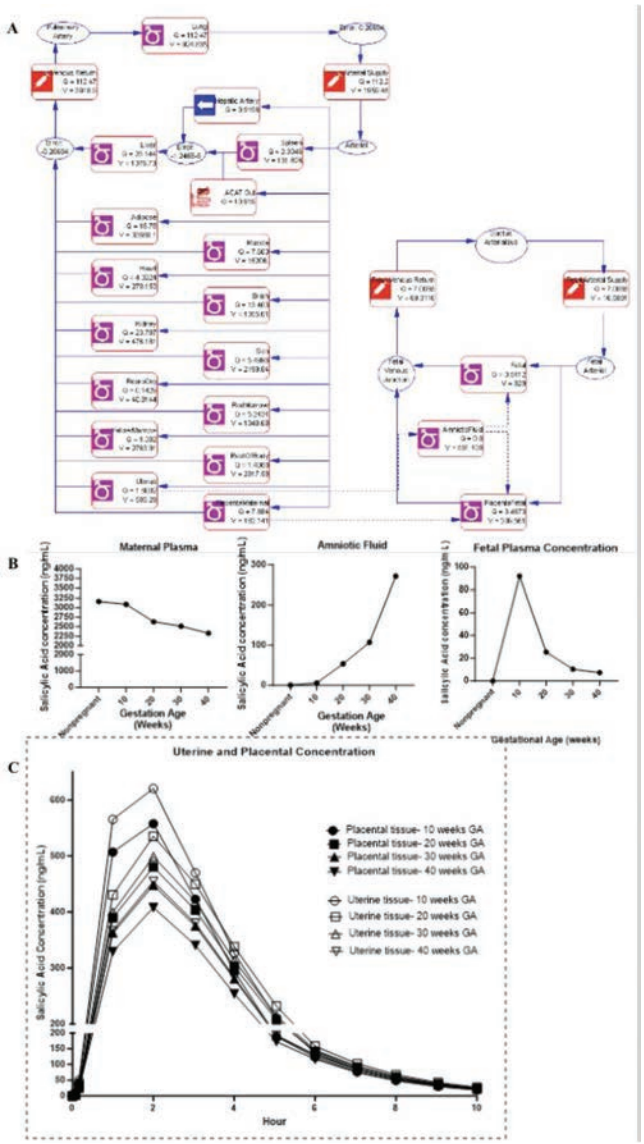
Objective: Aspirin is one of the most commonly used over-the-counter medications in pregnancy, particularly for the prevention of hypertensive disorders. However, there are limited studies on aspirin's pharmacokinetics (PK) in pregnant women. This study aimed to develop a pregnancy-specific physiologically based pharmacokinetic (PBPK) model for aspirin that could be individualized to patient specific parameters; illustrating differences in aspirin pharmacokinetics across the different trimesters of pregnancy.

Study Design: A PBPK model was developed using GastroPlus (a mechanistically based simulation software) for nonpregnant and pregnant subjects, including each trimester of pregnancy. The nonpregnant PBPK model was first established and validated against existing data from healthy adult volunteers. Once validated, the model was adapted for pregnant subjects and verified using observed pharmacokinetic profiles.

Results: The simulated PK parameters of aspirin in pregnant and nonpregnant women closely matched the clinical observations reported in the literature, with fold errors ≤1.04 (less than 1.5 is considered an acceptable simulation model). The predicted systemic exposure ($AUC_{0-24}h$) to aspirin decreased throughout gestation, showing a reduction of approximately 20% at 10 weeks and 30% at 40 weeks of gestation. An increase in clearance of approximately 3% was observed as gestation progressed.

Conclusion: A validated PBPK model using GastroPlus was developed to describe the pharmacokinetics and pharmacodynamics of aspirin in both pregnant and nonpregnant healthy adults. The model predicted a modest decrease of 10% in systemic exposure in pregnant women and a 20% increase in fetal exposure to aspirin as pregnancy progresses. The increasing fetal exposure with advancing gestational age may pose potential safety risks to the fetus.





126 | Success of Vaginal Birth after Cesarean (VBAC) Following Induced Versus Spontaneous Labor

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10:30 AM - 12:30 PM

Objective: To evaluate characteristics associated with vaginal birth after cesarean (VBAC) success in women undergoing induction of labor (IOL).

Study Design: Passive prospective cohort of singleton pregnancies with a history of one or two prior Cesareans undergoing a trial of labor after Cesarean (TOLAC) following IOL and spontaneous labor ≥ 36 weeks at a tertiary care center (2011-2022), retrospectively analyzed. We assessed univariate associations between pregnancy characteristics and 1) form of TOLAC onset (spontaneous versus induced) & 2) VBAC outcome (success / failure). Factors with P < .2 on one or both univariate analyses were considered for incorporation into a multivariable model predictive of VBAC.

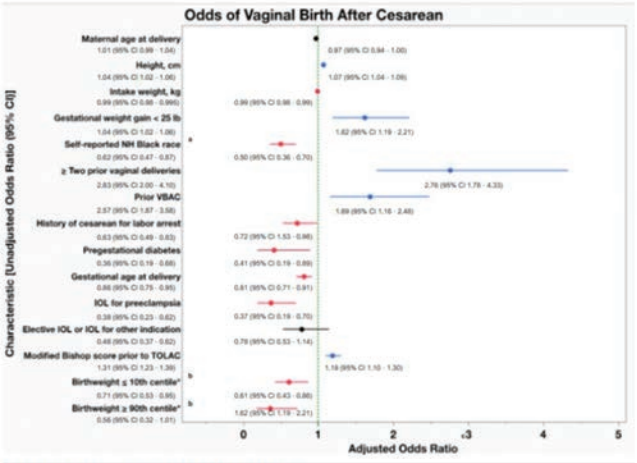
Results: Of 1434 individuals undergoing TOLAC, 919/1242 (74%) who met inclusion criteria had VBAC - 405/625 (65%) following induction vs 514/617 (83%) spontaneous labor, P < .0001. Some characteristics were similar between groups but the IOL group was slightly older and had a higher BMI, later gestational age, and lower modified Bishop scores at time of TOLAC (Table 1). Fewer undergoing IOL had a prior VBAC. More had gestational weight gain in excess of guidelines, hypertension, and diabetes. 13 factors were independently associated with odds of VBAC on multivariable analysis (Figure 1). IOL for preeclampsia was independently associated with lower odds of VBAC but IOL that was elective or for another indication was not (aOR0.78, 95% CI 0.53-1.14). The 15-covariate model (Figure 1) had an optimism-corrected bootstrapped (1000 replicates) AUROC of 0.78 (95% CI 0.74-0.80).

Conclusion: As compared to IOL, a higher proportion of pregnancies with spontaneous labor had VBAC. However, after adjustment of relevant clinical factors associated with VBAC success, only IOL for preeclampsia was found to be independently associated with failed TOLAC, while elective IOL and IOL for other indications was not.

Table 1. Demographic characteristics by labor method, induction or spontaneous (N=1242)

	Induction of labor (n = 625)	Spontaneous labor (n = 617)	P
Age (y)	29.0 ± 5.4	27.9 ± 5.2	<.001
Self-reported race & ethnicity:			.97
Non-Hispanic White	422 (67.5)	413 (66.9)	
Non-Hispanic Black	155 (24.6)	154 (25.0)	
Other race or Hispanic ethnicity	49 (7.8)	50 (8.1)	
BMI (kg/m²)	32.3 ± 8.2	29.8 ± 7.3	<.0001
Gestational weight gain, kg	9.2 ± 8.0	8.5 ± 8.0	.097
Weight gain based on IOM guidelines			.001
Under	253 (40.5)	288 (46.7)	
Within	136 (21.8)	156 (25.3)	
Over	236 (37.8)	173 (28.0)	
Obstetric history			
Parity, median (interquartile range)	2 (1-3)	1 (1-3)	.19
Two prior cesarean deliveries	70 (11.2)	67 (10.9)	.86
Prior labor arrest	181 (29.0)	193 (31.3)	.39
Prior vaginal deliveries			.090
None	342 (54.7)	305 (49.4)	
One	129 (20.6)	157 (25.5)	
Two or more	154 (24.6)	155 (25.1)	
Prior vaginal birth after cesarean	159 (25.4)	202 (32.7)	.005
Hypertension			
Chronic hypertension	81 (13.0)	34 (5.5)	<.0001
Hypertensive disorder of pregnancy	138 (22.1)	46 (7.5)	<.0001
Diabetes			
Pregestational	32 (5.1)	7 (1.1)	<.0001
Gestational	61 (9.8)	28 (4.5)	<.001
Tobacco use	123 (19.7)	109 (17.7)	.38
Gestational age at delivery, week	39.4 ± 1.3	39.2 ± 1.2	.005
At time of trial of labor after cesarean	39.4 ± 1.3	39.2 ± 1.2	.005
Gestational age, week			
Cervical exam			
Dilation, cm	1.5 ± 1.1	3.9 ± 2.1	<.0001
Effacement (%)	35.5 ± 26.9	72.3 ± 22.1	<.0001
Station (fifth's scale)	3.2 ± 0.4	4.0 ± 1.1	<.0001
Modified Bishop score	2.1 ± 1.6	5.4 ± 2.1	<.0001
IOL indication			
Elective, post-EDD, or other	188 (30.1)		
Premature rupture of membranes[a]	115 (18.4)		
Pregestational or gestational diabetes	63 (10.1)		
Chronic hypertension	21 (3.4)		
Hypertensive disorder of pregnancy	109 (17.4)		
Fetal growth restriction	41 (6.6)		
Oligohydramnios	35 (5.6)		
Non-reassuring fetal status	53 (8.5)		
Neonatal birth weight (g)	3248.3 ± 536.1	3252.2 ± 492.1	.89
Birthweight ≤ Hadlock 10[th] centile[b]	148 (23.7)	126 (20.4)	.17
Birthweight ≥ Hadlock 90[th] centile[b]	26 (4.2)	27 (4.4)	.89

Figure 1. Odds of vaginal birth after cesarean (N=1242). The bias-corrected bootstrapped (1000 replications) AUROC for the model incorporating the covariates below is 0.78 (95% CI 0.74-0.80)



[a]Included as a known social determinant of health in the US
[b]Hadlock reference range
[c]Adjusted for the other 14 covariates in the model

127 | Provider Perspectives About Smoking Cessation Programming For Patients With Substance Use Disorder: Mixed Methods Approach

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10:30 AM - 12:30 PM

Objective: To examine provider-centric determinants of smoking cessation counseling among patients with perinatal substance use disorder (SUD).

Study Design: We undertook a convergent parallel mixed methods study that included semi-structured key informant interviews and a systematic survey administered to providers caring for pregnant women with SUD. Survey elements contained Likert scale, open and closed ended questions focused on provider knowledge, attitudes and practices around smoking cessation counseling specifically while managing perinatal SUD. Interview questions were guided by the Consolidated Framework for Implementation Research (CFIR) and focused on provider-level barriers and facilitators to smoking cessation counseling, provider perceptions about patient-level barriers and motivators as well as role of the provider-patient relationship in achieving cessation during pregnancy. Interviews were audio recorded, transcribed and analyzed using deductive and inductive content analysis.

Results: 25 prenatal care providers including physicians in obstetrics & gynecology (n = 20), family medicine (n = 1), addiction medicine (n = 1) and nurse practitioners (n = 3) completed the in-depth interviews and surveys. The majority of respondents had not received formal training in smoking cessation counseling (n = 21, 84%). Major interview themes identified were: 1) Provider-level barriers and facilitators to cessation counseling 2) Provider perceptions about patient-level barriers and motivators for cessation 3) Role of the provider-patient relationship and 4) Smoking cessation as a means to achieve healthy pregnancy outcomes. Participants also provided valuable insights into the design and implementation of interventions to address provider, hospital and system-level barriers to enhance smoking cessation among patients with SUD.

Conclusion: Our mixed methods approach grounded in an implementation science framework has identified several actionable provider-level determinants of tobacco cessation for patients with perinatal SUD, laying the groundwork for designing multi-level interventions in future endeavors.

Table 1: Key Insights from Provider Surveys (n = 25)

Survey Question	"Somewhat Agree" (n %)	"Strongly Agree" (n %)
Counseling pregnant patients to stop smoking is important.	0 (0%)	25 (100%)
Healthcare providers should be trained in tobacco cessation counseling or treatment.	4 (16%)	21 (84%)
Healthcare providers have a responsibility to help their patients quit smoking.	3 (12%)	22 (88%)
I am comfortable counseling my patients through the tobacco quit process.	19 (76%)	5 (20%)
Pregnant women are often able to quit using tobacco during pregnancy.	15 (60%)	1 (4%)
Most pregnant women who use tobacco will not give up smoking even if their physician tells them to.	4 (16%)	0 (0%)
Most pregnant women are not interested in quitting smoking.	3 (12%)	0 (0%)
Pregnant women who stop smoking during pregnancy will start again after delivery.	4 (16%)	0 (0%)
Physicians, rather than nurses or health educators, should provide tobacco cessation counseling to patients.	3 (12%)	0 (0%)
Physicians receive sufficient reimbursement for tobacco cessation services.	0 (0%)	1 (4%)

Table 2: Primary Themes and Subthemes from Provider Interviews (n=25)

Themes	Subthemes
Provider-level barriers and facilitators to smoking cessation counseling.	• Provider knowledge: opportunities for enhanced training and formal education • Need for integration into clinic workflow • Lack of time to adequately address social and structural determinants • Smoking cessation is not prioritized in the setting of other comorbidities or other SUDs • Opportunities for increased multidisciplinary care coordination
Provider perceptions about patient-level barriers and motivators for smoking cessation	• Prioritizing smoking cessation in prenatal care education • Difficulty with obtaining prescribed medications • Smoking is normalized behavior • Lack of social support systems for cessation • Cessation counseling is not routinely addressed in the postpartum/preconception period
Role of the provider-patient relationship to foster smoking cessation	• Maintaining a healthy therapeutic patient-provider relationship throughout prenatal care • Patient empowerment through knowledge and resources • Acknowledging difficulties with achieving cessation with ongoing SUDs
Smoking cessation as a means to achieve healthy pregnancy outcomes	• Pregnancy as a facilitator to enhance readiness to change • Understanding and channeling inherent motivators to embrace healthy behaviors • Link between smoking cessation and achieving sobriety from substance use • Linking cessation with the maternal and neonatal outcomes during counseling

128 | "CODE OB": The Impact of Hospital-Wide Announcements on Decision-to-Incision Interval, Neonatal Outcomes in Emergency C-Sections

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10:30 AM - 12:30 PM

Objective: This study evaluates the effect of calling a hospital-wide obstetrical code on decision-to-incision (D-I) interval and neonatal outcomes for different emergency C-section indications. D-I intervals, arterial cord pH, arterial base deficit, and five-minute APGARs were assessed in relation to whether or not a code was called for bleeding placenta previa, placental abruption, category 2 tracing, category 3 tracing, cord prolapse, uterine rupture, and other indications (active herpes, detectable HIV, or malpresentation in active labor; uncontrolled pre-eclampsia/HELLP, etc.)

Study Design: A retrospective cohort study analyzing all emergency C-sections (689) between August 2017 and April 2023 was performed. Two-sample t-tests assessed for potential statistical significance in D-I interval and neonatal outcomes between code and non-code emergency deliveries for each hysterotomy indication.

Results: D-I time appeared to improve when a code was called for every indication except for bleeding placenta previa (insufficient sample size) and cord prolapse (9.91 minutes vs. non-code: 24.25 minutes, $p = 0.07$). For placental abruptions, there was a statistically significant difference in cord pH (7.12 vs. 7.24, $p = 0.007$) and base excess (-9.44 vs. -5.83, $p = 0.05$) between code and non-code c-sections. Calling a code appeared to have no effect on five-minute APGARs for any indication. When all indications were combined, there was a statistically significant difference in D-I interval (11.50 vs. 49.06 minutes, $p = 1.86E-69$), cord pH (7.13 vs. 7.22, $p = 5.37E-9$) and base excess (-8.79 vs. -5.79, $p = 1.62E-7$) between code and non-code c-sections.

Conclusion: It appears that calling a code in emergency c-sections shortens D-I interval but does not improve neonatal outcomes.

129 | Examining Maternity Care Workers' Antiracist Attitudes in the Southeast US

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10:30 AM - 12:30 PM

Objective: Racism contributes significantly to persistent racial disparities in maternal health outcomes in the Southeast United States (US). We aimed to identify key predictors of antiracist attitudes in maternity healthcare (MCH) staff.

Study Design: MCH staff completed a cross-sectional online survey adapted from a validated Anti-RaCist (ARC) Survey tool with 5-point Likert scale items. Outcome variables were antiracist attitudes including acknowledging the impact of racism, the likelihood of actually or hypothetically acting on a racist incident, and support for bias training. Predictor variables included job role, age, race, gender identity, and place of highest education. We performed ordinal logistic regression to model the associations between outcome quartile and predictor variables.

Results: Respondents (n = 93) included physicians, nurses, patient encounter specialists, administrative and other staff working in a major maternity care system in the US South. We found that some characteristics were associated with higher antiracist attitudes (Table 1). Compared to physicians, all other MCH staff had significantly lower odds of endorsing the impact of racism in healthcare. One or no bias trainings over the last 36 months was associated with 0.34 lower odds of acknowledging the impact of racism. Not witnessing a racist encounter at work was associated with 0.19 lower odds of endorsing the impact of racism in healthcare. Older aged (≥35 years) MCH staff had 0.21 lower odds of reporting that they would act ***if*** they witnessed a racist incident. Cis-male MCH staff had higher odds of acting ***when*** they actually witnessed a racist incident in their workplace, compared to cis-female MCH staff.

Conclusion: Our results indicate that endorsing antiracist attitudes varied by specific characteristics of MCH staff in this maternity care setting in the US South. Some types of staff were less likely than others to exhibit attitudes showing antiracism. Efforts to improve the quality of maternity care for racial minorities should address factors that promote antiracist attitudes in all maternity care workers.

Table 1: Maternity Healthcare Workers Antiracist Attitudes

Predictor Variables	Categories	AOR	95% CI
Outcome 1: Acknowledging Impact of Racism in Healthcare (N=93)			
No. of Bias Trainings in past 36 months	≥2	Ref	
	1 or none	0.34	0.13 - 0.88
Job Role	Physician	Ref	
	Administrative Staff	0.06	0.01 -0.36
	Nurse	0.07	0.02 - 0.30
	Patient Encounter Specialist	0.08	0.01 - 0.62
	Other Clinical Staff	0.31	0.06 - 1.55
Witnessed racist incident at work	Yes	Ref	
	No	0.19	0.08 - 0.48
Outcome 2: Acknowledging Impact of Racism in Society (N=93)			
Place of Highest Education	Alabama	Ref	
	US SE State	0.5	0.11 - 2.25
	Other	0.25	0.08 - 0.78
Job Role	Physician	Ref	
	Administrative Staff	0.04	0.01 - 0.22
	Nurse	0.07	0.02 - 0.30
	Patient Encounter Specialist	0.03	<0.01 - 0.24
	Other Clinical Staff	0.16	0.03 - 0.76
Age	18 - 34 years	Ref	
	≥35 years	0.25	0.09 - 0.65
Witnessed racist incident at work	Yes	Ref	
	No	0.19	0.07 - 0.46
Outcome 3: Likelihood of Acting on Hypothetical Racist Incident (N=93)			
Predictor Variables	**Categories**	**AOR**	**95% CI**
Age	18 - 34 years	Ref	
	≥35 years	0.21	0.08 - 0.56

Legend: AOR: Adjusted Odds Ratio; **CI:** Confidence Interval; **US SE State:** US Southeast State

130 | Fear of Insulin and Other Experiences with Gestational Diabetes Mellitus Management–a Qualitative Study

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10:30 AM - 12:30 PM

Objective: To understand the experiences of patients with gestational diabetes mellitus (GDM) using qualitative methods to explore barriers and facilitators to GDM self-management and insulin use, aiming to inform future interventions.

Study Design: In this ancillary study of an ongoing randomized controlled trial of thresholds for insulin initiation and titration for GDM, participants were recruited from 2/2023 to 1/2024 using purposive sampling, aiming for diversity with respect to age, race, ethnicity, insurance status, parity, and insulin use. In-depth

semi-structured interviews were conducted after 34 weeks' gestation and again postpartum within a week of childbirth. Interview guides covered 1) experience with and knowledge about GDM, 2) self-efficacy and social support, 3) experience with insulin, 4) adherence and persistence to their treatment plan, and 5) birth experience. Transcripts were analyzed using a reflexive thematic analysis approach to develop themes.

Results: Of 20 participants, 80% had GDM for the first time and 50% required insulin treatment (Table 1). Initial coding of transcripts identified key barriers and facilitators to treatment plan adherence (Table 2). Barriers included: 1) fear of insulin ("When I was first told about it, I threw a tantrum… I do not like needles, and that's all I could think about."), 2) the time and cognitive effort to learn self-management, 3) managing emotions related to GDM diagnosis and self-management, and both 4) jobs and 5) family/friends unawareness made it difficult to manage GDM as recommended. Facilitators included 1) training from the medical team ("once I saw my insulin pen, it wasn't that bad."), 2) support from family/friends, and 3) concern for the well-being of the baby.

Conclusion: Self-management of GDM requires substantial social and institutional support, learning, and adjusting to a new lifestyle in a short period of time. For some, the initial recommendation to use insulin caused a strong negative reaction, but hands-on education provided by the medical team helped to alleviate that fear.

Table 1 - characteristics of study participants

Characteristic		N=20 n (%) or mean ± SD
Age		32.6 ± 5.6
Race	American Indian or Alaskan Native	1 (5%)
	Asian	4 (20%)
	Black	4 (20%)
	White	8 (40%)
	More than one race	2 (10%)
	Other	1 (5%)
Ethnicity	Non-Hispanic	17 (85%)
	Hispanic	3 (15%)
Parity	Nulliparous	7 (35%)
	Multiparous	13 (65%)
Educational level	Completed Highschool	7 (35%)
	College	8 (40%)
	More than College	5 (25%)
Insurance type	Public	6 (30%)
	Private	14 (70%)
Marital status	Single	2 (10%)
	Married	17 (85%)
	Divorced	1 (5%)
Full time employment		15 (75%)
Pre-pregnancy BMI		34.4 ± 11.1
Prior pregnancy with GDM		4 (20%)
Use of medications for GDMA2 in prior pregnancy	Insulin	1 (5%)
	Oral antidiabetic medication	1 (5%)
Insulin use in this pregnancy		10 (50%)

Table 2. Exemplary quotation of barriers and facilitators to treatment plan adherence

Theme	Exemplary quotation
Barriers to treatment plan adherence	
Fear of Insulin	This pregnancy has been very smooth so far. My only additional experience is with the gestational diabetes and having to take insulin. So that was something new for me. Now, when I was first told about it, I threw a tantrum. I threw a tantrum for the simple fact that I do not like needles. And that's all I could think about is when I thought about the insulin. "I have to poke myself. Am I going to be able to do it? Will I need a family member to poke for me?" That's all I could think about, was the needles part. (GAP-0208)
The time and cognitive effort to learn self-management	It was scary at first. I've never had to inject myself with anything before. And I knew that taking the exact same dosage or units at the same periods every day doesn't really match up with my eating patterns, just because I have different things every day at different times. So I thought it could be more of a roller coaster. And it was at first, but after I got-- it took a long time to get the hang of it...It was very challenging for me…and it just took a while to get used to. It was really hard to do in a short period of time, especially. (GAP-0119)
Managing emotions related to GDM diagnosis and self-management, and both	It was a little overwhelming for me. And I was a little scared, too, googling it, what it is, how it will affect my pregnancy and my baby. I was scared in the beginning, but as time passed, I talked with my doctors and everyone. They helped me a lot. And yeah, yeah, it was overwhelming in the beginning, but now I'm just used to it. (GAP-0209)
Jobs	But the hardest part with work is if I'm in the middle of doing something, I can't always test right at that two-hour mark. I mean, I can't be like, "I'm sorry. Sorry. I'm in the middle of doing whatever. Let me just step out." So sometimes, I would test a little before or a little after. That makes it a little difficult. (GAP-0160)
Family/friends unawareness made it difficult to manage GDM as recommended	It was very challenging for me. A few months ago, I felt a lot more tired, so I didn't want to exercise like I should have. And I was just more spoiled by friends and family, so they love feeding me sugary treats. And if we had-- I just had a few baby showers. We had lots of snacks with carbs and sugary treats. But I feel like it was a lot easier without outside influences. (GAP-0119)
Facilitators to treatment plan adherence	
Training from the medical team	And once I saw my insulin pen, it wasn't that bad. I'm not going to say that I am used to it now, but I know that I have to do it to try to keep me and the baby together. So, I just basically do it because I know that I need the medicine to stay afloat. (GAP-0208)
Support from family	My husband, my mother, I mean, even my entire family. Like I said before, even if it's just calling to ask me, if we have a gathering, just what I can eat. My husband has found me keto cupcakes that I can have every now and then, so I'm not missing the pastry part of anything. And he's been really good because when I eat a healthy dinner, he'll also eat it with me. So, it's just having somebody there or even like your family that just listens to what you can and can't have and then kind of moving their views a little bit and what they can eat makes it really nice. (GAP-0143)
Concern for the well-being of the baby.	I feel like it was very easy to be motivated once you think, "I'm doing this for my baby. It's not for me. It's for my baby." And I think everyone just wants to do what's best for their baby. So, it makes it very easy to make those changes quickly. (GAP-0143)

131 | Mid-Pregnancy Cervical Length and Pregnancy Outcomes in Low-Risk Singletons: A Prospective Cohort (QP screening study)

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10:30 AM - 12:30 PM

Objective: Short midtrimester cervical length (CL) increases the risk for spontaneous preterm birth (sPTB), but sensitivity of this screening tool is low. This study aims to improve sPTB prediction by identifying which factors, combined with CL most accurately predict sPTB.

Study Design: This multicenter prospective cohort study included singletons with no prior sPTB < 34 weeks of whom CL was measured at 18-22 weeks gestation. Primary outcome was sPTB < 37 weeks. Secondary outcomes were (s)PTB < 28, 32, 34 and 37 weeks. CL predictive capacity was assessed with likelihood ratios (LR). Multivariable cox regression (MCR) combined CL with other risk factors (e.g. smoking, cervical surgery, interpregnancy interval (IPI) and was expressed as Hazard Ratios (HR) and 95% confidence intervals (CI)). For PTB risk factors, we calculated population-attributive risk (PAR) for sPTB < 37 and < 32 weeks. Nulliparous and multiparous women were assessed separately.

Results: We included 14,718 singletons between 2015–2021. Nulliparous women (N = 7532) with a CL ≤ 25, 26-30, 31-35 and > 35mm had sPTB < 37 rates of 28.6%, 9.0%, 9.4% and 3.4%, respectively. In multiparous (N = 7186) women, rates were 17.5%, 7.9%, 4.9% and 2.2%. Rates of sPTB < 32 weeks for CL ≤ 25 mm were 20.9% in nulliparous and 12.7% in multiparous women. MCR in nulliparous women showed that CL ≤ 25, 26-30 and 31-35 mm remained significantly associated with increased sPTB hazard (all $p < 0.001$). In multiparous women, CL ≤ 25mm ($p < 0.001$), smoking ($p = 0.049$) and IPI < 6 months ($p = 0.002$) increased

sPTB hazard. In total, 1.0% of women had a CL ≤25mm, yet the PAR of short cervix for sPTB < 37 and < 32 weeks was 7.0% and 29.3% in nulliparous vs 5.1% and 25.1% in multiparous women.

Conclusion: Asymptomatic short midtrimester CL is a significant predictor of sPTB, highlighting the need for implementation of measurement in routine care. A multifactorial approach may enhance sPTB prediction, yet the impact of these additional factors seems limited. CL measurement remains the most effective tool available, especially for identifying those at high risk for very sPTB.

Table 1: Rates and likelihood ratios of (s)PTB and other outcomes in low-risk nulliparous and multiparous singletons

Nulliparous singletons	Total N=7532	CL ≤ 25mm N=91			CL 26-30mm N=221			CL 31-35mm N=466			CL >35 mm N=6754		
	N (%)	N	%	LR	N	%	LR	N	%	LR	N	%	LR
sPTB < 28	34 (0.5%)	9	9.9	32.1	3	1.4	3.2	5	1.1	2.5	17	0.3	0.6
sPTB < 32	63 (0.8%)	19	20.9	36.5	5	2.3	2.8	10	2.1	2.7	29	0.4	0.5
sPTB < 34	100 (1.3%)	19	20.9	23.0	8	3.6	2.9	18	3.9	3.1	55	0.8	0.6
sPTB < 37	*322 (4.3%)*	*29*	*28.6*	*9.7*	*20*	*9.0*	*2.2*	*44*	*9.4*	*2.4*	*232*	*3.4*	*0.8*
Total PTB < 28	53 (0.7%)	14	15.4	31.9	3	1.4	2.0	5	1.1	1.6	31	0.5	0.6
Total PTB < 32	110 (1.5%)	24	26.4	26.3	6	2.7	1.9	14	3.0	2.2	66	1.0	0.7
Total PTB< 34	181 (12.4%)	25	17.5	13.3	9	4.1	2.1	26	5.6	1.0	121	1.8	0.9
Total PTB < 37	530 (7.0%)	33	36.3	7.5	25	11.3	1.7	60	12.9	2.0	412	6.1	0.9
Any perinatal death, n (%)	59/7338 (0.7%)	11/86 (12.8%)			1/217 (0.5%)			6/456 (1.4%)			35/6570 (0.5%)		

Multiparous singletons	Total N=7186	CL ≤25mm N=63			CL 26-30mm N=126			CL 31-35mm N=306			CL >35 mm N=6691		
	N (%)	N	%	LR	N	%	LR	N	%	LR	N	%	LR
sPTB < 28	17 (0.2%)	5	7.9	35,5	1	0.8	2,1	1	0.3	1,0	10	0.1	0,6
sPTB < 32	31 (0.4%)	8	12.7	31,2	1	0.8	1,2	5	1.6	2,8	17	0.3	0,6
sPTB < 34	47 (0.7%)	9	14.3	23,1	2	1.6	1,5	5	1.6	1,8	31	0.5	0,7
sPTB < 37	*186 (2.6%)*	*11*	*17.5*	*7,1*	*10*	*7.9*	*1,9*	*13*	*4.9*	*1,4*	*150*	*2.2*	*0,9*
Total PTB < 28	37 (0.5%)	5	7.9	16,3	2	1.6	1,9	2	0.7	0,9	28	0.4	0,8
Total PTB < 32	66 (0.9%)	10	15.9	18,3	2	1.6	1,1	6	2.0	1,6	48	0.7	0,8
Total PTB< 34	100 (1.4%)	11	17.5	13,3	6	4.8	2,1	6	2.0	1,0	77	1.2	0,9
Total PTB < 37	340 (4.7%)	15	23.8	5,3	16	12.7	1,7	22	7.2	1,1	287	4.3	0,9
Any perinatal death, n (%)	37/7034 (0.5%)	3/62 (4.8%)			1/125 (0.8%)			1/300 (0.3%)			32/6547 (0.5%)		

sPTB: spontaneous preterm birth, PTB: preterm birth, CL: cervical length, LR: likelihood ratio

132 | Whole Blood in the Management of Postpartum Hemorrhage

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10:30 AM - 12:30 PM

Objective: Although whole blood (WB) has been shown to improve outcomes in acute trauma patients, it is not widely available in many institutions. The objective of this study was to examine maternal outcomes in those receiving WB versus packed red blood cells with multiple blood products to reconstitute whole blood for postpartum hemorrhage (PPH).

Study Design: This was a prospective cohort study of patients undergoing vaginal delivery complicated by uterine atony who received transfusion within the first 2 hours after delivery at a large, academic facility. As an institutional practice, WB is preferentially ordered for PPH, however, when unavailable, a combination of packed red blood cells (PRBC) and fresh frozen plasma (FFP) is provided by transfusion services as a substitute. Data was collected by dedicated, trained research nurses in coordination with transfusion services. Statistical analysis included chi-square with P< 0.05 considered significant.

Results: Between Jan 2019 and Nov 2023, there were 119 patients meeting inclusion criteria. As shown in the Table, there were no significant differences in demographics or time from order to transfusion (P = 0.26) among the study cohort. Estimated blood loss was lower in the WB group: (1875 [1250,2500] mL vs 1250 [1000,1750] mL, P = 0.01). Compared to patients receiving multi-component therapy without WB, those who received WB required significantly fewer total blood products (2 [2,2] vs 6 [4,7], P< 0.001) and required an operative procedure less frequently (15.8% vs 42.9%, P = 0.04). There was a trend for less febrile morbidity and acute renal insufficiency with use of WB compared to use of multi-component therapy.

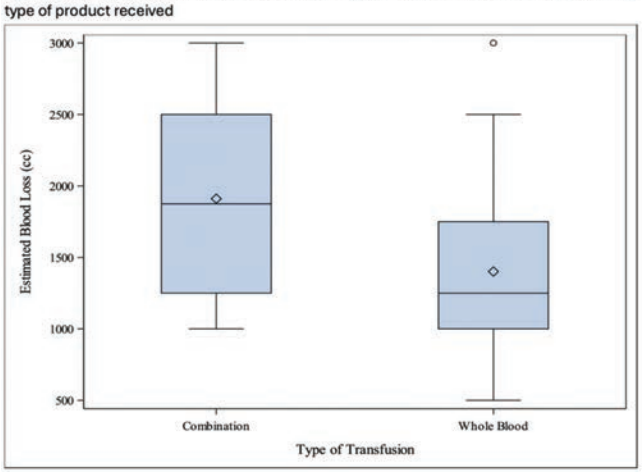
Conclusion: The Alliance for Innovation on Maternal Health advocates for early recognition and treatment of PPH. Compared to the use of PRBC and FFP, the use of WB reduces the need for large-volume (>4 units) blood product transfusion and need for operative intervention, in the setting of PPH due to uterine atony within the first 2 hours following delivery. Whole blood, if available, should be the preference for resuscitation in such cases.

Table 1: Patients who required transfusion for PPH due to atony within 2 hours of vaginal delivery

	Any whole blood N=38	Multi-component therapy without whole blood use N=14	P-value
Maternal Age, years	25.2±6.2	25.2±8.3	0.99
Maternal Race			0.13
Black	1 (2.6)	2 (14.3)	
White	2 (5.3)	2 (14.3)	
Parity	0 [0, 2]	0 [0, 2]	0.76
BMI (kg/m²)	34.1 (23.1, 50.8)	34.1 (25.4, 61.4)	0.90
EBL (mL)	1250 [1000, 1750]	1875 [1250, 2500]	0.02
Hematocrit			
Admission	36.6 [31.2, 39.7]	36.1 [31.5, 37.8]	0.93
Discharge	27.5 [25.7, 29.3]	26.2 [23.7, 27.9]	0.14
More than 4 units	6 (15.8)	12 (85.7)	<.001
Complications			
Febrile morbidity	3 (7.9)	2 (14.3)	0.49
Creatinine >1	1 (2.6)	1 (7.1)	0.45
Return to OR	6 (15.8)	6 (42.9)	0.04
Length of stay (hours)	58.1 [48.2, 69.2]	69.4 [52.3, 73.8]	0.22

Data provided as N (frequency), mean ± standard deviation, median [quartile1, quartile3]
PPH=postpartum hemorrhage
OR=operating room
EBL=estimated blood loss

Figure 1: Estimated blood loss in patients requiring transfusion within 2 hours of delivery by type of product received



133 | Trends in Perinatal Outcomes Following Publication of the Chap Trial: An Interrupted Time Series

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10:30 AM - 12:30 PM

Objective: The April 2022 CHAP trial showed that tight chronic hypertension (cHTN) control decreased preterm birth (PTB) and low birthweight (BW) < 2500g. We assessed national trends in PTB and low BW in pregnant patients with cHTN after publication and dissemination of the CHAP trial.

Study Design: Population level interrupted time series (ITS) analysis from February 2021 to August 2023 using US Natality data including patients with a singleton, non-anomalous gestation, cHTN, and who initiated prenatal care at ≤ 6 months gestation. Pre- and post-CHAP periods were defined *a priori* as February 2021-January 2022 and September 2022-August 2023 respectively with a washout period from February 2022-August 2022. Primary outcomes were PTB< 35 weeks, PTB< 37 weeks, and BW< 2500g. Poisson regression was used allowing for both a one-time level change and ongoing changes in trends following the CHAP trial. Incidence rate ratios (IRR) were adjusted for seasonality and the proportion of individuals with age >35 and BMI >30. A sensitivity analysis excluding patients with history of PTB to check for robustness was also performed. Analyses conducted with Stata18 SE.

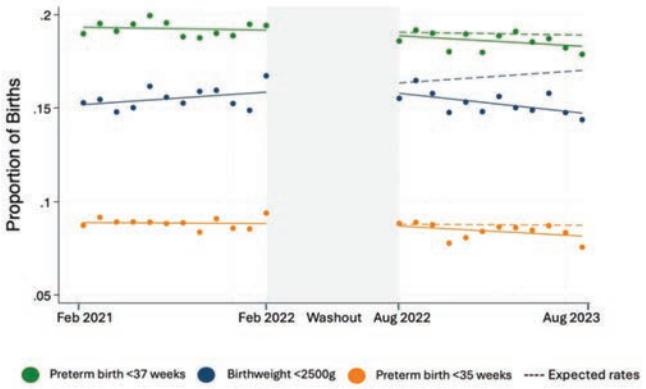
Results: There were 3,681,963 total births in the pre-CHAP period, 81,881 affected by cHTN (2.2%) and 3,625,611 total births in the post-CHAP period, 90,983 affected by cHTN (2.5%) (X^2, $p < 0.00001$). Baseline demographics were similar in the pre- and post-CHAP periods (Table 1). Though observed rates of primary outcomes were lower than expected immediately after the dissemination period, these one-time level changes were not significant (PTB< 35 weeks 8.6 v 8.8%, PTB< 37 weeks 18.6 v 19.1%, BW< 2500g 15.5 v 16.3%). There were significant ongoing temporal decreases in rates of PTB< 35 weeks (aIRR 0.977, 95% CI 0.965–0.990, p = 0.001), PTB< 37 weeks (aIRR 0.992, 95% CI 0.987–0.997, p = 0.001), and BW< 2500g (aIRR 0.981, 95% CI 0.970–0.993, p = 0.002) (Figure 1). Sensitivity analysis did not affect results.

Conclusion: These findings suggest a population-level impact of the CHAP trial. Further research is warranted to assess if these trends are found in all sub-groups.

Table 1. Population Characteristics Before and After CHAP Trial Publication

		Patient No. (%)	
Characteristics		**Pre-CHAP Trial (n=81,881)**	**Post-CHAP Trial (n= 90,983)**
Maternal Age, y			
	Age <35	56,468 (69.0)	62,033 (68.2)
	Age >/=35	19,265 (23.5)	21,619 (23.8)
	Age >/=40	6,148 (7.5)	7,331 (8.1)
BMI			
	BMI <30	28,936 (35.3)	31,556 (34.7)
	BMI >/=30	32,584 (39.8)	36,621 (40.3)
	BMI >/=40	19,246 (23.5)	21,424 (23.5)
Race			
	White	53,370 (65.2)	59,878 (65.8)
	Black or African American	21,915 (26.8)	23,327 (25.6)
	Asian	3,036 (3.7)	3,602 (4.0)
	American Indian or Alaska Native	876 (1.1)	855 (0.9)
	Native Hawaiian or Pacific Islander	217 (0.3)	259 (0.3)
	More than one	2467 (3.0)	3,062 (3.4)
Ethnicity			
	Hispanic or Latino	12,646 (15.4)	15,012 (16.5)
	Non-Hispanic or Latino	68,663 (83.9)	75,374 (82.8)
Payor Status			
	Private Insurance	43,210 (52.8)	48,298 (53.0)
	Public Insurance	34,222 (41.8)	38,065 (41.8)

Figure 1. Expected and observed trends in preterm birth rates and low birthweight



134 | Experiences of Black and Latin-X Pregnant People Undergoing Prenatal Diagnosis for Ultrasound Identified Fetal Anomalies

Asha N. Talati; Karen Sheffield-Abdullah; Catalina Montiel; Aryana Daye; Maria Reyes-Montilla; Kelly L. Gilmore; Neeta L. Vora
University of North Carolina at Chapel Hill, Chapel Hill, NC

10:30 AM - 12:30 PM

Objective: To describe experiences of prenatal genetic diagnosis (PGD) among pregnant people (PP) that self-identify as Black or Latin-X with ultrasound detected fetal anomalies.

Study Design: Qualitative study of PP that self-identify as Black or Latin-X with ultrasound detected fetal anomalies offered genetic counseling and PGD care between 11/22–01/24 at a tertiary care center. Interviews were conducted by team members that had ethnic and language concordance with participants. Interviews were one-on-one, semi structured, recorded and transcribed. Interviews with Spanish-speaking participants were translated to English for analysis. Interview domains included the following: respect, trust and genetic privacy, quality of care, and support. Interviews were coded and analyzed using thematic analysis and sampling was completed after theme saturation was achieved. All participants completed a demographic survey and the Everyday Discrimination Scale (EDS), a validated tool to assess the experiences of racial and ethnic minority groups.

Results: 24 interviews were completed (Table 1). All participants had complex, multi-anomaly fetal phenotypes. Six (25%) participants had an amniocentesis. Several key themes were identified across the cohort, including: (1) definitions of respectful care; (2) a need for self-advocacy; (3) the value of racial, ethnic, and linguistic concordance in care, and (4) navigation of healthcare policies (e.g. abortion restrictions, insurance). For Spanish speaking PP, Theme 3 included a discussion of translation services and Theme 4 included discussion of healthcare costs, particularly for those that recently immigrated (Figure 1). Zero interviewees expressed concern regarding genetic privacy for the fetus, self, other family members, now or in the future. Mean EDS score was 21.1 (SD 9.2); EDS scores were not associated with preferences for amniocentesis (r = 0.09).

Conclusion: Black and Latin-X PPs' reflections define respectful care and identify unique considerations and areas for improving quality of PGD care for these racial/ethnic groups.

Table 1. Demographic Characteristics

Characteristic	N=24
Age (mean, SD)	29 (5.4)
Race/Ethnicity[a]	
Black	12 (50)
Latin-X	12 (50)
Gravidity (median, IQR)	2 [1, 2.7]
Parity (median, IQR)	1 [0, 1.7]
Married or In a Relationship	19 (79)
Employed	11 (46)
High School Graduate or Above	22 (92)
Spanish (Primary Language)	7 (29)
Amniocentesis Performed	6 (25)
Termination of Pregnancy	5 (21)

[a]Note two participants in the group identified as biracial: Latin-X/White and Black/White.
[b]Data displayed as n (%) unless noted otherwise

Figure 1. Key Themes and Exemplary Quotations

Definitions of Respectful Care

Multiple participants described respectful care using the following or similar language:

- *"They listened to me"*
- *"They taught me, using pictures and images" "not using medical terms"*
- *"They provided resources and follow up"*
- *"They gave me time to ask questions"*
- *"They gave us contact information"*
- *"She made it her business to check on me..." "became my village"*

By contrast, less respectful care had the following or similar phrases attached:

- *"It wasn't explained"*
- *"In a rush"*
- *"I was shuffled from room to room"*

Self-Advocacy

Participants across the cohort described needing to find information for themselves, online, through community, or other trusted advisors:

- Participant 16 (27 yo, Latin-X PP) describes going online to find data from Facebook groups: *"I needed more information; when you receive that news, it's shocking.... Reading the stories from the groups [was most helpful]."*
- Participant 8 (37 yo, Black PP) describes calling a former primary care provider to verify recommendations: *"I did message her. I talk to her a lot. She's also African American... she helps me have a little resource."*

Value of Racial, Ethnic, and Linguistic Concordance

Black participants noted the lack of racial and ethnic concordance with members of their team, particularly in PGD care:

- Participant 12 (27 yo Black PP) reflects broadly on disparities in care and then on her own care team: *"I know for a fact that non-white women have different care whether it's conscious or unconscious and unfortunately pretty much all of the providers there are White."*

LatinX patients reflected on lack of language concordance; those speaking Spanish as a primary language discussed challenges with translation.

- Participant 21 (29 yo LatinX PP) describes challenges with interpretation and how language concordance adds value to her care: *"Doctors who speak your language, you feel like more confident to ask questions. Because when they were going to operate on the baby there was a doctor who spoke Spanish, so I felt more confident to ask him than to the others, even though there was an interpreter."*

Navigation of Healthcare Policies

Participants allude to the impact of policies such as abortion legislation, health insurance, and immigration as unique considerations for their PGD care.

- Participant 19 (22 yo LatinX PP) discussing testing decisions and cost: *"I wasn't born here so I don't have health insurance."*
- Participant 14 (29 yo Black PP) discussing decision for TOP and state regulations: *"I wasn't sure where I'd go with everything going on in the world, Roe v. Wade... I was stuck."*

[a]yo = year old

135 | Impact of Prenatal Trio-Exome Sequencing on Future Reproductive Decisions: A Qualitative Study

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[2]*Case Western Reserve University, Cleveland, OH*

10:30 AM - 12:30 PM

Objective: o determine how trio-exome sequencing (t-ES) in an incident pregnancy (IP) impacts reproductive decision making.

Study Design: Qualitative study of individuals from a t-ES cohort that had a pregnancy with ultrasound-detected fetal anomalies (fetal brain anomalies and/or multiple anomalies) and negative karyotype (K) and microarray (CMA) in an IP. Participants had t-ES 12-30 months prior to interview. Interviewer was blinded to IP history and t-ES results. One-on-one semi-structured interviews were completed, recorded and transcribed. Interview domains included adaptation of t-ES results, perceived value of testing at current time point, and future pregnancy decisions. Interviews were analyzed using grounded theory methods and sampling was completed after theme saturation was achieved.

Results: 15 interviews were completed. Mean age was 31. Eleven (73%) self-identified as non-Hispanic, White. Fourteen (93%) had at least a college education and all were employed. One had diagnostic findings that explain the fetal phenotype. Eight (53%) had subsequent pregnancies; of those, 100% used some form of genetic screening or testing (3 used cell free DNA (cfDNA), 2 used preimplantation genetic testing (PGT-A, PGT-M), 3 had amniocentesis for K and CMA) (Table 1). Key themes identified include: (1) "Knowledge is power"–participants valued genetic testing to guide future pregnancy decisions; (2) "Whiplash"–participants described how medical and psychological complexity of the IP felt incongruent with receiving negative t-ES results; (3) "Confidence moving forward"–participants described how t-ES results, even if negative, provided confidence with future pregnancy; (4) "value of genetic counseling"–participants describe the importance of genetic counseling to interpret results and guide subsequent pregnancies and prospective testing decisions.

Conclusion: Participants using t-ES expressed value in this testing strategy paired with genetic counseling and used results for future pregnancy decisions despite majority negative results.

Table 1. Interview Participants, t-ES results, and Subsequent Pregnancy

Number	Age	Pregnancy Disposition	t-ES DNA source	Results	Subsequent Pregnancy	Type of Genetic Testing
1	36	TOP	AF	Negative	No	
2	38	TOP	AF	Negative	Yes	IVF, PGT-A
3	23	IUFD	AF	Negative	No	
4	33	TOP	AF	Negative	No	
5	28	ND	CB	Negative	Yes	K, CMA
6	27	TOP	AF	Positive[c]	Yes	IVF, PGT-M
7	38	Living child	AF	Negative	Yes	cfDNA
8	26	TOP	AF	Negative	No	
9	25	TOP	AF	Negative	Yes	cfDNA
10	31	TOP	AF	Negative	No	
11	34	TOP	AF	Negative	No	
12	26	ND	AF	Negative	Yes	K, CMA
13	33	ND	AF	Negative	Yes	cfDNA
14	36	TOP	AF	Negative	Yes	K, CMA
15	34	TOP	AF	Negative	No	

[a]All included participants had incident pregnancy with fetal brain anomalies and/or multiple fetal anomalies.
[b]TOP= termination of pregnancy, AF = amniotic fluid, IUFD = intrauterine fetal demise, ND = neonatal demise, CB = cord blood
[c]Positive results included biallelic pathogenic variants in *ROBO1* that explained the fetal phenotype, maternally and paternally inherited

Figure 1. Key Themes and Exemplary Quotations

"Knowledge is Power"
"We really were searching for answers to what happened with our son…. also, you know, if we were going to try again…. this was kind of a cornerstone of whether we were going to try again, because if it came back with anything, we both said we're not going to do this again. We're not trying again. ***Participant 8***
"[talking about t-ES]…we just jumped in and said, "Okay, if you can find a risk for something, it's better to know than not know." ***Participant 6***
"Whiplash"
"It was such a weird feeling because I was so relieved for [living child], but then I was so mad that I had no answers why that happened to [incident pregnancy]. I wanted it to be something like that we could look at and point to and be like, This is what happened in his genetic sequencing, or in his DNA, or like, whatever that caused this, but there was none of that…It was very weird, because I was, obviously, really happy because I wouldn't have to worry about it with [living child]….But I was angry that we didn't have answers. ***Participant 9***
"I was also surprised, because I don't know, that was such a major diagnosis for him. And I just felt it, you know, the results. And what we went through did not match in my head." ***Participant 8***
"Confidence Moving Forward"
"[t-ES] was positive…I wanted that information. It ended up being good information. And I don't feel like I'd be confident going forward without that information." ***Participant 10***
"I remember getting the results saying that there was nothing that was found…And I remember feeling almost relieved knowing that this probably will not happen to me again…I was ten weeks pregnant with my son at the time." ***Participant 13***
"Value of Genetic Counseling"
"we sat down with the genetic counselor… and they took their time and explained it [t-ES results] to us… and based on that we decided to do the initial testing of the embryo and the NIPT [in subsequent pregnancy]. ***Participant 2***
"with genetic counseling, like…I really felt very well taken care of …[the genetic counselor] reached out a couple times through the portal…" ***Participant 1, discussing adapting testing results and future pregnancy decisions***

136 | Effect of Gestational Diabetes on Neonatal and Delivery Outcomes Across Race and Ethnicity

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10:30 AM - 12:30 PM

Objective: This study aims to evaluate the impact of gestational diabetes mellitus (GDM) on neonatal and delivery outcomes across different races and ethnicities, providing a comprehensive understanding of GDM and the influences it has on neonatal health across diverse populations.

Study Design: A retrospective analysis was conducted using CDC natality data from 2016 to 2022. The study group comprised pregnant individuals with gestational diabetes across Non-Hispanic (NH) White, NH Black, NH Asian, and Hispanic mothers with gestational age range of 37 to 42 weeks and infant birth weight (BW) range of < 5,000 grams (n = 1,535,308). GDM prevalence was measured in each race and ethnicity. Primary outcome measures included neonatal intensive care unit (NICU) admission rates, assisted ventilation (AV) usage, large for gestational age (LGA) (> = 4000 g), average infant BW, low five-minute APGAR scores (< = 6), and C-section rate. Descriptive analysis and multinomial logistic regression analysis were done using SPSS to calculate adjusted odds ratios (aOR) and 95% confidence intervals.

Results: NH Asian individuals have the highest prevalence of GDM, whereas NH Black individuals have the lowest (Table 1). Unlike other groups, NH Asians with GDM have lower average infant BW than those without GDM. GDM has the greatest impact on NICU admission, AV usage, C-section rate, and LGA rate in the NH Black population.

Conclusion: While GDM significantly increases the risk of various neonatal and delivery outcomes across all races and ethnicities, the extent to which it affects each population differs. NH Black individuals, who have the lowest overall prevalence of GDM and baseline birth weight compared to other populations, face the highest risk of adverse outcomes, particularly for LGA infants. On the contrary, despite the high prevalence of GDM, outcomes among Asian mothers were comparable to White race. Physicians should consider these racial and ethnic differences when managing GDM and the associated risks. Limitations of this study include potential error biases from using CDC birth certificate data.

	White	Black	Asian	Hispanic
% GDM	6.13%	5.48%	13.2%	7.37%

Table 1: GDM prevalence by Race/Ethnicity

	White		Black		Asian		Hispanic	
NICU	1.285 [1.260, 1.311]		1.624 [1.509, 1.747]		1.606 [1.534, 1.682]		1.516 [1.466, 1.567]	
AV	1.249 [1.196, 1.303]		1.428 [1.245, 1.638]		1.372 [1.138, 1.654]		1.583 [1.420, 1.765]	
Average Birth Weight*	GDM	3,303.14 (+/- 385.55)	GDM	3,223.56 (+/- 409.64)	GDM	3,162.10 (+/- 388.97)	GDM	3,293.50 (+/- 383.07)
	No GDM	3,319.09 (+/- 382.25)	No GDM	3,149.39 (+/- 406.81)	No GDM	3,187.63 (+/- 385.76)	No GDM	3,265.67 (+/- 380.32)
LGA	1.267 [1.248, 1.285]		2.629 [2.520, 2.742]		1.211 [1.148, 1.277]		1.724 [1.682, 1.767]	
Low Apgar Score	1.069 [1.031, 1.109]		1.149 [1.073, 1.230]		1.153 [1.019, 1.305]**		1.219 [1.126, 1.320]	
C-Section	1.112 [1.101, 1.123]		1.243 [1.211, 1.276]		1.137 [1.109, 1.165]		1.100 [1.082, 1.118]	
C-Section***	1.252 [1.224, 1.281]		1.333 [1.270, 1.400]		1.267 [1.216, 1.319]		1.306 [1.261, 1.351]	

*in grams (+/- 1 standard deviation)
**p-value < 0.05; all else p-value < 0.01
***for mothers with no previous births (both alive and dead) and cephalic presentation
Control variables: maternal BMI, maternal age, obstetric estimate of gestational age, infant birth weight, plurality, infant sex, pre-gestational hypertension, gestational hypertension, maternal tobacco use, Women, Infant, and Children (WIC) program status, and mode of delivery

Table 2: Adjusted Odds Ratio by Race/Ethnicity for Neonatal Outcomes; non-GDM population as the control

137 | Construction of a Predictive Model to Determine Probability of Low Birth Weight Using Machine Learning

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[1]University of Chicago, Chicago, IL; [2]Northwell Lenox Hill Hospital, New York, NY; [3]Lenox Hill Hospital, NY

10:30 AM - 12:30 PM

Objective: Low birth weight (LBW) is classified as weight of less than 2,500 grams after birth. Identifying LBW is crucial due to its association with high-risk neonatal outcomes. This study aims to predict the probability of LBW for full term (37 week) neonates using maternal and pregnancy characteristics as well as the expected fetal weight (EFW) at 30 weeks.

Study Design: CDC natality data from 2022 was used to select maternal, neonatal, and pregnancy factors associated with infant birth weight. Maternal factors included: BMI, age, height, race, weight gain during pregnancy, gestational diabetes, gestational hypertension, plurality, cigarette use, and pre-pregnancy diabetes. Pregnancy and neonate-related characteristics included: infant sex, gestational age, and total birth order. The birth weights for infants delivered at 37 weeks of gestational age from this database were used and unknown parameters were excluded (n = 439,251). The EFWs at 30 weeks for these neonates were computed using Hadlock's EFW curves at the 10th and 90th percentiles. A least squares logistic regression model was generated using

Google Colab to predict the probability of LBW given all the characteristics and EFW at 30 weeks. The model used an 80:20 split for testing and training, respectively, for validation purposes.
Results: The model performed with an accuracy of 94.3%. The positive predictive value (PPV) was 93.4% and the negative predictive value (NPV) was 95.2%. Sensitivity was 95.3% and specificity was 93.3%. The area under the curve (AUC) score was 98.7% (Graph 1).
Conclusion: The high accuracy, NPV, PPV, sensitivity, specificity, and AUC score of the model attest to its predictive strength. Moreover, the model was trained using a large, national dataset, demonstrating its applicability. Physicians can incorporate machine-based learning models in quantifying the risk of LBW during the earlier stages of the third trimester. Further model developments can include modeling based on earlier EFWs (< 30 weeks) to provide specialized prenatal care for those who are at higher risk for LBW.

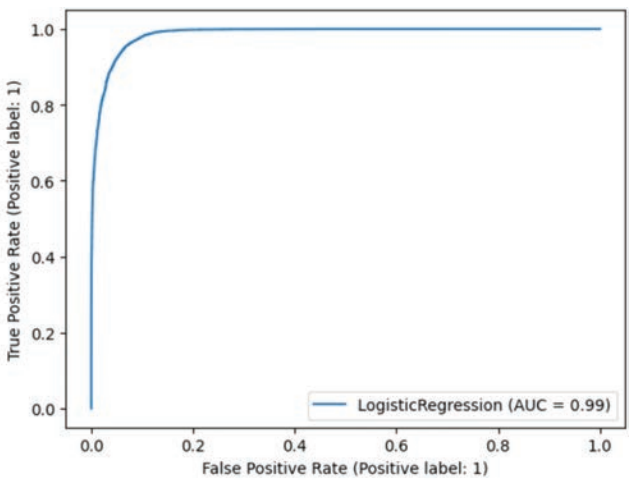

Image 1: ROC Curve

Input	Output
Pre-Pregnancy Weight: 120 pounds **Mother's Age:** 28 years **Mother's Height:** 65 inches **Mother's Race:** White **Weight Gain:** 25 pounds **Gestational Diabetes:** No **Gestational Hypertension:** No **Plurality:** Singleton **Total Birth Order:** 1 **Tobacco Use:** No **Infant Sex:** Female **EFW at 30 wks:** 1250 grams **Pre-Pregnancy Diabetes:** No	**Probability of Low Birth Weight:** 0.993

Table 1: Example Probability Prediction of LBW

138 | Impact of Interpregnancy Interval on Adverse Pregnancy Outcomes in Individuals with Prior Gestational Diabetes Mellitus

Ava D. Mandelbaum; Bharti Garg; Megha Arora; Aaron B. Caughey
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10:30 AM - 12:30 PM

Objective: Interpregnancy interval (IPI) has been shown to influence perinatal outcomes, yet its impact on individuals with prior gestational diabetes mellitus (GDM) remains under-explored. This study aims to evaluate the impact of IPI on pregnancy outcomes in patients with a history of GDM.
Study Design: This retrospective cohort study analyzed singleton, non-anomalous births in two consecutive deliveries among patients with a history of GDM in the index pregnancy in California (2008-2020). IPI was categorized into five groups: < 12, 12-23, 24-35, 36-59, and ≥ 60 months. Outcomes for the subsequent pregnancy included GDM, gestational hypertension, preeclampsia, preterm delivery < 37 weeks, cesarean delivery, severe maternal morbidity (SMM), macrosomia, and NICU admission. Chi-squared and multivariable logistic regressions were used for statistical analyses.
Results: Among 63,746 patients in our final sample, 20.7%, 31.8%, 19.3%, 18.4%, and 9.9% were classified in the < 12, 12-23, 24-35, 36-59, and ≥ 60-month IPI groups, respectively. Relative to the 12-23-month group, patients with IPI < 12 months had significantly higher proportions of preeclampsia (4.7% vs 4.3%), preterm delivery (8.5% vs 7.4%), macrosomia (16.2% vs 15.2%), and NICU admission (10.2% vs 9.3%) (Table 1). After adjustment, pregnancies with an IPI < 12 months remained associated only with preterm delivery (aOR 1.12, 95% CI 1.03-1.21) relative to an IPI of 12-23 months (Table 2). Conversely, compared to 12-23 months, an IPI ≥ 60 months was associated with higher rates and odds of gestational hypertension (aOR 1.46, 95% CI 1.30-1.65), preeclampsia (aOR 1.65, 95% CI 1.47-1.86), preterm delivery (aOR 1.63, 95% CI 1.48-1.79), cesarean delivery (aOR 1.58, 95% CI 1.42-1.75), and NICU admission (aOR 1.26, 95% CI 1.15-1.38).
Conclusion: Both short (< 12 months) and long (≥ 60 months) IPIs are associated with adverse perinatal outcomes among patients with GDM. These findings highlight the importance of counseling individuals with GDM on optimal pregnancy timing to mitigate risks in subsequent pregnancies.

Table 1. Unadjusted rates of perinatal outcomes associated with interpregnancy intervals among pregnant patients with a history of gestational diabetes mellitus

Outcomes	< 12 months n (%)	12-23 months n (%)	24-35 months n (%)	36-59 months n (%)	≥ 60 months n (%)	P-Value
Gestational Diabetes	6,659 (50.5)	10,355 (51.1)	6,294 (51.3)	6,105 (52.1)	3,201 (50.8)	0.118
Gestational Hypertension	614 (4.7)	949 (4.7)	606 (4.9)	628 (5.4)	444 (7.1)	<0.001
Preeclampsia	619 (4.7)	875 (4.3)	614 (5.0)	712 (6.1)	486 (7.7)	<0.001
Preterm Delivery <37 weeks	1,123 (8.5)	1,496 (7.4)	947 (7.7)	1,071 (9.1)	785 (12.5)	<0.001
Severe Maternal Morbidity	159 (1.2)	233 (1.2)	164 (1.3)	160 (1.4)	99 (1.6)	0.073
Cesarean Delivery	877 (10.1)	1,344 (10.1)	830 (10.5)	970 (13.1)	644 (16.5)	<0.001
Macrosomia	2,136 (16.2)	3076 (15.2)	1,751 (14.3)	1,803 (15.4)	890 (14.1)	<0.001
NICU Admission	1,340 (10.2)	1,877 (9.3)	1,109 (9.0)	1,195 (10.2)	776 (12.3)	<0.001

Table 2. Multivariable analyses of perinatal outcomes associated with interpregnancy intervals among pregnant patients with a history of gestational diabetes mellitus

Outcomes	<12 months aOR* (95% CI)	12-23 months	24-35 months aOR* (95% CI)	36-59 months aOR* (95% CI)	≥ 60 months aOR* (95% CI)
Gestational Diabetes	1.04 (0.99-1.09)	Reference	1.00 (0.95-1.05)	1.03 (0.98-1.08)	0.98 (0.92-1.04)
Gestational Hypertension	1.00 (0.90-1.11)	Reference	1.06 (0.95-1.18)	1.15 (1.04-1.28)	1.46 (1.30-1.65)
Preeclampsia	1.03 (0.93-1.15)	Reference	1.14 (1.03-1.27)	1.33 (1.20-1.48)	1.65 (1.47-1.86)
Preterm Delivery	1.12 (1.03-1.21)	Reference	1.04 (0.96-1.14)	1.20 (1.10-1.30)	1.63 (1.48-1.79)
Severe Maternal Morbidity	1.03 (0.83-1.26)	Reference	1.18 (0.96-1.44)	1.16 (0.94-1.42)	1.25 (0.98-1.60)
Cesarean Delivery	0.99 (0.90-1.08)	Reference	1.04 (0.95-1.14)	1.29 (1.18-1.41)	1.58 (1.42-1.75)
Macrosomia	1.03 (0.97-1.09)	Reference	0.92 (0.86-0.98)	0.99 (0.93-1.05)	0.85 (0.78-0.92)
NICU Admission	1.04 (0.96-1.12)	Reference	0.97 (0.89-1.05)	1.05 (0.97-1.13)	1.26 (1.15-1.38)

aOR - Adjusted Odds Ratio, CI - Confidence Interval
*Adjusted for maternal age, race/ethnicity, insurance status, educational attainment, number of prenatal care visits, and smoking status

139 | Association of Interpregnancy Interval on Obstetric Outcomes Among Patients with a History of Preeclampsia

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Oregon Health & Science University, Portland, OR

10:30 AM - 12:30 PM

Objective: Preeclampsia is associated with significant maternal morbidity, yet the impact of interpregnancy interval (IPI) on perinatal outcomes for subsequent pregnancies in these patients remains unclear. We aimed to evaluate the association of IPI with pregnancy outcomes in patients with a history of preeclampsia.

Study Design: This retrospective cohort study analyzed singleton, non-anomalous births in two consecutive deliveries among individuals with a history of preeclampsia in the index pregnancy in California (2008-2020). IPI was categorized into five groups: < 12, 12-23, 24-35, 36-59, and ≥ 60 months. Outcomes for the subsequent pregnancy included gestational hypertension, preeclampsia, preterm delivery, cesarean delivery, and severe maternal morbidity (SMM). Chi-squared and multivariable logistic regressions were used for statistical analyses.

Results: Our final sample included 36,435 patients with a history of preeclampsia in an index pregnancy. Among this group, 7,494 (20.6%), 10,827 (29.7%), 6,761 (18.6%), 6,918 (19.0%), and 4,435 (12.2%) individuals were classified in the < 12, 12-23, 24-35, 36-59, and ≥ 60-month IPI groups, respectively. Relative to the 12-23-month group, an IPI of < 12 months was significantly associated with gestational hypertension (10.5% vs 10.0%; aOR = 1.12, 95% CI 1.02-1.24) and preterm delivery (10.9% vs 9.1%; aOR = 1.16, 95% CI 1.05-1.28) (Table 1-2). Compared to 12-23 months, an IPI ≥ 60 months was linked to gestational hypertension (11.2% vs 10.0%; aOR = 1.17, 95% CI 1.04-1.31), preterm delivery (15.8% vs 9.1%; aOR = 1.72, 95% CI 1.54-1.91), cesarean delivery (17.3% vs 10.2%; aOR = 1.73, 95% CI 1.51-1.99), and SMM (2.3% vs 1.5%; aOR = 1.43, 95% CI 1.10-1.86).

Conclusion: This study demonstrates that short (< 12 months) and long (≥ 60 months) IPIs are associated with increased risks of adverse perinatal outcomes in patients with a history of preeclampsia. These findings may inform preconception counseling and tailored care plans to optimize maternal outcomes in this high-risk population.

Table 1. Unadjusted rates of perinatal outcomes associated with interpregnancy intervals among pregnant patients with a history of preeclampsia

Outcomes	< 12 months n (%)	12-23 months n (%)	24-35 months n (%)	36-59 months n (%)	≥ 60 months n (%)	P-Value*
Gestational Hypertension	786 (10.5)	1082 (10.0)	743 (11.0)	821 (11.9)	497 (11.2)	0.002
Preeclampsia	1,139 (15.2)	1,667 (15.4)	1,118 (16.5)	1,046 (15.1)	728 (16.4)	0.058
Preterm Delivery	814 (10.9)	982 (9.1)	736 (10.9)	857 (12.4)	699 (15.8)	<0.001
Severe Maternal Morbidity	134 (1.8)	159 (1.5)	110 (1.6)	110 (1.6)	100 (2.3)	0.012
Cesarean Delivery	458 (10.2)	655 (10.2)	444 (11.6)	534 (14.0)	419 (17.3)	<0.001

*Chi-squared analyses

Table 2. Multivariable analyses of perinatal outcomes associated with interpregnancy intervals among pregnant patients with a history of preeclampsia

Outcomes	<12 months aOR* (95% CI)	12-23 months	24-35 months aOR* (95% CI)	36-59 months aOR* (95% CI)	≥ 60 months aOR* (95% CI)
Gestational Hypertension	1.12 (1.02-1.24)	Reference	1.11 (1.0-1.23)	1.24 (1.13-1.37)	1.17 (1.04-1.31)
Preeclampsia	0.98 (0.90-1.07)	Reference	1.07 (0.99-1.17)	0.97 (0.89-1.05)	1.04 (0.94-1.14)
Preterm Delivery	1.16 (1.05-1.28)	Reference	1.19 (1.07-1.32)	1.36 (1.23-1.50)	1.72 (1.54-1.91)
Severe Maternal Morbidity	1.12 (0.88-1.43)	Reference	1.11 (0.87-1.43)	1.06 (0.82-1.36)	1.43 (1.10-1.86)
Cesarean Delivery	0.98 (0.86-1.11)	Reference	1.15 (1.01-1.31)	1.41 (1.24-1.60)	1.73 (1.51-1.99)

aOR - Adjusted Odds Ratio, CI - Confidence Interval
*Adjusted for maternal age, race/ethnicity, insurance status, educational attainment, number of prenatal care visits, and smoking status

140 | Continuous Glucose Monitoring (CGM) with Poor Glycemic Control Correlates to Increased Risk of Preterm Birth/Preeclampsia

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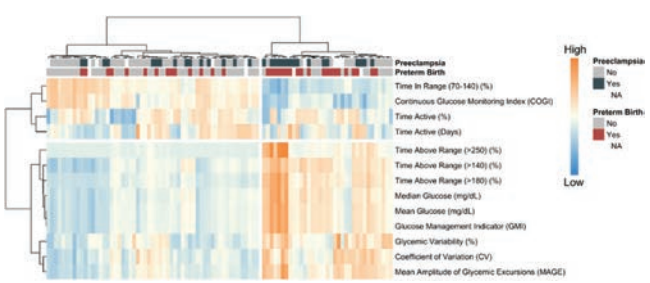
10:30 AM - 12:30 PM

Objective: We evaluated the association between glycemic control derived from CGM in patients with diabetes and the risk of adverse maternal/neonatal outcomes.

Study Design: We performed a retrospective cohort study of pregnant people with gestational and pregestational diabetes using CGM, who received care in a university-based MFM practice and delivered between July 2020 to December 2022, to evaluate the association between glycemic control and maternal/neonatal outcomes. CGM data was downloaded from the proprietary website and analyzed using a modified version of the iglu package using R. Maternal and neonatal demographic and pregnancy outcomes were abstracted from the EMR. Multivariable logistic regression was used to evaluate the relationship between glycemic control with maternal/neonatal outcomes.

Results: We evaluated 92 pregnancy episodes. HgbA1c was negatively correlated with time in range, composite glucose index and gestational age at delivery. HgbA1c was positively correlated with time above range, median glucose, GMI (vector of glucose measurement) and mean amplitude of glycemic excursion. Given high multicollinearity among CGM indices (VIF >24), we focused on GMI as a predictor. In simple logistic regression models, GMI was not significantly associated with: NICU admission (p = 0.23), LGA infants (p = 0.54), or SGA infants (p = 0.29). However, GMI was associated with PTB< 37w (OR 5.67, p < 0.002) and preeclampsia (OR 4.07, p < 0.005). In multivariable logistic regression models, GMI remained a significant predictor of PTB< 37w (aOR 5.50, 95% CI, 1.47-20.59, p < 0.02) and preeclampsia (aOR 3.56, 95% CI, 1.20-10.58, p < 0.03). Among the 34 preterm births noted in our cohort, 58.8% were noted to be iatrogenic and 41.2% were spontaneous.

Conclusion: We found that worsening glycemia in pregnancy was correlated with an increased risk of spontaneous and iatrogenic PTB and preeclampsia. Use of CGM in pregnancy has the potential to revolutionize diabetes care to provide a unique tool for patient education and targeted adjustments in medication therapy but more research is required to guide clinicians in its use.



141 | Preeclampsia-Like Features Induced by Reduced Uteroplacental Perfusion in a Transgenic Mouse Model of Alzheimer's Disease

Bani Medegan Fagla; Cielo Dela Rosa; Savita Sundar; Erykah Walton; Jason York; Guomao Zhao; Aswathi Jayaram; Leon M. Tai; Irina A. Buhimschi
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10:30 AM - 12:30 PM

Objective: Animal models that recapitulate preeclampsia (PE)-like features can greatly facilitate studies of PE mechanism. One such model, the reduced uteroplacental perfusion pressure (RUPP), was originally optimized in Sprague-Dawley rats. However, the advancement of genetically modified mice has led researchers to search for murine models where relationships between genes and disease phenotypes can be specifically studied. We aimed to optimize the RUPP procedure in *5xFAD*$^{+/-}$*/APOE*-TR$^{+/+}$ (EFAD) mice, a humanized transgenic mouse model of Alzheimer's disease and to compare the presence and severity of PE-like features to wild-type (WT) mice.

Study Design: 2-4 month old timed pregnant WT and EFAD C57/BL6J mice underwent RUPP on (GD)13.5 by bilateral ligation of ovarian vessels. Animals were sacrificed on GD17.5, for tissue harvest and assessment of PE endpoints: mean arterial pressure (MAP), albumin/creatinine ratio, serum sFlt-1/PlGF-2 ratio, kidney and placental morphology, fetal weights and placental efficiency (placental/fetal weight ratio). Pilot experiments assessing PE endpoints on GD18.5 resulted in fetal death of ~60% of RUPP mice. Control mice underwent sham procedures where ovarian vessels were not ligated. Data from n = 6-13 mice per group was tested for normality and analyzed by parametric statistics.

Results: **1)** RUPP resulted in a significant increase in MAP in WT ($p = 0.006$) but not in EFAD mice; **2)** RUPP did not increase the albumin/creatinine or sFlt-1/PlGF-2 ratios in either WT or EFAD mice; **3)** RUPP mice had discernable changes in kidney morphology consistent with kidney injury independent of genotype; **4)** RUPP decreased placental efficiency in EFAD ($p = 0.003$) but not in WT mice.

Conclusion: The extent to which RUPP mimics different PE-endpoints varies with mouse genetic background. Unlike WT mice, EFAD mice remain normotensive following RUPP, yet they have increased susceptibility to placental insufficiency; an observation with relevance to the heterogeneity of clinical manifestations comprising the PE syndrome.

142 | Outpatient Mangement Protocol for Preterm Premature Rupture of Membranes Before 34 Weeks

BARROIS Mathilde[1]; Seyral Antonin[1]; Aude Girault[2]; Francois Goffinet[3]; Camille Le Ray[4]
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10:30 AM - 12:30 PM

Objective: In cases of preterm premature rupture of membranes (PPROM), expectant management is preferred to reduce neonatal morbidity when no infection is present. While monitoring has traditionally been done through hospitalization, outpatient management (OM) is now an option, though selection criteria remain unclear. This study aims to compare obstetric and neonatal outcomes before and after the implementation and modification of a OM protocol for PPROM patients introduced in April 2013.

Study Design: We included all patients with PPROM before 34 weeks, admitted from January 1, 2011, to December 31, 2021. Patients were divided into two groups: Period A, where all were hospitalized until delivery, and Period B, where eligible patients were monitored at home (OM). Periods B1 to B3 reflect successive modifications of the OM protocol (Figure 1).

The primary outcome was the latency period, defined as the duration in days between PPROM and delivery. Secondary outcomes included obstetric and neonatal outcomes. Obstetric and neonatal outcomes were compared between periods A and B, and further analyzed among OM patients across periods B1 to B3

Results: During Period A, 145 patients were included, and 394 in Period B, of whom 126 (32%) received OM. Gestational age at PPROM was comparable between the periods (28.9 weeks ±3.1 vs. 28.9 weeks ±3.32, $p = 0.94$), as were the latency period (13.9 ±19.9 days vs. 14.5 ± 16.8, $p = 0.77$) and gestational age at delivery (30.8 ±3.26 weeks vs. 30.9 ±3.77, $p = 0.62$). Early neonatal bacterial infections were significantly lower in Period B (42% vs. 31%; $p = 0.018$), as was the rate of intraventricular hemorrhage (24% vs. 6.2%; $p < 0.01$). OM use increased from B1 to B3 due to relaxed eligibility criteria, with no significant change in the latency period (Table).

Conclusion: After the OM protocol was implemented, one-third of patients benefited from home monitoring, with usage increasing over time. In PPROM cases, HCM, even with broad eligibility criteria, does not appear to extend the latency period but may reduce neonatal morbidity.

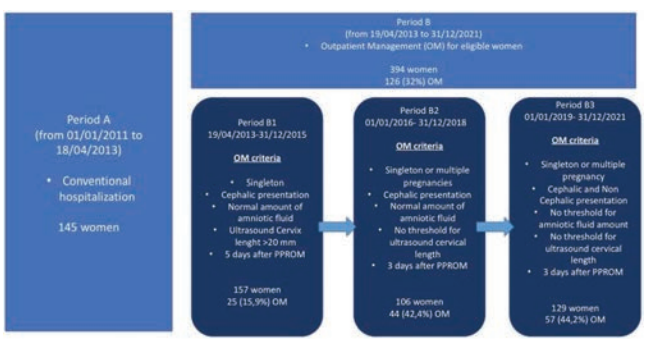

Table : OM patients issues

OM patients issue	Period B1 n = 25 n (%) Moy +/- SD	Period B2 n = 44 n (%) Moy +/- SD	Period B3 n = 57 n (%) Moy +/- SD	p
Initial hospitalization duration	8,44 +/- 7,43	7,29 +/- 4,91	6,60 +/- 2,83	0,88
Gestational age of HCM (weeks)	29.9 +/- 2.29	29.1 +/- 3.00	29.3 +/- 3.19	0,56
Latency period duration (days)	29,2 +/- 19,4	30,5 +/- 20,8	28,6 +/- 16,7	0,99
Term of delivery (weeks)	33.2 +/- 3.13	32.9 +/- 3.40	32.2 +/- 3.45	0,39

143 | Normal Blood Pressure Standard Across Gestation in Low-Risk Pregnant Individuals and Comparisons by Pregnancy Outcome

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[1]Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA; [2]University of Pennsylvania Perelman School of Medicine, Philadelphia, PA; [3]Epidemiology Branch, NICHD-NIH, Bethesda, MD; [4]University of Pennsylvania School of Nursing, Philadelphia, PA; [5]Pennsylvania Medicine Women's Health Clinical Research Center, Philadelphia, PA

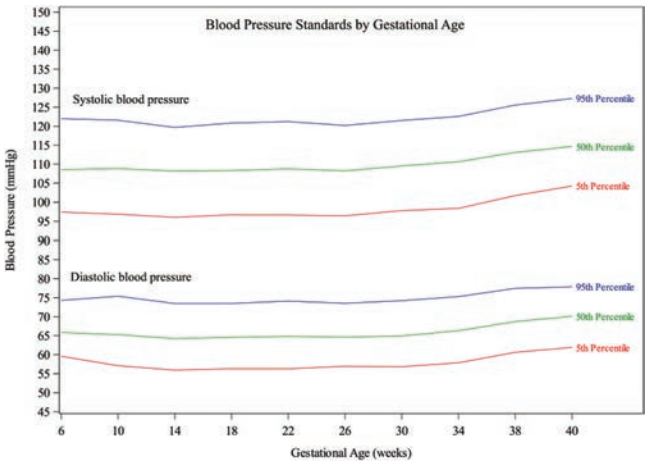
10:30 AM - 12:30 PM

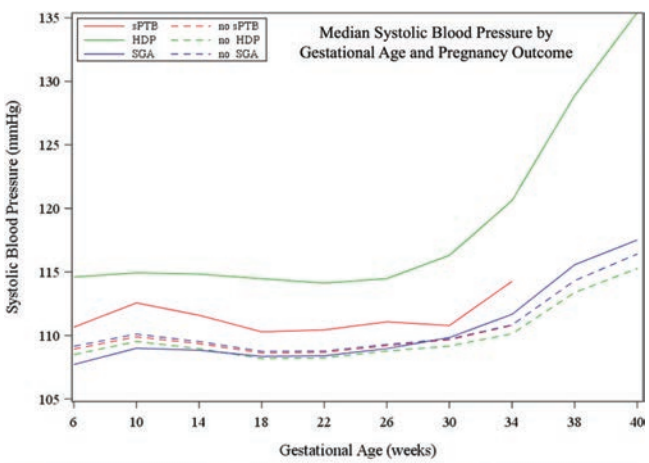
Objective: Nearly 50 years ago, mean blood pressure (BP) in 6,662 white pregnant women was reported to vary by gestational age, but the upper and lower limits of normal across gestation have not been defined. Our objectives were to create a BP standard based on the gestational age-specific BP in low-risk pregnant people, and to compare BP trajectories between those with and without hypertensive disorders of pregnancy (HDP; gestational hypertension or preeclampsia), spontaneous preterm delivery (sPTD), or small-for-gestational age neonates (SGA).

Study Design: This was a secondary analysis of 2334 low-risk, singleton pregnancies from 2009-2013 that were a part of a prospective NICHD cohort of individuals 18-40 years without medical conditions or prior pregnancy complications; BMI 19.0-29.9 kg/m2. Linear mixed models with cubic splines were used to estimate systolic and diastolic BP curves, based on BP abstracted from prenatal records. Likelihood ratio tests compared curves between pregnancies with HDP, sPTD, or SGA (< 10%ile based on Duryea reference) vs. those without these outcomes, adjusting for confounders.

Results: There were 2278 pregnancies included in the standard with a mean of 11 measurements (standard deviation [SD] 3). The mean maternal age was 28.2y (SD 5.5), gestational age at delivery 38.8wk (SD 1.7), and 49% were nulliparous. Participants were 28% Hispanic, 26% non-Hispanic (NH) Black, 26% NH white, and 20% NH Asian. HDP occurred in 123 (6%), sPTD in 90 (4%), and SGA in 191 (9%). BPs were lower and varied less with gestation than reported in the prior study, with standard curves shown in Figure 1. As early as at 6-8 weeks, BPs were significantly higher in those who ultimately developed HDP and sPTB compared to those who did not (p values < 0.05, Figure 2).

Conclusion: In a diverse, contemporary cohort, we established normative BP curves and trends for pregnancy. Additionally, early first-trimester BPs are higher for those destined to have HDP or sPTB. Future studies should evaluate whether deviation of BP trajectories is an opportunity for early intervention to decrease risks of HDP and sPTB.





sPTB, spontaneous preterm birth; HDP, hypertensive disease of pregnancy; SGA, small-for-gestational age

144 | Influence of the Solomon Technique in TTTS on Survival and Abruption–Temporal Or Causal?

Bettina Paek; Melissa Dorn; Martin Walker
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10:30 AM - 12:30 PM

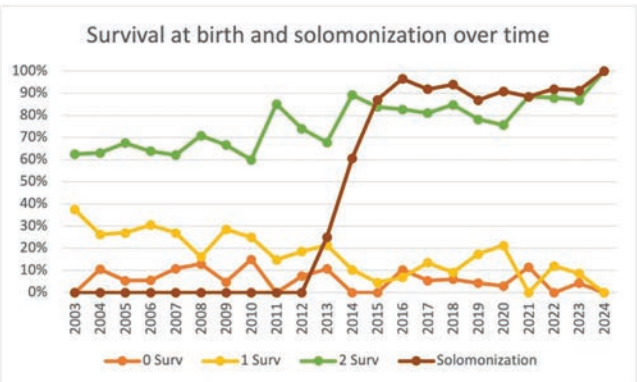
Objective: The fetoscopic laser Solomon technique (FLS) for treatment of Twin-Twin Transfusion Syndrome (TTTS) has been associated with an increased risk of placental abruption while also improving neonatal survival when compared to standard fetoscopic laser (FL). We aimed to determine the impact of implementation of FLS on neonatal survival and placental abruption.

Study Design: We conducted a single center retrospective study of patients with mo-di twins undergoing Fl or FLS from 2003-2024. We used logistic regression, interrupted time series, and non-parametric analysis to determine the impact of adoption of FLS on neonatal survival and placental abruption.

Results: Between 2003-2024, 584 mo-di twins underwent laser for the treatment of TTTS and had information on abruption status and neonatal outcomes available. FLS was adopted between 2013-2014. Patients undergoing FLS had improved chances of dual

survival (84% vs 69%, p < 0.001) and an increased risk of abruption (15% vs 5%, p = 0.027). There was no association between gestational age at surgery, placental position, number of anastomoses ablated or total fetoscopy time and risk of subsequent abruption. However, survival showed a significant incremental improvement throughout the study period with dual survival (annual means) increasing from 63% to 88% for the last year that full data were available (p = 0.02) and single survival decreasing from 38% to 9% (P = 0.01). The frequency of no survivors ranged from 0-12% and did not change significantly over time. The rate of TAPS requiring treatment was low (< 2%) pre and post adoption of FLS. Similarly, the rate of abruption increased starting early in the study period with a marginally significant decrease of the slope after adoption of FLS.

Conclusion: While both survival and abruption increased during the study period, this increase predated the adoption of FLS. This raises the question of causal attribution to FLS versus other factors, such as operator experience or more extensive use of laser. A randomized trial may be required to assess the true impact of FLS on obstetric and neonatal outcomes.



145 | Maternal Laparotomy to Fetoscopic MMC Repair in the Morbidly Obese is Safe and Feasible

Braxton Forde[1]; K. Schuyler Nissen[1]; Charles Stevenson[2]; Foong-Yen Lim[3]; Mounira Habli[2]; David McKinney[1]; Erinn Goetz[2]; Jose L. Peiro[4]

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10:30 AM - 12:30 PM

Objective: The Management of Myelomeningocele Study (MOMS) delineated inclusion and exclusion criteria for in utero myelomeningocele (MMC) repair. One exclusion was maternal BMI > 35 kg/m. Our institution expanded the criteria to include body mass index (BMI) up to 39.99. Concerns have been raised regarding fetoscopic MMC repair and the prolonged operative time in the morbidly obese, therefore, we sought to evaluate the outcomes of fetoscopic MMC repair in the setting of BMI ≥ 35 at the time of surgery.

Study Design: This was an IRB-approved, single institution study from 2016-2024. Inclusion criteria were any patients that underwent fetoscopic repair at our institution that had a BMI of at least 35.0 on the date of surgery. These patients all had a midline laparotomy to 3 port fetoscopic MMC repair (Figure 1). All patients underwent 3-layer closure, with 2 overlapping human umbilical cord matrix patches and either primary skin closure or skin patch placement. Outcomes assessed were operative time, gestational age at delivery, route of delivery, need for cerebrospinal fluid (CSF) diversion at 12 months, and postoperative complications.

Results: During study window, 92 patients underwent maternal laparotomy to fetoscopic MMC repair. Of those 92, 19 had a BMI ≥ 35 as documented in the medical record at the date of surgery. The median gestational age at surgery was 25 2/7 weeks (IQR 24 6/7, 25 5/7), median gestational age at delivery was 35 3/7 weeks (IQR 34 1/7, 36 5/7), and CSF diversion rate at 12 months was 31.3%, which were similar to better than outcomes with BMI < 35 (Table 1). The rate of vaginal delivery was 42%, also similar to those with BMI < 35. Interestingly, total OR time was no different with respect to BMI (OR time 255 min, IQR 235.5, 294 in BMI ≥ 35 vs 251, IQR 230, 297 in BMI < 35, p = 0.707).

Conclusion: Maternal BMI 35-< 40 did not negatively affect the pregnancy or postoperative outcomes in the setting of fetoscopic MMC repair. Further evaluation of fetoscopic MMC outcomes in the setting of maternal BMI of 40-45 may be warranted.

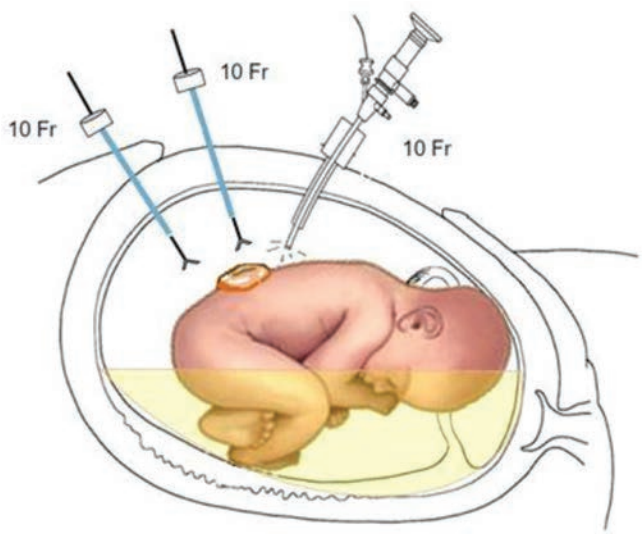

Table 1. Comparison between Fetoscopic MMC repair in the setting of BMI ≥ 35 and < 35.

	BMI ≥ 35 kg/m N = 19	BMI < 35 kg/m N = 73	p
Gestational age at surgery, weeks	25 2/7 (24 6/7, 25 5/7)	25 1/7 (24 5/7, 25 5/7)	0.882
Operative time, min	255 (235.5, 294)	251 (230, 297)	0.707
Fetoscopy time, min	167 (156.5, 213)	195 (172, 238)	0.173
Pulmonary edema by CXR	0/19 (0%)	1/73 (1%)	0.793
PPROM < 37 weeks	10/19 (53%)	40/73 (55%)	0.868
Vaginal delivery**	8/19 (42%)	31/73 (42%)	0.999
Maternal skin infection/separation, managed conservatively	3/19 (16%)	1/73 (1%)	0.053
Gestational age at delivery, weeks	35 3/7 (34 1/7, 36 5/7)	34 0/7 (31 0/7, 36 5/7)	0.048
CSF diversion by 12 months of life	5/16* (31%)	24/68* (35%)	0.782
CSF leak at birth	0/19 (0%)	1/73 (1%)	0.793

*Data available for 16 and 68 patients, respectively.
Data is presented as median (IQR), and N (%).

146 | TTTS + sFGR + TAPS: Does "Triple Disease" Lead to Worse Outcomes in TTTS?

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10:30 AM - 12:30 PM

Objective: Twin-twin transfusion syndrome (TTTS) is often diagnosed with selective fetal growth restriction (sFGR). Concomitant TTTS + sFGR is believed to worsen outcomes, but the impact of TAPS upon TTTS + sFGR, i.e. "triple disease," is unknown. Thus we sought to evaluate these patients' outcomes relative to the TTTS and TTTS + sFGR populations.

Study Design: IRB-approved retrospective cohort at a single institution from 2011-2024. Inclusion criteria were patients who underwent fetoscopic laser photocoagulation (FLP) for monochorionic twins and had both middle cerebral artery peak systolic velocity (MCA-PSV) and estimated fetal weight (EFW) calculated by ultrasound. Three groups were analyzed: TTTS alone, TTTS + sFGR, and TTTS + sFGR + TAPS. sFGR was defined by ≥2 of the following: EFW or abdominal circumference (AC) of one twin < 10th percentile, EFW discordance of ≥25%, or umbilical artery pulsatility index of the smaller twin >95th percentile. TAPS was defined by an MCA-PSV delta >0.5 between the twins. Preoperative, operative, and postoperative characteristics were compared, with primary outcomes being fetal survivorship and gestational age at delivery.

Results: Out of 942 patients who underwent FLP, 780 met study criteria: 392 with TTTS, 296 with TTTS + sFGR, and 92 with TTTS + sFGR + TAPS. The TTTS + sFGR + TAPS group had a later gestational age at surgery and higher rates of Stage IV disease (Table 1). Outcomes varied significantly between groups. Fetal survival (i.e. live birth) of 2 infants was 88% for TTTS, 76% for TTTS + sFGR, and 68% for TTTS + sFGR + TAPS (p < 0.001). The gestational age at delivery was latest in the TTTS + sFGR + TAPS group (mean 33.1 weeks, 95% CI 32.4-33.8) compared to TTTS alone (30.1 weeks, 95% CI 29.8-30.4, p < 0.001). This later age correlated with higher birthweights for both donors and recipients (Figure 1). Donor birthweight was lowest in the TTTS + sFGR group (Table 1).

Conclusion: TTTS + sFGR + TAPS is associated with worse survival but longer pregnancy duration compared to TTTS + sFGR and TTTS alone. This information is valuable for preoperative counseling.

	TTTS N = 392	TTTS + sFGR N = 296	TTTS + sFGR + TAPS N = 92	p
Maternal age	28.9 (95% CI 28.3-29.4)	29.3 (95% CI 28.6-30.0)	29.0 (95% CI 27.9-30.2)	0.801
Maternal BMI	29.4 (95% CI 28.6-30.0)	29.4 (95% CI 28.2-30.5)	30.3 (95% CI 28.8-31.8)	0.994
TTTS Stage				<0.001
I	55 (14%)	39 (13%)	9 (10%)	
II	78 (20%)	64 (22%)	10 (11%)	
III	228 (58%)	182 (61%)	57 (62%)	
IV	31 (8%)	11 (4%)	16 (17%)	
Placental location				0.564
Anterior	187 (48%)	128 (43%)	42 (46%)	
Posterior	179 (46%)	150 (51%)	46 (50%)	
Previa	2 (<1%)	2 (<1%)	0 (0%)	
Other (i.e. fundal)	24 (6%)	12 (4%)	4 (4%)	
GA at surgery	20.4 (95% CI 20.2-20.7)	20.4 (95% CI 20.1-20.7)	21.4 (95% CI 20.9-21.9)	0.008
Short cervix	28 (7%)	43 (15%)	12 (13%)	0.006
Cerclage/Pessary	27 (7%)	30 (10%)	11 (12%)	0.165
DVP preop, cm	11.0 (95% CI 10.7-11.3)	11.1 (95% CI 10.8-11.4)	11.5 (95% CI 10.8-12.1)	0.149
Pregnancy Outcomes				
GA at delivery, weeks	30.1 (95% CI 29.8-30.4)	30.0 (95% CI 29.6-30.4)	33.1 (95% CI 32.4-33.8)	<0.001
PPROM < 37 weeks	156 (40%)	131 (44%)	25 (27%)	0.014
Abruption < 37 weeks	38 (10%)	24 (8%)	4 (4%)	0.243
Recurrent TTTS or postop TAPS	7 (2%)	8 (3%)	3 (3%)	0.592
Donor Birthweight, g	1287.4 (95% CI 1239.4-1335.4)	1072.3 (95% CI 1018.6-1126.0)	1627.8 (95% CI 1498.6-1757.1)	<0.001
Recipient Birthweight, g	1441.4 (95% CI 1393.8-1488.9)	1437.3 (95% CI 1381.4-1493.1)	2103.4 (95% CI 1990.3-2216.5)	<0.001
Fetal Survival*				<0.001
2	330/375 (88%)	217/284 (76%)	62 (68%)	
1+	370/375 (99%)	279/284 (98%)	89 (98%)	
0	5/375 (1%)	5/284 (2%)	2 (2%)	

Table 1. Preoperative, operative, and pregnancy characteristics between TTTS, TTTS + sFGR, and TTTS + sFGR + TAPS.
*Delivery information only available for 375, 284, and 91 patients, respectively amongst groups.
Fetal survival is defined as a livebirth of a vigorous infant.
Data is presented as mean (95% CI) or N (%) unless noted otherwise. GA = gestational age, PPROM = preterm prelabor rupture of membranes

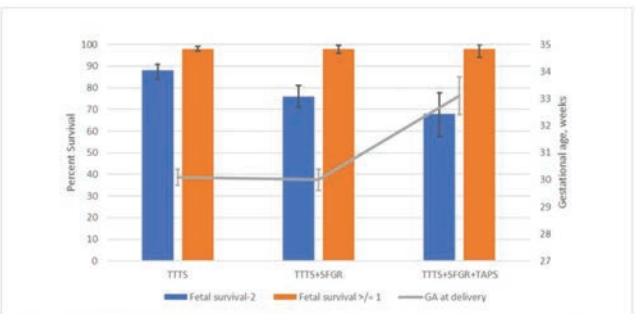

Figure 1. Fetal survival and gestational age at delivery stratified by diagnoses.
The left Y axis is the percent survival of either 2, or at least 1 fetuses, represented by the bar graph, and the right Y axis is the gestational age at delivery in weeks, represented by the line graph. Data is presented as Percent +/- 95th CI, or Mean +/- 95th CI.

147 | Outcomes of Maternal Alloimmunization with Multiple Antibodies Compared to a Single Antibody

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10:30 AM - 12:30 PM

Objective: To investigate outcomes related to the presence of multiple alloantibodies compared to a single antibody.

Study Design: A single-center retrospective cohort study of alloimmunized singleton gestations with antibodies known to be associated with hemolytic disease of the fetus and newborn (HDFN) from 2018 to 2023. We excluded pregnancies if the fetus was determined to be not at risk for HDFN either by negative paternal genotyping or negative invasive diagnostic testing. Multiple gestations were excluded as well. Univariate and multivariate analyses were performed. P-value < 0.05 was considered statistically significant.

Results: 166 alloimmunized pregnancies were identified during the study period. Patients with multiple antibodies were more likely to have had an intrauterine transfusion (IUT) in a previous pregnancy (20% vs. 0.8%, $p < 0.001$) and were more likely to be with anti-D. 64% of patients had antibody titers drawn early in pregnancy. This titer was higher in patients with multiple antibodies (254.5 ± 325.8 vs. 19.48 ± 51.1, $p = 0.007$) despite being collected at around the same gestational age (10.97 ± 3.3 vs. 10.35 ± 2.7, $p = 0.39$). Patients with multiple antibodies reached a higher maximum titer during pregnancy (381.6 ± 431.4 vs. 40.56 ± 92.2, $p = 0.004$) and were more likely to undergo middle cerebral artery (MCA) Dopplers (93.3% vs. 59.8%) that was started at an earlier gestational age (25.6 ± 4.6 vs. 29.8 ± 6.3, $p = 0.02$). They were also more likely to need IUT (80% vs. 34.3%, $p = 0.005$) that was both earlier and more frequent(3.6 ± 1.3 vs. 1.9 ± 1, $p = 0.003$) and to deliver at an earlier gestational age (34.7 ± 5.4 vs. 36.7 ± 2.6, $p = 0.01$).

Conclusion: Patients with alloimmunization involving multiple antibodies rather than a single antibody are more likely to have critical antibody titers, require early MCA Dopplers, develop HDFN requiring IUT procedures that were more commonly early and multiple, and deliver at an earlier gestational age.

Table 1: Alloimmunization diagnostic and antenatal monitoring characteristics

		1 antibody (n=136)	≥2 antibodies (n=30)	P-Value
Antibody titer drawn early in pregnancy (%)		89 (71.2%)	18 (66.7%)	0.6
Starting antibody titer		N=88 19.55 ± 50.5	N=18 254.5 ± 325.8	**0.007**
Gestational age at the time of the first titer test (weeks.days)		N=89 10.25 ± 2.7	N=18 10.97 ± 3.3	0.3
Maximum antibody titer during pregnancy		N=87 40.56 ± 92.2	N=18 381.6 ± 431.4	**0.004**
Gestational age at maximum titer (weeks.days)		N=87 17.43 ± 10.75	N=18 15.9 ± 7.8	0.6
Type of alloimmunization	Big M	23 (17%)	0	**<0.001**
	Big D	26 (19.3%)	16 (55.2%)	
	Big E	30 (22.2%)	3 (10.3%)	
	Little c	10 (7.4%)	2 (6.9%)	
	Little s	1 (0.7%)	0	
	Kidd	6 (4.4%)	0	
	Big K	20 (14.8%)	2 (6.9%)	
	Big C	7 (5.2%)	5 (17.2%)	
	Big S	5 (3.7%)	0	
	Duffy	5 (3.7%)	0	
	Little e	2 (1.5%)	1 (3.4%)	
MCA Doppler assessment started (%)		81 (60.4%)	28 (93.3%)	**<0.001**
Gestational age at first MCA Doppler assessment		N=78 23.4 ± 5.9	N=28 22.7 ± 5.6	0.6
Maximum MCA MoM		N=80 1.47 ± 0.3	N=26 1.55 ± 0.39	0.3
Gestational age at maximum MCA MoM		N=80 29.4 ± 5.9	N=27 28.8 ± 5.1	0.6
Maximum MCA MoM≥ 1.5 (%)		38/80 (45%)	15/27 (53.6%)	0.51
Gestational age when MoM was first ≥1.5		N=37 29.8 ± 6.3	N=15 25.6 ± 4.6	**0.02**
Patient needed IUT (%)		12/35 (34.3%)	12/15 (80%)	**0.005**

Table 2: Maternal antenatal characteristics focusing on obstetric history and outcomes in current pregnancy, including IUT details and gestational age at delivery.

Maternal characteristics	1 antibody (n=136)	≥2 antibodies (n=30)	P-Value
Age	N=130 30.43 ± 5.7	N=30 30.4 ± 3.6	0.9
Gravidity	N=135 3.97 ± 2.2	N=30 4.2 ± 1.9	0.7
Parity	N=135 2.07 ± 1.5	N=30 2.1 ± 1.4	0.8
GA at referral	N=133 17.4 ± 7.8	N=29 20.3 ± 7.8	0.07
BMI at referral	N=115 31 ± 7.3	N=26 34.2 ± 8.9	0.06
Maternal antibodies in prior pregnancy (alloimmunization)?	47/88 (53.4%)	16/26 (61.5%)	0.5
History of IUT at previous pregnancy (%)	1/118 (0.8%)	5/25 (20%)	**<0.001**
Gestational age at first IUT in prior pregnancy (weeks.days)	N=1 25	N=5 28.4 ± 4.7	-
History of maternal blood transfusion prior to current pregnancy (%)	29/61 (47.5%)	7/15 (46.7%)	1
Patient with history of prior abortion or miscarriage (%)	72/134 (53.7%)	18/29 (62.1%)	0.5
Rh negative blood type (%)	35/135 (25.9%)	18/30 (60%)	**<0.001**
Confirmed received Rhogam for all prior abortions/miscarriages (%)	1/9 (11.1%)	1/2 (50%)	0.3
Confirmed received Rhogam in all previously indicated preterm or term deliveries (%)	11/17 (64.7%)	2/4 (50%)	0.6
History of IUFD related to HDFN	0	0	-
History of neonatal death related to HDFN (%)	0/129 (0%)	1/27 (3.7%)	0.2
Prior newborn requiring phototherapy or transfusion due to HDFN (%)	12/69 (17.4%)	9/22 (40.9%)	**0.04**
If IUT needed, number of IUTs performed	N=10 1.9 ± 1	N=11 3.6 ± 1.3	**0.003**
Gestational age at first IUT (weeks.days)	N=12 28.6 ± 4.5	N=12 25.2 ± 4	0.06
Procedure-related complications first IUT	3/12 (25%)	0/12 (0%)	1
Procedure-related complicated last IUT	0/7 (0%)	2/11 (18.2%)	0.5
Fetal demise during pregnancy	3/118 (2.5%)	3/26 (11.5%)	0.07
If demise, what gestational age (weeks.days)	N=3 27.2 ± 7.4	N=2 25.5 ± 4.2	0.8
Gestational age at delivery (weeks.days)	N=116 36.7 ± 2.6	N=23 34.7 ± 5.4	**0.01**

148 | Differences in Risk Factors for Postpartum Hemorrhage in Obese and Non-Obese Patients

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10:30 AM - 12:30 PM

Objective: Several studies have noted an association between obesity and increased rates of postpartum hemorrhage. However, it is still unclear why this correlation exists. Our objective is to evaluate if there are differences in risk factors for postpartum hemorrhage between obese and non-obese pregnant patients.

Study Design: We conducted a retrospective cohort study of all patients who delivered at our level 4 maternal care hospital between August 1, 2020 and July 31, 2021. Records were reviewed for sociodemographic characteristics, pre-existing medical conditions, and whether they had a postpartum hemorrhage, defined as a quantitative blood loss (QBL) of > = 1000ml within the first 24 hours after delivery, based on ReVITALize criteria. Univariate logistic regression was then used to analyze known risk factors for postpartum hemorrhage in patients with BMI < $30 kg/m^2$ and BMI ≥ $30 kg/m^2$.

Results: A total of 693 patients delivered during the study period, of which 225 (32%) had BMI < 30 and 468 (68%) had BMI >30. Of note, 76% of our study population identified as Hispanic or LatinX. Risk factors differed between the two BMI groups.

Regardless of BMI, having a placental abnormality including placenta accreta spectrum was a risk factor for postpartum hemorrhage. Having vaginal bleeding or anemia on admission were only risk factors in the BMI < 30 group. Intraamniotic infection was only a risk factor in the BMI ≥ 30 group. All other variables listed here were not risk factors for postpartum hemorrhage in this cohort of patients.

Conclusion: In our primarily Hispanic cohort of pregnant patients, there are differences in risk factors for postpartum hemorrhage between obese and non-obese patients. This study may have been limited due to sample size. Further studies should utilize this information to create better models to predict postpartum hemorrhage.

	BMI < 30kg/m²				BMI ≥ 30kg/m²			
Independent variable	OR[1]	95% CI[1]	p-value	q-value[2]	OR[1]	95% CI[1]	p-value	q-value[2]
Multiple gestation	6.48	0.94, 128	0.059	0.18	1.87	0.68, 5.58	0.22	0.34
Grand Multiparity	2.38	0.39, 18.4	0.34	0.64	1.68	0.68, 4.37	0.26	0.35
HTN	0.64	0.03, 16.3	0.75	0.81	1.26	0.57, 2.87	0.57	0.61
History of PPH	1.58	0.29, 8.69	0.58	0.80	2.02	0.69, 6.66	0.20	0.34
VB on admission	**3.41**	**1.47, 8.37**	**0.004**	**0.029**	1.45	0.71, 3.03	0.31	0.39
Uterine Fibroids	3.16	0.30, 68.7	0.33	0.64	2.53	0.81, 9.46	0.11	0.24
Macrosomia	1.52	0.58, 3.95	0.38	0.64	1.56	0.94, 2.63	0.087	0.22
Polyhydramnios	-*	-*	-*	-*	3.00	0.86, 13.8	0.087	0.22
Placental abnormality	**13.6**	**2.43, 255**	**0.001**	**0.022**	**10.3**	**1.91, 190**	**0.004**	**0.030**
Anemia	**2.61**	**1.13, 6.29**	**0.025**	**0.094**	1.10	0.50, 2.46	0.81	0.81
Thrombocytopenia	1.39	0.60, 3.16	0.44	0.66	1.23	0.66, 2.31	0.51	0.59
Known coagulopathy	1.56	0.06, 39.9	0.75	0.81	-*	-*	-*	-*
Trial of Labor after C-section	0.77	0.16, 3.00	0.71	0.81	0.43	0.16, 1.02	0.057	0.21
Induction or Augmentation of Labor	1.01	0.59, 1.73	0.97	0.97	1.25	0.87, 1.80	0.23	0.34
Intra-amniotic infection	2.31	0.77, 7.26	0.13	0.33	**3.22**	**1.60, 6.91**	**<0.001**	**0.013**

1OR = odds ratio, CI = confidence interval
2False discovery rate correction for multiple testing
*Unable to assess OR or statistical significance given complete separation of variables in these groups

149 | Associations Between H48/H0 β-HCG Ratio in the Fourth Gestation Week and Pregnancy Outcomes:A Retrospective Analysis

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10:30 AM - 12:30 PM

Objective: Does an H48/H0 hCG ratio of pregnancy in the fourth gestation week associate with pregnancy outcomes in pregnancy loss patients? we aimed to investigate the correlations between hCG ratio and pregnancy outcomes in patients with a history of pregnancy loss.

Study Design: This is a retrospective cohort study, the receiver operator curves were plotted to determine the optimal cut-off for the pregnancy outcomes. The odds ratio was also calculated through univariable and multivariable analyses, with continuous variables categorized into binary categories based on the cut-off value.

Results: In total, 279 women ended with live birth and 79 with no live birth. A lower H48/H0 ratio of hCG in the fourth gestation week was an independent risk factor for no live birth ($p < 0.01$) and preterm birth ($p = 0.03$). The optimal value for predicting no live birth of H48/H0 is 1.85 (AUC = 0.717). For early pregnancy loss, the optimal value of H48/H0 is 1.85 (AUC = 0.711), and for biochemical pregnancy loss, it is 1.55 (AUC = 0.953). Compared to the live birth group, patients with a H48/H0 ratio < 1.85 exhibited a significantly higher risk of no live birth (OR: 9.54, 95% CI: 5.16-17.63). Similarly, individuals with a H48/H0 ratio < 1.55 faced an elevated risk of biochemical pregnancy loss (OR:603.0, 95% CI: 61.08-5953.14). A H48/H0 ratio (< 2.56) was associated with a tendency towards an increased risk of preterm birth (OR: 1.85, 95%CI:0.74-4.65).These odds ratio remained consistent even after adjusted by age, BMI, previous losses, initial hCG(H0), E2 and P.

Conclusion: Our study revealed that the H48/H0 ratio of hCG in the fourth gestation week of pregnancy might be correlated with both no live birth and preterm birth. Further prospective large studies are needed to confirm our findings.

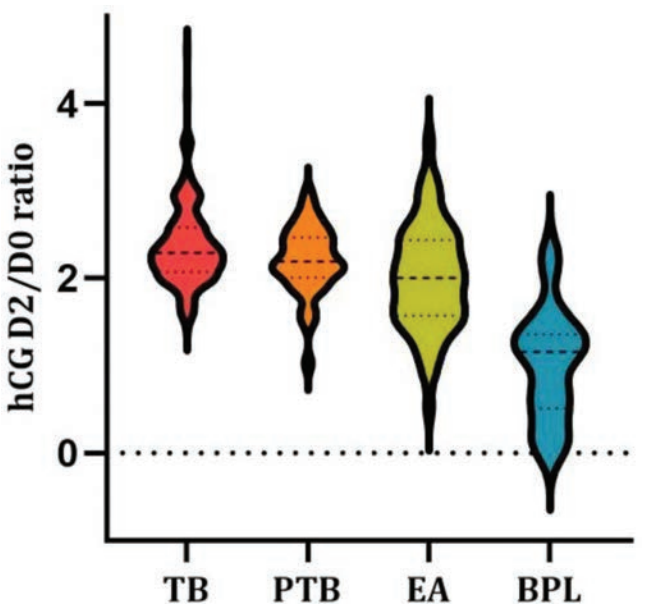

Table1 The characteristics of live birth and No Live Birth group

Characteristics	Live Birth	NO Live Birth	*P* value	*P*[a] value	[a]OR(95%CI)
n	272	79			
Age(year)	30.3±3.5	30.8±3.6	0.266	0.261	0.950(0.868-1.039)
Height(cm)	161.4±4.6	161.7±4.8	0.591	0.674	1.099(0.709-1.702)
Weight(kg)	58.1±7.7	60.0±9.9	0.096	0.540	0.831(0.460-1.501)
BMI(kg/m²)	22.3±2.8[b]	22.9±3.7[c]	0.145	0.604	1.502(0.323-6.987)
Previous losses	2.2±1.2	2.5±1.3	0.081	0.454	0.911(0.714-1.163)
HCG(H0)(mIU/ml)	878.3±824.1	770.2±804.3	0.303	0.078	1.0(1.0-1.001)
E2(pg/ml)	353.4±287.3	307.7±186.9	0.196	0.219	1.001(0.999-1.003)
P(ng/ml)	30.5±12.0	27.8±12.8	0.091	0.951	1.001(0.974-1.029)
HCG(H48/H0)ratio	2.3±0.5	1.9±0.70	**<0.001**	**<0.001**	**7.088(3.417-14.705)**

b: 21missing c:11missing

a :adjusted by age, heght, weight, BMI, previous losses, hCG(H0), E2 and P

150 | Subdividing Early Fetal Growth Restriction Based on Gestational Age at Diagnosis: Implications for Perinatal Management

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10:30 AM - 12:30 PM

Objective: Two distinct phenotypes of fetal growth restriction (FGR) have been identified based on gestational age at diagnosis: early (< 32 weeks) and late (≥32 weeks), with different outcomes observed between these two categories, though this cutoff is debated. We hypothesized differences in early FGR outcomes based on the gestational age at diagnosis.

Study Design: To test our hypothesis, we conducted a retrospective cohort study on data extracted from our database on 334 women with singleton pregnancies diagnosed with FGR (fetal weight/AC below the 10th percentile). The 1st ultrasound was at less than 20 weeks' gestation. Patients were divided into four groups based on the gestational age at diagnosis: Group A (20.0-23.6 weeks), Group B (24.0-27.6 weeks), Group C (28.0-31.6 weeks), and Group D (≥32 weeks).

Outcome measures included:

1. Composite adverse perinatal outcomes (neonatal acidosis, Apgar score < 7 at 5 minutes, perinatal death, severe intraventricular hemorrhage, necrotizing enterocolitis, and respiratory distress requiring intubation)
2. Gestational age at delivery < 37 weeks
3. Mode of delivery

Chi-square, Fisher's exact test, and pairwise comparisons were used when appropriate, with a p-value < 0.05 indicating statistical significance.

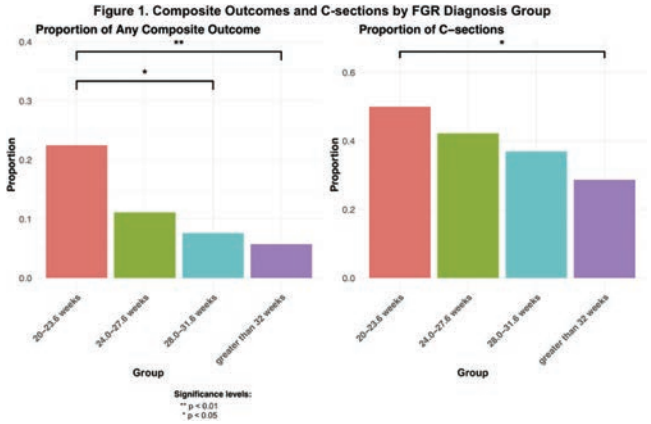
Results: Group A had the highest number of deliveries at < 37 weeks (see Table); however, the difference was significant only when compared to Group D. Composite adverse perinatal outcomes decreased from Group A to Group D, with significant differences between Group A and Group C, and between Group A and Group D (see Figure). Although the cesarean delivery rate declined from Group A to Group D, this change was statistically significant only between Group A and Group D (see Figure).

Conclusion: Our results highlight the importance of subdividing early FGR by gestational age at diagnosis. This stratification aims to improve perinatal management and outcomes. Further research should focus on optimizing protocols for each FGR subgroup.

Table 1. Gestational age at delivery of the four FGR groups

	Group A GA at Diagnosis 20-23.6 weeks (n=40)	Group B GA at Diagnosis 24-27.6 weeks (n=45)	Group C GA at Diagnosis 28-31.6 weeks (n=92)	Group D GA at Diagnosis ≥32 weeks (n=157)	P-Value
Gestational Age at Delivery					
< 37 weeks	14 (35.0)	8 (17.8)	19 (20.7)	16 (10.2)	0.018

Values are n (%).



151 | Association Between Rural-to-Urban Obstetric Transport and Severe Maternal Morbidity and Neonatal Complications

Carly M. Dahl[1]; Lisa Pappas[1]; Marcela C. Smid[2]; Torri D. Metz[1]; Kaitlyn P. Casper[1]; Michelle P. Debbink[1]
[1]University of Utah, Salt Lake City, UT; [2]University of Utah Health, Salt Lake City, UT

10:30 AM - 12:30 PM

Objective: To compare the frequency of severe maternal morbidity (SMM) between obstetric transports from rural-to-urban counties (RTU) versus urban-to-urban (UTU) counties.

Study Design: Retrospective cohort study of pregnant individuals undergoing transport for delivery for maternal medical or fetal indications using National Vital Statistics System birth records from 2016-2021. Inclusion criteria were all individuals who underwent transport with available county level data. The primary exposure was maternal residence in a rural county (< 99 individuals per square mile). The primary outcome was SMM (ICU admission, uterine rupture, hysterectomy, and blood transfusion). The secondary outcome was a composite of neonatal complications. Maternal demographic, obstetric, and medical factors were assessed as potential covariates. We performed univariate and bivariate analyses using Chi-squared and Wilcoxon tests as appropriate. A multivariable generalized linear model was used to assess the association between rurality and outcomes.

Results: 117,050 obstetric transports occurred between 2016-2021 (0.52% of all births). Among people undergoing RTU transports, SMM was lower than UTU transports (3.4% versus 3.7%, p = 0.012). Neonatal complications were higher among RTU versus UTU transports (71.3% versus 63.6%, p = < 0.001). After adjusting for covariates, people undergoing RTU transports had 12% lower odds of SMM than UTU transports [aOR 0.88, 95% CI (0.81-0.95, p = 0.001)]. However, neonates born after RTU transports had 7% higher odds of neonatal morbidity [aOR 1.07, 95% CI (1.03-1.11, p < 0.001)] (Figure).

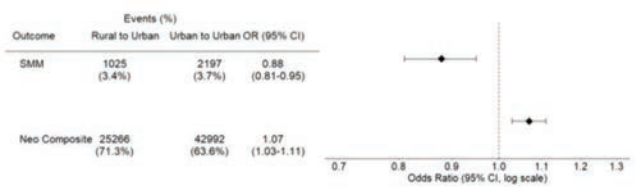
Conclusion: Pregnant people undergoing UTU obstetric transportation experience higher rates of SMM than RTU transports, which may reflect differences in threshold to transfer based on hospital capabilities. Neonatal complications are higher amongst RTU transports compared to UTU transports, indicating that RTU transports may be more likely to involve complications that affect neonatal safety.

Table: Maternal and Neonatal Outcomes Associated with RTU versus UTU Obstetric Transportation

Primary Outcome: Severe Maternal Morbidity (SMM)			
	Rural to Urban (RTU)	**Urban to Urban (UTU)**	**P value**
Singleton births	30092	58726	
SMM (%)	1025 (3.4)	2197 (3.7)	0.012
Maternal Transfusion (%)	549 (1.8)	1117 (1.9)	0.033
Ruptured Uterus (%)	36 (0.1)	62 (0.1)	0.039
Unplanned Hysterectomy (%)	110 (0.4)	176 (0.3)	0.012
Admission to Intensive Care Unit (%)	513 (1.7)	1287 (2.2)	<0.001
Secondary Outcome: Composite Neonatal Outcome			
	Rural to Urban (RTU)	**Urban to Urban (UTU)**	**P value**
All births	35447	67603	
Composite Neonatal Complications (%)	25266 (71.3)	42992 (63.6)	<0.001
Assisted Ventilation (>6 hrs) (%)	9055 (25.5)	15232 (22.5)	<0.001
Admission to NICU (%)	24493 (69.1)	41124 (60.8)	<0.001
Surfactant (%)	3911 (11.0)	6777 (10.0)	<0.001
Antibiotics (%)	7721 (21.8)	13848 (20.5)	<0.001
Seizures (%)	59 (0.2)	120 (0.2)	0.147
Infant Alive (%)	34487 (97.3)	65145 (96.4)	<0.001

NICU – neonatal intensive care unit; hrs – hours; Analyses assessing SMM were limited to singleton pregnancies to avoid double-counting; analyses assessing neonatal complications included all births and multifetal gestation as a covariate.

Figure: Maternal and Neonatal Outcomes of RTU versus UTU Obstetric Transports



OR – Odds Ratio, CI – Confidence Interval, Neo Composite – Neonatal Composite Outcome, SMM – Severe Maternal Morbidity; RTU – Rural to Urban; UTU – Urban to Urban; After adjusting for weekend birth, maternal age, marital status, maternal education level, parity, month prenatal care began, WIC, cigarette usage, BMI, prenatal diabetes, chorioamnionitis, trial of labor attempted (if cesarean), gestational age and type of insurance, the observed associations with rurality were significant. Delivery method, previous cesarean delivery, and gestational diabetes were dropped from the model due to collinearity.

152 | Obstetric Air Transportation in the Intermountain West: An Assessment of Quality Metrics

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[1]University of Utah, Salt Lake City, UT; [2]University of Utah Health, Salt Lake City, UT

10:30 AM - 12:30 PM

Objective: Obstetric transport is a critical service for high risk and rural patients and is largely understudied, especially with respect to quality metrics (QM) for common transport indications. We aimed to 1) describe obstetric transportation in the Intermountain West and 2) define and assess QM adequacy among individuals transported for the most common obstetric indications - preterm prelabor rupture of membranes (PPROM), preterm labor (PTL), and preeclampsia.

Study Design: This was a prospective cohort study of obstetric transports within a single tertiary institution with a perinatal transport service. Demographic, transport, and clinical factors were collected for all obstetric transports. Based on the Society of Maternal Fetal Medicine transport checklist, we defined QMs as recommended interventions during obstetric transport specific to PPROM, PTL, and preeclampsia. A priori, we defined QM adequacy as receipt of ≥ 75% of recommended interventions per indication. We compared QM adequacy across transport indications using Chi-squared analysis.

Results: Between July 2023-June 2024, 125 obstetric transports were performed, most frequently by rotor wing (70.4%), fixed wing (26.4%), and ambulance (3.2%). Transport distance on average was 226.1 miles (SD 186.5) (Figure 1). Mean gestational age at time of transportation was 31.1 weeks (SD 5.91). Most frequent indications for transport were preeclampsia (33.6%), PTL (27.2%), PPROM (15.2%), and fetal anomalies (13.6%). Most transported patients (88%) received medications peri-transport; 76.8% of patients received either antenatal corticosteroids, magnesium, a tocolytic, or antibiotics. QM adequacy did not differ by indication for transport (p = 0.265), and was most frequently met within transports for preterm labor (73.5%), followed by preeclampsia (71.4%), and PPROM (63.2%) (Figure 2).

Conclusion: Obstetric transport in the Intermountain West relies primarily on air given the large geographic catchment. QMs specific to obstetric transport were not always met, and may provide valuable quality benchmarks to identify areas for improvement.

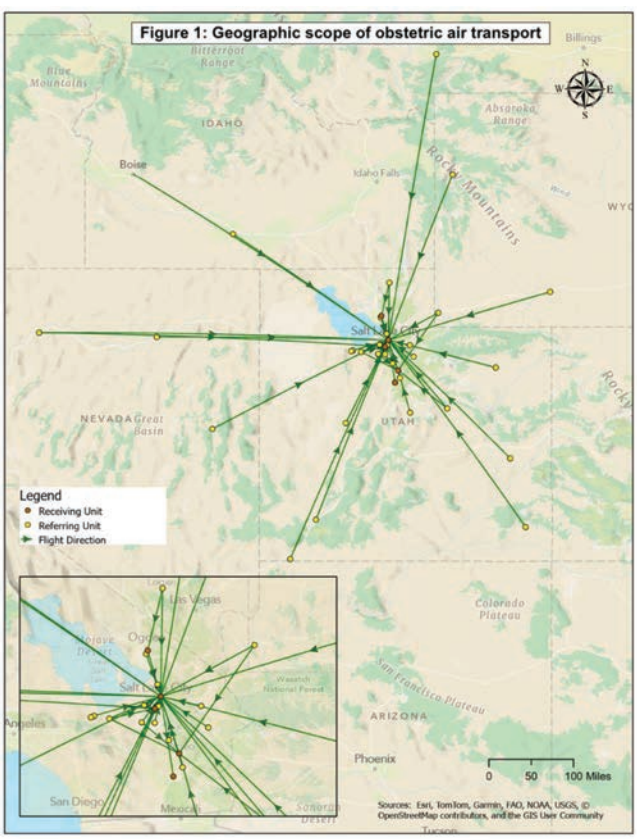
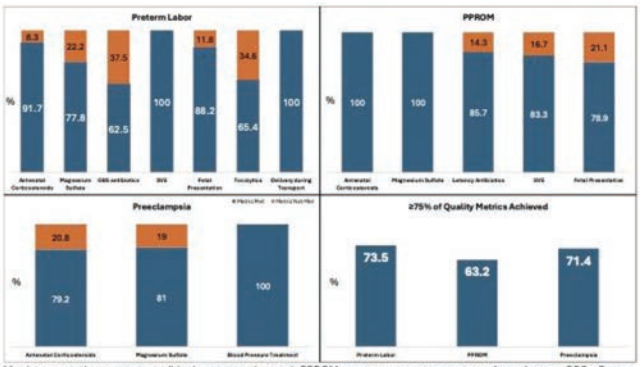


Figure 2: Quality Metrics by Transport Indication



Metrics reported as percent met (blue) or not met (orange). PPROM – preterm premature rupture of membranes. GBS – Group B streptococcus. SVE – sterile vaginal exam or evaluation of cervical dilation via speculum exam. Preterm labor metrics include receipt of antenatal corticosteroids if <34 weeks, magnesium sulfate if <32 weeks, GBS antibiotics if GBS unknown and <37 weeks, tocolytics if <34 weeks, evaluation of cervical dilation (SVE) and fetal presentation and if delivery during transport occurred. PPROM metrics include receipt of antenatal corticosteroids if <34 weeks, magnesium sulfate <32 weeks, latency antibiotics, and evaluation of cervical dilation (SVE) and fetal presentation. Preeclampsia metrics include receipt of antenatal corticosteroids if <34 weeks and magnesium sulfate as well as if severe range blood pressures were treated in the peri-transport period. Metrics met/Metrics not met exclude individuals that were not eligible for the intervention based on clinical factors (i.e., magnesium sulfate for cerebral palsy prophylaxis >32 weeks). Percentage of quality metrics met is the % of individuals who received ≥75% of the interventions in the peri-transport period (pre-transport patient stabilization and in transit).

153 | Oral Probiotic Versus Placebo and the Maternal Metabolome During Pregnancy: a Randomized Controlled Trial

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[1]Keck Medicine of USC, Los Angeles, CA; [2]University of California San Diego, La Jolla, CA; [3]UC San Diego Medical Center, La Jolla, CA; [4]University of California, San Diego Medical Center, La Jolla, CA

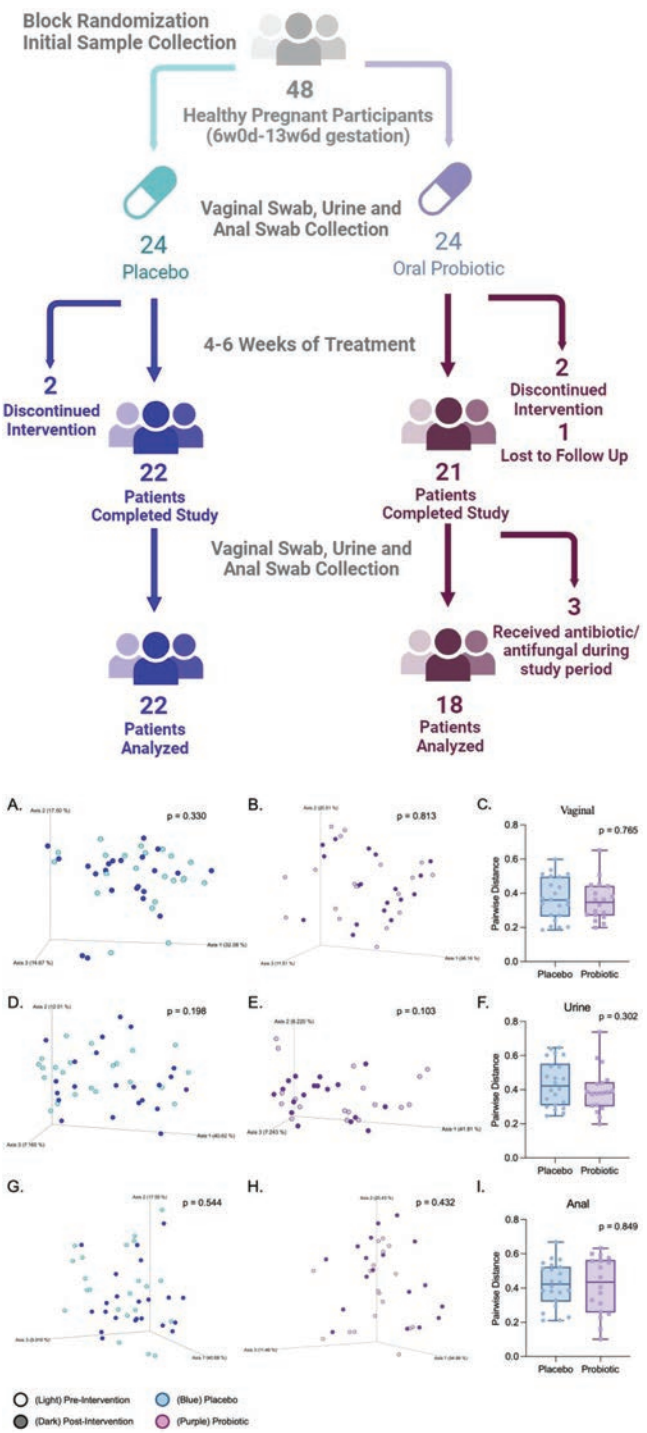
10:30 AM - 12:30 PM

Objective: The original aim of this study was to investigate whether an oral probiotic with a mixture of Lactobacillus and Bifidobacterium species could change the vaginal microbiome during pregnancy, and the results showed overall no change. Studies suggest a complex interplay between the microbiome and metabolome during pregnancy, which can have an impact on perinatal outcomes. Therefore, a secondary aim was to examine the influence of the oral probiotic on the maternal metabolome.

Study Design: This was a pilot randomized double-blinded placebo-controlled trial at a university hospital. Healthy singleton pregnancies were enrolled between 6w0d and 13w6d and randomized to an oral probiotic or placebo. Samples from the vagina, urine, and anus were obtained prior to randomization and 4-6 weeks after intervention. Samples were extracted using ideal conditions for small molecule reverse phase positive mode untargeted metabolomics and run using a high-performance mass spectrometer coupled to a liquid chromatography system. Data was analyzed using GNPS and QIIME2.

Results: 48 patients were enrolled, and 43 completed the study, with 22 randomized to the placebo, and 21 to the probiotic. 3 patients in the probiotic group developed vaginal infections requiring treatment during the study period and were excluded from the analysis (Figure 1). The groups were similar in baseline characteristics and metabolomic profiles for all sample sites. Post-intervention, the groups remained similar. Comparing pre versus post intervention with Bray Curtis distance metric PCoA, there was no significant difference in the metabolome for the placebo group (Figure 2; A, D, G) or the probiotic group (B, E, H). Comparing the placebo versus probiotic groups with paired longitudinal distance boxplots, there was no significant shift in the metabolome for participants (C, F, I).

Conclusion: The overall vaginal, urine, and anal metabolomes did not change significantly after the introduction of an oral probiotic into the maternal diet, and the metabolomes appeared relatively stable over the course of 4-6 weeks during the first half of pregnancy.



154 | Participation in a Comprehensive Addiction In Pregnancy Program and Maternal Outcomes

Charlotte B. McCarley[1]; Yumo Xue[2]; Victoria C. Jauk[1]; Lynda Ugwu[1]; Lorie M. Harper[3]; Casey Brian[4]; Brian E. Brocato[1]; Carolyn Webster[1]; Rachel G. Sinkey[1]; Ayodeji Sanusi[2]
[1]University of Alabama at Birmingham, Birmingham, AL; [2]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL; [3]Dell Medical School, Austin, TX; [4]West Virginia University, Morgantown, WV

10:30 AM - 12:30 PM

Objective: The Society for Maternal-Fetal Medicine issued a special report on substance use disorder (SUD) in pregnancy recommending research "to determine the care model that results in the best outcomes for women…" Our objective was to evaluate the effect of a comprehensive addiction in pregnancy program (CAPP) on maternal outcomes among pregnant persons with SUD.

Study Design: Retrospective cohort of pregnant patients with SUD who delivered a live neonate at ≥22 weeks gestational age (WGA) at a referral center in the southeast US (4/9/2018-8/5/2022). Patients with SUD were divided into 2 groups: those who attended CAPP and those who did not (non-CAPP). CAPP combines perinatal care with social services, case management, peer support, ±pharmacotherapy. Participation in CAPP required prenatal care (PNC) < 32 WGA and score ≥4 on the National Institute on Drug Abuse–Modified Assist Tool. The primary outcome was number of PNC visits. Secondary outcomes included pharmacotherapy, non-prescription substance use at delivery, SUD treatment program graduation, and depressive symptoms as determined by Center for Epidemiologic Studies Depression Scale (CES-D). Outcomes were compared between groups; multivariable logistic regression was used to adjust for covariates.

Results: Overall, 431 patients were included: 153 CAPP, 278 non-CAPP. CAPP participants initiated PNC earlier (16±7 vs 21±10 WGA, p< .001) and delivered later (39 vs 38 WGA, p = .047, Table 1) than non-CAPP. CAPP participants attended a median of 10 PNC visits while non-CAPP attended 6 (mean difference 3.48 [2.48-4.48], Table 2). There was no difference in pharmacotherapy, however, CAPP participants were less likely to have a positive urine drug screen for a non-prescribed substance at delivery (OR 0.37, 95%CI 0.21-.067). Among those who participated in CAPP, 30% completed a SUD treatment program and had a 4.5 point decrease in the CES-D score from intake to 6 weeks postpartum.

Conclusion: CAPP participation is associated with increased utilization of PNC and decrease use of non-prescribed substances. Additional follow up is needed to assess long-term outcomes.

Table 1. Baseline Demographics

Characteristic	CAPP (n=153)	Non-CAPP Group (n=278)	p-value
GA at PNC (weeks)	16.5 ± 7.0	21.3 ± 9.5	<0.001
Age	34.0 ± 5.3	35.6 ± 5.2	0.002
Race/Ethnicity			0.278
Non-Hispanic White	118 (78.2)	204 (73.4)	
Non-Hispanic Black	26 (17.2)	65 (23.4)	
Hispanic/ Other	7 (4.6)	9 (3.2)	
Education Level			0.233
Less than HS/GED	45 (29.)	46 (36.8)	
Graduated HS/GED	47 (31.3)	42 (33.6)	
Greater than High School	59 (39.1)	37 (29.6)	
Marital Status			<0.001
Married	8 (5.3)	52 (19.0)	
Partnered	20 (13.3)	2 (0.7)	
Single	122 (81.3)	220 (80.3)	
Employment Status			0.313
Employed	15 (10.1)	20 (7.3)	
Unemployed	134 (89.9)	256 (92.7)	
Insurance Status			<0.001
Medicaid	145 (96.0)	213 (76.6)	
Self-Pay/Other	6 (4.)	65 (23.4)	
Gestational age at delivery	38.9 (37.0-39.3)	37.9 (35.9-39.1)	0.047
Delivery Type			0.847
SVD	77 (57.5)	165 (59.8)	
OVD	5 (3.7)	8 (2.9)	
Cesarean Delivery	52 (38.8)	103 (37.3)	
Narcotics at delivery	3 (2.3)	19 (7.7)	0.035
Feeding method at discharge from delivery hospitalization			<0.001
Exclusive Breastmilk	58 (43.6)	38 (14.5)	
Formula	43 (32.3)	150 (57.3)	
Both	32 (24.1)	74 (28.2)	
Any breastmilk (Exclusive Breastmilk or Both)	90 (67.7)	112 (42.7)	<0.001

Data presented as n (%), mean ± SD, or median (interquartile range) as appropriate
GA, gestational age; PNC, prenatal care; HS, high school; GED, general education diploma; SVD, spontaneous vaginal delivery; OVD, operative vaginal delivery

Table 2. Maternal Outcomes

	CAPP (n=153)	Non-CAPP (n=278)	Mean difference/OR(95 % CI) aOR(95% CI)*
Primary Outcome			
Number of prenatal care visits	10 (8-12)	6 (2-10)	**3.48 (2.48-4.48)** 0.22 (-0.55-0.99)
Secondary Outcomes			
On Pharmacotherapy	64 (47.8)	129 (46.4)	1.06 (0.70-1.60) 1.05 (0.62-1.76)
Methadone	11 (17.2)	16 (12.4)	1.47 (0.64-3.38) 1.74 (0.51,5.95)
Subutex	51 (79.7)	103 (79.8)	0.99 (0.47-2.09) 0.81 (0.28-2.28)
Suboxone	1 (1.6)	6 (4.7)	0.33 (0.04-2.76) 0.31 (0.03-3.36)
Maternal +UDS at delivery	52 (52.5)	171 (77.4)	**0.32 (0.20-0.54)** **0.47 (0.24-0.89)**
Non-prescribed drug use at delivery	17 (17.2)	79 (35.8)	**0.37 (0.21-0.67)** 0.68 (0.32-1.45)
Maternal addiction therapy in pregnancy	48 (96.0)	N/A	-
Treatment completed	14 (29.8)	N/A	-
Difference in CES-D (intake-6mo PP)	-4.5 (-13.0-0.0)	N/A	-

Data presented as n (%) or median (interquartile range) as appropriate
CAPP, comprehensive addiction medicine prenatal care program; MAT, medication assisted therapy; UDS, urine drug screen; CES-D, Center for Epidemiologic Studies Depression Scale; PP, postpartum
*Adjusted for GA at PNC, maternal age, marital status, insurance status, GA at delivery, narcotics at delivery, feeding method at discharge to delivery hospitalization

155 | The Association Between Participation in a Comprehensive Addiction Medicine Prenatal Care Program and Child Custody

Charlotte B. McCarley[1]; Yumo Xue[2]; Ayodeji Sanusi[2]; Victoria C. Jauk[1]; Lynda Ugwu[1]; Casey Brian[3]; Brian E. Brocato[1]; Samuel Gentle[1]; Rachel G. Sinkey[1]
[1]University of Alabama at Birmingham, Birmingham, AL; [2]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL; [3]West Virginia University, Morgantown, WV

10:30 AM - 12:30 PM

Objective: Patients with substance use disorder (SUD) are more likely to lose custodial rights than those who do not have SUD. We evaluated the effect of a comprehensive addiction in pregnancy program (CAPP) on parental custody.

Study Design: Retrospective cohort of pregnant patients with SUD who delivered a liveborn neonate at ≥22 weeks gestational age (GA) at a referral center in the southeast US (4/9/2018-8/5/2022). Patients with SUD were divided into 2 groups: those who attended CAPP and those who did not (non-CAPP). CAPP combines perinatal care with social services, case management, peer support, ±pharmacotherapy. CAPP participation requires entry to care < 32 weeks GA and score ≥4 on the National Institute on Drug Abuse–Modified Assist Tool. The primary outcome was proportion of neonates discharged with the birthing parent. Secondary outcomes included neonatal opioid withdrawal syndrome (NOWS), neonatal urine drug screen (UDS) at delivery, and neonatal length of stay (LOS). Outcomes were compared between groups.

Results: Overall, 431 patients were included: 153 CAPP, 278 non-CAPP. CAPP patients initiated prenatal care earlier than non-CAPP (p< .001) and delivered at a greater mean GA (38.9 vs 37.9 weeks, p = .047, Table 1). CAPP neonates were more likely to be discharged home in parental custody (77% vs 58%, OR 2.49 [1.55-4.01], Table 2). There was no difference in diagnosis of NOWS (OR 1.20 [0.78-1.86]) or neonatal LOS (OR -0.61 [-5.19-3.97]). Neonatal UDS was less likely to be positive (OR 0.45 [0.29-0.72]) among CAPP neonates compared to non-CAPP neonates.

Conclusion: Participation in CAPP was associated with parental custody, though nearly one-quarter of participating individuals were not granted custody. Further research is needed to understand how to safely support custodial rights for all birthing persons with SUD interested in parenting.

Table 1. Baseline Demographics

Characteristic	CAPP (n=153)	Admin Group (n=278)	p-value
GA at entry to PNC (weeks)	16.5 ± 7.0	21.3 ± 9.5	<0.001
Age	34.0 ± 5.3	35.6 ± 5.2	0.002
Race/Ethnicity			0.278
Non-Hispanic White	118 (78.2)	204 (73.4)	
Non-Hispanic Black	26 (17.2)	65 (23.4)	
Hispanic/ Other	7 (4.6)	9 (3.2)	
Education Level			0.233
Less than HS/GED	45 (29.8)	46 (36.8)	
Graduated HS/GED	47 (31.3)	42 (33.6)	
Greater than High School	59 (39.1)	37 (29.6)	
Marital Status			<0.001
Married	8 (5.3)	52 (19.0)	
Partnered	142 (94.7)	222 (81.0)	
Single	122 (81.3)	220 (80.3)	
Employment Status			0.313
Employed	15 (10.1)	20 (7.3)	
Unemployed	134 (89.9)	256 (92.7)	
Insurance Status			<0.001
Medicaid	145 (96.0)	213 (76.6)	
Self-Pay/Other	6 (4.0)	65 (23.4)	
Gestational age at delivery	38.9 (37.0-39.3)	37.9 (35.9-39.1)	0.047
Delivery Type			0.847
SVD	77 (57.5)	165 (59.8)	
OVD	5 (3.7)	8 (2.9)	
Cesarean Delivery	52 (38.8)	103 (37.3)	
Narcotics at delivery	3 (2.3)	19 (7.7)	0.035
Feeding method at discharge			<0.001
Exclusive Breastmilk	58 (43.6)	38 (14.5)	
Formula	43 (32.3)	150 (57.3)	
Both	32 (24.1)	74 (28.2)	
Any breastmilk (Exclusive Breastmilk or Both)	90 (67.7)	112 (42.7)	<0.001

Data presented as n (%), mean ± SD, or median (interquartile range) as appropriate
GA, gestational age; PNC, prenatal care; HS, high school; GED, general education diploma; SVD, spontaneous vaginal delivery; OVD, operative vaginal delivery

Table 2. Neonatal Outcomes			
	CAPP (n=157)	Non-CAPP n=290)	OR (95% CI)
Primary Outcome			
Discharged home in parental custody	102 (77.3)	150 (57.7)	**2.49 (1.55-4.01)**
If no, Foster	15 (50.0)	53 (49.1)	1.04 (0.46-2.33)
Adoption	1 (3.3)	9 (8.3)	0.38 (0.05-3.12)
Grandparent	9 (30.0)	32 (29.6)	1.02 (0.42-2.46)
Aunt/Uncle	3 (10.0)	9 (8.3)	1.22 (0.31-4.83)
Distant relation	2 (6.7)	5 (4.6)	1.47 (0.27-7.99)
Secondary Outcomes			
Birthweight (g)	2959.6 ± 646.6	2664.9 ± 749.9	281.2 (140.6-421.8)
5m Apgar <7	8 (5.8)	25 (8.7)	0.65 (0.28-1.47)
Neonatal UDS positive at delivery	67 (54.0)	173 (71.2)	**0.45 (0.29-0.72)**
Amphetamines	1 (1.5)	17 (9.7)	0.14 (0.02-1.08)
Barbiturates	4 (6.0)	5 (2.9)	2.12 (0.55-8.12)
Benzodiazepines	2 (3.0)	11 (6.3)	0.46 (0.10-2.13)
Buprenorphine	45 (67.2)	100 (57.1)	1.47 (0.81-2.67)
Cannabis	2 (3.0)	7 (4.0)	0.74 (0.15-3.65)
Cocaine	1 (1.5)	19 (10.9)	0.14 (0.02-1.07)
Heroin	0	2 (1.1)	--
Methadone	7 (10.5)	14 (8.0)	1.34 (0.51-3.48)
Opiates	22 (32.8)	60 (34.3)	1.01 (0.55-1.85)
Oxycodone	1 (1.5)	5 (2.9)	0.51 (0.06-4.49)
Hydrocodone	0	10 (5.7)	--
Diagnosed with FAS	1 (0.7)	2 (0.7)	1.01 (0.09-11.25)
Diagnosed with NOWS	50 (36.5)	89 (32.4)	1.20 (0.78-1.86)
Highest modified Finnegan Score	9.5 ± 4.8	10.6 ± 3.9	-1.13 (-2.34-0.07)
Average NICU/CCN LOS	10.5 ± 15.9	11.8 ± 19.9	-0.61 (-5.19-3.97)

Data presented as n (%), mean ± SD, or median (interquartile range) as appropriate
CAPP, comprehensive addiction medicine prenatal care program; UDS, urine drug screen; FAS, fetal alcohol syndrome; NOWS, neonatal opioid withdrawal syndrome; NICU, neonatal intensive care unit; LOS, length of stay; CCN, continuing care nursery

156 | The Philadelphia Urban ACE is associated with Spontaneous Preterm Birth Among Black Pregnant Individuals

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10:30 AM - 12:30 PM

Objective: Adverse childhood experiences (ACE), including physical, sexual, and verbal abuse and household dysfunction associate with poor health across an individual's life course. Evidence of associations with these exposure and adverse pregnancy outcomes has been based on the traditional Kaiser ACE survey (KACE), which quantifies childhood adversity within the home. The Philadelphia Urban ACE survey (PHLACE) expands on KACE by incorporating community-level stressors derived from a more socioeconomically and racially diverse urban population. We sought to assess associations between these surveys and spontaneous preterm birth (sPTB) among Black individuals.

Study Design: From a prospective cohort of Black pregnant persons (N = 638), those who completed both KACE and PHLACE and had an adjudicated birth outcome were included for this analysis (N = 336). A high score was defined as ≥4 for both surveys. We used multivariable logistic regression to estimate odds ratios for sPTB among participants with high vs. low KACE and high vs. low PHLACE, controlling for maternal education and insurance.

Results: Overall, 5.2% of participants experienced sPTB, 68.4% reported high PHLACE while only 15.8% reported high KACE (Table 1). In bivariate analysis, high PHLACE (p = 0.015), but not high KACE (p = 0.774) was associated with sPTB. In adjusted models, those with high PHLACE had 3.9 times (95% CI 1.46, 11.49) higher odds of sPTB compared to those with low PHLACE. Removing those with prior sPTB, the association persisted (aOR 4.55 95% CI 1.21, 21.74). Among the same single childhood adversities, the PHLACE appears to capture higher rates of positive responses compared to the KACE (Table 2).

Conclusion: PHLACE may capture childhood adversity more comprehensively than KACE and may more accurately reflect the impact of early lived experiences on adverse pregnancy outcomes in Black, urban populations. Understanding how these experiences perturb biological pathways leading to sPTB is imperative for the optimization of therapeutic strategies. Importantly, policies that help to mitigate these experiences can also improve pregnancy health.

Table 1. Spontaneous Preterm Birth and Philadelphia Urban ACE and Kaiser ACE.

	sPTB (N=19)	No sPTB (N=317)	P-value
Age at consent*	28.0 [9.00]	27.0 [10.0]	0.804
Marital Status			
Not Married	19 (100%)	258 (81.4%)	0.032
Married	0 (0%)	59 (18.6%)	
Insurance			
Public	18 (94.7%)	235 (74.1%)	0.053
Commercial	1 (5.3%)	82 (25.9%)	
Education			
HS or less	16 (84.2%)	169 (53.3%)	0.029
Some college/degree	3 (15.8%)	133 (42.0%)	
Post college/degree	0 (0%)	15 (4.7%)	
Body Mass Index*	29.7 [7.14]	29.3 [13.0]	0.923
Nulliparous	2 (10.5%)	58 (18.3%)	0.545
Prior Preterm Birth			<0.001
Prior spontaneous preterm birth	7 (36.8%)	36 (11.4%)	
Prior medically indicated preterm birth	0 (0%)	13 (4.1%)	
Prior preterm birth (unknown type)	2 (10.5%)	2 (0.6%)	
Chronic Hypertension	5 (26.3%)	34 (10.7%)	0.055
Pregestational Diabetes Mellitus	2 (10.5%)	9 (2.8%)	0.123
Gestational age at delivery*	35.0 [4.02]	39.2 [1.58]	<0.001
Birthweight*	2630 [510]	3160 [533]	<0.001
Fetal sex			0.05
Female	5 (26.3%)	171 (53.9%)	
Male	13 (68.4%)	146 (46.1%)	
KACE score without divorce*	1.00 [2.00]	0 [2.00]	0.208
KACE score ≥4	3 (15.8%)	66 (20.8%)	0.774
KACE emotional abuse	3 (15.8%)	73 (23.0%)	0.582
KACE physical abuse	3 (15.8%)	46 (14.5%)	0.747
KACE sexual abuse	4 (21.1%)	50 (15.8%)	0.523
KACE emotional neglect	6 (31.6%)	54 (17.0%)	0.123
KACE physical neglect	3 (15.8%)	15 (4.7%)	0.073
KACE divorced parents	12 (63.2%)	189 (59.6%)	0.815
KACE domestic violence	3 (15.8%)	29 (9.1%)	0.408
KACE household substance abuse	5 (26.3%)	63 (19.9%)	0.555
KACE household mental illness	2 (10.5%)	47 (14.8%)	1
KACE family member incarcerated	6 (31.6%)	70 (22.1%)	0.395
PHLACE score*	4.00 [4.00]	3.00 [4.00]	0.065
PHLACE score ≥4	13 (68.4%)	124 (39.1%)	0.015
PHLACE emotional abuse	6 (31.6%)	96 (30.3%)	1
PHLACE physical abuse	8 (42.1%)	97 (30.6%)	0.313
PHLACE sexual abuse	8 (42.1%)	62 (19.6%)	0.036
PHLACE emotional neglect	1 (5.3%)	11 (3.5%)	0.509
PHLACE physical neglect	5 (26.3%)	54 (17.0%)	0.348
PHLACE domestic violence	6 (31.6%)	56 (17.7%)	0.134
PHLACE household substance abuse	7 (36.8%)	79 (24.9%)	0.28
PHLACE household mental illness	5 (26.3%)	77 (24.3%)	0.788
PHLACE family member incarcerated	5 (26.3%)	79 (24.9%)	1
PHLACE witnessed violence	13 (68.4%)	161 (50.8%)	0.16
PHLACE felt discrimination	7 (36.8%)	102 (32.2%)	0.801
PHLACE adverse neighborhood experience	8 (42.1%)	143 (45.1%)	1
PHLACE experience bullying	2 (10.5%)	33 (10.4%)	1
PHLACE foster care	4 (21.1%)	31 (9.8%)	0.123

*Presented as Median [Interquartile Range]

Table 2. Components of Philadelphia Urban ACE and Kaiser ACE

Indicator	KACE n, % (n=363)		PHLACE n,% (n=363)		Difference, captured in PHLACE but not KACE
Emotional abuse	81	22.3%	108	29.8%	7.44%
Physical abuse	51	14.0%	110	30.3%	16.25%
Sexual abuse	59	16.3%	75	20.7%	4.41%
Emotional neglect 1	65	17.9%	13	3.6%	-14.33%
Emotional neglect 2	65	17.9%	73	20.1%	2.20%
Physical neglect	21	5.8%	65	17.9%	12.12%
Domestic violence	35	9.6%	68	18.7%	9.09%
Household substance abuse	74	20.4%	90	24.8%	4.41%
Household mental illness	56	15.4%	88	24.2%	8.82%
Incarcerated family member	84	23.1%	89	24.5%	1.38%
Divorce	216	59.5%			
Witnessed violence		0.0%	191	51.9%	
Felt discrimination		0.0%	113	30.7%	
Adverse neighborhood experience		0.0%	167	45.4%	
Bullied		0.0%	38	10.3%	
Foster care		0.0%	36	9.8%	

157 | Accuracy of Fetal Anatomy Survey in Diagnosis of Marginal Cord Insertion: A Retrospective Case Study

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10:30 PM - 12:30 PM

Objective: Marginal cord insertion (MCI) is defined as the umbilical cord insertion within 2cm of the placental edge. Preeclampsia, placental abruption and low birth weight have historically been associated with MCI. While assessment of placental cord insertion is recommended during formal fetal anatomy survey, the accuracy of ultrasound detection in the second trimester has not been studied. This study was designed to assess the accuracy of ultrasound diagnosis of MCI at the time of midtrimester fetal anatomical survey, as compared to postnatal histological evaluation.

Study Design: We conducted a retrospective study of all deliveries at our hospital from January 2021 to June 2024 in which MCI was diagnosed on fetal anatomy survey and examined the corresponding placental pathology reports. All anatomical surveys were performed in the second trimester. Maternal variables such as age, presence of prior Cesarean scar, and severe obesity (BMI >35) were collected, as well as fetal variables such as presence of multi-fetal gestation and placental location.

Results: Among the 210 patients diagnosed with MCI on anatomy scan, only 45.2% were confirmed to have MCI on review of placental pathology. A false positive finding of MCI was more common in obese (BMI >35) patients and in multiple gestations. Only placental location correlated significantly with sonographic accuracy of detection- with anterior placentation favoring correct diagnosis.

Conclusion: MCI found at the time of midtrimester fetal anatomical survey is often not confirmed at postnatal histology. Placental location at the time of exam modestly impacts accuracy of midtrimester MCI diagnosis.

Table 1. Accuracy of MCI Diagnosis at Midtrimester Ultrasound

		MCI Suspected			
		MCI Confirmed	MCI Not Confirmed	test statistic	p
Number		100	121		
Parity					
	Nulliparous (n)	61	73	0.01	0.91
BMI					
	BMI >35 (n)	6	15	2.6	0.1
Previous Cesarean Delivery					
	N	13	20	0.54	0.46
Placenta Location					
	Anterior	60	47	9.86	0.02
	Posterior	29	55		
	Lateral	3	6		
	Fundal	6	10		
Multiple Gestation					
	N	9	14	0.39	0.54

* Chi square used for the above calculations

158 | Does Fetal Sex Impact the Risk of Maternal Diabetes 10-14 Years After Delivery?

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10:30 AM - 12:30 PM

Objective: Limited data suggest that male fetal sex is associated with worse maternal Beta-cell function in pregnancy and a possible increased risk of maternal diabetes after delivery. We examined the association between fetal sex and the risk of prediabetes or diabetes 10-14 years after delivery.

Study Design: This is a secondary analysis of data from the prospective Hyperglycemia and Adverse Pregnancy Outcome Follow-Up Study (HAPO FUS). The exposure was assigned fetal sex at birth (female as the reference). The primary outcome was having either prediabetes or diabetes assessed 10-14 years after the index pregnancy; secondarily, prediabetes and diabetes were assessed separately. Modified Poisson regression models were used and adjusted for baseline covariates at enrollment (study field center, maternal age, parity, family history of diabetes) as well as time from enrollment to follow-up. We secondarily assessed whether the association between fetal sex and diabetes or prediabetes varied by gestational diabetes (GDM) status (effect modification), and whether maternal insulin sensitivity at pregnancy enrollment and insulin resistance at 10-14 year follow-up differed by fetal sex.

Results: Of 3,976 individuals in the analytic sample, 16.7% developed GDM and 48.7% of infants were assigned female sex. At 10-14 years after delivery (median 11.6 years), 3.1% of individuals developed diabetes and 22.9% developed prediabetes. In adjusted analyses, the risk of diabetes or prediabetes did not differ by fetal sex (female vs. male: 24.9 vs. 25.5%; aRR: 1.02, 95% CI 0.90, 1.15) (TABLE). This association was similar regardless of GDM status (interaction p = 0.59). There was also no association between fetal sex and maternal insulin sensitivity at enrollment or insulin resistance at 10-14 year follow-up.

Conclusion: There was no association between fetal sex and the risk of maternal diabetes or prediabetes 10-14 years after delivery. Further research is needed to better understand the possible impact of fetal sex on maternal Beta-cell function.

Table. Risk of maternal diabetes and prediabetes at 10-14 years by fetal sex in index pregnancy

	Overall N=3,976	Female N=1,940	Male N=2,036	Unadjusted analysis	Adjusted analysis
	n (%)	n (%)	n (%)	Unadjusted Risk Ratio, 95% CI	Adjusted Risk Ratio, 95% CI[1]
Diabetes or prediabetes	1,003 (25.2)	484 (24.9)	519 (25.5)	1.02 (0.92, 1.14)	1.02 (0.90, 1.15)
Diabetes	122 (3.1)	58 (3.0)	64 (3.1)	1.05 (0.74, 1.49)	1.05 (0.74, 1.50)
Prediabetes	881 (22.9)	426 (22.6)	455 (23.1)	1.02 (0.91, 1.14)	1.02 (0.89, 1.16)
	Mean (SD)	Mean (SD)	Mean (SD)	Unadjusted Beta Coef. (95% CI)	Adjusted Beta Coef. (95 CI%)[2]
Maternal pregnancy Insulin Sensitivity (SI Unit)[3]	203.1 (77.9)	203.4 (75.9)	202.9 (79.8)	-0.50 (-5.38, 4.38)	-0.20 (-4.92, 4.52)
Maternal insulin resistance at follow-up, HOMA-IR[4]	2.4 (1.9)	2.4 (2.0)	2.3 (1.9)	-0.05 (-0.17, 0.07)	-0.05 (-0.17, 0.07)

[1]Modified Poisson regression and linear regression models were used and adjusted for baseline: study field center, maternal age, parity, family history of diabetes, and time from enrollment to follow-up.
[2] Linear regression model was used and adjusted for baseline: study field center, maternal age, parity, family history of diabetes, and time from enrollment to follow-up.
[3]Pregnancy insulin sensitivity calculated from fasting and 1-hour glucose and C-peptide values.
[4]Insulin resistance at follow up calculated by the Homeostatic Model Assessment for Insulin Resistance [HOMA-IR]: [fasting glucose mmol x fasting insulin uU/ml]/22.5.

159 | Primipara with Cesarean History: Impact of Gestational Age at Term on Mode of Delivery

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10:30 AM - 12:30 PM

Objective: To assess the risk of cesarean delivery (CD) for each week of gestation (WG) of ongoing pregnancy (OP) in primipara at term with a prior CD.

Study Design: Secondary analysis of the randomized Lower Uterine Segment Trial. All included women were eligible for a trial of labor. From the start of term and at the start of each subsequent week of completed gestation, OP was defined as that of a woman who was still pregnant and who gave birth at any time after that date. For each WG for these OP, the CD rate was defined as the number of CDs performed in each OP group divided by the number of women in this group. Separate models for each WG, adjusted by maternal characteristics and hospital status, were used to compare the CD risk between OP and those delivered in the preceding week. The same methodology was applied in a subgroup of women with induction of labor (IoL). Odds ratios were calculated after adjusting for center, BMI, diabetes, hypertensive disorders, and macrosomia.

Results: Among the 2,339 included primipara at term, 1834 (78.4%) finally had a trial of labor including 390 (16.6%) IoL. The overall CD rate was 44.2% (n = 1,034). This rate was 44.3% (n = 173) in the 390 women with IoL. These rates remained stable for OP from 370/7 to 400/7 WG and increased at 410/7 WG (Table 1). In both univariate and multivariate analyses, OP at or beyond 410/7 WG was associated with a higher risk of CD than pregnancy delivered the previous week (ORa = 2.13 (95% CI [1.65-2.75]). In contrast, at each gestational week, the CD rate after IoL was not significantly different between OP and pregnancy delivered the previous week, even at or beyond 41 0/7 WG (Table 2).

Conclusion: The overall CD rate for OP in primipara with a previous CD only increases from 41 0/7 weeks. Among women delivered after IoL, there was no significant difference in CD rates for OPs compared with those for women who gave birth in the preceding WG.

Table 1. Risk of caesarean delivery (CD) per week of gestation

Gestational Age	Overall number of deliveries N=2339	Overall number of CDs N=1034	CD Rate, %, (95% CI)
OPs at 37 0/7 WG	2339	1034	44.2 (42.2-46.2)
OPs at 38 0/7 WG	2267	1002	44.2 (42.2-46.3)
OPs at 39 0/7 WG	1974	877	44.4 (42.1-46.6)
OPs at 40 0/7 WG	1333	600	45.0 (42.3-47.7)
OPs at 41 0/7 WG	604	341	56.4 (42.3-60.4)

*CD, cesarean delivery; CI, confidence interval; OP, ongoing pregnancy; WG, week of gestation

Table 2. Crude odd ratios (ORs) and adjusted odds ratios (aORs) and their confidence intervals (CIs) for CD rates for ongoing pregnancies (OPs) compared with those for women who gave birth in the preceding week of gestation.

Variable	CD rates for OPs, % (n/N)	CD rates in women who gave birth in the preceding week of gestation, % (n/N)	OR % (95CI)	aOR*% (95CI)
Deliveries for OPs at ≥37 0/7 WG,				
• **Overall population**	**44.2 (1034/2339)**			
• Induction of labor	44.3 (173/390)			
Deliveries for OPs at ≥38 0/7 WG vs deliveries between 37 0/7 WG and 37 6/7 WG				
• **Overall population**	**44.2 (1002/2266)**	**44.4 (32/72)**	**0.99 (0.60-1.64)**	**0.95 (0.55-1.66)**
• Induction of labor	44.0 (164/372)	47.0 (9/18)	0.78 (0.27-2.29)	0.77(0.27- 2.20)
Deliveries for OPs at ≥39 0/7 WG vs deliveries between 38 0/7 WG and 38 6/7 WG				
• **Overall population**	**44.4 (877/1974)**	**42.6 (125/293)**	**1.07 (0.83-1.38)**	**1.18 (0.88-1.59)**
• Induction of labor	45.6 (140/307)	36.9 (24/65)	1.43 (0.79-2.68)	1.68 (0.85-3.35)
Deliveries for OPs at ≥40 0/7 WG vs deliveries between 39 0/7 WG and 39 6/7 WG				
• **Overall population**	**45.0 (600/1333)**	**43.2 (277/641)**	**1.07 (0.88-1.30)**	**1.14 (0.91-1.43)**
• Induction of labor	46.2 (104/225)	43.9 (36/82)	1.09 (0.64-1.89)	1.22 (0.66-2.25)
Deliveries for OPs at ≥41 0/7 WG vs deliveries between 40 0/7 WG and 40 6/7 WG				
• **Overall population**	**56.4 (341/604)**	**35.5 (259/729)**	**2.35 (1.87-2.95)**	**2.13 (1.65-2.75)**
• Induction of labor	50.3 (74/147)	38.4 (30/78)	1.61 (0.89-2.95)	1.59 (0.82-3.09)

** In the mixed model, the associations between CD rates and gestational age were adjusted for maternal BMI, diabete, hypertensive disorders, macrosomia, and center.*

160 | Outcomes Associated with Prolonged Rupture of Membranes

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10:30 AM - 12:30 PM

Objective: Prolonged rupture of membranes (ROM) can be associated with worse maternal and neonatal outcomes. However, there is no clear understanding of the linear relationship between duration of ROM during labor and adverse outcomes. We aimed to evaluate how length of ROM can affect maternal and neonatal outcomes.

Study Design: This was a secondary analysis of the MFMU network ARRIVE trial. Low-risk nulliparous were randomized to labor induction at 39 weeks versus expectant management until 42 weeks 2 days. We compared women with ROM between 6-11.9 hours (baseline) versus those who had prolonged ROM between 12-17.9 hours (group I) and 18+ hours (group II). The primary outcome was a composite maternal adverse outcome (CMAO) defined as postpartum infection, postpartum hemorrhage, chorioamnionitis, ICU admission, or uterine rupture. Our secondary outcome was the composite neonatal adverse outcome (CNAO) defined as APGAR < 3 at 5 minutes, NICU admission, seizures, sepsis, hypoxic-ischemic encephalopathy, birth injury, and neonatal death. Adjusted relative risk (aRR) with 95% confidence interval (CI) was calculated.

Results: Overall, 2199 were in the baseline group, 1117 in group I, and 743 in group II. BMI on admission, and delivery type varied among the groups. The primary outcome was significantly different between the groups when compared with the baseline group; there was a higher CMAO in Group I (aRR 1.74 CI 1.5-2.0)

and group II (aRR 2.0 CI 1.7-2.4). The CNAO was also higher in Group I (aRR 1.53 CI 1.3-1.8) and Group II (aRR 2.1 CI 1.8-2.6). Length of ROM was not a predictor of CMAO or CNAO based on the area under the receiver operating characteristic curve for prolonged ROM. A logistic regression curve demonstrated for every hour of prolonged ROM increased the risk of CD by 7% ($p < 0.01$ CI 6.0-8.0).

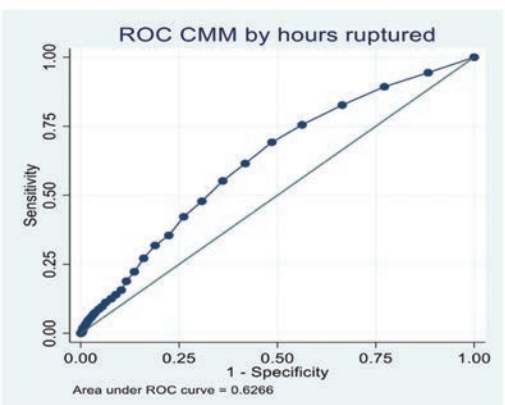
Conclusion: Our secondary analysis suggests that prolonged ROM during labor, regardless of the mode of delivery, is associated with increased likelihood of CMAO and CNAO. This risk is highest among those with 18+ hours of ROM during labor.

Table 1. Maternal and neonatal composite outcomes associated with prolonged rupture of membranes.

	Rupture of membranes to delivery				
	6-11.9 Hours (N= 2,199)	12-17.9 Hours (N= 1,117)	P	>18 hours (N= 743)	P
Composite Maternal Outcome	17.1	29.7 (aRR* 1.74 95% CI 1.5-2.0)	**<0.01**	34.5 (aRR* 2.0 95% CI 1.7-2.4)	**<0.01**
Postpartum infection	1.6	3.0	**0.008**	3.1	**0.014**
Postpartum Hemorrhage	4.5	6.0	0.054	8.1	**<0.01**
Chorioamnionitis	12.5	24.0	**<0.01**	28.1	**<0.01**
ICU admission	0.1	0.3	0.397	0.4	0.163
Uterine Rupture	0	0	0	0	0
Composite Neonatal Outcome	11.2	17.1 (aRR* 1.53 95% CI 1.3-1.8)	**<0.01**	24.0 (aRR* 2.1 95% CI 1.8-2.6)	**<0.01**
APGAR <3 at 5 minutes	0.2	0.6	0.05	1.4	**<0.01**
NICU admission	10.8	16.7	**<0.01**	23.6	**<0.01**
Seizure	14.0	0.5	0.084	0.4	0.163
Sepsis	0.1	0.2	0.227	0.13	0.42
HIE	0.2	1	**0.003**	1.6	**<0.01**
Birth Injury	0.5	1	0.069	0.8	0.258
Neonatal Death	0.1	0	0.476	0.1	0.42

Data presented as N (%)
ICU: Intensive Care Unit
NICU: Neonatal intensive Care Unit
HIE: Hypoxic Ischemic Injury
*aRR adjusted for maternal age, body mass index, gestational age at delivery, and randomization group from parent trial

Figure 1. Receiver operating characteristic curve of the prediction of CMM by number of hours with rupture of membranes. The area under the receiver operating characteristic curve (AUC) was 0.62.



161 | Twins Exposed to Late Preterm Steroids May Be at Increased Risk for Neonatal Respiratory Morbidity

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10:30 AM - 12:30 PM

Objective: To determine if administration of antenatal corticosteroids (ACS) to patients with twin gestations at risk of late preterm delivery is associated with reduced risk of neonatal respiratory morbidity.

Study Design: This was a retrospective cohort study in a large tertiary care health system (2013–2022) of non-anomalous twin gestations at risk of preterm delivery between 34 0/7- 36 6/7 weeks. Patients were excluded if they previously received ACS or had pregestational diabetes. The exposed group included twin gestations that received 1 or 2 doses of betamethasone in the late preterm period. The primary outcome was a respiratory morbidity composite including need for any of the following in the first 72 hours: continuous positive airway pressure (CPAP) or high flow nasal cannula (HFNC) for 2 or more hours, supplemental oxygen of 30+% for 2 or more hours, ECMO, mechanical ventilation, fetal or neonatal death. Secondary outcomes included surfactant use, RDS, and TTN. Adjusted and unadjusted relative risks (RR) with 95% confidence intervals (CI) were calculated.

Results: During the study period, 366 twin gestations, corresponding to 733 patient-infant dyads, were included, with 162 gestations (321 infants) in the exposed group and 204 gestations (401 infants) in the unexposed group. The mean gestational age of ACS administration was 35 2/7 weeks in the exposed group and 35 6/7 weeks in the unexposed group. Timing and indications for administration are described in Table 1. Exposed fetuses had 16% higher risk of composite respiratory morbidity (95% CI 0.83–1.61), which was driven by higher rates of CPAP and HFNC. Exposed fetuses had lower risk of needing supplemental oxygen of 30+% for 2 or more hours (aRR 0.16, 95% CI 0.02–0.75) and mechanical ventilation (aRR 0.19, 95% CI 0.04 - 0.86) (Table 2).

Conclusion: In a large cohort of twins at risk for late preterm delivery, exposure to ACS was associated with increased risk of composite neonatal respiratory morbidity. The results of our study add to the literature questioning the benefits of late preterm ACS in twins.

Table 1
Timing and indications for antenatal corticosteroids administration in twins at risk for late preterm delivery

	ACS (n=162)	No ACS (n=204)
Gestational age at delivery (weeks)		
34	44 (27.2)	24 (11.8)
35	54 (33.3)	49 (24)
36	60 (37)	121 (59.3)
37	3 (1.9)	9 (4.4)
38	1 (0.6)	1 (0.5)
Mean (SD) gestational age at delivery (weeks)	35.2 (0.9)	35.6 (0.8)
Indication for late preterm delivery		
Medically/Obstetrically indicated	80 (49.4)	104 (51)
PPROM	39 (24.1)	31 (15.2)
Preterm Labor	43 (26.5)	69 (33.8)
Hypertensive disorders of pregnancy	26 (16)	37 (18.1)
Fetal growth restriction	38 (23.5)	33 (16.2)
Fetal distress	3 (1.9)	7 (3.4)
Oligohydramnios	1 (0.6)	5 (2.5)
Placental abnormality[a]	1 (0.6)	3 (1.5)
Other[b]	20 (12.3)	31 (15.2)

Data is n (percent) unless otherwise specified.
ACS: antenatal corticosteroids; SD: standard deviation; PPROM: preterm prelabor rupture of membranes.
[a]Includes placental abruption, placenta previa, placenta accreta spectrum, vasa previa
[b]Includes prior classical cesarean or myomectomy, uncomplicated mono-di twins, complication of mono-di twins, intrahepatic cholestasis of pregnancy, other

Table 2
Risk of neonatal respiratory morbidity in a cohort of twins associated with exposure to late preterm steroids

	ACS (n=321)	No ACS (n=401)	Relative Risk (95% CI)	[a]Adjusted RR (95% CI)
Primary outcome:				
Composite neonatal respiratory morbidity	75 (23.4)	82 (20.4)	1.17 (0.84, 1.62)	1.16 (0.83, 1.61)
CPAP for ≥2 hours	68 (21.2)	74 (18.5)	1.15 (0.82, 1.61)	1.16 (0.83, 1.62)
HFNC for ≥2 hours	20 (6.2)	9 (2.2)	3.08 (1.16, 8.17)	—
O2 with FiO2 30+% for ≥2 hours	2 (0.6)	14 (3.5)	0.18 (0.04, 0.79)	0.16 (0.04, 0.75)
Mechanical ventilation	2 (0.6)	13 (3.2)	0.19 (0.04, 0.86)	—
ECMO	0	0	—	—
Neonatal death	0	0	—	—
Secondary outcomes:				
Surfactant	2 (0.6)	5 (1.2)	0.5 (0.09, 2.77)	—
Need for resuscitation within first 30 mins	106 (33)	97 (24.2)	1.36 (1.03, 1.80)	1.30 (0.99, 1.72)
RDS	45 (14)	54 (13.5)	1.11 (0.69, 1.77)	1.06 (0.67, 1.67)
TTN	37 (11.5)	38 (9.5)	1.21 (0.74, 1.97)	—
Bronchopulmonary dysplasia	0	0	—	—

Data is n (percent) unless otherwise specified.
[a]Adjusted for age, chorionicity, ethnicity, and gestational diabetes
ACS: antenatal corticosteroids; CI: confidence interval; CPAP: continuous positive airway pressure; HFNC: high flow nasal cannula; O2: oxygen; ECMO: extra corporeal membrane oxygenation; RDS: respiratory distress syndrome; and TTN: transient tachypnea of the newborn
Note: RDS was defined as respiratory distress requiring some form of supplemental oxygen and/or respiratory support, along with a chest radiograph consistent with RDS or surfactant deficiency; TTN was defined as clinical signs of respiratory distress that resolved within 72 hours of life and with radiographic findings of increased perihilar interstitial markings and pulmonary fissure edema (or in the absence of a chest x-ray).

162 | Twins Exposed to Late Preterm Steroids and the Risk of Neonatal Hypoglycemia

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10:30 AM - 12:30 PM

Objective: Singletons exposed to late preterm antenatal corticosteroids (ACS) are at higher risk of hypoglycemia. We sought to determine if twins exposed to late preterm ACS are also at increased risk for neonatal hypoglycemia.

Study Design: This was a retrospective cohort study in a large tertiary care health system (2013–2022) of non-anomalous twin gestations at risk of preterm delivery between 34 0/7- 36 6/7 weeks. Patients were excluded if they previously received ACS or had pregestational diabetes. The exposed group included gestations who received 1 or 2 doses of betamethasone (BMZ) in the late preterm period. The primary outcome was risk of neonatal hypoglycemia (blood glucose < 40 mg/dL). Secondary outcomes were lowest average blood glucose, need for hypoglycemia treatment and NICU admission for hypoglycemia. Descriptive statistics and adjusted and unadjusted risk ratios (RR) with 95% confidence intervals (CI) were calculated.

Results: During the study period, 366 twin gestations, corresponding to 733 patient-infant dyads, were included with 162 gestations (321 infants) in the exposed group and 204 gestations (401 infants) in the unexposed group. The mean gestational age of ACS administration was 35 2/7 weeks in the exposed group and 35 6/7 weeks in the unexposed group. In the exposed group, 72 (44%) received 2 doses of BMZ. Ten percent had gestational diabetes in both groups. Other group demographics are listed in Table 1. Compared to unexposed twins, exposed twins had a modest increase in risk of hypoglycemia (RR 1.06, 95% CI 0.88 - 1.28). Exposed twins had lower mean blood glucose and higher risk of need for hypoglycemia treatment (Table 2). Exposed twins were more likely to be admitted to NICU for hypoglycemia and to have hypoglycemia as the only indication for NICU admission.

Conclusion: In a large cohort of twins at risk for late preterm delivery, exposure to ACS was associated with a modest increase in risk for hypoglycemia. These data add to the body of literature on potential risks associated with late preterm ACS administration for twins.

Table 1
Demographic characteristics of twins at risk for late preterm birth

	Exposed group (ACS) (n=162)	Unexposed group (no ACS) (n=204)
Age at Delivery, mean (SD)	32.6 (5.7)	34 (5.5)
Race/Ethnicity		
American Indian/Alaskan Native	2 (1.2)	0 (0)
Asian	18 (11.1)	26 (12.7)
Other/Unknown	51 (31.5)	52 (25.5)
Native Hawaiian or Pacific Islander	3 (1.9)	3 (1.5)
White	88 (54.3)	123 (60.3)
Hispanic/Latinx	18 (11.1)	17 (8.3)
BMI, mean (SD)	26.8 (5.9)	27.3 (6.5)
Parity		
Nulliparous	92 (56.8)	95 (46.6)
Parous	70 (43.2)	109 (53.4)
Chorionicity		
Dichorionic-diamniotic	110 (67.9)	158 (77.5)
Monochorionic-diamniotic	52 (32.1)	46 (22.5)
Gestational Diabetes		
A1GDM	15 (9.3)	17 (8.3)
A2GDM	2 (1.2)	5 (2.5)
Hypertensive disorder of pregnancy	46 (28.4)	57 (27.9)

Data is n (%) unless otherwise specified.
ACS: antenatal corticosteroids; BMI: Body Mass Index; GDM: gestational diabetes; SD: standard deviation.

Table 2
Risk of hypoglycemia and related outcomes in twins exposed to late preterm steroids

	Exposed group (ACS) (n=321)	Unexposed group (no ACS) (n=401)	RR or mean/median difference (95% CI)	[a]Adjusted RR or mean/median difference (95% CI)
Primary Outcome:				
Hypoglycemia (blood glucose < 40mg/dL)	142 (44.2)	167 (41.7)	1.05 (0.92, 1.20)	1.06 (0.88, 1.28)
Secondary outcomes:				
Lowest blood glucose, mean (mg/dL)	40.3 (13.4)	43.6 (13)	-3.2 (-6.0, -0.5)	-10.0 (-11.7, -8.3)
Onset of hypoglycemia				
<72 hours	134 (94.4)	145 (86.8)	1.80 (0.98, 3.30)	1.09 (1.01, 1.18)
After 72 hours	8 (5.6)	22 (13.2)		
Median [IQR] time to resolution, hours	1 [1-9]	1 [1-9]	-0.4 (-4.2, 3.3)	12.3 (-14.1, 38.7)
Need for hypoglycemia treatment	115 (81.0)	120 (71.9)	1.24 (1.00, 1.54)	1.13 (0.98, 1.30)
Oral	79 (55.6)	79 (47.3)	1.17 (0.95, 1.43)	1.22 (0.95, 1.58)
IV	67 (47.2)	62 (37.1)	1.21 (0.98, 1.51)	1.23 (0.92, 1.63)
Hypoglycemia as an indication for NICU admission	55 (17.1)	39 (9.7)	1.73 (1.11, 2.69)	1.61 (1.01, 2.57)
Hypoglycemia as only indication for NICU admission	33 (10.3)	21 (5.2)	1.42 (1.13, 1.78)	—

Data is n (percent) unless otherwise specified.
[a]Adjusted for age, chorionicity, ethnicity, and gestational diabetes
ACS: antenatal corticosteroids; RR: risk ratio; CI: confidence interval; IV: intravenous

163 | Examining Psychometric Screening Scores for Depression, Anxiety, and Post-Traumatic Stress After Fetal KCL Injection

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10:30 AM - 12:30 PM

Objective: To examine the incidence of positive screens for depression, anxiety, and post-traumatic stress among patients undergoing therapeutic abortion at ≥ 22 weeks' gestation.

Study Design: This was a prospective, observational cohort study of patients undergoing fetal potassium chloride (KCL) injection for therapeutic abortion at ≥ 22 weeks' gestation. All patients scheduled for said procedure were approached within 48 hours of the scheduled termination. After obtaining informed consent, basic demographic information was collected. Patients completed the Edinburgh Postnatal Depression Scale (EPDS), General Anxiety Disorder-7 (GAD-7), and Primary Care Post-Traumatic Stress Disorder-5 (PC-PTSD-5) questionnaires twice, first prior to their KCL procedure and then again two weeks later. Consents and questionnaires were provided in both English and Spanish. Patients who scored positive on any tool were referred to an in-house social worker and connected to ongoing mental health care as appropriate.

Results: 41 patients were screened for this study, of whom 24 enrolled. The mean gestational age in weeks was 24.8 (Table 1). Fetal anomaly was the indication for termination in 70.8% of patients. 14 patients (58.3%) completed the two-week follow-up surveys. The median baseline and two-week follow up scores for the EPDS, GAD-7, and PC-PTSD-5 were, respectively, 13.5 and 10, 7 and 4.5, and 1 and 2 (Table 2). There was no difference in the proportion who screened positive on any measures between those patients who completed the follow up surveys and those who did not. There were also no differences in the proportion of positive screens by evacuation method or termination indication.

Conclusion: Most patients undergoing termination at ≥ 22 weeks' gestation at our institution during the study period did so for fetal anomalies. Patients undergoing these terminations should be screened for depression, anxiety, and PTSD, and those who screen positive should be connected to resources for further care. More research is needed on the long-term mental health outcomes of patients undergoing termination after 22 weeks.

Table 1. Demographics

Characteristic	Total= 24 N (%)
Age at Termination, years (mean, sd)	33.5 (5.7)
Gestational Age at Termination, weeks (mean, sd)	24.8 (1.4)
Race and Ethnicity	
White	9 (37.5)
Asian	5 (20.8)
Black / African American	3 (12.5)
Hispanic / Latina	6 (25.0)
Other	1 (4.2)
Insurance Coverage	
Private	16 (66.7)
Public	6 (25.0)
None	2 (8.3)
Primary Language	
English	20 (83.3)
Spanish	4 (16.7)
Indication for Termination	
Fetal Anomaly (Genetic and/or Structural)	17 (70.8)
Other Therapeutic Indication	0 (0.0)
Maternal Indication	7 (29.2)
Pre-existing Psychiatric Diagnoses	
Anxiety	3 (12.5)
Depression	1 (4.2)
Bipolar Disorder	1 (4.2)
Method of Evacuation	
Induction of Labor	12 (50.0)
Dilation and Evacuation	12 (50.0)
Mental Health Resource Uptake	
In-house Social Work Assessment	9 (64.3)
Outside Connection to Care	3 (33.3)

Table 2: Psychometric Screening Results

	Baseline N = 24		2-Week Follow-Up N = 14		
Characteristic	Median (IQR)	N(%) Scored Positive	Median (IQR)	N(%) Scored Positive	*p**
EPDS (score ≥ 10 = positive screen)	13.5 (6.3)	19 (79)	10 (5.5)	9 (64)	0.56
GAD-7 (score ≥ 5 = positive screen)	7 (7.3)	17 (71)	4.5 (4.5)	7 (50)	0.2
PC-PTSD-2 (score ≥ 3 = positive screen)	1 (2.3)	6 (25)	2 (1)	5 (36)	0.21

164 | Examining the Role of Neighborhood Level Indices in Predicting Spontaneous Preterm Birth

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10:30 AM - 12:30 PM

Objective: Cervical length is an established but limited predictor of spontaneous preterm birth (sPTB). We examined whether measures of the neighborhood environment, which reflect structural determinants of pregnancy outcomes, improve prediction of sPTB as compared to CL alone.

Study Design: This was a retrospective cohort study of 1000 patients and each of their gestations with: 1) delivery at a tertiary, urban academic hospital between January 2013-August 2023 and

2) at least one transvaginal CL at 16w0d-24w6d gestational age (GA). The primary outcome was sPTB, defined from chart review as delivery prior to 37w0d GA. CL was abstracted from ultrasound images. Medical history, GA at delivery, progesterone therapy, and cerclage placement were abstracted from the electronic medical record. We ascertained neighborhood structural and social determinants of health (SDOH) from the Index of Concentration at the Extremes (indicator of racial-economic segregation) and Child Opportunity Index (neighborhood resources), based on patient address and 2020 census tract. We used logistic regression to predict the probability of sPTB in models with (1) CL only, (2) CL plus neighborhood indices, and (3) CL, neighborhood, and individual-level characteristics We compared model discrimination using the area under the receiver operating characteristics curve (AUC). Analyses were performed in R version 4.4 (24 April 2024).

Results: The 1000 patients yielded 1038 pregnancies that met inclusion criteria. 21.4% of pregnancies had a prior sPTB (Table 1). 13.3% of index pregnancies ended in sPTB. Decreased CL was associated with increased odds of sPTB in all models. A model with CL only achieved an AUC of 0.56 and 0.57 with addition of neighborhood indices (Table 2). Including other individual covariates increased performance to an AUC of 0.72.

Conclusion: Inclusion of the ICE and COI neighborhood indices did not improve sPTB prediction among individuals who underwent CL screening. Research should explore additional, diverse SDOH indicators alongside individual clinical characteristics to identify those at highest risk of sPTB.

Table 1: Demographics

	Total = 1038	
Characteristic	**N**	**%**
Age at Delivery		
≤ 25	209	20.13
26 - 30	268	25.82
31 - 35	327	31.50
36 - 40	174	16.76
> 40	60	5.78
Race and Ethnicity		
Asian, Native Hawaiian, Pacific Islander	44	4.24
Black or African American	256	24.66
Hispanic or Latina	463	44.61
White	185	17.82
Other	79	7.61
Missing	11	1.06
Insurance Coverage		
Public	503	48.46
Private	457	44.03
None	78	7.51
Pre-Pregnancy BMI		
<= 30	650	62.62
30-35	209	20.13
35-40	96	9.25
> 40	76	7.32
Missing	7	0.67
Tobacco Use in Pregnancy	27	2.60
Alcohol Use in Pregnancy	3	0.29
Substance Use in Pregnancy	20	1.93
History of Spontaneous Preterm Birth	222	21.39
Prescribed Progesterone in Pregnancy	199	19.17
Cerclage Placed during Pregnancy	48	4.62

Table 2: Logistic regression models predicting spontaneous preterm birth

	OR	95% CI	AUC	95% CI
Model 1			0.56	0.45, 0.63
Cervical Length	0.63	0.47, 0.86		
Model 2			0.57	0.47, 0.64
Cervical length	0.64	0.48, 0.86		
COI	1.00	0.99, 1.00		
Model 3			0.57	0.48, 0.63
Cervical length	0.66	0.49, 0.91		
ICE	0.68	0.32, 1.37		
Model 4			0.57	0.50, 0.64
Cervical length	0.67	0.49, 0.91		
COI	1.01	0.98, 1.03		
ICE	0.39	0.04, 3.52		
Model 5*			0.72	0.65, 0.78
Cervical length	0.82	0.59, 1.15		
COI	1.01	0.98, 1.03		
ICE	0.58	0.05, 6.02		

COI=Childhood Opportunity Index, ICE=Index of Concentration at the Extremes.

*Adjusted for maternal age at delivery, race and ethnicity, insurance, tobacco use, substance use, progesterone therapy, cervical cerclage, and prior history of spontaneous preterm birth

165 | Antibiotic Prophylaxis with Balloon and Vacuum-induced Tamponade Devices for Vaginal Deliveries Complicated by Postpartum Hemorrhage

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10:30 AM - 12:30 PM

Objective: Balloon and vacuum-induced tamponade devices provide alternative treatment options in cases of postpartum hemorrhage when first-line uterotonic agents either fail or are contraindicated. This study sought to determine if antibiotic prophylaxis at time of intrauterine balloon tamponade (IBT) or vacuum-induced tamponade (VID) insertion in vaginal deliveries complicated by postpartum hemorrhage effects subsequent rates of postpartum endometritis.

Study Design: We conducted a prospective observation cohort study comparing all patients who received an IBT following vaginal delivery to those who did not from dates 7/2022 through 7/2024. Patients were excluded if additional antibiotics apart

from penicillin for GBS prophylaxis were administered, were gestational age < 34 weeks, or had an allergy to antibiotic therapy. Patients receiving antibiotics specifically were given cefazolin 1g every 8 hours until removal of IBT or VID.

Results: The study included 415 patients, where 313 patients received IBT and 102 received VID. In the IBT group, 160 received antibiotics and 153 did not. In the VID group 55 received antibiotics and 47 did not. Demographic factors were not significantly different. Rates of postpartum endometritis were less in the IBT antibiotic group (5.6% versus 13.7%, p = 0.003) in addition to a 37% decreased risk in confounder adjusted models (RR = 0.63, 95% CI 0.47-0.75, p = 0.041). Rates of postpartum endometritis were not significantly different in the unstratified VID group. In stratified analysis, rates of postpartum endometritis were less in the VID antibiotic groups for nulliparous patients (0.55% v. 2.35%, p = 0.001), with a 11% decreased risk in adjusted models (RR = 0.89, 95% CI 0.72-0.97, p = 0.034).

Conclusion: Antibiotic prophylaxis at time of IBT for vaginal deliveries complicated by postpartum hemorrhage is reasonable for endometritis prevention with potential benefits for VID use in nulliparous patients.

166 | Intrapartum Cesarean Delivery in PPROM: Identifying Key Risk Factors and Developing a Predictive Model

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10:30 AM - 12:30 PM

Objective: To identify risk factors for intrapartum cesarean delivery (CD) in women with preterm premature rupture of membranes (P-PROM) and to develop a risk prediction score for this outcome.

Study Design: We conducted a retrospective cohort study at a university-affiliated tertiary medical center with approximately 12,500 deliveries annually (2012-2023). The study included women with P-PROM who planned a trial of labor, excluding those opting for elective CD or with non-viable fetuses. We compared maternal and neonatal characteristics between those who delivered vaginally and those who underwent intrapartum CD. Risk factors were identified using univariate and multivariate logistic regression analyses. A predictive risk score was developed based on the relative risk of each factor, with model performance assessed using the ROC curve.

Results:

1. During the study period, 145,833 women delivered at our center. Of these, 1,494 (1%) were admitted with P-PROM and were eligible for analysis.
2. Among these, 470 (31.5%) underwent intrapartum CD, with a median gestational age of 34.5 weeks (IQR 32.3, 36.0) compared to 35.4 weeks (IQR 33.5, 36.4) in women who delivered vaginally.
3. Multivariate analysis revealed that maternal age > 40 years, multiple gestations, and previous CD are independent risk factors for intrapartum CD. Conversely, BMI > 30, use of oxytocin or antibiotics during labor, and spontaneous onset of labor were protective factors. We assigned risk scores to each factor and incorporated them into our model. [Table 2].
4. The developed risk score model, with a cut-off of 7, predicted intrapartum CD with an area under the curve of 0.85 (95% CI [0.80-0.88], p < 0.001), demonstrating 70% sensitivity and 80% specificity.

Conclusion: Utilizing our risk score to assess factors before and during labor can aid clinicians in making more informed decisions regarding the risk for intrapartum CS in women with P-PROM.

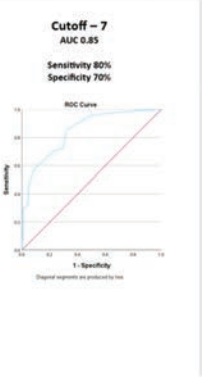
Table 1: Clinical and Demographic Characteristics

	Vaginal birth N = 1024	CS N = 470	p- value
Maternal age, (mean, SD)	33.2 (4.69)	35.1 (5.59)	<0.001
Pre-gestational BMI (median, IQR)	22.1 (20.08, 24.6)	22.8 (20.3, 25.4)	0.005
Gestational week, (median, IQR)	35.4 (33.5, 36.4)	34.5 (32.3, 36.0)	<0.001
Newborn weight (median, IQR)	2420 (1963, 2710)	2111 (1715, 2490)	<0.001
Nulliparity, n (%)	611 (59.8)	260 (55.6)	0.127
Regional anesthesia, n (%)	714 (70.1)	414 (90.4)	<0.001
IVF pregnancy, n (%)	145 (15.1)	116 (26.5)	<0.001
Intra-partum Fever, n (%)	25 (3.3)	5 (6.9)	0.172
Spontaneous onset of labor (n, %)	746 (74.9)	70 (16.7)	<0.001
HB < 10 (median, IQR)	39 (10.5)	5 (7.1)	0.515
WBC (median, IQR)	13.9 (10.8, 17.1)	13.2 (10.9, 15.9)	0.22
PLT (median, IQR)	211 (174, 258)	203 (165, 269)	0.52
Oxytocin use, n (%)	441 (43.1)	144 (30.6)	<0.001
Multiple gestation (n, %)	102 (10)	195 (41.8)	<0.001
Antibiotic use during delivery, n (%)	115 (61.8)	71 (23.5)	<0.001
Previous CD, n (%)	46 (4.5)	111 (23.7)	<0.001
Chronic DM (n, %)	7 (0.7)	9 (1.9)	0.053
GDM, n (%)	113 (11)	80 (17)	0.002
PET, n (%)	18 (1.8)	16 (3.4)	0.06

Table 2: Score for intrapartum CD in P-PROM.

	RR (95% CI)	p-value	Score	
			Yes	No
Age > 40	3.9 (1.2-12.9)	0.023	4	0
BMI >30	0.2 (0.05-0.8)	0.022	0	1
Delivery before 34 weeks	0.54 (0.25-1.13)	0.1	-	-
IVF	0.98 (0.41-2.39)	0.97	-	-
Multiple pregnancy	5.6 (2.46-12.9)	<0.001	6	0
Previous Caesarean Delivery	13.82 (3.4 – 55.8)	<0.001	10	0
GDM	1.75 (0.67-4.53)	0.25	-	-
Newborn weight > 3kg	1.57 (0.19-12.76)	0.67	-	-
Oxytocin use	0.28 (0.13-0.61)	0.001	0	1
Spontaneous onset of delivery	0.047 (0.022-0.10)	<0.001	0	1
Regional anesthesia	2.11 (0.6-7.37)	0.24	-	-
Antibiotics use during Labor	0.33 (0.16-0.67)	0.002	0	1

RR: Relative Risk; CI: Confidence Interval; DM: Diabetes Mellitus



167 | Comparison of Antibiotic Regimens for Preventing Infectious Complications Following Elective Cesarean Delivery

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10:30 AM - 12:30 PM

Objective: To compare the efficacy of two antibiotic regimens (Cefazolin versus Clindamycin + Gentamicin) for preventing infectious complications following elective cesarean delivery.

Study Design: A retrospective cohort study was conducted at a single tertiary university-affiliated medical center (2012 and 2023). All women who underwent an elective cesarean delivery were included and divided into two groups: the standard regimen group (control) were treated by Cefazolin (2 grams) and the study group, comprising of women with cephalosporin allergy were treated by a Clindamycin (900 mg) + Gentamicin (5 mg/kg) regimen. Maternal and neonatal outcomes were collected and analyzed.

The primary outcome was the need for antibiotics admission for the mother during hospitalization and the secondary outcome was the need for readmission due to obstetric or gynecological complications.

Results:

1. Out of 145,883 deliveries, 19,977 (13.5%) were elective cesarean deliveries.
2. Cefazolin was administered to 11,586 women (92%), while 1,010 women (8%) received Clindamycin + Gentamicin.
3. The control group (Cefazolin only) had a lower incidence of infectious complications compared to the study group. [Table 1].
4. Primary outcome (the need for antibiotic treatment during hospitalization) was 35.4% vs. 5.7% in the control group ($p < 0.001$) and rate of re-admission was 3.2% vs. 1.9% in the control group ($p = 0.008$)
5. Multivariate logistic regression analysis revealed that women in the alternative regimen group (Clindamycin + Gentamicin) had higher odds for antibiotic treatment during hospitalization (aOR 13.04, 95% CI 5.3-31.6, $p < 0.001$), and readmission (aOR 1.92, 95% CI 1.27-2.94, $p = 0.002$). [Table 2]

Conclusion: The antibiotic regimen of Cefazolin is more effective in preventing infectious complications following elective cesarean delivery compared to the combination of Clindamycin + Gentamicin regimen. The study highlights the need for careful assessment of beta-lactam allergies to ensure appropriate prophylactic choices.

Table 1: Comparison of Maternal and Neonatal Outcomes

	Standard Regimen (Cefazolin) N= 11,586	Alternative Regimen (Clindamycin + Gentamicin) N= 1010	p-value
Maternal age (mean SD)	35.1 (5.24)	35.6 (5.45)	0.003
Gestational week (median IQR)	38.3 (37.5, 39.0)	38.3 (37.2, 39.1)	0.05
Body Mass Index (median IQR)	23.1 (20.6, 26.8)	23.6 (20.9, 27.3)	0.013
Nulliparity, n (%)	4040 (35.1)	395 (39.6)	0.005
Previous Cesarean Delivery, n (%)	5222 (45.4)	402 (40.3)	0.002
Assisted Reproductive Technology, n (%)	1824 (18.1)	197 (21.6)	0.009
PET, n (%)	555 (4.8)	67 (6.6)	0.011
Multiple pregnancy, n (%)	1429 (12.4)	138 (13.9)	0.19
Gestational Diabetes Mellitus, n (%)	2362 (20.4)	233 (23.1)	0.046
Pre-Gestational Diabetes Mellitus, n (%)	233 (2)	29 (2.9)	0.078
General anesthesia, n (%)	250 (2.3)	115 (11.9)	<0.001
Pre-operative Hemoglobin (median IQR)	12 (11, 12.8)	11.8 (10.5, 12.6)	0.144
Pre-operative White Blood Cell (median IQR)	11.1 (9.1, 14.4)	12.1 (10, 15.2)	0.022
Pre-operative Platelet (median IQR)	193 (152, 243)	188 (146, 229)	0.426

Table 2: Multivariate logistic regression – Alternative regimen compared to standard regimen for delivery outcomes.

	aOR (95%CI)	p- value
Antibiotics during hospitalization	13.04 (5.3-31.6)	<0.001
Packed Cell Transfusion	2.07 (1.34-3.2)	0.001
Gynecological Readmission	1.92 (1.27-2.94)	0.002

168 | Adjunctive Medications in the Management of Long Covid in 3rd Trimester Pregnancies and Postpartum Periods

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10:30 AM - 12:30 PM

Objective: Long Covid (LC) is a collective term referring to the persistence of symptoms and complications related to those acquiring an acute SARS-CoV-2 infection. This study sought to evaluate the effects of medications often employed empirically in the management of LC for pregnant patients in the 3rd trimester and postpartum periods.

Study Design: We conducted a multi-center, prospective observational study from 7/2022 to 7/2024 comparing all pregnant women diagnosed with SARS-CoV-2 infection (CoV-2) in the 3rd trimester through 6 weeks postpartum. Patients with preexisting respiratory or neurological disorders or preterm delivery < 37 weeks-gestation, were excluded. Medications including enoxaparin, aspirin, inhaled corticosteroids with or without a long-acting beta blocker (CBB), theophylline, antidiabetic medications, and 1st generation antihistamines were included as covariates. The primary outcomes included the development of LC and improvement or worsening following treatment. Primary outcomes were determined by patient-reported symptoms confirmed by physician assessment in the immediate, 1-week (1P), and 6-week postpartum (6P) periods, as discrete events.

Results: The study included 369 patients diagnosed with LC. Patients who received enoxaparin were less likely to report LC at the 1P and 6P visits (39.7% v. 47.9%, p = 0.004). Patients receiving aspirin antepartum were also less likely to report LC at the same intervals (25.8% v. 51.2%, p = 0.001). Patients with LC were more likely to report improvement when taking aspirin at doses of at least 325mg (31.8% v. 11.9%, p = 0.022). In stratified analysis, patients with diabetes in pregnancy and received metformin were less likely to report LC at the 1P and 6P visits (22.7% v. 48.2%, p = 0.004). Patients with LC who received semaglutide were more likely to report worsening status at the 6P visit (45.2% v. 54.8%, p = 0.045).

Conclusion: These findings suggest that treatments targeting the circulatory system may prove more useful for LC in the 3rd trimester and postpartum period, with a possible extended benefit when using metformin in diabetic patients.

169 | Physical Activity in Pregnancy Moderates Short and Long-Term Associations Between Depressive Symptoms and Psychobiologic Markers

Danielle M. Panelli[1]; Jessica Buthmann[1]; Tan Kok Hian[2]; Helen Chen[3]; Ai Peng Tan[2]; Yap-Seng Chong[2]; Katherine Bianco[1]; Ian H. Gotlib[1]; On behalf of the GUSTO

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10:30 AM - 12:30 PM

Objective: Poor mental health is a leading cause of maternal morbidity and mortality, yet simple interventions that are effective on a biologic level are lacking. We evaluated whether physical activity is associated with improvements in psychobiologic markers in pregnant people with depressive symptoms.

Study Design: We analyzed pregnancies among people enrolled in a prospective cohort from 2009-2010 who had depressive symptoms (Edinburgh Postpartum Depression Scale [EPDS] score >8) at 26 weeks gestation. We examined: 1) the cross-sectional interaction of EPDS score and physical activity (PA) predicting maternal leukocyte telomere length (LTL), a biomarker of stress and aging when shortened; and 2) whether LTL and PA predict longitudinal change in EPDS scores from pregnancy to 2 years postpartum. PA was categorized as based on report of metabolic equivalent tasks (METs). LTL was reported as telomere/single gene (T/S) ratios from quantitative PCR. We used linear generalized estimating equation regression models, adjusting for confounders.

Results: 235 pregnancies were included. In pregnant people with no PA, higher EPDS scores were related to shorter LTL; this was reversed in people with mild or high PA, in whom LTL lengthening was seen (mild PA: ß = 0.02, 95% CI 0.002, 0.04, p = 0.03; high PA: ß = 0.03, 95% CI -0.001, 0.05, p = 0.06; Figure 1). Longitudinally, longer LTL and higher PA levels predicted significant decreases in EPDS scores by 2 years postpartum (mild PA: ß = -12.8, 95% CI -20.1, -5.4, p < 0.01; high PA: ß = -15.3, 95% CI -30.3, -0.19, p = 0.047, Figure 2).

Conclusion: In pregnant people with depressive symptoms, physical activity reversed the negative effects of higher EPDS scores on LTL shortening. This was also evident longitudinally: people with the longest LTL and highest PA had a 15-point reduction in EPDS scores by 2 years postpartum compared to people with no PA. Investigation into PA as a treatment for perinatal depressive symptoms is warranted.

Figure 1. Regression model fit (with 95% Confidence Intervals) demonstrating interaction between pregnancy physical activity level and maternal depressive symptoms on maternal leukocyte telomere length (N=235)

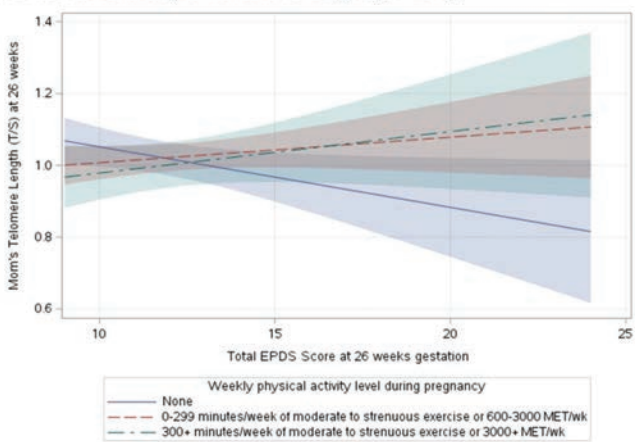
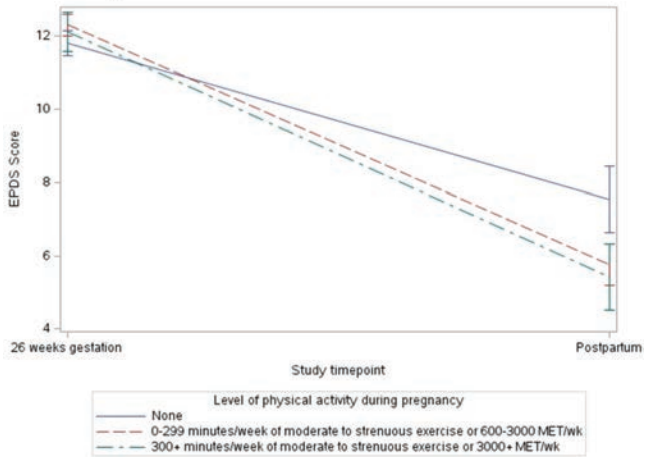


Figure 2. Longitudinal changes in Edinburgh Postpartum Depression (EPDS) scores by physical activity level



170 | Induction Versus Expectant Management in Nulliparous Low-Risk Women: Single Institution Impact of the Arrive Trial

Kathleen M. Pulice[1]; Shekinah Dosunmu[2]; Joanne N. Quiñones[2]; Meredith Rochon[2]; Amanda B. Flicker[2]; Travis Dayon[2]; George Angelakakis[3]; Ahsan Usmani[3]; Janae Cornwall[3]; Danielle Durie[2]
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10:30 AM - 12:30 PM

Objective: The ARRIVE trial found that elective induction of labor (eIOL) at 39 weeks in nulliparous persons compared to expectant management was associated with a lower rate of cesarean delivery (CD). Our goal was to see if this benefit persisted in a non-research setting.

Study Design: Retrospective cohort study of all nulliparous pregnant persons admitted for delivery ≥ 39w0d at a single academic community institution between 3/1/20-3/1/22, when we started offering eIOL. Those with singleton low risk pregnancies, without any clinical indication for delivery prior to 40w5d, were included. Maternal and neonatal outcomes of persons undergoing eIOL between 39w0d-39w4d were compared to women expectantly managed. The primary outcome was rate of CD. Secondary outcomes included select maternal outcomes and composite neonatal outcome (neonatal death and/or serious morbidity).

Results: 1009 nulliparous persons with low-risk singleton gestations admitted for delivery during the study period were identified, 149 (14.8%) undergoing eIOL and 860 (85.2%) expectantly managed. Those undergoing eIOL delivered earlier (39.2 vs 40.1 wks, $p < 0.001$), were more likely to be obese (38.8% vs 20.4%, $p < 0.001$) and were less likely to be of advanced maternal age (4.0% vs 9.3%, $p = 0.033$). There was no difference in CD rate (20.8% vs 17.8%, $p = 0.38$), maternal outcomes or composite neonatal outcome between the eIOL and expectant management groups (Table). eIOL was associated with longer maternal length of stay (LOS) but similar neonatal LOS. When evaluating only those undergoing induction, CD rate was significantly lower in the eIOL group (20.8% vs 32.9%, $p = 0.019$).

Conclusion: In our cohort of low-risk nulliparous pregnant persons in a non-research setting, eIOL at 39w0d-39w4d did not decrease CD rate, which differs from the ARRIVE trial results. Reassuringly, there was no increase in adverse outcomes, confirming that eIOL is safe. In low-risk patients, induction at 39w0d-39w4d may be associated with a lower CD rate than induction later in gestation.

Table 1: Nulliparous Patient Demographics, Perinatal and Neonatal Outcomes

	eIOL (n=149)	Exp. Mgt (n=860)	p-value
Maternal age (years)	26.0 (5.0)	27.6 (5.0)	0.945
Age ≥35	6 (4.0)	80 (9.3)	0.033
Gestational age (wk)	39.2 (0.21)	40.1 (0.70)	<0.001
Pregestational BMI ≥30 kg/m²	54 (38.8)	163 (20.4)	<0.001
GDM (diet controlled)	7 (4.7)	38 (4.4)	0.879
Cesarean delivery	31 (20.8)	153 (17.8)	0.379
Hypertensive disorders of pregnancy	39 (26.2)	268 (31.2)	0.222
3rd/4th degree perineal laceration	3 (2.4)	43 (6.0)	0.134
Postpartum hemorrhage	11 (7.4)	79 (9.2)	0.476
Intra-amniotic infection	15 (10.1)	83 (9.7)	0.874
Hospital length of stay			<0.001
<2d	0 (0)	19 (2.2)	
2d	25 (16.8)	367 (42.7)	
3d	81 (54.4)	367 (42.7)	
4d	32 (21.5)	81 (9.4)	
>4d	11 (7.4)	26 (3.1)	
Composite neonatal outcome	12 (8.1)	70 (8.1)	1.000
Neonatal death	1 (0.7)	0 (0)	0.148
Respiratory support	10 (6.7)	57 (6.6)	0.970
Hypoxic-ischemic encephalopathy	0 (0)	0 (0)	---
Seizure	0 (0)	1 (0.1)	1.000
Infection	3 (2.0)	6 (0.7)	0.135
Meconium aspiration syndrome	0 (0)	19 (2.2)	0.095
Birth trauma	0 (0)	6 (0.7)	0.600
Intracranial/subgaleal hemorrhage	2 (1.3)	0 (0)	0.022
Hypotension requiring vasopressors	1 (0.7)	2 (0.2)	0.381
5 minute Apgar ≤3	2 (1.3)	1 (0.1)	0.059
Newborn length of stay			0.921
<2d	17 (11.4)	88 (10.2)	
2d	107 (71.8)	623 (72.4)	
3d	15 (10.1)	97 (11.3)	
4d	4 (2.7)	26 (3.0)	
>4d	6 (4.0)	26 (3.0)	
Data presented as n(%) or mean (SD)			

171 | Impact of Emergency Room Abortion Bans on Pregnancies with Previable Preeclampsia: a Cost-Effectiveness Analysis

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10:30 AM - 12:30 PM

Objective: In August 2022, the federal government sued the state of Idaho, arguing that the federal Emergency Medical Treatment and Labor Act (EMTALA) required providers in the state to provide abortions in certain emergency situations. The suit cited severe preeclampsia as a condition that would require abortion as definitive treatment, particularly in the previable period. This cost-effectiveness model estimated the maternal health outcomes and costs associated with an inability to provide emergency abortion care for previable preeclampsia across the United States.

Study Design: A decision-analytic model was built using TreeAge software to evaluate a total ban on emergency abortion in a theoretical cohort of 5,428 women based on the incidence of previable preeclampsia and birth data from the 23 states with bans. Probabilities, utilities and costs were derived from the literature. National data were used to estimate the number of women who would travel out of state to obtain an abortion (27.2%). The threshold for cost-effectiveness was set at $100,000 per quality adjusted life year (QALY). Clinical outcomes included ICU admission, cases of HELLP syndrome or eclampsia, maternal death, NICU admission, and neonatal neurodevelopmental delay.

Results: Emergency abortion bans limiting care for previable severe preeclampsia resulted in 549 additional maternal and neonatal ICU admissions, 1,976 cases of HELLP syndrome, and 152 cases of eclampsia. The ban resulted in 1,476 individuals traveling out-of-state for termination. A policy restricting abortion was associated with higher costs ($374,350,596) and decreased quality of life (2,859 QALYs) annually.

Conclusion: Abortion bans that restrict emergency abortion care to treat previable severe preeclampsia result in increased maternal complications and costs and decreased quality of life. Policies addressing abortion access should consider these health and cost impacts for both individuals and society.

Table 1.
Additional cases of each outcome in a theoretical cohort of 5,428 women with previable severe preeclampsia at 20 weeks' gestation in states with abortion bans.

n=5,428	No Abortion Ban	Abortion Ban	Difference
Maternal Mortality	0	64	64
Maternal ICU Admission	0	439	439
HELLP Syndrome	0	1,976	1,976
Eclampsia	0	152	152
NICU Admission	0	110	110
Neonate with Neurodevelopmental Disability	0	31	31
Abortions	5,428	1,476	3,952
Cost	$43,913,823	$418,264,419	$374,350,596
Effectiveness (QALY)	134,352	131,493	2,859

172 | Reference Range for Elecsys Sflt-1/Plgf Ratio in a Diverse U.S Population

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10:30 AM - 12:30 PM

Objective: Preeclampsia (PE) is a major cause of maternal and neonatal mortality and morbidity. The imbalance of two proteins, soluble fms-like tyrosine kinase 1 (sFlt-1) and placental growth factor (PlGF), are known to contribute significantly to the development of PE.

The sFlt-1/PlGF ratio test is used for the clinical prediction of PE in many countries worldwide but has not been widely adopted in the US. This study aimed to determine the reference range for the Roche Elecsys® sFlt-1/PlGF ratio (electrochemiluminescent immunoassays) in a racially and ethnically diverse healthy US population of pregnant women at 23+0 - 34+6 gestational weeks.

Study Design: A non-interventional sample and data collection study performed from November 2022 to December 2023 at nine US hospitals. Consented apparently healthy pregnant individuals (≥18 years old) had one serum sample collected (frozen at -60 to -90°C) with postpartum maternal and neonatal clinical outcomes collected to confirm eligibility for analysis. To ensure a healthy study population subjects were excluded from analysis if they met any of the pre-defined exclusion criteria including diagnosis of specific health conditions or preterm delivery < 37 weeks. The sFlt-1/PlGF ratio was not known to the enrolling sites at any time. A nonparametric method per CLSI EP28-A3c was used to calculate the central 95% reference interval and the 90% confidence intervals (CIs) around the lower and upper reference limits (2.5th and 97.5th percentiles) for the overall cohort and three gestational age windows subgroups (23+6 - 26+6, 27+0 - 30+6, 31+0 - 34+6).

Results: Of 591 enrolled, 380 subjects met criteria for analysis in gestational weeks 23+0 - 34+6 days. Gestational hypertension was the main reason for exclusion followed by PE and preterm delivery. The cohort (n = 380) was representative of the US population in terms of self-reported race and ethnicity: 78.16% White, 14.21% Black/African American, 5.53% Asian and 18.95% Hispanic or Latina.

Conclusion: This study is the first to estimate sFlt-1/PlGF ratio reference ranges in a diverse US population using the Roche Elecsys assays.

Table 1: sFlt-1/PlGF reference range distribution

Gestational week	Total N	Mean	Median	2.5th percentile (90% CI)	97.5th percentile (90% CI)
23+0 - 34+6	380	4.31	3.21	0.857 (0.671, 1.01)	13.5 (11.6, 14.9)
Sub-divided reference range windows					
23+0 - 26+6	141	4.59	3.91	1.32 (0.848, 1.43)	11.9 (11.0, 14.1)
27+0 - 30+6	116	3.55	3.05	0.853 (0.290, 1.08)	10.4 (7.25, 13.5)
31+0 - 34+6	123	4.68	2.76	0.733 (0.395, 0.887)	16.4 (13.1, 43.9)

173 | Severe Maternal Morbidity from Peripartum Hysterectomy: Is there a Difference Between Accreta and Non-Accreta Cases?

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10:30 AM - 12:30 PM

Objective: Evaluate the difference in rates of severe maternal morbidity (SMM) among patients undergoing peripartum hysterectomy for placenta accreta spectrum (PAS) compared to non-PAS indications.

Study Design: This was a retrospective cohort study of all patients who had a peripartum hysterectomy performed at an urban, tertiary care hospital from 1/1/2010-6/30/2023. Patients with a preoperative diagnosis of suspected PAS were compared to those who underwent peripartum hysterectomy for non-PAS indications, such as uterine atony. The primary outcome was composite SMM. Secondary outcomes included individual

maternal morbidities and mortality. A planned subgroup analysis comparing unscheduled, peripartum hysterectomy for PAS compared to non-PAS peripartum hysterectomy was conducted. Chi-square and Fisher's exact were used as appropriate.

Results: 125 patients underwent peripartum hysterectomy during the specified period, 63 (50.4%) for suspected PAS and 62 (49.6%) for non-PAS indications. Those who underwent peripartum hysterectomy for non-PAS cases had a significantly higher SMM rate compared to suspected PAS cases (96.7% vs 85.7%, p = 0.03). This was largely driven by transfusion (96.7% vs 85.7%, p = 0.03), as non-transfusion SMM did not differ between the groups (67.7% vs 68.2%, p = 0.95). Only bowel and bladder injury were noted to be different between the groups, with more events in the suspected PAS group (26.9% vs 6.4%, p < 0.05). In a subgroup analysis comparing unscheduled, peripartum hysterectomy for PAS (n = 24) compared to non-PAS cases, there was no difference in composite SMM between the groups (100% vs 96.7%, p = 0.37).

Conclusion: Composite SMM was higher in cases of non-PAS peripartum hysterectomy compared to suspected PAS cases, driven exclusively by higher rates of blood transfusion. However, this difference disappears when comparing non-PAS hysterectomy to unscheduled, peripartum hysterectomy for suspected PAS. While both groups have high rates of SMM, this highlights the difference that preparation can have for planned peripartum hysterectomy for suspected PAS cases.

Table 1 Severe Maternal Morbidity (SMM) for peripartum hysterectomies between non-PAS and PAS indications

	Non-PAS n = 62		Suspected PAS n = 63		
	n	%	n	%	*p* -value
SMM	60	97%	54	86%	0.029
Non-transfusion SMM	42	68%	43	68%	0.951
Individual Components					
Respiratory distress	14	23%	12	19%	0.627
Cardiac arrest/VF	1	2%	1	2%	0.748
DIC	16	26%	8	13%	0.063
CV disorder	1	2%	0		0.496
Pulmonary edema	1	2%	4	6%	0.365
Sepsis	1	2%	2	3%	1.000
Shock	4	6%	2	3%	0.440
Air/Thrombotic embolism	2	3%	0		0.496
Any transfusion	60	97%	54	86%	0.029
Mechanical ventilation	17	27%	12	19%	0.268
Other Maternal Morbidity					
>4 u pRBCs	41	66%	36	57%	0.302
Reoperation in 30 days	1	2%	1	1%	1.00
UAE	4	6%	3	3%	0.717
ICU admission	26	42%	19	19%	0.170
Renal injury	2	3%	1	2%	0.619
Reintubation after surgery	1	1%	0		0.496
Bowel/bladder injury	4	6%	17	27%	0.002
Ileus >4 d	2	3%	0		0.244

Values are presented as n (%). The following morbidities had no cases in either group and were removed from the table: myocardial infarction, renal failure, amniotic fluid embolism, aneurysm, eclampsia, heart failure, anesthesia complications, sickle cell crisis, conversion of cardiac rhythm, temporary tracheostomy, and maternal death. Abbreviations: VF, ventricular fibrillation; DIC, disseminated intravascular coagulopathy; CV, cardiovascular; pRBCs, packed red blood cells; UAE, uterine artery embolization; ICU, intensive care unit

Table 2 Severe Maternal Morbidity (SMM) for peripartum hysterectomies between non-PAS and unscheduled PAS indications

	Non-PAS n = 62		Unscheduled PAS n = 24		
	n	%	n	%	*p* -value
SMM	60	97%	24	100%	0.373
Non-transfusion SMM	42	68%	22	92%	0.023
Individual Components					
Respiratory distress	14	23%	8	3%	0.409
Cardiac arrest/VF	1	2%	0		1.000
DIC	16	2%	5	21%	0.630
CV disorder	1	2%	0		0.496
Pulmonary edema	1	2%	3	13%	0.064
Sepsis	1	2%	2	8%	0.187
Shock	4	6%	1	4%	1.000
Air/Thrombotic embolism	2	3%	0		0.496
Any transfusion	60	97%	24	100%	0.373
Mech ventilation	17	27%	8	33%	0.588
Other Maternal Morbidity					
>4 u pRBCs	41	66%	20	83%	0.115
Reoperation in 30 days	1	2%	0		
UAE	4	6%	1	4%	1
ICU admission	26	42%	11	46%	0.743
Renal injury	2	3%	0		
Reintubation after surgery	1	1%	0		
Bowel/bladder injury	4	4%	10	42%	<0.001
Ileus >4 d	2	2%	0		

Values are presented as n (%). The following morbidities had no cases in either group and were removed from the table: myocardial infarction, renal failure, amniotic fluid embolism, aneurysm, eclampsia, heart failure, anesthesia complications, sickle cell crisis, conversion of cardiac rhythm, temporary tracheostomy, and maternal death. Abbreviations: VF, ventricular fibrillation; DIC, disseminated intravascular coagulopathy; CV, cardiovascular; pRBCs, packed red blood cells; UAE, uterine artery embolization; ICU, intensive care unit

174 | Factors Associated with a Positive Tilburg Pregnancy Distress Scale Among Ghanaian Patients

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10:30 AM - 12:30 PM

Objective: To identify factors associated with a positive Tilburg Pregnancy Distress Scale (TPDS) among Ghanaian patients.

Study Design: We performed a prospective cohort study of obstetric patients who were admitted at an urban, teaching hospital in Ghana between November to December 2023. Patients below the age of 18 or critically ill were excluded. Demographic and medical history were collected, and the TPDS was administered. We performed descriptive and inferential statistics including cross tabs with chi-square analysis and logistic regression models.

Results: Out of the 440 patients eligible for participation, 420 patients enrolled in our study. A total of 166 (40%) patients were admitted antepartum, and 254 (60%) patients were admitted postpartum. Overall, 157 (37%) patients screened positive for pregnancy distress; 60 (36%) antepartum patients, and 97 (38%) postpartum patients screened positive for pregnancy distress.

For those in the antepartum period, the factors associated with a positive screen included low income (p = 0.042), younger age (p < 0.001), and lower parity (p-0.049) while those with more education and older age were less likely to have a positive TPDS.

For those in the postpartum period, less education (p = 0.048), cohabitation compared to other relationships (p = 0.01), having an emergency compared to elective cesarean delivery (p = 0.036), and having at least one antepartum admission (p = 0.025) were associated with having a positive TPDS.

Conclusion: Our study is the first to identify risk factors contributing to Ghanaian patients' pregnancy distress, which can contribute to depression with peripartum onset. We believe utilizing these risk factors among Ghanaian pregnant patients for increased screening and monitoring can improve the prevention and treatment of mental health disorders, which is aligned with Sustainable Development Goal 3.4.

175 | Implementation of External Cephalic Version at Korle Bu Teaching Hospital, Ghana: A Quasi-Experimental Design

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10:30 AM - 12:30 PM

Objective: To understand outcomes after the implementation of external cephalic version (ECV).

Study Design: We conducted a quasi-experimental study of patients with malpresentation at an urban teaching hospital in Ghana. Patients with multiple gestation or presenting with intrauterine fetal demise were excluded. Demographics and medical history of those presenting for delivery complicated by malpresentation between January 2012 to December 2015 were collected. The practice of ECV was implemented by the Obstetrics and Gynecology Department between 2016-2018. Demographics and medical history of those receiving ECVs between January 2019 to December 2022 were collected. We performed descriptive statistics.

Results: From 2012 to 2015, data was available for 1,789 patients who presented for delivery with malpresentation. Our study included 1,739 patients after excluding incomplete data entries. From 2019 to 2022, data was available for 133 patients who underwent ECV. Our study included 72 patients after excluding incomplete data entries.

Prior to implementation of ECV, 438 (25%) and 1,301 (75%) had vaginal breech and cesarean deliveries, respectively. Overall, 122 (7%) of malpresentations resulted in intrapartum fetal demise. Ninety-five (22%) of the vaginal deliveries, and 27 (2.1%) of the cesarean deliveries were complicated by intrapartum fetal demise.

After implementation of ECV, 39 (54%) had spontaneous, breech, or operative vaginal deliveries, and 33 (46%) had cesarean deliveries. There was no intrapartum fetal demise.

Of the 72 ECVs, 53 (74%) were successful. When presenting for delivery, 48 (91%) remained in the cephalic presentation. Of those with successful ECV and remaining in the cephalic presentation, 35 (73%) had a spontaneous or operative vaginal delivery, and 13 (27%) had a cesarean delivery.

Conclusion: The implementation of ECV resulted in the reduction of intrapartum fetal demises and cesarean deliveries. Our research suggests external cephalic version is a practical, feasible, and implementable intervention that can be integrated into low- and middle-income countries' hospitals.

176 | Clinical Outcomes with the use of Thromboelastography in Postpartum Hemorrhage

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10:30 AM - 12:30 PM

Objective: Thromboelastography (TEG) is a viscoelastic test which has been shown to improve outcomes in postpartum hemorrhage (PPH) by rapidly guiding resuscitation. We incorporated TEG into our hemorrhage response protocol (HRP), an algorithm facilitating swift response to PPH, in a pilot study at our high-volume academic medical center. We evaluated the impact of TEG utilization on maternal outcomes and transfusion rate.

Study Design: We conducted a retrospective study of patients with PPH, defined as quantitative blood loss (QBL) >900cc for vaginal delivery or QBL >1500cc for cesarean delivery. The composite (primary) outcome of maternal morbidity included ICU admission, DIC, UAE, surgical intervention including hysterectomy, and/or administration of >3 units of any blood products. Secondary outcomes included number and type of products transfused. Outcomes were compared before (pre-TEG) and after (post-TEG) incorporation of TEG. Analysis was performed with Chi Square, Fisher's Exact, Mann Whitney U, T-tests, and relative risk. Outcomes were also analyzed by QBL category, mode of delivery, and stages of PPH.

Results: 271 post-TEG and 131 pre-TEG cases were analyzed. Demographics were similar in pre and post TEG groups (Table 1). 5.3% of pre-TEG and 7.4% of post-TEG cases met the composite outcome (p = 0.44). Overall more pRBCs were transfused post-TEG (p = 0.05) with no significant difference in non-RBC transfusion (p = 0.29). Subgroup analyses are shown in Table 2. Cases with stage 3 hemorrhage received more pRBCs post-TEG (p = 0.03) with no significant difference in non-RBC transfusion. Of cases with QBL >3L, significantly more non-RBC products were given post-TEG (p = 0.01).

Conclusion: Overall, inclusion of TEG in an HRP protocol was associated with unchanged rates of composite maternal morbidity. Future studies should investigate TEG as well as the optimal cohort of patients who could benefit from TEG for guided resuscitation of PPH.

	Pre-TEG (N = 131)	Post-TEG (N = 271)	p-value
Age (years)	35 (32, 38)	35 (31, 38)	0.7844
Race			**0.0253**
Asian	21 (16%)	26 (10%)	
Black	3 (2%)	25 (9%)	
Hispanic/Latino	8 (6%)	22 (8%)	
Native American	0 (0%)	0 (0%)	
White	73 (56%)	156 (58%)	
Other	26 (20%)	40 (15%)	
BMI	28.9 (26.4, 32.1)	29.3 (25.9, 33.1)	0.5436
Mode of Delivery			**0.002**
Vaginal Delivery	77 (58.8%)	144 (52.9%)	
Cesarean section	35 (26.5%)	112 (41.3%)	
QBL, mL	1500 (1150, 1865)	1550 (1200, 1950)	0.4492

	Pre-TEG (N = 131)	Post-TEG (N = 271)	p-value
Composite endpoint	7 (5.3%)	20 (7.4%)	0.4445
Blood transfusion	60 (45.8%)	153 (56.5%)	0.05747
pRBC	59 (45.0%)	152 (56.1%)	**0.04850**
non-pRBC blood	16 (12.2%)	44 (16.2%)	0.2888
Stage 1 Hemorrhage (N = 36)			
Composite endpoint	0 (0%)	0 (0%)	NA
Blood transfusion	2 (15.4%)	5 (21.7%)	0.6436
pRBC	2 (15.4%)	5 (21.7%)	0.6436
non-pRBC blood	0 (0%)	0 (0%)	NA
Stage 2 Hemorrhage (N = 16)			
Composite endpoint	0 (0%)	0 (0%)	NA
Blood transfusion	0 (0%)	3 (25%)	0.2673
pRBC	0 (0%)	3 (25%)	0.2673
non-pRBC blood	0 (0%)	0 (0%)	NA
Stage 3 Hemorrhage (N = 338)			
Composite endpoint	7 (6.3%)	20 (8.8%)	0.4251
Blood transfusion	58 (52.3%)	145 (63.9%)	**0.0404**
pRBC	57 (51.4%)	144 (63.4%)	**0.0336**
non-pRBC blood	16 (14.4%)	44 (19.4%)	0.2615

177 | Preeclampsia and the Risk for Celiac Disease of the Offspring

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10:30 AM - 12:30 PM

Objective: While the pathophysiology of preeclampsia is multifactorial, the immune system plays a major role in the pathogenesis of the disease. As celiac is an immune mediated inflammatory disease, we opted to investigate the association between maternal preeclampsia and celiac disease of the offspring.

Study Design: A population-based cohort study was conducted to evaluate the risk of celiac disease in offspring (up to the age of 18 years) born to mothers with and without preeclampsia. Deliveries occurred between the years 1991-2021 in a tertiary medical center. Data for the diagnosis of celiac disease of the offspring was extracted from community-based clinics and hospitalization records. Kaplan-Meier survival curve was used to compare the cumulative incidence of celiac disease between the study groups. A cox proportional hazards model was used to control for confounders.

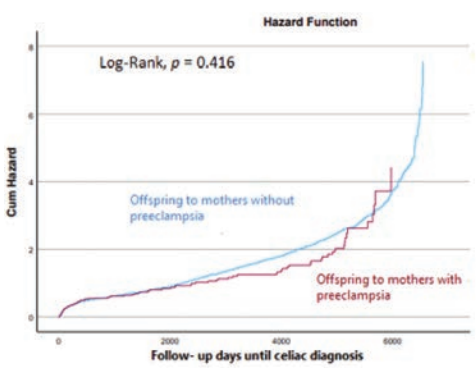
Results: During the study period, 356,356 singleton deliveries were included in the study of which 13,721 deliveries (4.2%) were in women with preeclampsia. Being born to a woman with preeclampsia was not significantly associated with higher risk for childhood celiac disease of the offspring (0.6% vs. 0.5%, p = 0.378, Table). Likewise, the Kaplan-Meier survival curve did not demonstrate a significantly higher cumulative incidence of celiac disease in offspring born to women with preeclampsia (Log- Rank p = 0.416, Figure). Using a Cox proportional hazards model, adjusted for maternal celiac disease, maternal age and gestational age at birth, maternal preeclampsia was not independently associated with childhood celiac disease of the offspring (Adjusted HR 0.89, 95% CI 0.71-1.11, p = 0.316, Table).

Conclusion: Despite the shared possible pathophysiology of preeclampsia and celiac disease, no significant association was found between maternal preeclampsia and childhood celiac disease of the offspring.

Figure: The association between maternal preeclampsia and celiac disease; univariable analysis, Kaplan-Meier survival curve, and a Cox proportional hazards model

	Preeclampsia (n=13,721) n (%)	No preeclampsia (n=342,635) n (%)	OR (95% CI)	P value	Adjusted HR* (95% CI)	P* value
Childhood celiac disease	83 (0.6)	1878 (0.5)	1.10 (0.88-1.37)	0.378	0.89 (0.71-1.11)	0.316

*Adjusted for gestational age, maternal age and maternal celiac



178 | Let's Talk About Race: Clinician Perspectives on Navigating Conversations Around Racial Disparities in Obstetrics

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10:30 AM - 12:30 PM

Objective: Discussions around racial disparities in obstetrics occur in varied silos including the media, communities, and medical institutions. Yet, whether and how these discussions occur in the context of the clinician-patient relationship is unknown. We sought to explore clinician perspectives on conversations with patients regarding racial disparities in maternal health using a qualitative approach.

Study Design: We enrolled perinatal clinicians (n = 14) across two hospitals within one academic health system from 8/2023-3/2024, purposively sampled by self-identified race/ethnicity and role until thematic saturation was achieved. Semi-structured interviews utilizing the Health Equity Implementation Framework evaluated (a) prior experience with, and (b) optimization of disparities counseling, focusing on clinician-patient race concordance, comfort levels, barriers, ideal circumstances, and recommended content for conversations around racial disparities in maternal health. Interviews were coded using a content analysis approach by two coders with high inter-rater reliability (k >0.8).

Results: Clinicians universally recognized the impact of race, specifically racism, on US maternal outcomes. Conversations around racial disparities most frequently arose (1) when Black patients voiced fears of dying or concerns about bias in their care, or (2) in the context of recommending aspirin for preeclampsia risk reduction. Black clinicians felt more comfortable with these discussions, attributed to lived experience and practice. While most clinicians agreed that conversations with patients about racial disparities are important, they identified barriers such as fear of patient reactions (particularly with discordant race), time constraints, and unclear actionable response (Table 1). Participant suggestions for facilitating these conversations are shown in Table 2.

Conclusion: These data, alongside ongoing work on the patient perspective, provide the groundwork for guiding clinician-patient conversations on maternal health disparities.

Table 1: Examples of Comfort Level and Barriers to Discussing Race with Obstetric Patients

	Participant Quotes
Factors underlying clinician comfort or discomfort	*Worry about patient perception* "I wouldn't want my intention to have the wrong impact, especially being a White person and in a relative position of power…**if it came across as me discriminating against them.**" (Non-BIPOC) *Unclear actionable response* "I think what makes me uncomfortable is that **I can't promise to keep someone as safe based on their race.**" (Non-BIPOC) *Overcoming discomfort through shared identity* "**I was black before I became a doctor.** I feel very comfortable talking about racial issues." (BIPOC) *Overcoming discomfort through practice* "There are many things in medicine that may have been uncomfortable [like taking a sexual history] **that if you keep doing them and if it becomes part of your workflow, it'll get easier.** You'll figure out your way to navigate around it." (BIPOC)
Concerns and barriers	*Lack of training* "I don't think **I've ever received true training in how to talk to patients** about it. I feel like I know how to talk to colleagues about it, but to actually talk to a patient who has a very real fear that they are going to be within that percentage of bad outcomes is very different." (BIPOC) *Finding the right phrasing and context* "Sometimes I would say, Black patients we know get preeclampsia at a higher rate. **I found it hard to explain the racism.**" (Non-BIPOC) *Time constraints* "I feel we only have time to get through so much. And a conversation about race and disparity is like an hours long conversation. **So, how do you do it justice, is my concern.**" (BIPOC) *Burden on Black providers* "There's an immense pressure on us to see black patients by black patients, because patients want racial concordance, especially if they've already had a bad outcome, and **we need to empower [our colleagues] to feel comfortable talking about race.**" (BIPOC)

BIPOC – those who self-identify as Black, indigenous, or other people of color

Table 2: Participant Suggestions for Facilitating Conversations about Race with Patients

	Examples:
Build Knowledge and Comfort with the Topic	• Engage in relevant book clubs, movie discussions, social media content • Participate in community work • Standardize implicit bias training • Hold Grand Rounds discussions
Practice	• Organize communication exercises or simulations with standardized patients • Practice with patients through trial and error
Enhance the System	• Lead guided patient group discussions, e.g. during group prenatal care • Use intake questionnaires to ask about experiences of racism and trauma • Incorporate doulas into obstetric care as a mediators

Use Example Strategies	• Frame conversations to make patients feel safe and that you are their advocate
	• Link a disparity with a medical or institutional action
	  • E.g. programs for free iron tablets or blood pressure cuffs
	• Acknowledge racism as the risk factor, not race
	  • E.g. discuss racism as a risk factor for preeclampsia, and the use of aspirin to reduce that risk

179 | Postpartum Contraceptive Use Among South Asians: A Retrospective Cohort Study from Kaiser Northern California

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10:30 AM - 12:30 PM

Objective: Health outcomes data among South Asian subgroups are scarce due to outdated federal reporting standards that merge various racial and ethnic groups into a single 'Asian or Pacific Islander' category, potentially obscuring disparities. As a result, obstetric and gynecologic outcomes, including contraception use and abortion trends, are poorly understood in this population. This study aimed to characterize postpartum contraceptive use among South Asian patients, factors associated with usage, and to determine the proportion of short interval pregnancies based on postpartum contraceptive use.

Study Design: This retrospective cohort study included all South Asian patients who delivered at Kaiser Northern California hospitals between 1/1/2018-1/1/2021 and had documentation of contraceptive use or declination within 12 weeks postpartum. Adjusted odds ratios for each outcome were calculated using multivariate logistic regression adjusting for variables found to be significant in bivariate comparisons.

Results: 11,264 patients met study inclusion criteria (91% Indian, 3% Pakistani, 2% Nepali, and 4% other South Asian or mixed race). 64.6% reported no postpartum birth control use. Only 7.37% of the total cohort selected a LARC (Nexplanon, Mirena or Copper IUD). Multiparity was associated with increased likelihood of birth control use ($p < 0.05$); while increasing age, higher socioeconomic status, marriage, and Indian descent ($p < 0.05$) were associated with lower likelihood of birth control and LARC use. Postpartum LARC users had the lowest incidence of short interval pregnancies ($p < 0.05$) and the use of any postpartum birth control was associated with a 14% lower incidence of short interval pregnancies ($p < 0.05$).

Conclusion: Use of postpartum birth control reduces the likelihood of short interval pregnancies. The majority of South Asians in our cohort reported no postpartum birth control use, and the rate of postpartum LARC use was lower than the US average of 9-15%. These findings suggest that targeted counseling and interventions are needed to improve postpartum contraception uptake among South Asian patients.

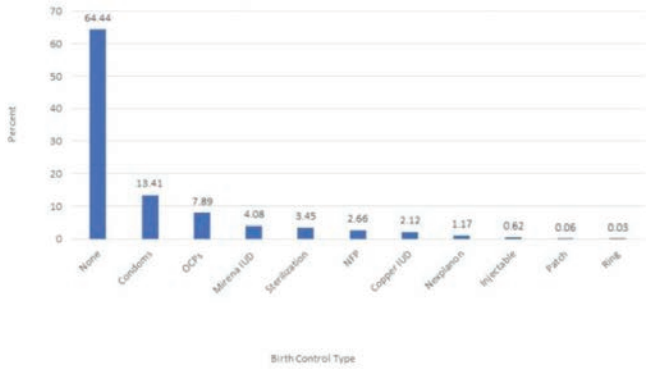

Table 1: Types of postpartum birth control within 12 weeks of delivery

	Any Birth Control Use			LARC Use		
Characteristic	OR[1]	95% CI[1]	p-value	OR[1]	95% CI[1]	p-value
Age						
18-24	—	—		—	—	
25-30	0.68	0.54, 0.87	0.002	0.39	0.27, 0.57	<0.001
31-35	0.69	0.54, 0.88	0.003	0.36	0.25, 0.52	<0.001
36-40	0.73	0.56, 0.95	0.017	0.37	0.25, 0.55	<0.001
>40	0.47	0.32, 0.69	<0.001	0.22	0.11, 0.43	<0.001
Parity						
Nulliparous	—	—		—	—	
1 prior pregnancy	1.50	1.38, 1.64	<0.001	2.71	2.28, 3.21	<0.001
2 prior pregnancies	1.93	1.63, 2.29	<0.001	4.74	3.62, 6.20	<0.001
3 prior pregnancies	2.72	1.89, 3.95	<0.001	6.23	3.72, 10.4	<0.001
4 or more pregnancies	2.44	1.31, 4.61	0.005	6.00	2.55, 14.1	<0.001
Marital Status	0.74	0.63, 0.86	<0.001	0.56	0.44, 0.73	<0.001
Mode of Delivery						
SVD	—	—		—	—	
C/S	1.27	1.17, 1.39	<0.001	0.74	0.63, 0.88	<0.001
Operative VD	0.82	0.71, 0.94	0.007	0.63	0.46, 0.86	0.003
NDI Quintile						
NDI 5	—	—		—	—	
NDI 1	0.83	0.70, 0.99	0.034	0.49	0.37, 0.65	<0.001
NDI 2	0.81	0.68, 0.96	0.015	0.63	0.47, 0.84	0.001
NDI 3	0.83	0.69, 0.99	0.034	0.66	0.50, 0.89	0.005
NDI 4	1.03	0.85, 1.25	0.8	0.84	0.62, 1.15	0.3
Country of Origin						
India	—	—		—	—	
Mixed/Other	1.32	1.09, 1.59	0.004	1.75	1.30, 2.34	<0.001
Pakistan	1.16	0.95, 1.41	0.2	1.07	0.76, 1.51	0.7

Table 2. Factors associated with any birth control method use and LARC use specifically.

180 | The Unmet Needs of Patients with Cardiac Disease in the Fourth Trimester: a Mixed-methods Study

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10:30 AM - 12:30 PM

Objective: To uncover the hidden challenges and unmet needs of cardiac patients during the postpartum period.

Study Design: This was a parallel mixed-methods study of participants with cardiac disease who had delivered at a single tertiary hospital from 2013 to 2023. An electronic survey was sent to 330 participants with congenital heart disease (CHD) and acquired cardiac disease. Additionally, 20 participants with CHD were interviewed by phone in English or Spanish. Grounded theory methodology was employed to code and analyze the interviews, revealing key themes, which were then compared with survey findings.

Results: Interview participants highlighted five key themes: the necessity of taking time away from newborn for hospitalizations and surgeries due to cardiac complications, coping with cardiac symptoms that could be incapacitating, relying on support from family members or caregivers, desiring more medical follow-up appointments and in-person counseling about postpartum health expectations, and grappling with uncertainty regarding the appropriate healthcare professional to address their postpartum healthcare needs. Among the 128 survey participants, 83% preferred more than one postpartum visit and 61% preferred their first postpartum visit to take place within the first two weeks after delivery. When asked about their preferred alternatives to the standard postpartum clinic visit, 59% of respondents chose a telehealth visit with their obstetrician and 41% chose a home visit with a nurse or midwife.

Conclusion: Qualitative themes emphasize the physical and mental challenges patients with cardiac disease encounter following pregnancy. Interview participants also articulated the healthcare gaps they encountered during the postpartum period, resulting in unmet health concerns and visits to the emergency department. Survey findings highlight patient preference for earlier and more frequent postpartum visits with their obstetrician. These findings underscore the urgent need for more comprehensive postpartum care, particularly for patients with high-risk pregnancies.

	Total interview participants N= 20	Total survey participants N= 128
Maternal age (years)		
<25	1 (5%)	9 (7%)
25-29	3 (15%)	21 (16%)
30-34	6 (30%)	44 (34%)
35-39	9 (45%)	42 (33%)
40+	1 (5%)	12 (9%)
Patient Language		
English	19 (95%)	120 (94%)
Spanish	1 (5%)	8 (6%)
Deliveries at Stanford		
1	14 (70%)	122 (95%)
2	5 (25%)	14 (11%)
3+	1 (5%)	2 (2%)
Race/Ethnicity		
Single race-White	11 (55%)	70 (56%)
Single race-Black	1 (5%)	3 (2%)
Single/Multi race-Latinx	4 (20%)	29 (23%)
Single race-Asian/Pacific Islander	4 (20%)	27 (21%)
Other (Native, Multi, other)	0 (0%)	1 (1%)
Insurance		
Public	6 (30%)	29 (23%)
Private	14 (70%)	97 (76%)
Other/Unknown		2 (2%)
Type of Cardiac Disorder		
Congenital	20 (100%)	54 (42%
Acquired	0 (0%)	74 (58%)
History of Sudden Cardiac arrest	1 (5%)	4 (3%)
Prior cardiac surgery or procedure before pregnancy	11 (55%)	50 (39%)
	Total deliveries = 27	**Total deliveries = 148**
Mode of Delivery		
Vaginal	16 (59%)	69 (47%)
Cesarean	11 (41%)	80 (54%)
Antenatal Hospitalization	5 (19%)	38 (26%)
Preeclampsia	1 (4%)	16 (11%)
Preterm Delivery	4 (15%)	32 (22%)
NICU admission or intermediate care nursey	4 (15%)	26 (18%)
Breastfeeding at discharge	24 (88%)	127 (86%)
Prolonged Postpartum Hospitalization	3 (11%)	29 (20%)
EPDS score >12	2 (7%)	6 (4%)

Fig 1. Demographic and delivery information of phone interviewees and survey respondents.

Key Theme	Quotes
Taking time away from newborn for hospitalizations and surgeries due to cardiac complications	"…my second child I went into heart failure, I think four months or five months after that. So that was fun. So I had to deal with all this other stuff." "So I went to (hospital name). They took my blood pressure immediately…I have like a brand new baby in the hospital room with me for like, you know, over 24 hours you know, trying to like care for her..."
Coping with cardiac symptoms that could be incapacitating	"I'd say the only thing with the second one was I'd say some of the cardiac symptoms certainly remained after delivering and they have not…even five years almost six years later, I have not fully resolved at this point" "Going to my doctor's appointment like for me it was hard but I had to go especially with my condition. You know, I can't miss an appointment… I mean it was hard for me to get out of the bed sometimes"
Relying on support from family members or caregivers	"After a C section…you're told not to drive. So imagine somebody who has to take his or her child like my son was in the ICN… And he [husband] was able to drive us but like how do I even see my son or even send my milk?" "I didn't want to hold him. I didn't want to, like I knew in my heart that I loved him. I just didn't feel that connection with him right away. Like my husband pretty much took care of him for the first month of his life because I just couldn't do it."
Desiring more medical follow-up appointments and in-person counseling about postpartum health expectations	"Yeah, I feel like thing they would be better if they could offer a little more postpartum support. So basically all I have is one postpartum checkup at six week mark."
Uncertainty regarding the appropriate healthcare professional to address their postpartum healthcare needs	"I was okay with my primary care because…I trusted him but it did feel to me at the time that it should have been my OB just because I gave birth two weeks ago, and now I'm having blood pressure issues since." "You have a baby and then like for nine months or so you're under the care of somebody else. By the time you're out of that…I had to figure it out and I had to get a new family care provider."

Fig 2. Table of key qualitative themes with corresponding quotes from interview participants.

181 | Fetal MRI Versus Ultrasound Ratios for Predicting Perinatal Outcomes in Prenatally Diagnosed Omphalocele

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10:30 AM - 12:30 PM

Objective: Complications associated with pulmonary hypoplasia are the primary cause of morbidity and mortality in neonates with omphalocele. Various prognostic indicators have been employed to identify neonates at greatest risk. Recently, fetal MRI lung volumetric analysis has become more commonplace, despite being costly and requiring access to specialized centers. This study compares fetal MRI-derived fetal lung volumes and ultrasound-derived ratios as prognostic tools in fetuses with prenatally detected omphalocele (PDO).

Study Design: This retrospective cohort study included all pregnancies with PDO who underwent evaluation at our fetal center from 2007-2023. Pregnancies with fetal aneuploidy or concurrent life-limiting fetal anomaly were excluded. MRI-derived fetal lung volume analysis calculated the observed-to-expected total fetal lung volume (O/E TLV) ratio. Omphalocele diameter (OD), abdominal circumference (AC), and head circumference (HC) were recorded, and OD/HC and OD/AC ratios were calculated. The primary outcome was neonatal death. Secondary outcomes included the need for intubation, prolonged intubation >30 days, pulmonary hypertension, and time to full feeds. Cutoffs for the prediction of neonatal outcomes were determined by receiver operating characteristic curve (ROC) analysis.

Results: 53 pregnancies met the inclusion criteria. Omphaloceles ranged in size from 0.9-20cm in diameter. 8 neonates (15%) experienced neonatal death (Table 1). The most frequent secondary outcome was the need for intubation, occurring in 22 (42%) neonates. Using an optimal cutoff of >0.58, MRI-based O/E TLV outperformed ultrasound-based ratios in predicting neonatal death (sensitivity 0.75; specificity 1.0; AUC 0.92), as well as most of the secondary outcomes (Table 2). Among ultrasound-based ratios, OD/AC consistently outperformed OD/HC.

Conclusion: Fetal MRI O/E TLV outperforms ultrasound-based ratios in predicting perinatal severe morbidity and neonatal mortality in PDO. These findings underscore the need for more advanced ultrasound-based measures to increase accessibility to high-quality care.

Table 1. Demographic and clinical characteristics of 53 prenatally diagnosed omphalocele cases that underwent fetal MRI evaluation

Maternal age, median [IQR]	30.0 [24.0-33.0]
Maternal BMI, median [IQR]	26.0 [23.4-30.1]
Gestational age at MRI (weeks), median [IQR]	24.7 [22.0-29.3]
Transverse diameter size (cm), median [range]	3.7 [0.92-20.0]
Death	8 (15%)
Pulmonary arterial hypertension	11 (21%)
Intubated at DOL 30	14 (26%)
Any intubation	22 (42%)
Full feeds by DOL 30	18 (34%)

Table 2

Ratio	Outcome	Threshold	Sensitivity	Specificity	PPV	NPV	AUC
OD/HC	Neonatal Death	>0.12	0.55	0.17	0.93	0.55	0.57
	Required intubation	>0.40	0.70	0.65	0.56	0.77	0.65
	Intubation > 30 days	>0.32	0.25	1.0	1	0.81	0.54
	Time to full feeds >30 days	>0.39	0.19	1.0	1.0	0.73	0.54
	Pulmonary Hypertension	>0.19	0.44	0.76	0.29	0.86	0.58
OD/AC	Neonatal Death	>0.11	0.75	0.75	0.27	0.96	0.72
	Required intubation	>0.37	0.79	0.73	0.65	0.84	0.78
	Intubation > 30 days	>0.36	0.56	1.0	1.0	0.87	0.68
	Time to full feeds>30 days	>0.47	0.38	1.0	1.0	0.74	0.62
	Pulmonary Hypertension	>0.17	0.5	0.87	0.43	0.90	0.6
O/E TLV	Neonatal Death	<0.58	0.75	1.0	1.0	0.96	0.92
	Required intubation	<0.52	0.59	0.90	0.81	0.76	0.75
	Intubation > 30 days	<0.38	0.71	0.87	0.67	0.89	0.81
	Time to full feeds>30 days	<0.47	0.56	0.86	0.67	0.79	0.76
	Pulmonary Hypertension	<0.30	0.82	0.88	0.64	0.95	0.94

182 | Electronic Health Record Smart-Phrase Intervention to Improve Rates of Low-Dose Aspirin Prescription for Preeclampsia Prevention

Elisha Jaeke[1]; Sara Abuzahra[1]; Ihuoma (Yvette) Igbokwe[1]; Amarpreet Mahil[2]; Emily Davidson[1]; Jacqueline Peebles[1]; Anna Palatnik[1]
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10:30 AM - 12:30 PM

Objective: While low-dose aspirin (LDA) is recommended for preeclampsia prevention in at-risk patients, studies show suboptimal screening and prescription in routine obstetric care. The goal of this quality improvement initiative was to create, implement and test an electronic health record (EHR) smart-phrase to increase LDA prescription rates.

Study Design: After a retrospective analysis in 2021 revealed low baseline rates of LDA prescription for eligible patients within our academic hospital system (Table), an LDA eligibility screening smart-phrase was created and launched for use in First OB note templates through a departmental quality initiative from January 2023-May 2024 (Figure). Low baseline LDA prescription rates

were shared at Hospital-Wide OB, OBGYN Generalist, and MFM Division meetings, with serial reminders to use the smart-phrase throughout the study period. Rates of smart-phrase utilization by obstetricians and LDA prescription for eligible patients were collected at three quality assessment cycles 3-, 9-, and 13-months post-intervention launch.

Results: A total of 721 LDA eligible First OB notes were evaluated. Rates of LDA prescription for patients with at least one high-risk factor improved from 72% pre-intervention to 92% at 13-months post-intervention (Table). LDA prescription for patients with at least two moderate-risk factors and no high-risk factors improved from 21% pre-intervention to 61% at 13-months post-intervention. The use of the LDA eligibility screening smart-phrase during First OB visits increased during each quality assessment cycle from 42% to 53% and to 56% at 3-, 9-, and 13-months post-intervention, respectively. Of patients eligible for LDA, there was a statistically significant increase in prescription rates across the evaluation periods for patients whose provider used a smart-phrase ($p = 0.02$, < 0.01, and 0.04 at 3-, 9-, and 13-months, respectively).

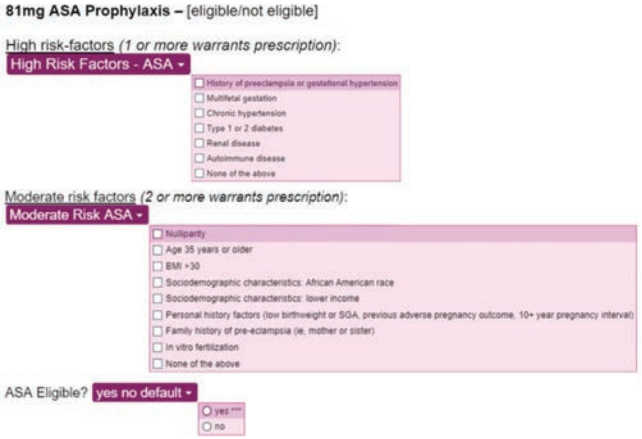
Conclusion: Incorporating a risk-identifying smart-phrase into First OB EHR notes led to two synergistic improvements: increased identification of at-risk patients who are LDA eligible and increased rates of LDA prescription.

Table. Baseline and post-intervention LDA eligibility and prescription rates, and associated smart-phrase utilization over three post-intervention study periods

	Baseline Cohort Patients who delivered between 9/1/2021 and 12/31/2021	3 Months Post-Intervention First OB Visit during July 2023	9 Months Post-Intervention First OB Visit during January 2024	13 Months Post-Intervention First OB Visit during May 2024
Total number of patients in each cycle	755	207	301	213
Number of LDA eligible in each cycle	398	121	173	132
Number of patients with at least one high-risk factor for preeclampsia	120	42	43	39
Number of patients with at least two moderate-risk factors and no high-risk factors for preeclampsia	278	79	130	93
Percent of eligible patients prescribed LDA for at least one high-risk factor	71.7%	83.3%	83.7%	92.3%
Percent of eligible patients prescribed LDA for no high-risk factors and at least two moderate-risk factors	20.5%	57.0%	61.5%	61.3%
Percent of patients in each cycle with an obstetrician note utilizing an LDA-identifying smart-phrase	N/A	42.0%	52.8%	56.3%
Percent of eligible patients whose obstetricians successfully identified their LDA eligibility with a smart-phrase	N/A	76.8%	87.6%	77.2%
Percent of eligible patients whose obstetricians successfully identified their LDA eligibility without using a smart-phrase	N/A	56.9%	47.4%	60.4%

LDA = low-dose aspirin

Figure. LDA eligibility screening smart-phrase with drop-down fields displayed



183 | Physical Activity Among Pregnant Individuals by BMI Category: a Specific Focus on Class III Obesity

Eliza M. Nguyen; Megan E. Branda; Linda M. Szymanski
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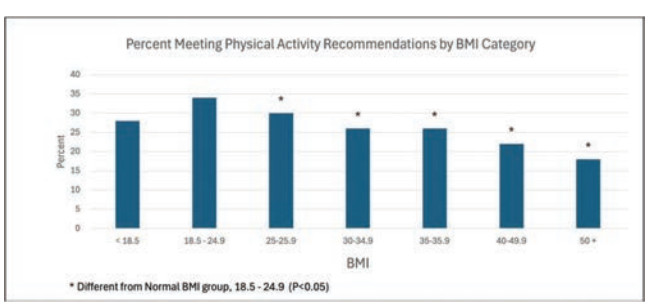
10:30 AM - 12:30 PM

Objective: The prevalence of pre-pregnancy obesity, including pre-pregnancy class III obesity has increased over time, with significant implications for maternal and neonatal well-being. Regular physical activity may mitigate these risks. Data also suggest that a majority of pregnant individuals do not meet the recommended physical activity guidelines of accumulating at least 150 minutes of moderate-intensity exercise per week; however physical activity data are limited for individuals in higher BMI categories, particularly for those with class III obesity (BMI > 40). The aim of this study was to evaluate whether pregnant individuals are meeting physical activity guidelines. We assessed self-reported physical activity across BMI categories including those with class III obesity, subdivided into BMI 40-49.9 and ≥ 50.

Study Design: This is a retrospective cohort study of individuals at an academic hospital system who delivered between May 1, 2018 and May 1, 2023. To be included, individuals had a documented pre-pregnancy BMI and responded to the following two-item physical activity questionnaire during or just prior to pregnancy: 1) On average, how many days per week do you engage in moderate to strenuous exercise? And 2) On average, "how many minutes do you engage in exercise at this level?" Individuals met physical activity guidelines if they engaged in greater than or equal to 150 minutes of physical activity per week. Data were analyzed using Kruskal Wallis and Chi-Square tests.

Results: A total of 6,884 individuals were included in the cohort. See table for descriptive data. Physical activity data are shown in the figure.

Conclusion: Our results are consistent with existing data showing that pregnant individuals are not meeting physical activity goals. Overweight and obese pregnant individuals participate in significantly less activity than normal weight counterparts with even less activity reported in those with Class III obesity. More data is needed on physical activity among pregnant individuals with class III obesity, as this may have implications for both maternal and neonatal health.



BMI: Category:	<18.5 (Underweight)	18.5 - 24.9 (Normal)	25-29.9 (Overweight)	30-34.9 (Class I)	35-39.9 (Class II)	40-49.9 (Class III)	50 + (Class III)	P-value
N	122	2604	1676	1117	655	449	61	
Maternal Age	29.4 ± 4.8	30.3 ± 4.9	30.1 ± 4.9	30.1 ± 4.9	30.3 ± 5.0	30.0 ± 5.2	30.5 ± 4.3	0.151
GA at delivery	38.5 ± 2.7	38.6 ± 2.0	38.5 ± 2.2	38.4 ±2.4	38.3 ±2.64	37.9 ± 2.5	37.8 ± 1.78	<0.011
Gestational Weight Change	13.2 ± 6.41	13.0 ± 6.93	12.1 ± 7.56	9.7 ± 8.28	7.8 ± 8.53	7.2 ± 8.36	6.7 ± 8.99	<0.011
P-value based on Kruskal Wallis Test								

184 | Histologic Chorioamnionitis as a Marker for Surgical Site Infection

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10:30 AM - 12:30 PM

Objective: Clinical chorioamnionitis is a known risk factor for c-section surgical site infection (SSI). As histologic chorioamnionitis (HCA) is a marker for intraamniotic infection, we hypothesized that the frequency of HCA would be increased in SSI.

Study Design: This was a case-control study of singleton pregnancies having had c-sections from 2002-2022, in which the placenta was submitted to pathology. Subjects were identified via electronic information management system query. Univariate comparisons of SSI and non-SSI groups were made using Student's t-test and chi-square test. We calculated that 189 patients (126 controls and 63 cases) would be needed to detect a two-fold increased rate of HCA, using a two-sided test, with 80% power and significance level of 0.05. Logistic regression analysis tested whether or not HCA was an independent predictor of SSI.

Results: The estimated incidence of SSI was 6.95%. 63 cases of SSI were compared to 127 randomly selected controls (see Figure); about 32% of subjects labored. Presence of HCA was higher in cases (20.6%) than in controls (9.4%), (OR 2.49, 95% CI [1.06, 5.84]). After adjusting for the independent variables of labor, ruptured membranes, pre-pregnancy BMI, nonreassuring fetal heart status, and preoperative vaginal preparation HCA was no longer significantly associated with SSI. Independent positive predictors for SSI included increasing BMI and c-section for nonreassuring fetal status, while having had a vaginal prep reduced the odds of SSI (see Table).

Conclusion: HCA was increased in cases but was not an independent predictor of SSI. The strength of this study was using a standardized definition for SSI and individual patient chart review. The study was limited by the sample size, and that the majority of cases didn't labor. As intraamniotic infection and HCA are relatively rare in nonlaboring patients, future studies should include only SSI in cesarean section after labor. If HCA were found to be an independent risk factor for SSI, this could be a group to target for further studies on the efficacy of postpartum antibiotic prophylaxis in reducing SSI.

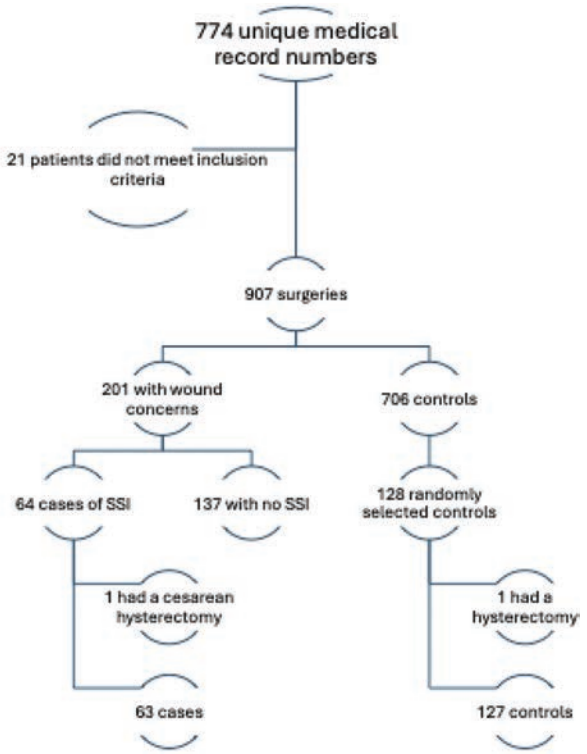

Figure: Flow diagram case (SSI) and control (non-SSI) selection

Table: Logistic regression analysis for independent predictors of SSI

Label		Odds Ratio (95% Confidence Interval)	p-value
Histologic Chorioamnionitis	Yes vs No	1.54 (0.56 – 4.24)	0.41
Presence of Labor	Yes vs No	1.33 (0.46 – 3.84)	0.60
ROM prior to delivery	Yes vs No	1.47 (0.52 - 4.13)	0.46
Pre-pregnancy BMI		1.07 (1.03 - 1.11)	**<0.001**
NRFHT as indication for delivery	Yes vs No	2.33 (1.06 - 5.12)	**0.03**
Pre op vaginal prep	Yes vs No	0.23 (0.07 - 0.72)	**0.01**

185 | Exploring Postpartum Social Determinants through Patient-Reported Outcome Measures: a Systematic Review

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[1]Northwestern University Feinberg School of Medicine, Providence, RI; [2]Northwestern University Feinberg School of Medicine, Chicago, IL; [3]Galter Health Sciences Library, Northwestern University Feinberg School of Medicine, Chicago, IL

10:30 AM - 12:30 PM

Objective: Social determinants of health (SDOH) pose specific challenges for the postpartum (PP) period. Although existing tools screen SDOH generally, few address SDOH in this unique life stage. We aimed to evaluate patient-reported outcome measures (PROMs) used to screen for SDOH during the PP period.

Study Design: This PROSPERO-registered systematic review included studies using a PROM to assess at least one SDOH in the PP period (up to 12 months after birth) in the United States. An academic librarian conducted a strategic search across 6 platforms using a protocol developed with clinical experts (Figure 1). Two authors independently screened all search results. For articles meeting inclusion criteria, authors extracted data and assessed quality of evidence with GRADE criteria and risk of bias using NIH tools.

Results: Of 4952 articles screened, 6 studies used a PROM to evaluate SDOH in PP people (Figure 2). Most studies were rated low-quality evidence and fair risk of bias. Among 11 PROMs identified across studies, only 5 were created specifically for PP administration. Of the 5 CDC-designated SDOH domains, Economic Stability was measured most through food or housing insecurity, followed by Social and Community Context through assessing social support. Only 6 PROMs measured social stability (e.g., employment status), and none covered all 5 SDOH domains.

Conclusion: Few PROMs exist to screen for PP SDOH. Areas such as change in insurance, childcare support, and maternal food assistance are rarely assessed even though these impact the PP period. To improve effectiveness for this population, PROMs should address PP-specific challenges, account for medical factors impacting level of social needs, such as parity and comorbidities, and measure resource access longevity through social stability metrics. Developing a comprehensive PP-specific SDOH PROM for routine PP care can address this evidence gap to better target unmet social needs and promote patient-centered care. Collaboration between community stakeholders, social workers, and clinicians to create a PP-specific SDOH PROM is vital for this process.

Figure 1: PRISMA Flow Diagram of Included Studies

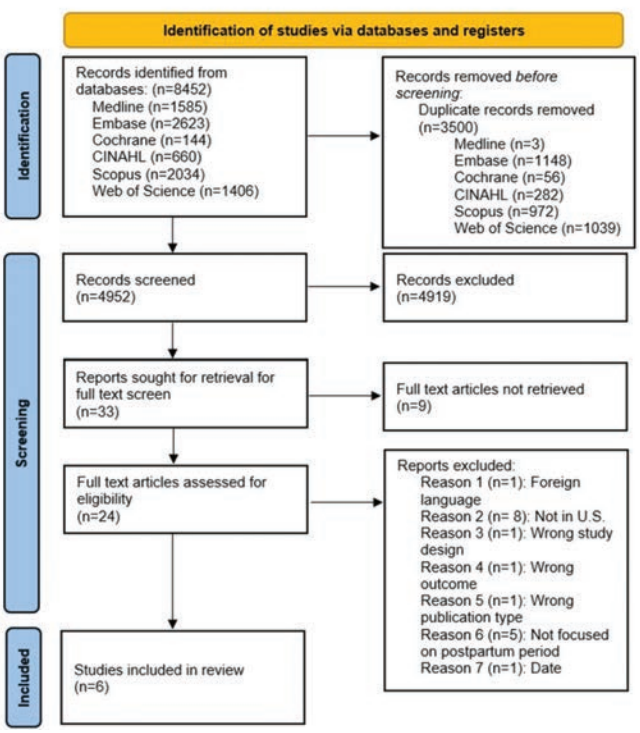
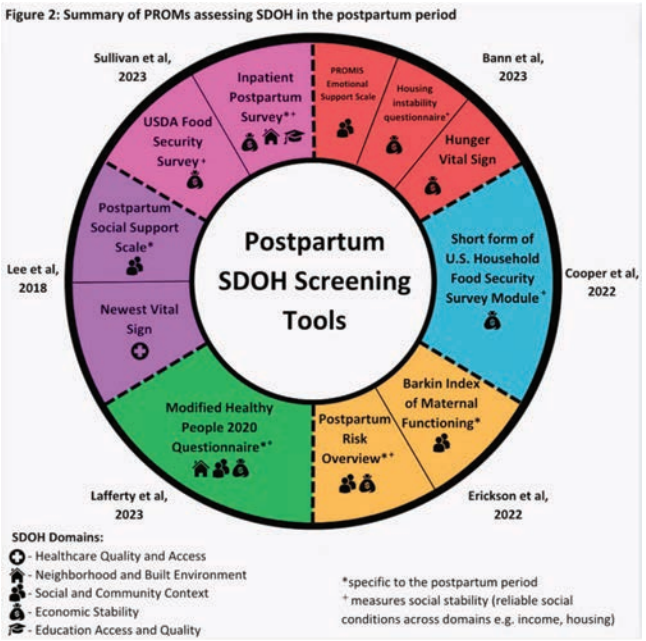


Figure 2: Summary of PROMs assessing SDOH in the postpartum period



186 | Low Renin Angiotensin Aldosterone System (RAAS) Activation and Delivery Outcomes in Preeclampsia with Severe Features

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10:30 AM - 12:30 PM

Objective: To determine if a correlation exists between defects in RAAS activation and adverse delivery outcomes in patients diagnosed with preeclampsia with severe features.

Study Design: Prospective cohort study of patients admitted with preeclampsia with severe features from 2022 to 2024. Demographics, medical history and laboratory parameters were collected on admission. Serum samples were also analyzed from enrollment for angiotensin I, angiotensin II, and aldosterone by LC-MS/MS using RAAS-Triple A and compared based on serum aldosterone concentration. Maternal and fetal outcomes were compared between those with a low aldosterone concentration (Shoemaker et al., 2023) vs. the remainder of the cohort. A composite of delivery outcome complications including fetal growth restriction, abnormal umbilical artery Doppler, oligohydramnios, pulmonary edema, eclampsia, and postpartum hemorrhage was compared between subgroups, in addition to individual elements of the composite.

Results: 50 patients were enrolled. RAAS profiling revealed two distinct subpopulations: 35 patients had low serum aldosterone [median 120.0 pmol/L; IQR (35.0–132.2 pmol/L)]. In contrast, 15 patients had normal pregnancy concentration [median 589.8 pmol/L; IQR (402.2 - 769.6 pmol/L)]. Demographic variables were similar between the two populations, apart from enrollment serum creatinine (Table 1). Delivery outcomes were mostly similar (Table 2). The rate of pulmonary edema varied between groups, but the composite complication rate did not reach statistical significance (RR 1.71, 95% CI 0.79-3.70). Neonatal length of stay was longer in the low aldosterone population [median 16.5,

IQR (7-69) vs. 5, IQR (3-25)], and maternal length of stay similarly approached significance.

Conclusion: Serum aldosterone concentration in patients with severe features may be associated with select maternal complications of preeclampsia at or near delivery. Additional studies are needed due to the rarity of these complications.

Table 1: Demographics and Clinical Characteristics by Aldosterone Concentration

	Aldosterone Concentration		
	Low	Normal	P-value
Study N	n = 35	n = 15	
Demographics, n (%)			
Age			0.574
<35	28 (80.0)	13 (86.7)	
>35	7 (20.0)	2 (13.3)	
Race			0.654
Black	4 (11.4)	1 (7.1)	
Hispanic	3 (8.6)	0	
White	28 (80.0)	13 (92.9)	
Primiparous	24 (68.6)	7 (46.7)	0.144
BMI > 30	27 (77.1)	12 (80.0)	0.823
History of Preeclampsia	3 (8.6)	4 (26.7)	0.091
Pregestational Diabetes	9 (26.5)	3 (21.4)	0.714
Renal Disease	0	1 (7.1)	0.115
Chronic Hypertension	12 (34.3)	7 (46.7)	0.409
Clinical Characteristics, mean ± SD			
GA at Enrollment (weeks)	31.9 ± 0.7	32.8 ± 1.2	0.487
Highest SBP, mmHg	166 ± 3	166 ± 4	1.000
Highest DBP, mmHg	98 ± 2	99 ± 3	0.720
Creatinine	0.7 ± 0.03	0.8 ± 0.1	0.036
Urine P/C Ratio	2.2 ± 0.6	2.8 ± 0.8	0.515
24 Hour Urine Protein	1772 ± 425	1329 ± 438	0.580

BMI: Body mass index; GA: Gestational age; SBP: Systolic blood pressure; DBP: Diastolic blood pressure; P/C: Protein to creatinine

Table 2: Delivery Outcomes by Aldosterone Concentration

	Aldosterone Concentration		
	Low	Normal	RR (95% CI) or P-value
Mean ± SD or n (%)			
Gestational Age at Delivery, weeks	32.6 ± 0.7	33.0 ± 1.2	0.99 (0.96-1.03)
Cesarean	24 (72)	8 (53)	1.36 (0.81-2.29)
FGR	10 (28.6)	3 (20)	1.43 (0.46-4.47)
Abnormal UAD			
AEDF	5 (14.3)	1 (6.7)	2.14 (0.27-16.81)
REDF	3 (8.6)	2 (13.3)	0.64 (0.12-3.46)
Placental Abruption	0	1 (6.7)	0.30
Oligohydramnios	2 (5.7)	1 (6.7)	0.86 (0.08-8.75)
Postpartum Hemorrhage	1 (2.9)	2 (13.3)	0.21 (0.02-2.19)
Pulmonary Edema	7 (20)	0	0.09
Eclampsia	1 (2.8)	0	0.70
Composite Complications, patient level	20 (57.1)	5 (33.3)	1.71 (0.79-3.70)
Median (IQR)			
Latency from sampling to delivery, days	0.4 (0.1-1.4)	0.1 (0.1-0.4)	0.025
Maternal LOS, days	8 (5.5-13)	7 (5-8)	0.098
Neonatal LOS, days	16.5 (7-69)	5 (3-25)	0.063
Mean birthweight, g	1996 ± 163	2168 ± 273	0.576

FGR: Fetal growth restriction; UAD: Umbilical artery Doppler; LOS: Length of stay

187 | Cell-Free DNA Screening Results by Stage of Maternal Malignancy

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10:30 AM - 12:30 PM

Objective: Cell-free DNA (cfDNA) screening is increasingly used for non-invasive fetal aneuploidy screening. Maternal malignancy is associated with abnormal or non-reportable cfDNA screening results but the impact of tumor staging and origin on cfDNA screening remains unclear. Our objective was to characterize the types and stages of malignancies that result in atypical cfDNA results.

Study Design: We present a single center, retrospective review of cases with a known, suspected, or incidentally diagnosed malignancy during pregnancy who underwent cfDNA fetal aneuploidy screening between 2015-2023. We queried patients using ICD9/10 codes for malignancy. We excluded patients who did not have a confirmed malignancy during pregnancy or within 2 years post-partum, and those who did not undergo cfDNA testing. We extracted maternal history, cancer type/stage, cfDNA results, and fetal outcomes from the medical record. We used Fisher's exact test to analyze categorical variables.

Results: 97 cases of malignancy in pregnancy were identified, of which 37 patients underwent cfDNA screening. Eleven patients (30%) had abnormal or non-reportable cfDNA results: 2/8 (25%) patients with blood cancers and 9/29 (31%) patients with solid tumors. Overall, the fraction of stage 0, I, II, III, and IV solid cancers with abnormal cfDNA screening results was 0/3 (0%), 0/5 (0%), 2/6 (33%), 1/4 (25%), and 6/11 (50%), respectively. Pregnant patients with stage 2-4 cancers were more likely to have an abnormal cfDNA result than those with stage 0-1 cancers ($p = 0.03$). No fetuses had a confirmed cytogenetic abnormality.

Conclusion: Our data suggest that early stage, solid tumors are not reliably detected by prenatal cfDNA screening, while metastatic tumors are more likely to result in atypical cfDNA results. Larger patient cohorts are needed to further characterize the association of different tumor types and the pattern of cfDNA results. Ultimately, cfDNA may be more likely to incidentally diagnose certain types of maternal malignancy than others.

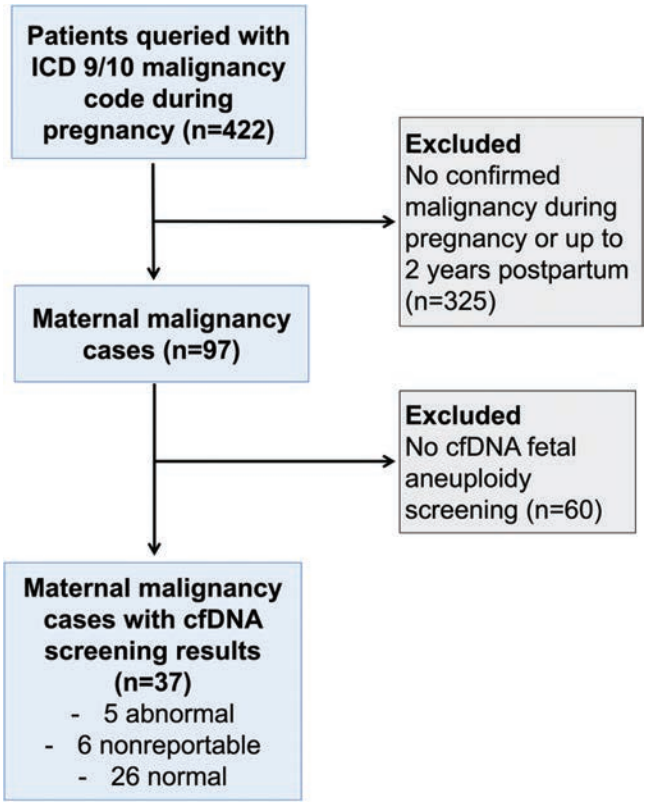

Table 1. Cell-free DNA screening results by stage of maternal malignancy

Stage	Cancer Type	cfDNA result
0	Basal cell carcinoma (n=2)	normal (n=2)
	Melanoma	normal
I	Invasive ductal carcinoma (n=4)	normal (n=4)
	Thyroid carcinoma	normal
II	**Renal cell carcinoma**	**nonreportable**
	Invasive ductal carcinoma	**abnormal**
	Invasive ductal carcinoma	normal
	Ductal carcinoma	normal
	Endometroid ovarian carcinoma	normal
	Metaplastic breast carcinoma	normal
III	**Rectal adenocarcinoma**	**nonreportable**
	Ductal carcinoma	normal
	Retroperitoneal sarcoma	normal
	Parotid carcinoma	normal
IV	**Ovarian carcinoma**	**abnormal**
	Rectal adenocarcinoma (n=2)	**nonreportable (n=2)**
	Colon adenocarcinoma	**abnormal**
	Neuroblastoma	**nonreportable**
	Ductal carcinoma	**nonreportable**
	Ductal carcinoma	normal
	Renal cell carcinoma	normal
	Gastric adenocarcinoma	normal
	Esophageal squamous cell carcinoma	normal
	Urothelial carcinoma	normal
Hematologic	**Acute myeloid leukemia (untreated)**	**abnormal**
	Classic Hodgkin lymphoma (stage IV)	**abnormal**
	Large cell lymphoma (stage IV)	normal
	Marginal zone lymphoma (stage I)	normal
	Chronic lymphocytic leukemia	normal
	Acute lymphoblastic leukemia (untreated)	normal
	Essential thrombocythemia	normal
	Acute undifferentiated leukemia (untreated)	normal

188 | Maternal Mortality According to State Abortion Legislation Following the Supreme Court Dobbs v. Jackson Ruling

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10:30 AM - 12:30 PM

Objective: Following the 2022 *Dobbs v Jackson* United States Supreme Court case, many states passed legislation limiting abortion access. We assessed how maternal mortality rates (MMR) were affected by the ruling, accounting for the coronavirus (COVID-19) pandemic.

Study Design: This was a difference-in-difference (DID) analysis using data from CDC WONDER (Center for Disease Control and Prevention, Wide-ranging ONline Data for Epidemiologic Research) from January 2018 to December 2023. We split this timeframe into three periods: pre-COVID (Jan 2018 to Feb 2020), pandemic (Mar 2020 to Jun 2022), and post-Dobbs (Jul 2022 to Dec 2023). We classified U.S. states as either abortion-restrictive (AR) or abortion-supportive (AS) based on their legislation at the time of this analysis. The primary outcome was maternal mortality, defined as "the death of a woman while pregnant or within 42 days of termination of pregnancy." We fitted generalized estimating equations with a Poisson distribution and a log link function to calculate DID estimates with 95% confidence intervals (95% CI).

Results: Of 16,417,081 births included in this analysis, 5,740,974 were in AR states and 10,676,107 were in AS states. Compared to the pre-COVID period, the pandemic had a higher MMR in both AR states (15.1 per 100,000 births; 95% CI 10.6, 19.6) and AS states (5.6 per 100,000 births; 95% CI 1.3, 9.9). The increase in MMR during COVID-19 was greater in AR states (DID 9.5 per 100,000 births; 95% CI 3.3, 15.7). Compared to the pre-COVID period, the post-Dobbs period was not associated with a higher MMR in AR states (1.3 per 100,000 births; 95% CI -4.6, 7.2) or AS states (1.3 per 100,000 births; 95% CI -1.3, 3.9).

Conclusion: MMR were consistently higher in AR states compared to AS states. COVID-19 exacerbated this difference, but the gap did not increase following the Dobbs ruling. These findings highlight the disparities in pregnancy outcomes across the US, underscoring the need for policies that address these differences.

Table 1. Outcomes according to state legislative climate and time periods (pre-COVID, pandemic, and post-Dobbs).

	Abortion-restrictive	Abortion-supportive	Difference (95% CI)
	Pre-COVID	Pre-COVID	Pre-COVID
Maternal mortality to 42 days (per 100,000 births)	23.8 (18.7-28.9)	14.6 (12.0-17.2)	9.2 (3.6-14.8)
Maternal mortality to 365 days (per 100,000 births)	32.8 (25.0-40.7)	22.2 (18.0-26.3)	10.7 (1.9-19.5)
Preterm birth (%)	11.1 (10.6-11.7)	9.1 (8.8- 9.5)	2.0 (1.4- 2.6)
Cesarean delivery (%)	33.9 (32.1-35.7)	31.2 (30.0-32.3)	2.7 (0.4- 5.1)
Overall mortality per 100,000 reproductive women	8.5 (6.8-10.3)	5.9 (5.2- 6.5)	2.7 (0.9-4.5)
	Pandemic	Pandemic	Pandemic
Maternal mortality to 42 days (per 100,000 births)	38.9 (35.4-42.3)	20.2 (14.5-25.9)	18.7 (12.1-25.3)
Maternal mortality to 365 days (per 100,000 births)	52.7 (47.5-57.9)	31.3 (24.7-37.8)	21.4 (13.1-29.8)
Preterm birth (%)	11.4 (10.9-11.9)	9.2 (8.9- 9.6)	2.1 (1.5- 2.7)
Cesarean delivery (%)	34.0 (32.3-35.7)	31.5 (30.3-32.7)	2.5 (0.3- 4.7)
Overall mortality per 100,000 reproductive women	11.4 (9.2-13.7)	7.5 (6.8- 8.3)	3.9 (1.6-6.2)
	Post-Dobbs	Post-Dobbs	Post-Dobbs
Maternal mortality to 42 days (per 100,000 births)	25.1 (22.6-27.6)	15.9 (12.0-19.8)	9.2 (4.6-13.7)
Maternal mortality to 365 days (per 100,000 births)	35.2 (32.1-38.3)	23.7 (17.9-29.6)	11.5 (4.8-18.1)
Preterm birth (%)	11.4 (10.9-11.9)	9.3 (9.0- 9.6)	2.1 (1.5- 2.7)
Cesarean delivery (%)	33.9 (32.3-35.4)	31.9 (30.8-33.0)	2.0 (-0.0- 4.0)
Overall mortality per 100,000 reproductive women	9.8 (8.0-11.6)	6.8 (6.1- 7.4)	3.0 (1.2-4.8)

Abbreviations: CI (confidence interval); COVID (coronavirus disease)
Pre-COVID (January 2018 to February 2020); Pandemic (March 2020 to August 2022); and Post-Dobbs (September 2022 to March 2024).
Outputs are obtained from Poisson regression using generalized estimating equations with exchangeable correlation structure and robust standard errors.

Table 2. Difference-in-Differences Estimates of Outcomes after Pandemic and Post-Dobbs.

Pandemic vs Pre-COVID	Abortion-restrictive [a]	Abortion-supportive [b]	Difference-in-differences
Maternal mortality to 42 days (per 100,000 births)	15.1 (10.6-19.6)	5.6 (1.3- 9.9)	9.5 (3.3-15.7)
Maternal mortality to 365 days (per 100,000 births)	19.9 (14.0-25.7)	9.1 (5.2-13.0)	10.8 (3.7-17.8)
Preterm birth (%)	0.3 (0.2- 0.3)	0.1 (-0.0- 0.2)	0.2 (0.0- 0.3)
Cesarean delivery (%)	0.1 (-0.1- 0.3)	0.3 (0.0- 0.7)	-0.2 (-0.6- 0.1)
Overall mortality per 100,000 reproductive women	2.9 (2.3-3.4)	1.7 (1.4-1.9)	1.2 (0.6-1.8)
Post-Dobbs vs. Pre-COVID	**Abortion-restrictive [c]**	**Abortion-supportive [d]**	**Difference-in-differences**
Maternal mortality to 42 days (per 100,000 births)	1.3 (-4.6- 7.2)	1.3 (-1.3- 3.9)	-0.0 (-6.5- 6.5)
Maternal mortality to 365 days (per 100,000 births)	2.4 (-4.4- 9.1)	1.6 (-2.4- 5.5)	0.8 (-7.2- 8.8)
Preterm birth (%)	0.3 (0.1- 0.4)	0.2 (0.0- 0.3)	0.1 (-0.1- 0.3)
Cesarean delivery (%)	-0.0 (-0.4- 0.3)	0.7 (0.4- 1.1)	-0.7 (-1.2--0.3)
Overall mortality per 100,000 reproductive women	1.2 (1.0-1.5)	0.9 (0.6-1.2)	0.3 (-0.1-0.7)

Pre-COVID (January 2018 to February 2020); Pandemic (March 2020 to August 2022); and Post-Dobbs (September 2022 to March 2024).
Abbreviations: CI (confidence interval); COVID (coronavirus disease)
[a] Estimates (95% CI) represent the difference between predicted outcomes in the pandemic period and predicted outcomes in the pre-COVID period for the Abortion-restrictive states.
[b] Estimates (95% CI) represent the difference between predicted outcomes in the pandemic period and predicted outcomes in the pre-COVID period for the Abortion-supportive states.
[c] Estimates (95% CI) represent the difference between predicted outcomes in the post-Dobbs period and predicted outcomes in the pre-COVID period for the Abortion-restrictive states.
[d] Estimates (95% CI) represent the difference between predicted outcomes in the post-Dobbs period and predicted outcomes in the pre-COVID period for the Abortion-supportive states.

189 | Amniotomy Versus Deferral at ≥4cm during Standardized Induction of Labor: A Propensity Score-Matched Study

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10:30 AM - 12:30 PM

Objective: To determine the impact of artificial rupture of membranes (AROM) at first exam ≥4cm vs. deferring AROM at that exam while undergoing otherwise standardized labor induction (IOL).

Study Design: This is a secondary analysis of a prospective cohort evaluating the implementation of standardized IOL management of patients undergoing ≥37 weeks IOL at 2 sites from 2018-2022 with a singleton pregnancy, intact membranes, and unfavorable cervix without prior cesarean delivery (CD). For this analysis, patients who underwent AROM or spontaneous rupture at < 4cm were excluded. Patients were grouped by whether AROM was performed at first exam ≥4cm or deferred. 1:1 propensity score matching balanced parameters associated with AROM at the ≥4cm exam, including clinician type (midwife vs. physician), study year, maternal age, parity, gestational age, cervical ripening agent used, and adherence to the IOL protocol prior to the ≥4cm exam, including time from first to last misoprostol if used, and time Foley balloon in place if used. The primary outcome was length of IOL. Secondary outcomes included length of each stage of labor, CD, and maternal/neonatal morbidity. Time-to-event regression analyses for labor length, censored for CD, were modeled with a Cox proportional hazard model. Analyses were stratified by parity.

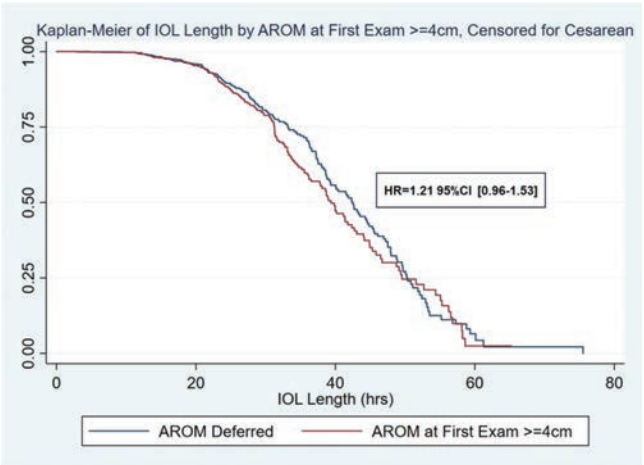
Results: Among 8509 inductions in the parent study, 5784 (67.0%) remained unruptured by first exam ≥4cm. After propensity score matching, 1592 were included (n = 796/group). Overall, AROM was associated with shorter IOL compared to deferral at first exam ≥4cm (21.3h[14.4-29.0] vs. 22.7h[16.1-31.2]), $p = 0.001$; Table), a finding consistent across parity. AROM at first exam ≥4cm was also associated with shorter latent and active phases. Once censored for CD, these findings were no longer significant (Figure). There were no differences by AROM vs. deferral in CD or morbidity.

Conclusion: Even in the context of otherwise standardized IOL management, AROM at first exam ≥4cm may still be associated with shortened IOL without increasing morbidity, but this finding is not significant once censored for CD.

Table: Outcomes compared amniotomy vs. deferral during IOL at first exam ≥4cm among propensity score matched cohort

	Amniotomy (n=796) Median or No. [IQR] (%)	No Amniotomy (n=796) Median or no. [IQR] (%)	*p*-value	aRR (95% CI)
Total IOL length (hours)	21.3 [14.4-29.0]	22.7 [16.1-31.2]	0.001	
Multiparous	13.9 [10.1-19.5]	16.2 [11.9-22.4]	0.01	-
Nulliparous	23.9 [18.1-31.3]	25.7 [18.3-34.1]	0.01	
Length of latent phase (hours)	17.8 [12.3-24.7]	18.6[13.1-26.8]	0.01	-
Length of active phase (hours)	1.5 [0-3.1]	1.7 [0.1-3.9]	0.001	-
Length of second stage (hours)	1.2 [0.4-1.8]	1.3 [0.5-1.7]	0.32	-
Maximum oxytocin dose (milliunits/min)	10 [6-16]	10 [6-16]	0.89	-
Estimated blood loss (mL)	350 [300-725]	350 [300-800]	0.16	-
Cesarean delivery	165 (20.7)	183 (23)	0.28	0.88 (0.69-1.11)
Maternal morbidity[a]	165 (20.7)	186 (23.4)	0.20	0.89 (0.68-1.09)
Neonatal morbidity[b]	17 (2.1)	26 (3.3)	0.17	0.65 (0.35- 1.20)
Postpartum hemorrhage	106 (13.6)	128 (16.4)	0.12	0.80 (0.61- 1.06)
Chorioamnionitis	93 (11.7)	92 (11.6)	0.94	1.01 (0.75- 1.38)
Cord prolapse	2 (0.3)	1 (0.1)	1.00	-

[a] Any one of the following: endometritis, EBL≥1L, blood transfusion, wound infection/separation, venous thromboembolism, unplanned hysterectomy, intensive care unit admission, readmission, or maternal death within 30 days of delivery [b] Any one of the following: severe respiratory distress syndrome or neonatal sepsis



190 | A Predictive Model for Preterm Birth Among Individuals Diagnosed with Early-Onset Fetal Growth Restriction

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10:30 AM - 12:30 PM

Objective: Fetal growth restriction (FGR) affects 3-7% of all pregnancies and is associated with high rates of preterm delivery. Yet it remains unclear what factors beyond gestational age (GA) at onset of FGR and abnormal umbilical artery Dopplers affect the odds of preterm birth.

Study Design: We performed a single-site retrospective cohort analysis of all individuals with a singleton gestation diagnosed with early-onset FGR (i.e., ≤32w0d) from 2020 to 2023. Fetuses with genetic or infectious abnormalities were excluded. The exposure was GA at onset of FGR, defined categorically (20-28 weeks v. 28-32 weeks). The primary outcome was preterm delivery. Bivariate and multivariate logistic regression analyses were performed, and their results were compared using a test of equality for receiver operating characteristics (ROC) areas. Abnormal umbilical artery Doppler values were considered in the model as an a priori covariate. Covariates eligible for inclusion in the model were selected based on $p < .05$ on bivariate analyses. Stepwise backward selection was used to identify covariates that would be retained in the model.

Results: 93 individuals were available for analysis (Table). The unadjusted logistic regression model resulted in an area under the

ROC curve (AUC) of 0.63. The adjusted logistic regression model included insurance payor and an interaction term associated with chronic hypertension and a hypertensive disorder of pregnancy. Gestational age (0.23, 95% CI 0.08-0.74), insurance payor (OR 7.45, 95% CI 2.12-26.22) and the interaction term (OR 14.22, 95% CI 3.35-60.41) were associated with preterm delivery. The adjusted logistic regression resulted in an AUC of 0.80. The ROC curves for the unadjusted and adjusted logistic regression models were compared (Figure) and found to differ significantly (p< .01).

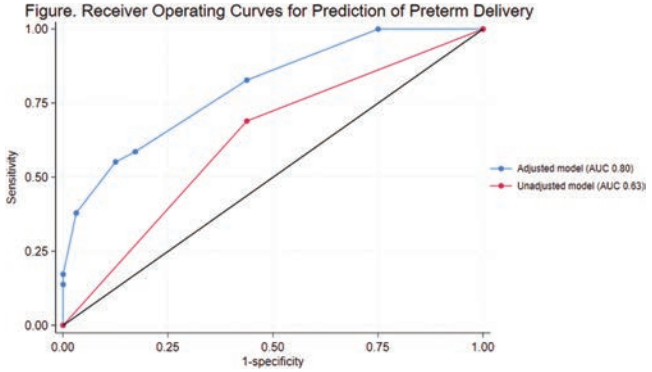
Conclusion: Gestational age at onset, insurance payor, and hypertension are associated with preterm birth in individuals diagnosed with FGR prior to 32 weeks. These data highlight both biological and social determinants of perinatal health and call for further research on these topics.

Table: Biomedical and sociodemographic characteristics of pregnant people, by gestational age at time of FGR diagnosis (n=93)

	FGR diagnosed at 20-28 weeks (n=48)	FGR diagnosed at 28-32 weeks (n=45)	p-value[a]
Maternal age, in years	31 (25-34)	27 (24-32)	.11
Self-reported race			
Non-Hispanic White	5 (10)	2 (4)	.27
Non-Hispanic Black	35 (73)	39 (87)	
Other	8 (17)	4 (9)	
Latinx	3 (6)	0	.24
Nulliparous	18 (38)	26 (58)	**.050**
Insurance			
Government payor	33 (69)	20 (44)	**.018**
Private or self-pay	15 (31)	25 (56)	
Cigarette use	12 (25)	7 (16)	.28
Pre-pregnancy BMI (kg/m^2)	28 (22-23)	26 (21-35)	.74
Chronic hypertension	19 (40)	9 (20)	**.040**
Pre-gestational diabetes	2 (4)	3 (7)	.59
History of FGR	5 (17)	2 (11)	.69
Severity of FGR			
EFW < 3rd percentile, any scan	24 (50)	22 (49)	.92
Abnormal UAD, any scan[b]	18 (38)	10 (22)	.11
Hypertensive disorders of pregnancy			
Gestational hypertension	6 (13)	8 (18)	.48
Preeclampsia without severe features	19 (40)	7 (16)	**.010**
Preeclampsia with severe features	18 (95)	7 (100)	.54
Preterm birth	20 (42)	9 (20)	**.024**
Gestational age at delivery, in weeks	37.1 (34.1-39.0)	37.2 (37.1-38.4)	.33

Data are median (IQR) or n (%) unless otherwise specified. Bold indicates statistical significance < .05.
[a]Chi-squared or Fisher's exact test for categorical variables, Wilcoxon rank-sum test for continuous variables
[b]Defined as any finding of absent flow, reversed flow, or S/D > 95th percentile.
BMI = body mass index; EFW = estimated fetal weight; FGR = fetal growth restriction; UAD = umbilical artery Doppler

Figure. Receiver Operating Curves for Prediction of Preterm Delivery



191 | Nicotine and Mental Health: Risk of Neonatal Outcomes in Pregnancy

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10:30 AM - 12:30 PM

Objective: Maternal mental health and substance use in pregnancy are leading causes of maternal mortality. Nicotine is the most used substance in pregnancy and the prevalence of mental health disorders in pregnancy is rising. In this study, we analyzed the impact of nicotine use and mental health disorders, separately and together, on neonatal outcomes, an understudied area.

Study Design: This retrospective cohort study used California linked vital statistics and hospital discharge data (2008-2020). Patients were categorized into nicotine users, mental health disorders, both, or neither. We included singleton gestations delivered between 23-42 weeks and excluded individuals using other substances. Exposure (mental health disorders) and outcomes were identified using birth certificate and ICD-9/10 codes. Results were analyzed by chi-square tests and multivariable Poisson regression models. Adjusted risk ratios (aRR) with 95% confidence intervals (CI) were estimated.

Results: 5,466,352 pregnant individuals were included, of whom 1.6% (89,278) had a nicotine-use diagnosis, 2.9% (161,590) had a mental health disorder, and 0.2% (9,722) had both in pregnancy. The impact of nicotine-use and mental health disorders (0.5%; aRR = 3.35 (2.51-4.46)) had an additive effect compared to either nicotine use (0.3%; aRR = 1.98 (1.74-2.25)) or mental health disorders (0.1%; aRR = 1.26 (1.09-1.45)) on post-neonatal deaths. Compared to no nicotine use or mental health disorders, the risk of NICU admissions was higher with both nicotine-use and mental health disorders (16.8%; aRR = 1.50 (1.44-1.57)), nicotine use (10.0%; aRR = 1.28 (1.26-1.31)) and mental health disorders (11.2%; aRR = 1.12 (1.10-1.14)). Similarly, the risk of infant deaths and preterm delivery was significantly higher in individuals with both nicotine use and mental health disorders.

Conclusion: The risk of infant and post neonatal death, and neonatal morbidity is significantly higher in individuals with mental health disorders that use nicotine. This patient population will benefit from nicotine cessation counseling.

Table 1: Proportions of adverse neonatal outcomes in California, 2008-2020

	No nicotine or mental health disorders	Nicotine only	Mental health disorders only	Nicotine users with mental health disorders	p*
	N = 5,205,762	N = 89,728	N = 161,590	N = 9,722	
NICU admission	521,760 (10.0%)	12,559 (14.1%)	18,030 (11.2%)	1,630 (16.8%)	<0.001
Infant deaths	14,357 (0.3%)	596 (0.7%)	627 (0.4%)	87 (0.9%)	<0.001
Neonatal deaths	8,636 (0.2%)	290 (0.3%)	418 (0.3%)	35 (0.4%)	<0.001
Post neonatal deaths	5,721 (0.1%)	306 (0.3%)	209 (0.1%)	52 (0.5%)	<0.001
Small for gestational age	447,264 (8.6%)	12,084 (13.5%)	12,775 (7.9%)	1,303 (13.4%)	<0.001
Respiratory distress syndrome	141,647 (2.7%)	3,171 (3.6%)	9,383 (5.8%)	615 (6.3%)	<0.001
Preterm birth<37 weeks	342,676 (6.6%)	9,144 (10.2%)	14,834 (9.2%)	1,185 (12.2%)	<0.001
Preterm birth<32 weeks	42,704 (0.8%)	1,280 (1.4%)	2,199 (1.4%)	195 (2.0%)	<0.001

*Chi-square test

Table 2: Multivariable Poisson regression analyses showing adjusted risk ratios for adverse neonatal outcomes in California 2008-2020

	No nicotine or mental health disorders	Nicotine only	Mental health disorders only	Nicotine users with mental health disorders
	N = 5,205,762	N = 89,728	N = 161,590	N = 9,722
NICU admission	Reference	1.28 (1.26-1.31)	1.12 (1.10-1.14)	1.50 (1.44-1.57)
Infant deaths	Reference	1.63 (1.49-1.78)	1.42 (1.31-1.55)	2.39 (1.92-2.97)
Neonatal deaths	Reference	1.37 (1.19-1.56)	1.53 (1.37-1.69)	1.68 (1.19-2.37)
Post neonatal deaths	Reference	1.98 (1.74-2.25)	1.26 (1.09-1.45)	3.35 (2.51-4.46)
Small for gestational age	Reference	1.67 (1.63-1.69)	1.01 (0.98-1.02)	1.69 (1.61-1.78)
Respiratory distress syndrome	Reference	1.13 (1.08-1.17)	1.80 (1.76-1.84)	1.83 (1.69-1.98)
Preterm birth<37 weeks	Reference	1.36 (1.22-1.39)	1.31 (1.29-1.33)	1.55 (1.47-1.65)
Preterm birth<32 weeks	Reference	1.24 (1.17-1.32)	1.48 (1.42-1.55)	1.69 (1.46-1.96)

All models were adjusted for maternal race and ethnicity, age, education, pre-pregnancy BMI, insurance, parity, prenatal visits, chronic hypertension, and pre-existing diabetes

192 | Emergency Care Use in Early Pregnancy Among North Carolina Medicaid Beneficiaries

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10:30 AM - 12:30 PM

Objective: We sought to describe those seeking emergency care (EC) in early pregnancy and identify risk factors, including social drivers of health (SDOH), for EC use.

Study Design: Linked Medicaid hospital claims, live birth records, and North Carolina (N.C.) Pregnancy Medical Home risk screen (https://bit.ly/NCpregriskscreen) data were used to identify risk factors for EC use among 154,353 pregnant Medicaid beneficiaries in N.C. who had a live birth between 1/2014 and 12/2019. EC use included visits to the Emergency Department or obstetric triage unit prior to 20 weeks' gestation. Demographic characteristics, SDOH, medical co-morbidities, and pregnancy characteristics were compared by the number of EC visits. Among those with ≥1 EC visit, visit diagnoses were assessed by the number of SDOH risk factors. Multivariable ordered logistic regression modeled the association between potential risk factors for EC use and the number of EC visits (0,1,2, ≥3).

Results: A total of 73,836 women (47.8%) had an EC visit prior to 20 weeks' gestation; 39,367 had one visit, 18,751 had two, and 15,718 had ≥3 visits. Demographic, SDOH, medical, and pregnancy characteristics by number of EC visits are described in Table 1. Among those with ≥3 SDOH risk factors, 62.4% had an EC visit related to substance use, and 17.5% had a visit related to mental health. In the regression model, selected SDOH, medical comorbidities, and a history of adverse pregnancy outcomes were associated with increased odds of EC use before 20 weeks' gestation (Table 2). SDOH most associated with increased odds of ED use were physical assault within the last year, food insecurity, unstable living, undesired pregnancy, and substance use among family, friends, or partners.

Conclusion: Nearly half of pregnancies among Medicaid beneficiaries in NC had ≥1 EC visit prior to 20 weeks' gestation. Given the association between SDOH and increased odds of EC use, early EC use in pregnancy may signal social vulnerability and opportunity for targeted intervention.

Table 1. Demographic, clinical, pregnancy and SDOH characteristics of pregnancies among North Carolina Medicaid beneficiaries, by number of EC visits before 20 weeks' gestation.

	Number of EC Visits			
	0 N=80,517	1 N=39,367	2 N=18,751	≥3 N=15,718
Demographics				
Age ≥35 years	8.4	6.2	5.3	4.6
Hispanic/Latinx Ethnicity	10.6	9.1	7.9	6.5
Non-Hispanic Black	35.5	45.3	50.4	54.2
SDOH				
Higher education	6.6	3.3	2.3	1.8
Current intimate partner violence	0.3	0.4	0.4	0.6
Late entry to prenatal care	17.6	15.8	14.3	12.9
History of sexual assault	1.2	1.5	1.9	2.4
History of physical assault within 1 year	2.3	3.6	4.8	6.3
Food insecurity	3.7	5.2	6.1	7.2
Unstable living	2.1	2.8	3.5	4.1
Current smoker	18.8	22.8	23.6	23.3
Substance use in past month	7.2	8.8	9.5	10.8
Non-English speaking	2.1	1.0	0.7	0.5
Medical Comorbidities				
Diabetes	1.7	2.1	2.3	3.3
Chronic Hypertension	3.5	4.2	4.5	6.0
Asthma	4.9	6.9	8.7	11.6
Mental Illness	7.4	9.8	11.7	14.3
Seizure	0.8	1.2	1.5	2.1
Pregnancy Characteristics				
Multiple order pregnancy	1.8	1.7	1.5	1.3

Numbers are represented as percentage of cohort with each characteristic (column percentages).
Abbreviation: EC, emergency care; SDOH, social drivers of health.

Table 2. Multivariable ordered logistic regression model for the association between SDOH, medical comorbidities, pregnancy characteristics and EC use before 20 weeks' gestation.

	OR (95% CI)
SDOH	
College education or more*	0.81 (0.80-0.82)
Current intimate partner violence	0.88 (0.74-1.05)
History of sexual assault	1.06 (0.98-1.15)
History of physical assault within 1 year	1.67 (1.58-1.76)
Food insecurity	1.29 (1.23-1.35)
Unstable living	1.35 (1.27-1.44)
Current smoker	1.08 (1.05-1.10)
Substance use in past month	1.10 (0.99-1.21)
Parent, partner or friend with substance use	1.07 (1.04-1.09)
Undesired pregnancy	1.06 (1.02-1.09)
Non-English speaking	0.40 (0.36-0.44)
Medical Comorbidities	
Diabetes	1.37 (1.28-1.47)
Chronic hypertension	1.36 (1.29-1.43)
Asthma	1.61 (1.55-1.67)
Mental Illness	1.32 (1.27-1.36)
Seizure	1.46 (1.33-1.59)
Pregnancy history	
History of preterm birth	1.41 (1.36-1.47)
History of 2nd trimester loss	1.35 (1.22-1.49)
History of cervical insufficiency	1.43 (1.25-1.65)

Abbreviation: EC, emergency care; SDOH, social drivers of health.
*Based on education category, comparison of those with bachelor's degree or higher versus all others.

193 | Patient Characteristics and Unexpected Delivery Complications Predict Cessation of Exclusive Breastfeeding by 4-8 Weeks Postpartum

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10:30 AM - 12:30 PM

Objective: Although exclusive breastfeeding (BF) is recommended for the first 6 months of life, many women encounter barriers to meeting their BF goals. We analyzed predictors of early cessation of exclusive BF to identify women who may benefit from more intensive lactation support in the early postpartum period.
Study Design: Secondary analysis of a multicenter randomized controlled trial of elective labor induction vs. expectant management of low risk nulliparas at 39 weeks' gestation (MFMU ARRIVE trial). Participants were included in this analysis if they reported infant feeding data at 4-8 weeks postpartum. Logistic regression modeled the association between participant characteristics, unexpected delivery complications, and cessation of exclusive BF by 4-8 weeks postpartum. We defined unexpected delivery complications as neonatal morbidity (as per the initial RCT), neonatal intensive care unit (ICU) admission, intrapartum cesarean, operative vaginal delivery, 3rd or 4th degree perineal lacerations, preeclampsia, magnesium administration, chorioamnionitis, postpartum hemorrhage, blood transfusion, maternal ICU admission, labor pain scores ≥90%ile, and postpartum stay ≥4 days. Backward selection identified independent predictors of cessation of exclusive BF at 4-8 weeks postpartum. Model accuracy was assessed via the area under the ROC curve.
Results: 5,412 individuals were included in the analytic sample; 33% were exclusively BF at 4-8 weeks postpartum. In the backward elimination model, predictors of cessation of exclusive BF included Black race, non-Hispanic ethnicity, not being employed, having public or no insurance, smoking, body mass index ≥30, NICU admission, and intrapartum cesarean (Table). The model had an area under the ROC of 0.73 (95%CI 0.72-0.75).
Conclusion: In a cohort of low risk nulliparas, we identified maternal characteristics and unexpected delivery complications that predicted cessation of exclusive BF at 4-8 weeks postpartum. Targeted postpartum lactation support to individuals at high risk of BF cessation has the potential to enable more women to meet their infant feeding goals.

Table. Maternal factors and delivery complications independently associated with cessation of exclusive breastfeeding at 4-8 weeks postpartum.

Variable	Beta coefficient	Odds ratio	95% CI
Black race+	0.85	2.27	1.89-2.72
Smoking	0.83	2.27	1.68-3.07
BMI ≥30	0.30	1.36	1.20-1.54
Not working in pregnancy	0.30	1.35	1.17-1.56
NICU Admission	0.30	1.30	1.01-1.67
Intrapartum cesarean	0.35	1.29	1.06-1.55
Hispanic ethnicity	-0.55	0.59	0.50-0.70
Private insurance	-0.83	0.44	0.38-0.52

Abbreviations: CI, confidence interval; BMI, body mass index; NICU, neonatal intensive care unit
+Black race was compared to those of all other races.

194 | Monitoring and Management of Hemolytic Disease of the Fetus and Newborn, International Delphi Consensus

Enaja Sambatur[1]; Sonia Johnson[2]; Alireza A. Shamshirsaz[3]; Kenneth J. Moise, Jr.[4]; Ahmet A. Baschat[5]; E. J. T. (Joanne) Verweij[6]; Ali Javinani[7]; Mark Kilby[8]; Enrico Lopriore[9]; Rebecca Rose[10]; Roland Devlieger[11]; Saul Snowise[12]; Ulrich Sachs[13]; Asma Khalil[14]; Hiba J. Mustafa[15]

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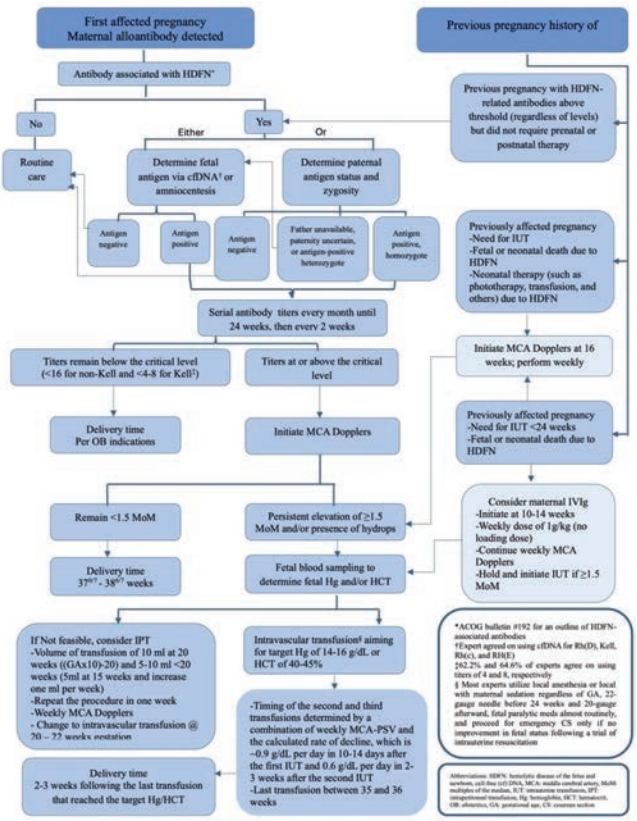
10:30 AM - 12:30 PM
Objective: To develop structured, expert-based clinical guidance on the prenatal and postnatal management of hemolytic disease of the fetus and newborn (HDFN).
Study Design: A Delphi procedure was conducted among an international panel of experts in fetal medicine, neonatology, and hematology. Experts were selected based on their expertise, relevant publications, and affiliations. The domains were (i) prenatal workup, (ii) prenatal monitoring and management, (iii) intrauterine transfusion, (iv) delivery, and (v) postnatal management. The pre-defined cut-off for consensus was ≥ 70% agreement.
Results: A total of 107 experts completed the first round and 100 (93.45%) completed the subsequent round. 75.3% agreed on the use of cfDNA to determine fetal antigen status, particularly for RhD, Kell, Rhc, and RhE antigens. The critical titer is considered when the threshold of 16 is for non-Kell and 4-8 for Kell antigens. 70% agreed on the use of maternal IVIg in pregnancies with prior IUT < 24 weeks or fetal/neonatal death due to HDFN. The minimum GA for IUT is 16-18 weeks and the maximum is 35-36 weeks. Guidance on the procedure, if it was technically not feasible, follow-up, and delivery is reached as shown in the workflow.
Postnatal management consensus was reached for the following: Anemia labs should be investigated in the affected neonates before hospital discharge (92% agreement) and if they received IUT then the labs are to be repeated within one week of discharge (84% agreement). 96% agreed that exchange transfusions should be centralized in hospitals with sufficient exposure and experience and 92% agreed that the Hg cut-off level to consider transfusion following hospital discharge is 7g/dL, and the newborns need to be monitored until 2-3 months of age (96% agreement).
Conclusion: The Delphi method facilitated the development of a consensus-based clinical workflow for the management of pregnancies at risk or affected by alloimmunization. These

workflows are intended to enhance clinical practice, improve outcomes, and facilitate future research.



195 | Nationwide Nursing Perspectives Survey on Intrapartum Maternal Position Changes

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10:30 AM - 12:30 PM

Objective: To characterize nursing perspectives and practices regarding intrapartum maternal position changes.
Study Design: We performed an anonymous, nationwide survey of nurses that had worked on a labor and delivery unit in the past year. The survey was disseminated through social media and email via snowball sampling. The primary objective was to determine the proportion of respondents using intrapartum position changes and why they used these position changes. Our secondary outcomes included use of a circuit of position changes and the reasons position changes were not utilized. We used descriptive statistics to characterize responses and bivariate analyses to compare respondents who employed a circuit to inform further research.
Results: Our sample included 498 respondents. Nearly all (98.8%) respondents use intrapartum position changes and 95.6% believe labor maneuvers are effective and improve maternal and neonatal outcomes. Nurses routinely use positional maneuvers for the indications of slow labor progress (91.5%), suspected occiput posterior fetal position (86.2%), and suspected asynclitic fetal position (83.5%). Commonly reported reasons for not using position changes included patient BMI (67.3%), patient preference (66.3%), fetal monitoring (64.9%), and lack of knowledge or references (64.7%). Approximately two-thirds of nurses utilizing maneuvers (67.1%) employ a circuit of position changes. Of the 20 listed maneuvers, 7 were used by >50% of respondents **(Figure 1)**. These maneuvers were also perceived as the most efficacious and were the most commonly used in a circuit. Nurses that employ circuits were younger ($p = 0.03$) and more likely to work in the Southwest or Midwest ($p = 0.04$, **Table 1**).
Conclusion: Maternal position changes are a frequently used intrapartum intervention despite lack of supporting Level I evidence. Labor and delivery nurses utilize position changes in the setting of protracted labor or fetal malposition. Further research is needed to elucidate the effectiveness of circuit-based position changes in labor.

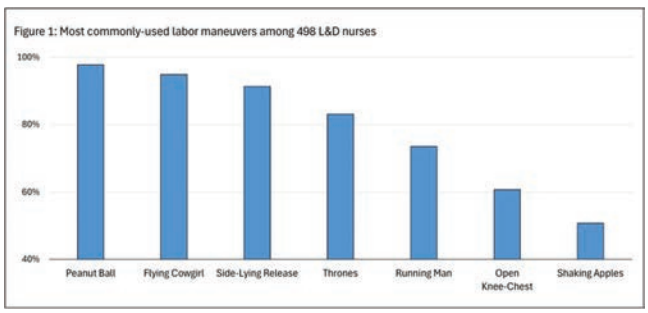

Table 1: Comparison of respondent characteristics by employing position changes in a circuit versus not using a circuit

	Total	Employ position changes in a circuit		
		Yes	No or I don't know	
Characteristic	n=498	n=330	n=162	***p***
Number of labor rooms	14 [10, 18]	15 [10, 18]	13 [9, 18]	0.06
Age, years	32 [27, 40]	31 [27, 38]	34 [28, 42]	0.03
Years as L&D nurse	5 [2, 10]	5 [2, 9]	6 [3, 12]	0.07
Highest level of training				0.44
Midwife	10 (2)	5 (2)	5 (3)	
NP	8 (2)	5 (2)	2 (1)	
Masters	32 (6)	18 (5)	14 (9)	
BSN	310 (62)	211 (64)	95 (59)	
RN	138 (28)	91 (28)	46 (28)	
Region of practice				0.04
Northeast	72 (14)	39 (12)	31 (19)	
Southeast	103 (21)	66 (20)	35 (22)	
Midwest	203 (41)	142 (43)	60 (37)	
Southwest	51 (10)	41 (12)	10 (6)	
West	69 (14)	42 (13)	26 (16)	
Curriculum				0.29
Yes	185 (37)	192 (58)	103 (64)	
No	299 (60)	130 (39)	53 (33)	
I don't know	14 (3)	8 (2)	6 (4)	

Dare are presented as median [IQR] and n (%), percentages may not add to 100 due to rounding, p-values calculated using Mann-Whitney U, chi-square and Fisher's exact, as appropriate

196 | Cost Drivers in Inpatient Care for Placenta Accreta Spectrum: A National Analysis

Eve Overton[1]; Gabriela F. Tessler[1]; Brittany Arditi[2]; Maria Andrikopoulou[2]; Alexandre Buckley de Meritens[2]; Kartik K. Venkatesh[3]; Alexander M. Friedman[2]; Mirella Mourad[1]; Timothy Wen[4]
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10:30 AM - 12:30 PM

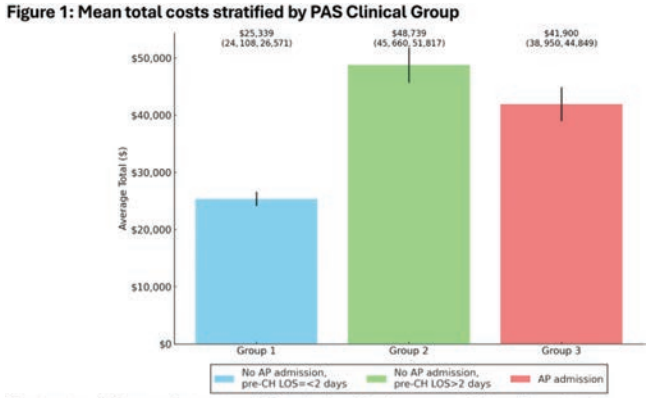
Objective: Management of placenta accreta spectrum (PAS) frequently includes prolonged hospitalization and antepartum inpatient care, but cost estimates are limited. We evaluated costs for inpatient care associated with cesarean hysterectomies for PAS and patient factors associated with increased cost.

Study Design: A serial cross-sectional analysis of cesarean hysterectomies for PAS occurring between 23-35 weeks were identified in the 2016-2021 Nationwide Readmission Database stratified by antepartum inpatient care in three groups. Cesarean hysterectomies were categorized by those with no antepartum admission and with $\leq$ 2 day pre-delivery length of stay (LOS) (Group 1); those with prolonged pre-delivery LOS (>2 days) (Group 2); and those distinct antepartum admission of any length prior to delivery (Group 3). Total inpatient costs for each group were assessed. The primary outcome was high cost, defined as >80th percentile of inpatient costs in this cohort, and secondarily, total inpatient costs as a continuous measure adjusted for inflation to represent 2023 US dollars. Adjusted logistic and linear regression models assessed the association between groups with the primary and secondary outcomes, adjusting for clinical, demographic, and hospital factors.

Results: From 2016-2021, 3,309 cesarean hysterectomies for PAS were identified with 1,684 (50.9%), 1,065 (32.2%), and 560 (16.9%) in Groups 1, 2, and 3 respectively. High costs (≥$49,706) were noted in 9.3%, 39.6%, and 28.0% of deliveries in Groups 1, 2, and 3, respectively. In adjusted analyses, Group 2 had the highest mean costs (Figure 1, $p < 0.05$). Groups 2 (aOR 9.33, 95% CI: 6.45, 13.50) and 3 (aOR 5.18, 95% CI: 3.48, 7.71) had higher likelihood of high costs, and on average had $23,477 and $17,204 higher costs versus Group 1 (Figure 2). Disseminated intravascular coagulopathy, placenta increta/percreta, and postoperative LOS was on average associated with $12,940, $6,500, $3,941 (per day) higher costs ($p < 0.01$).

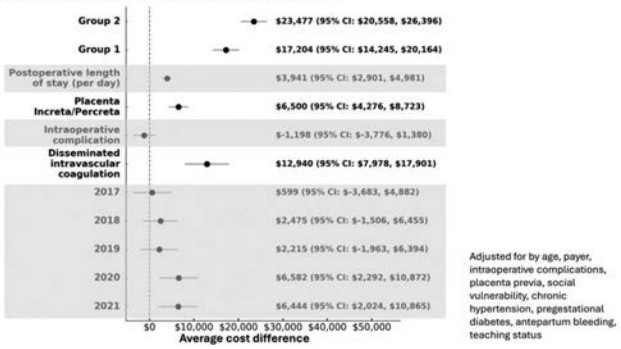
Conclusion: In the US between 2016 to 2021, prolonged pre-delivery hospitalization for PAS was associated with increased cost of care.

Figure 1: Mean total costs stratified by PAS Clinical Group



AP: antepartum, CH: Cesarean hysterectomy; **LOS**: length of stay; Error bars represent 95% confidence intervals

Figure 2: Total Costs Multivariable Linear Regression



197 | Feasibility and Efficacy of Vascular Closure Device for Sealing Uterine Entry Site: Pregnant Sheep Models

Eyal Krispin[1]; Shohra Qaderi[2]; Ali Javinani[2]; Nikan Zargarzadeh[2]; Yves Ville[3]; Ramen H. Chmait[4]; Braxton Forde[5]; Jose L. Peiro[6]; Katte Carreon[7]; Kjersti M. Aagaard[8]; Alireza A. Shamshirsaz[9]

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10:30 AM - 12:30 PM

Objective: Trans-amniotic trans-uterine suturing approaches have been associated with a reduced incidence of preterm premature rupture of membranes (PPROM). Our study aimed to explore the feasibility and effectiveness of employing a vascular closure device for trans-amniotic trans-uterine suturing in a sheep model.

Study Design: We employed multiple orthogonal methodologies to evaluate the Abbott Perclose for suturing the membranes at the uterine entry site of 12 French cannulas. Feasibility was defined as successful suture placement by two separate teams at two different gestational ages. Efficacy was demonstrated by the watertight closure of the entry site during in-vivo gross examination, along with the organizing fibrosis and healing of membranes and myometrium at post-delivery histopathologic evaluation. The following three approaches were used for uterine entry: midline laparotomy, 2-cm mini laparotomy, and percutaneous. The Perclose stitches were placed either before or after cannula insertion, utilizing one of three techniques: single, double vertical, or double parallel closures. Histopathological examination of samples from the entry sites was conducted using

H&E and trichrome staining, as well as immunohistochemistry for connexin 43. This study was approved by IACUC(AN-2010).
Results: Ten pregnant sheep were included in this study, and 4 of 10 were twin gestations. The median gestational age at the first and second rounds of intervention was 85.5 and 104 days, respectively. Overall, 32 Perclose devices were used and 75% were successfully placed. Watertight closure of all sutures was observed during the 1st and 2nd interventions, at cesarean delivery, and in situ. Histopathological examination confirmed membrane healing and organizing fibrosis surrounding the device entry site in addition to overexpression of connexin 43.
Conclusion: Employing multiple orthogonal approaches, we have demonstrated for the first time that the Perclose is both feasible and efficacious as a uterine port closure in our preclinical sheep model.

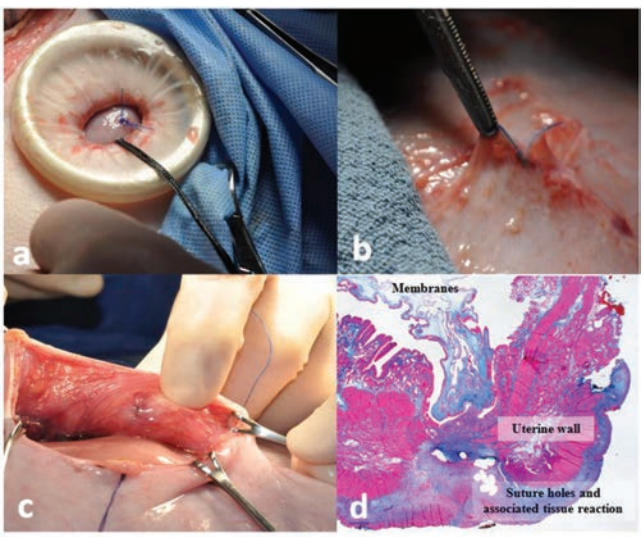


Figure 1: (a) Stitch placed in the mini-laparotomy approach, **(b)** Stitch visualized during cesarean delivery, **(c)** The stitch demonstrated from the interior following hysterotomy, **(d)** Full wall-thickness section of the uterine wall (inked serosal surface toward the bottom) with attached membranes. The suture holes show associated granulation tissue and early fibrosis (*Masson's trichrome stain, 1.25X*).

Table 1a: Overview of perclosure device placement - first round

Sheep	Gestational age [days]	Number of devices used	Time of placement		Entry method			Placement technique			Successful placement
			Pre cannulation	Post cannulation	Direct uterine	Percutaneous	Mini laparotomy	Single	Vertical	Parallel	
1	90	1		1	1			1			1
2	90	1	1		1			1			1
3	84	2	2		2				2		2
4*	91	2	2			2		2			0
5#	91	2	2			2		2			1
6*	85	3	3		1	2		3			0
7	80	1		1			1	1			1
8	86	1	1				1	1			1
9	81	2	2				2		2		2
10	81	2	2				2		2		2
Total		**17**	**15**	**2**	**5**	**6**	**6**	**11**	**6**	**0**	**11**

Table 1b: Overview of perclosure device placement - second round

Sheep	Gestational age [days]	Number of devices used	Time of placement		Entry method			Placement technique			Successful placement
			Pre cannulation	Post cannulation	Direct uterine	Percutaneous	Mini laparotomy	Single stitch	Double vertical	Double Parallel	
1	104	1		1	1			1			1
2*	106	4	4		4					4	4
3	107	2	2		1		1	2			2
4	105	2	2		2				2		2
5	99	2		2		2		2			2
6	99	2	2		1		1			2	2
7	94	2		2	1		1	2			0
Total		**15**	**10**	**5**	**10**	**2**	**3**	**7**	**2**	**6**	**13**

* Twin pregnancy, two devices were used per uterine horn.
* Two attempts were made: the first reached the bowel serosa, while the second reached the uterus and fascia, and the thread tore when pulling on the uterus.[1] There were two attempts; the first failed, and the second was successful.
# This case underwent three tries of Perclose device placement, two first attempts were not successful due to Knob coming out and membrane rupture, and for the third attempt, the less traction caused deployment of the suture into the uterus and thus the stitch did not hold.

198 | Failure-to-Rescue Following Severe Cardio-Pulmonary Morbidity at Delivery: Assessment of Race and Ethnic Differences

Fay Pon[1]; Zaira Chavez Jimenez[1]; Erin Yu[1]; Jennifer Yao[2]; Shinya Matsuzaki[3]; Rachel S. Mandelbaum[1]; Joseph G. Ouzounian[1]; Koji Matsuo[1]

[1]University of Southern California/Los Angeles General Medical Center, Los Angeles, CA; [2]Keck School of Medicine, University of Southern California, Los Angeles, CA; [3]Osaka University Graduate School of Medicine, Osaka, Osaka

10:30 AM - 12:30 PM
Objective: To assess the association between race / ethnicity and maternal mortality following severe cardio-pulmonary morbidity at delivery.
Study Design: This cross-sectional study queried the Healthcare Cost and Utilization Project's National Inpatient Sample. The study population included 19,724,839 delivery hospitalizations from 2016-2021. Under the Centers for Disease Control and Prevention-provided definitions of severe maternal morbidity indicators, six severe cardio-pulmonary morbidity subtypes were identified, including acute myocardial infarction, acute respiratory distress syndrome, cardiac arrest / ventricular fibrillation, conversion of cardiac rhythm, heart failure / arrest during surgery or procedure, and pulmonary edema / acute heart failure. Failure-to-rescue, defined as mortality event following these severe cardio-pulmonary events, was assessed by race and ethnicity in multivariable log-Poisson generalized linear model.
Results: A total of 36,090 patients developed severe cardio-pulmonary morbidity, of which Black and Native American patients had the two highest incidence rates followed by Asian, Hispanic, and White (32.2, 31.4, 19.9, 17.5, and 14.3 per 10,000 deliveries, respectively, $P < .001$) Failure-to-rescue rate following severe cardio-pulmonary morbidity at delivery was highest in Asian (5.8%), followed by Native American (5.3%), Black (4.1%), Hispanic (3.5%), and White (3.2%) ($P < .001$). In multivariable analysis, Asian (adjusted-OR 1.75, 95%CI 1.45-2.13) and Native American (adjusted-OR 1.68, 95%CI 1.12-2.54) pregnant patients were 75% and 68% more likely to die, respectively, following severe cardio-pulmonary events compared to White pregnant patients.
Conclusion: Our analysis suggest that there are racial and ethnic differences in failure-to-rescue following severe cardio-pulmonary morbidity at delivery: Although the incidence rate was highest in Black pregnant patients, failure-to-rescue risk following with these morbidities was highest in Asian pregnant patients.

199 | Buprenorphine Treatment for Maternal Opioid Use Disorder: Differences between High and Low Retention Groups

Felicitas A. Huber[1]; Nandini Raghuraman[2]; Bridget Galati[3]; Michael Wenzinger[3]; Antonina I. Frolova[4]; Megan L. Lawlor[3]; Jeannie C. Kelly[2]

[1]Washington University in St Louis, St. Louis, MO; [2]Washington University School of Medicine in St. Louis, St. Louis, MO; [3]Washington University in St. Louis, St. Louis, MO; [4]Washington University School of Medicine, St. Louis, MO

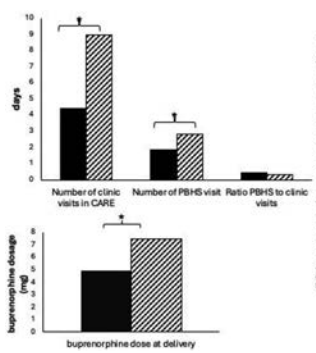
10:30 AM - 12:30 PM
Objective: Prevalence of maternal opioid use disorder (OUD) has substantially increased over the past decade. Medications for OUD are essential for effective treatment. Yet, factors that impact retention of opioid agonist treatment during pregnancy and beyond are poorly understood. Our objective was to examine

differences in biopsychosocial factors between individuals with high versus low buprenorphine treatment retention.

Study Design: We used a prospective database from CARE, an interdisciplinary, wrap-around clinic providing prenatal, OUD, and extended postpartum care for patients with OUD at an urban tertiary care center. Data were analyzed from patients who received buprenorphine treatment (June 2018-August 2022), dichotomized into two groups of low (< 31 days of buprenorphine tx) and high (≥32 days) retention. Differences between groups on demographics, medical, behavioral, and psychological variables were assessed via chi-square & independent samples t-tests.

Results: 79 patients were included for analysis; 63% identified as non-Hispanic White, 46% had a history of hepatitis C, and 72% had public insurance. ½ of patients fell into low and ½ into high retention groups. There were no differences in race, age, hepatitis c dx, time until buprenorphine induction, OUD length, polysubstance use, psychiatric tx, or anxiety/depression between groups. However, greater buprenorphine dosage at delivery, more clinic visits, and more behavioral health visits were found in the high retention group. No difference between groups was found when examining ratio of behavioral health to clinic visits.

Conclusion: Behavioral and medical factors differed between groups such that those who stayed on buprenorphine >31 days were more engaged with clinical and behavioral health care and had higher buprenorphine dosage at delivery. That the ratio of behavioral health to clinic visits did not significantly differ suggests that the cumulative amount of positive clinic contact may be more relevant than specific interventions. Results demonstrate the importance of treating OUD from a biopsychosocial and interdisciplinary perspective.



Variable	Low retention group (N=39)			High retention group (N=40)			Test statistic
Continuous	n	M	SD	n	M	SD	
Age	39	30.13	5.06	40	30.20	5.02	t(77)=-.06
Length of OUD	20	6.4	3.27	23	8.17	3.34	t(41)=-1.76
# of clinic visits	37	4.43	.48	40	8.98	.76	t(65)=-5.03**
# of perinatal behavioral health visits	30	1.87	1.14	37	2.84	1.21	t(65)=-3.35**
Ratio pbh:clinic visits	30	.41	.19	37	.34	.16	t(65)=1.66
Buprenorphine dosage at delivery	37	4.24	4.93	40	7.50	5.43	t(75)=-2.75*
Time to bup induction	38	1.26	10.79	40	1.83	12.60	t(76)=-.21
Nominal	n	%		n	%		
Non-Hispanic White	21	53.85		29	72.50		χ^2=2.96
Hepatitis C	16	43.24		20	50.00		χ^2=.35
Polysubstance use	30	76.92		27	67.50		χ^2=.87
Anxiety&depression	7	17.95		15	37.50		χ^2=3.76
Psychiatric tx	26	66.67		32	80.00		χ^2=1.80

Note. **p<.001, *p<.05. OUD=opioid use disorder, pbh=perinatal behavioral health, bup=buprenorphine, tx=treatment.

200 | Assessing the Risk of Chorioamnionitis by Type of Suture Used for Cerclage

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10:30 AM - 12:30 PM

Objective: A recent randomized trial comparing cerclage suture type identified a possible increased rate of chorioamnionitis with braided suture; however this was evaluated as one of many secondary outcomes. We aimed to assess whether braided sutures are associated with increased odds of chorioamnionitis in pregnancies undergoing cerclage.

Study Design: This is a retrospective cohort study of singleton gestations who underwent a cerclage within a large healthcare system from 01/2019–06/2023. Patients with missing delivery data or suture type were excluded. The primary outcome was incidence of chorioamnionitis at delivery and was compared between patients who underwent cerclage with a monofilament suture (monofilament polypropylene (Prolene)) compared to those with a braided suture (ethylene terephthalate (Mersilene) or braided polyester suture (Tri-Cron)). Multivariate logistic regression was performed to adjust for the following confounders: indication for cerclage, gestational age at cerclage placement, and nulliparity. Data were presented as adjusted odds ratios (aOR) with 95% confidence intervals (CI).

Results: Of the 719 patients included, 200 (28%) had a monofilament polypropylene suture, 519 (72%) had braided suture. Baseline characteristics were similar except obesity (Table). The odds of chorioamnionitis was similar between the monofilament vs braided sutures (4/200 [2.0%] vs. 16/519 [3.1%]; aOR 1.36 [0.54-4.14].

Conclusion: This study suggests a lower rate of chorioamnionitis than previously reported among patients with braided sutures. These findings suggest there is no difference in the rate of chorioamnionitis based on the use of braided versus monofilament sutures at time of cerclage. Currently evidence supports clinicians using their preferred suture type.

Table. Baseline characteristics compared between the two groups.

	Monofilament (n=200)	Braided (n=519)	P value
Indication for cerclage			
History	71 (35.5)	142 (27.4)	0.42
Physical Exam	49 (24.5)	127 (24.5)	
Ultrasound	80 (40.0)	250 (48.2)	
Nulliparous	127 (63.5)	303 (58.4)	0.21
Gestational age at placement (weeks)	17.0 (3.5)	17.3 (3.7)	0.24
Maternal age	32.9 (5.1)	33.3 (4.8	0.32
Obesity			
BMI <35	44 (22)	162 (31.2)	0.02
BMI ≥35	156 (78)	357 (68.8)	
Race and Ethnicity			
Non-Hispanic white	32 (16)	92 (17.7)	0.688
Non-Hispanic black	81 (40.5)	199 (38.3)	
Hispanic or Latina	40 (20.0)	87 (16.8)	
Asian or Pacific Islander	22 (11.0)	72 (13.9)	
Native American Alaska Native Multiracial or other	25 (12.5)	69 (13.3)	

201 | First Versus Early Second Trimester Dating: Accuracy in Predicting Small for Gestational Age Neonates

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10:30 AM - 12:30 PM

Objective: While "optimal" pregnancy dating is defined as any ultrasound confirmation prior to 22 weeks, evaluation in

the first trimester may provide a more accurate assessment of gestational age (GA). This is important when early fetal growth restriction (FGR) is detected, as inaccurate dating can cause a false positive diagnosis. We sought to compare the accuracy of FGR in predicting small for gestational age (SGA) using first versus early second trimester dating.

Study Design: We conducted a multi-center observational study of singleton pregnancies with FGR (EFW < 10th percentile) diagnosed during a 16-24 week anatomy scan between 1/2016 and 12/2021. Pregnancies with estimated date of delivery (EDD) confirmed by first trimester ultrasound were compared to those with dating confirmation in early second trimester (between 14 and 22 weeks). Cases with suspected anatomic, genetic, or infectious etiologies of FGR were excluded. The primary outcome was SGA at birth (< 10th percentile for gestational age). Secondary outcomes were GA at delivery, hypertensive disorders of pregnancy (HDP), mode of delivery, indicated preterm delivery, and a composite of adverse neonatal outcomes. Data were analyzed using Pearson's Chi-Square (Fisher's-Exact) and Mann-Whitney U tests.

Results: Of 385 cases of FGR, 319 (83%) had dating confirmation in first trimester and 66 (17%) in the early second trimester. The prevalence of SGA was similar between groups with 30% in the first trimester cohort and 26% in the early second trimester cohort ($p = 0.24$). Both groups had a similar median GA at delivery, and similar rates of medically indicated preterm delivery, HDP, and composite neonatal morbidity.

Conclusion: In pregnancies with FGR, first trimester dating confirmation was not superior to early second trimester dating in predicting SGA. This lends support to the current definition of optimal dating utilized by the American College of Obstetricians and Gynecologists. Future studies with a larger second-trimester dating cohort as well as FGR diagnosed later in pregnancy would help further validate these findings.

Table 1. Baseline Demographic and Clinical Characteristics

	First Trimester Dating Confirmation (n = 319)	Early Second Trimester Dating Confirmation (n = 66)	*P* value
Median maternal age (years) (IQR)	32.19 (26.90-36.18)	30.59 (25.95-35.55)	0.238
Race – no. (%)			0.087
White	109 (34)	30 (45)	
Asian or Pacific Islander	87 (27)	14 (21)	
Black	30 (9)	2 (3)	
Other	36 (11)	3 (5)	
Multiple	4 (1)	1 (2)	
Unknown	53 (17)	16 (24)	
Ethnicity – no. (%)			0.018*
Hispanic or Latino	80 (25)	26 (39)	
Not Hispanic or Latino	239 (75)	40 (61)	
Insurance status – no (%)			0.058
Private	110 (34)	14 (21)	
Public	208 (65)	51 (77)	
None	1 (0)	1 (2)	
Nulliparous – no. (%)	153 (48)	21 (32)	0.016*
Median pre-pregnancy BMI (kg/m^2) (IQR)	25.32 (22.02-29.90)	25.93 (22.91-28.70)	0.460
Maternal medical comorbidities – no. (%)			
Diabetes	44 (14)	8 (12)	0.718
Chronic Hypertension	14 (4)	1 (2)	0.272
Medication use – no. (%)			
Aspirin	70 (22)	14 (21)	0.896

* There were no significant differences between the two groups except for Hispanic ethnicity (p = 0.018) and nulliparity (p=0.016)
Race or ethnicity was self-reported. Patients of any race could report Hispanic ethnicity.
BMI =body mass index (kg/m^2)
Maternal medical comorbidities at time of delivery limited to diabetes or chronic hypertension

Table 2. Neonatal and maternal outcomes for pregnancies affected by fetal growth restriction (FGR) dated by first versus second trimester ultrasound

	First Trimester Dating Confirmation (n = 319)	Second Trimester Dating Confirmation (n = 66)	*P value*
Neonatal Outcomes:			
Small for gestational age (<10% birth weight) – no. (%)	97 (30)	17 (26)	0.45
Median gestational age at delivery (days) (IQR)	274 (261-281)	276 (263-284)	0.06
Median birth weight (grams) (IQR)	2950 (2480-3255)	3170 (2601-3425)	0.08
Very low birth weight (<1500 grams) – no. (%)	22 (1)	6 (9)	0.53
Low birth weight (<2500 grams) – no. (%)	60 9 (19)	10 (15)	0.48
Composite of neonatal morbidity – no. (%)	112 (35)	20 (30)	0.45
Medically indicated preterm delivery	47 (15)	13 (20)	0.31
APGAR <7 at 5 minutes	5 (2)	3 (5)	0.12
Need for respiratory support	63 (20)	12 (18)	0.77
Neonatal hypoglycemia	39 (12)	7 (11)	0.71
Neonatal death	3 (1)	0 (0)	0.43
Maternal Outcomes:			
Hypertensive disorder of pregnancy – no. (%)	48 (15)	7 (11)	0.35
Mode of delivery – no. (%)			0.32
Vaginal delivery	199 (62)	45 (68)	
Cesarean delivery	120 (38)	21 (32)	

Small for gestational age (SGA) = birth weight <10th percentile for gestational age
Hypertensive disorder of pregnancy (HDP): comprises any maternal hypertensive disorder including gestational hypertension (gHTN), preeclampsia without severe features (PEC without SF), preeclampsia with severe features (PEC with SF), chronic hypertension with superimposed preeclampsia without severe features (siPEC without SF), and chronic hypertension with superimposed preeclampsia with severe features (siPEC with SF).
Need for respiratory support is defined as requiring supplemental oxygen for >2hrs
Neonatal hypoglycemia is defined as a point of care glucose <30mg/dL at <24hrs of life, <45 mg/dL thereafter during birth admission

202 | Intrapartum Continuous Glucose Monitor Profiles and the Association with Neonatal Hypoglycemia

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10:30 AM - 12:30 PM

Objective: Use of continuous glucose monitors (CGMs) is becoming more common among pregnant patients with pregestational diabetes, but little is known about the optimal intrapartum CGM glycemic profiles in pregnancy. The objective of this study was to characterize intrapartum CGM glycemic profiles and any association with neonatal hypoglycemia.

Study Design: This was a retrospective cohort study among subjects with pregestational diabetes between July 1, 2022 and June 1, 2024 that utilized a CGM intrapartum for glycemic monitoring. Demographics and perinatal outcomes were abstracted from the medical record while glycemic profiles (time in range, above range, and below range) were abstracted from the CGM portal. Glucose range was defined as 70-140 mg/dL. Pearson's correlation coefficient was used to assess association.

Results: During the study period, 25 subjects with intrapartum CGM data available were identified. Participants were 31.3 years old (±5.8 years), predominately White (72%), and have type 1 diabetes melitus (68%). The average intrapartum glucose was 136.8 mg/dL (±24.4 mg/dL), with subjects spending a mean 39.2% of time above range, 59.4% of time in range, and 1.7% of time below range. The mean neonatal glucose immediately after birth was 46.3 mg/dL (±15.0 mg/dL) and mean glucose 24 hours after birth was 59.2 mg/dL (±13.2 mg/dL). Approximately 52% of neonates required treatment for hypoglycemia, with 25% of those requiring treatment needing intravenous therapy. There was a moderate negative correlation (r = -0.52) between percentage of time in range and mean neonatal glucose within the first 24 hours after birth and a moderate positive correlation (r = 0.55) between percentage of time above range and mean neonatal glucose within the first 24 hours after birth.

Conclusion: Characterizing CGM profiles is the first step to better utilization in labor. Despite small numbers, our study shows a correlation with time above range and increased neonatal

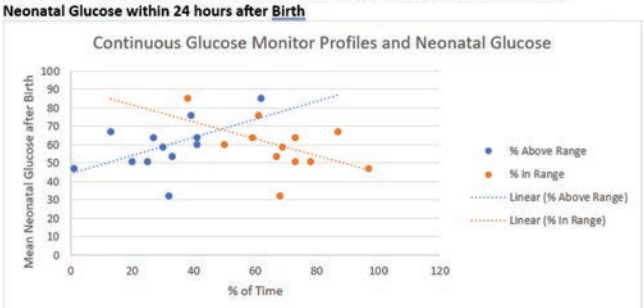
glucose. Larger studies with standardized intrapartum treatment strategies are needed to determine the optimal intrapartum CGM glycemic profiles.

Table 1. Demographic and Glycemic Outcomes of Patients with Pregestational Diabetes

Demographics	n=25
Age (years)	31.3 (±5.8)
Race	
Black	3 (12.0%)
White	18 (72.0%)
Other	4 (16.0%)
Ethnicity	
Hispanic	6 (24.0%)
Non-Hispanic	19 (76.0%)
Pre-gravid Body Mass Index (kg/m²)	30.3 (4.8)
Nulliparous	11 (44%)
History of Chronic Hypertension	5 (20.0%)
History of Pre-eclampsia	9 (36.0%)
History of Cesarean Delivery	13 (54.2%)
First Trimester A1c (%)	6.6 (±1.3)
Third Trimester A1c (%)	6.9 (±1.0)
Glycemic Outcomes	
Mean Intrapartum Glucose (mg/dL)	136.8 (±24.4)
% of Time in Range	59.4 (±22.2)
% of Time Above Range	39.2 (±22.5)
% of Time Below Range	1.7 (±2.8)
Perinatal Outcomes	
Mean First Neonatal Glucose (mg/dL)	46.2 (±15.0)
Mean Neonatal Glucose 24 hours after Birth	59.2 (±13.2)
Neonate Treated for Hypoglycemia	12 (50.0%)
Neonatal Birthweight (g)	3381 (±918)
Gestational Age (weeks)	36.8 (±3.3)

All data are presented as mean (±standard deviation) or n(%).

Figure 1. Scatter Plots of Percent of Time on Continuous Glucose Monitors and Mean Neonatal Glucose within 24 hours after Birth



203 | Exploring the Risk Factors for Re-Laparotomy Following Cesarean Delivery

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10:30 AM - 12:30 PM

Objective: Cesarean delivery (CD) is the most common obstetrical surgery with increasing rates worldwide. Although considered relatively safe, intra- and post-operative complication including bleeding, bladder and intestinal injury and wound infection have been reported. One rare, but significant, complication after CD is re-laparotomy. We conducted this study to define risk factors for re-laparotomy after CD.

Study Design: A retrospective cohort study was conducted comparing all singleton CD that took place in a tertiary medical center between the years 1991-2021. Cesarean deliveries complicated by re-laparotomy were compared with uncomplicated CD. Generalized estimation equation (GEE) models were constructed to control for possible confounding variables.

Results: During the study period, 49,922 cesarean deliveries met our inclusion criteria, of them, 97 (0.2%) had undergone re-laparotomy. The group of women complicated with re-laparotomy tended to be multiparous and to have undergone a previous CD. Furthermore, these women had higher rates of placental complications (placenta previa, abruption and placenta accreta). They also had higher rates of cervical tears and post-partum hemorrhage (**Table 1**). In a GEE model, several independent risk factors for re-laparotomy following CD, with cervical tear being the most prominent one, were noted (adjusted OR = 24.39, 95%CI 8.20-72.55, p < 0.001, **Table 2**).

Conclusion: Independent risk factors for relaparotomy following CD include cervical tear, placenta previa, placental abruption and placenta accreta, preeclampsia and a previous CD. These risk factors should be taken into account when dealing with high-risk patients expected to undergo repeated cesarean delivery.

Table 1. Maternal characteristics, pregnancy complications and perinatal outcomes of women with and without re-laparotomy after cesarean delivery: Univariate analysis

	Re-laparotomy n=97	No re-laparotomy n=49,825	Odds ratio (95%CI)	P value
MATERNAL CHARACTERISTICS				
Parity				
1	9 (9.3)	12,755 (25.6)		<0.001
2-4	47 (48.5)	24,431 (49.0)		
5+	41 (42.3)	12,634 (25.4)		
Previous cesarean delivery, n (%)	57 (58.8)	23,299 (46.8)	1.62 (1.08 – 2.43)	0.018
PREGNANCY COMPLICATIONS				
Hypertensive disorders [a], n (%)	11 (11.3)	4,868 (9.8)	1.18 (0.63 – 2.21)	0.603
Placenta previa, n (%)	17 (17.5)	1,350 (2.7)	7.63 (4.51 – 12.91)	<0.001
Second trimester bleeding, n (%)	1 (1.0)	26 (0.1)	19.95 (2.68 – 148.50)	<0.001
Placental abruption, n (%)	13 (13.4)	1,307 (2.6)	5.75 (3.19 – 10.33)	<0.001
chorioamnionitis, n (%)	5 (5.2)	935 (1.9)	2.84 (1.15 – 70.00)	0.018
Preeclampsia with severe features, n (%)	10 (10.3)	1,725 (3.5)	3.20 (1.66 – 6.17)	<0.001
PERINATAL OUTCOMES				
Gestational age at birth (weeks ± SD)	36.2 ± 4.0	38.1 ± 2.4		<0.001
Preterm delivery, n (%)	41 (42.3)	7,480 (15.0)	4.14 (2.76 – 6.20)	<0.001
Low birthweight (< 2500 g.), n (%)	30 (30.9)	7,122 (14.3)	2.68 (1.74 – 4.13)	<0.001
Low Apgar at 5 minutes (<7), n (%)	8 (8.7)	956 (1.9)	4.83 (2.33 – 10.00)	<0.001
Perinatal mortality, n (%)	9 (9.3)	531 (1.1)	9.49 (4.75 – 18.95)	<0.001
Cervical tear, n (%)	4 (4.1)	89 (0.2)	25.47 (9.15 – 70.87)	<0.001
Placenta accreta, n (%)	11 (11.3)	196 (0.4)	32.38 (17.02 – 61.61)	<0.001
Post-partum hemorrhage, n (%)	27 (27.8)	193 (0.4)	99.19 (62.24 – 158.06)	<0.001
Peripartum hysterectomy, n (%)	12 (12.4)	76 (0.2)	92.41 (48.49 – 176.12)	<0.001

[a] including chronic hypertension and gestational hypertension

[b] including preeclampsia with and without severe features

Table 2. Independent risk factors for relaparotomy after CS: Results from a GEE model

Characteristic	*Adjusted* OR*	*95% Confidence interval*	*P value*
Cervical tear	24.39	8.20 – 72.55	<0.001
Placenta accreta	12.08	4.67 – 31.25	<0.001
Placental abruption	5.36	2.80 – 10.27	<0.001
Placenta previa	4.06	1.87 – 8.83	<0.001
Preeclampsia [a]	2.24	1.26 – 3.97	0.006
Previous CD	1.68	1.08 – 2.62	0.021

* The model also adjusts for repeated deliveries, maternal age, chorioamnionitis and second trimester bleeding

[a] including preeclampsia with severe features and eclampsia

204 | Does Maternal Chronic Hypertension Increase the Risk for Offspring Long-Term Respiratory Morbidity?

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10:30 AM - 12:30 PM

Objective: Maternal chronic hypertension has been associated with various adverse pregnancy and neonatal outcomes, including superimposed preeclampsia and preterm labor. Both complications have been shown to expose the offspring for both short and long-term adverse consequences. However, most studies investigating offspring long-term outcomes included mothers with all types of hypertensive disorders of pregnancy and did not discern them from mothers with preexisting disease. We decided to explore a possible association between maternal chronic hypertension and long-term respiratory morbidity of the offspring.

Study Design: A population-based retrospective cohort study comparing offspring of mothers with and without chronic hypertension or any hypertensive disorders. We included singleton deliveries that took place between the years 1991-2021 at a tertiary center. Offspring long-term (up to 18 years) respiratory morbidity was compared using registered diagnoses from hospitalization of the offspring involving a respiratory disease. A Kaplan–Meier survival curve was used to compare the cumulative incidence of respiratory morbidity, and a Cox regression model was constructed to control for confounders.

Results: A total of 342,365 singleton deliveries were included. Among them 3,097 (0.9%) were deliveries of mothers with chronic hypertension. The total respiratory morbidity rate of children exposed to maternal chronic hypertension was significantly higher than children from pregnancies without hypertensive disorders (**Table**). However, the cumulative incidence of respiratory morbidity over time was comparable between the groups (**Figure**). Furthermore, using the Cox regression model, controlling for maternal and gestational age, the association between maternal chronic hypertension and long-term respiratory morbidity of the offspring was no longer significant (**Table**).

Conclusion: In our cohort, although the crude rates of respiratory morbidity are higher for exposed offspring, careful analysis found that maternal chronic hypertension is not an independent risk factor for offspring long-term respiratory morbidity.

Figure. Kaplan-Meier survival curve demonstrating the cumulative incidence of respiratory morbidity in children exposed and unexposed to maternal chronic hypertension

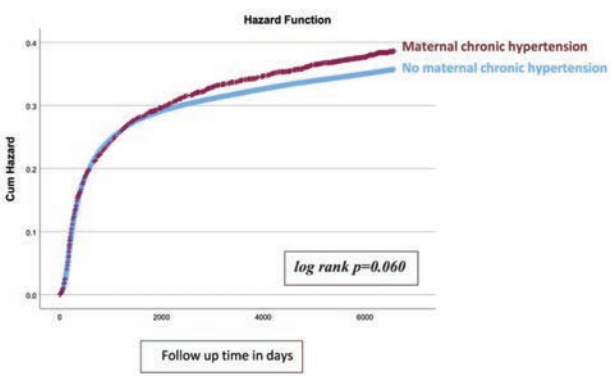

Table. Long-term respiratory morbidity of children born to mothers with and without chronic hypertension: crude and adjusted hazards ratio (HR)

	Maternal chronic hypertension (n=3,097)	No maternal chronic hypertension (n=339,538)	Odds ratio (95%CI)	Adjusted* HR (95%CI)
Total respiratory morbidity, n (%)	936 (30.2%)	89,829 (26.5%)	1.20 (1.11 – 1.30)	1.03 (0.96 – 1.09)

205 | Postpartum Hemorrhage Risk in Patients with a Low-Lying Placenta: A Systematic Review and Meta-Analysis

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10:30 AM - 12:30 PM

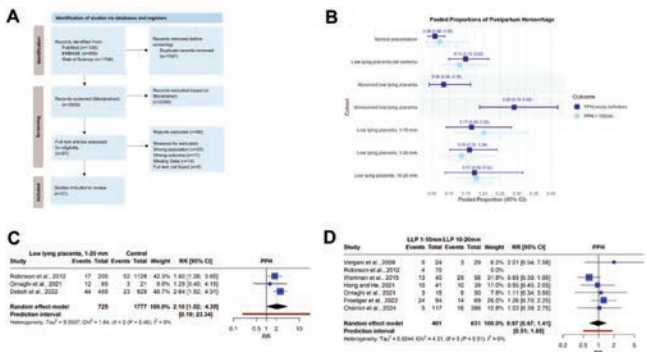
Objective: Postpartum hemorrhage (PPH) is a major cause of maternal morbidity and mortality. We hypothesized that low-lying placenta (LLP) imparts underappreciated risk for PPH. We conducted a **systematic review and meta-analysis to quantify the PPH risk accompanying an antepartum diagnosis of LLP**.

Study Design: We systematically searched PubMed, Embase, and Web of Science (inception - 4/30/2024) and included RCTs, prospective and case-control studies per PICO framework: **Population - singleton pregnancies; Intervention - low-lying placenta; Comparators - normal placentation (non-LLP); Outcomes - PPH and Placenta Accreta Spectrum (PAS) disorders (Fig.1A).** Subgroup analyses by cervical os distance and resolution status were conducted. The Newcastle-Ottawa Scale was used to assess study quality. Risk Ratios (RRs) and pooled proportions were computed using R. PROSPERO registration: CRD42024558043.

Results: We included 21 studies (n = 3,704 LLP, n = 2,555 normal placenta). **Antepartum diagnosis of LLP, at any gestational age, imparted a significant PPH risk** (RR 2.10, 95% CI 1.02-4.35, p = 0.0477, I^2 = 0%; Fig.1B). PPH incidence was 15% (95%

CI 10-22%, I^2 = 93%) in LLP versus 6% (95% CI 4-9%, I^2 = 83%) in non-LLP. **When parsed by clinically meaningfully strata, significant risk of PPH persisted with resolved LLP** (resolved 8%, 95% CI 4-16%, I^2 = 85% vs unresolved 29%, 95% CI 19-42%, I^2 = 71%; Fig.1B) with **no difference in PPH risk at under 2cm from the os (LLP 1-10 mm** vs 10-20 mm; RR 0.97, 95% CI 0.67-1.41, p = 0.84, I^2 = 0%; Fig.1C, D). Importantly, PAS disorders affected 9% (95% CI 5-17%, I^2 = 89%) of all LLP cases.

Conclusion: **Antepartum diagnosis of LLP, including presumptively resolved cases, is associated with a twofold increased risk of PPH when compared to pregnancies without LLP.** This is the first meta-analysis to reliably quantify the risk of LLP, emphasizing a previously underrecognized role of rigorous monitoring and delivery management of pregnancies with LLP in reducing the burden of PPH on maternal morbidity.



206 | Association between Maternal Age at First Delivery and Long-term Risk for Cardiac Morbidity

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10:30 AM - 12:30 PM

Objective: While the global trend of advanced maternal age at first delivery is on the rise, the potential long-term risk for the mothers is yet to be fully elucidated. In our study, we have sought to examine the association between advanced maternal age at first delivery and maternal cardiac morbidity.

Study Design: A population-based cohort analysis was conducted including all primigravida at a tertiary hospital occurring between 1991 to 2021 divided by four groups of ages (less than 30 years, between 30-35, 35-40 and older than 40 years). Data were collected from medical records according to pre-defined ICD-9 codes. Cardiac outcomes were compared and analyzed. Women with prior cardiac disease were excluded. A Kaplan-Meier survival curve was used to assess cumulative cardiac morbidity. A Cox proportional hazards model was used to control for confounders.

Results: Out of the 74,543 primigravida included in the study, 1187 women had their first delivery when they were at the ages of 35-40 and 315 were older than 40 years. A linear correlation was found with regard to maternal age at first delivery and cardioac morbidity, showing increasing cumulative incidence of cardiac morbidity with the highest risk for women that delivered first over the age of 40 (Kaplan-Meier log-rank p < 0.001; Figure). This correlation was significantly found in the univariable analysis for overall cardiovascular disease (16.5% vs. 10.3%) and moreover, for specific related diagnoses such as hypertension (10.6% vs. 3.3%) and ischemic heart disease (1.1% vs. 0.2%) (p < 0.001 for all, **Table**). A Cox proportional hazards model confirmed that maternal age at first pregnancy is an independent risk factor for cardiovascular morbidity of the mother, and that the risk is higher as maternal age advanced at the first pregnancy (**Table**). regarding mothers age reaching a peak in women that give birth for the first time after the age of forty (adjusted HR = 1.96, 95% CI 1.45–2.63, p < 0.001; **Table**).

Conclusion: Maternal age at first delivery in an independent risk factor for cardiac morbidity later in life.

Figure. The association between maternal age at first delivery and long-term cardiac morbidity of the mother: Univariate analysis, Kaplan-Meier survival curve

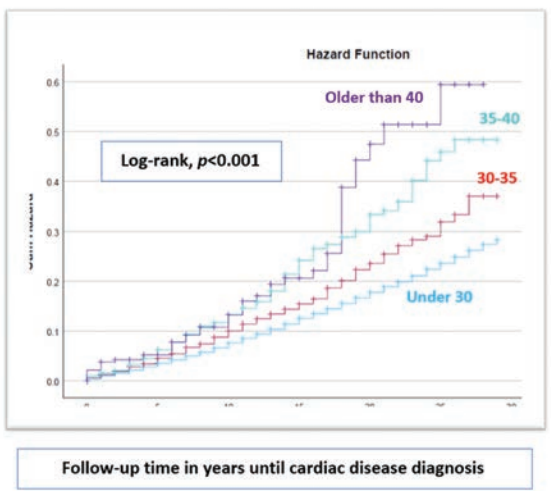

Table. Comparison of long-term cardiac morbidity of the mothers divided by age at first delivery.

Maternal age, years	<30 (n=68,216)	30-35 (n=4867)	35-40 (n=1187)	>40 (n=273)	*p* value
Hypertension	3.3%	5.4%	9.6%	10.6%	<0.001
Arrhythmia	7.4%	5.9%	6.8%	7.7%	0.002
Ischemic heart disease	0.2%	0.4%	0.5%	1.1%	<0.001
Pulmonary heart disease	0.2%	0.1%	0.5%	0.4%	0.024
Total cardiac morbidity	**10.3%**	**10.5%**	**14.4%**	**16.5%**	**<0.001**
Adjusted HR (95% CI) *	1 (reference)	1.32 (1.20-1.45)	1.76 (1.50-2.05)	1.96 (1.45-2.03)	

* Each age group is adjusted to maternal age under 30, as well as to fertility treatments and ethnicity.

***p* value<0.001 for all.**

207 | Racial and Health Care Disparities of Pregnancies Affected by Late Stillbirth

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10:30 AM - 12:30 PM

Objective: Late stillbirths are commonly defined as fetal demises occurring after 28 weeks and may potentially be preventable in high risk pregnancies with antenatal testing. Our objectives were to analyze the rate of late stillbirth and assess the influence of varying types of insurance coverage and race on late stillbirth.

Study Design: A retrospective review of late stillbirths over a 2 year period was performed. Demographics, sonograms, and risk factors for stillbirth were abstracted. Patients were divided into three groups (group 1: patients with PPO and HMO insurance, group 2: patients with Medicaid insurance, and group 3: patients with managed care Medicaid insurance). The overall late stillbirth rate was calculated as were the rates of late stillbirth for each group. Potentially preventable late stillbirths were defined as those in which no antenatal testing was performed within a week of the stillbirth.

Results: A total of 6108 pregnancies with 61102 antepartum tests were analyzed. There were 42 late stillbirths with an overall late stillbirth rate of 6.87 per 1000 births. Group 1 had the lowest late stillbirth rate of 3.26 per 1000 births (8/2452) and group 2 had a late stillbirth rate of 6.57 per 1000 (12/1825) births. Group 3 had a late stillbirth rate of 12.01 per 1000 births (22/1831). There was a greater proportion of patients in group 2 and group 3 with three or more risk factors for stillbirth (736/1825 = 40.3% and 786/1831 = 42.9%) than in group 1 (17.9%), $p < 0.05$. There were no potentially preventable late stillbirths in group 1 whereas there were 5 potentially preventable late stillbirths in group 2 and 13 potentially preventable late stillbirths in group 3. One out of 8 late stillbirths in group 1 was African American, in comparison to 6/12 in group 2 and 12/22 in group 3 ($p < 0.05$).

Conclusion: Health care disparities with respect to the late stillbirth rate exist, with a higher rate being seen in the indigent and African American population as well as in those with Medicaid and managed care Medicaid insurance. Future research should focus on efforts to address these healthcare inequities.

208 | Statewide Utilization of Telemedicine for Prenatal Care Visits

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[1]Texas A&M University School of Engineering Medicine; [2]University of Michigan Medical School, Ann Arbor, MI; [3]University of Michigan, Ann Arbor, MI; [4]Michigan Medicine, Ann Arbor, MI

10:30 AM - 12:30 PM

Objective: To investigate statewide telemedicine practices for prenatal care, including barriers and facilitators of widespread adoption.

Study Design: Prenatal care providers were identified across Michigan through systematic web searches and snowball sampling. Semi-structured surveys assessed prenatal care practices, including use of telemedicine or not and modalities employed. We evaluated telemedicine utilization across clinic characteristics: clinic type, number of patients served, region, EHR type used, and insurance type limitations. Free-response questions about perceived barriers and facilitators of telemedicine implementation were summarized using qualitative content analysis. Funding support from Blue Cross Blue Shield of Michigan.

Results: In total, 19 clinics representing 8/10 state designated prosperity regions completed the survey, with an average of 408 (range 20-1700) patients per site. Telemedicine prenatal visits were offered at 13/19 (68.4%) clinics, of which, 5 offered video-only, 1 offered telephone-only, and 7 offered both. Fewer clinics that had restrictions on patient enrollment (e.g., do not accept patients with Medicaid) utilized telemedicine, but telemedicine availability did not differ across clinic types (Table 1). Key implementation barriers included provider willingness, patient comfort with/access to technology, scheduling, and lack of patient-provider connection through telemedicine. Facilitators were COVID-19 initiatives, time savings, existing telemedicine infrastructure, and training.

Conclusion: While stakeholders identified numerous advantages to the implementation of telemedicine in prenatal care, both infrastructure and interpersonal barriers exist. Realizing the potential improvements in accessibility, convenience, and efficiency for all patients requires thoughtful implementation across varied care settings.

Table 1: Care Sites that Offer Telemedicine by Clinic Characteristics

	Telemedicine		p value**
	Offer (n=13)	Do Not Offer (n=6)	
Clinic Type			
FQHC	4	5	p = 0.13
Outpatient	7	0	
Private practice	2	1	
Number of patients served (n=13)			
<50	1	1	p = 0.49
50-100	0	1	
100-400	3	2	
>400	4	1	
Region			
2	2	0	p = 0.08
4	2	0	
5	2	0	
6	2	0	
7	1	0	
8	0	2	
9	0	2	
10	4	2	
EHR Type			
National (EPIC/Cerner)	8	3	p = 0.64
Local (Other)	5	3	
Patients served*			
No limits	11	2	p = 0.03
Limits	2	4	

FQHC=Federally Qualified Health Center; EHR=Electronic Health Record

*Refers to the insurance type accepted by the clinic. Limits include not accepting patients with Medicaid or no insurance

**Tests of comparison performed with Chi Square

209 | Association of Chorionicity and Severe Maternal Morbidity in Twin Pregnancies

Heather N. Czarny[1]; Amanda M. Baucom[2]; Isabella Toledo[3]; Braxton Forde[1]; Robert M. Rossi[1]

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10:30 AM - 12:30 PM

Objective: Twin gestations are associated with higher risks for adverse neonatal and perinatal outcomes, with chorionicity known to influence these risks. However, the impact of

chorionicity on severe maternal morbidity (SMM) is unclear. This study assessed the risk of SMM and obstetric complications by chorionicity in twin gestations.

Study Design: Population-based, retrospective cohort study of U.S. delivery hospitalizations from 2015-2021 using the National Inpatient Sample database. ICD-10 codes identified delivery hospitalizations, chorionicity, and outcomes. SMM was defined by the CDC criteria (excluding transfusion) and individual indicators grouped by organ system. The primary objective was to compare SMM risk by chorionicity in twin versus singleton gestations, with secondary analysis of obstetric complications. Adjusted relative risks (aRR) and 95% confidence intervals (CI) were estimated using multivariate logistic regression.

Results: Of 22,482,597 delivery hospitalizations, 98.5% were singleton, 0.3% monochorionic and 1.2% dichorionic twins. SMM risk was higher in mono- (1.9%, aRR 2.07, 95% CI 1.81-2.37) and dichorionic (2.3%, aRR 2.38, 95% CI 2.23-2.53) gestations compared to singletons (0.8%), however, composite SMM did not vary by chorionicity. Eclampsia, thromboembolic SMM, and hysterectomy risk was significantly increased in dichorionic twins (aRR 2.25, 95% CI 1.84-2.76; aRR 1.51, 95% CI 1.13-2.01; aRR 2.31, 95% CI 1.99-2.68) compared to singletons, but did not differ by chorionicity (Figure 1). Cesarean section risk was elevated in both mono- (aRR 8.43, 95% CI 8.09-8.79) and dichorionic (aRR 8.89, 95% CI 8.69-9.10) twins compared to singletons. Monochorionicity had the highest risk for vasa previa (aRR 8.25, 95% CI 6.43-10.6) and intrauterine fetal demise (aRR 8.93, 95% CI 8.29-9.63), while dichorionicity had the highest risk of severe preeclampsia (aRR 3.22, 95% CI 3.12-3.31) (Figure 2).

Conclusion: SMM risk is higher in twin gestations compared to singletons, but SMM risk is not altered by chorionicity. This is valuable information for maternal counseling in the setting of twin pregnancy.

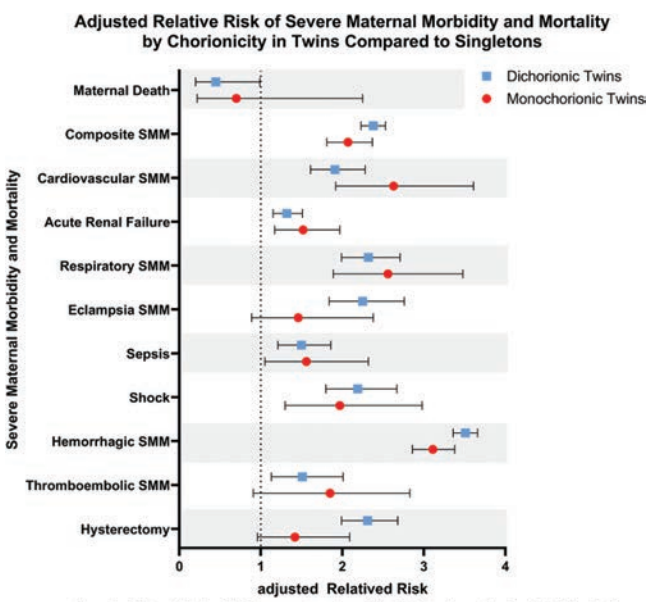

Figure 1. Adjusted relative risk of severe maternal morbidity (SMM) and mortality by chorionicity in twin compared to singleton pregnancies (dotted line). Composite SMM indicates any event falling within the following categories (excluding blood transfusion): Cardiac SMM (acute myocardial infarction, aneurysm, cardiac arrest or ventricular fibrillation, conversion of cardiac rhythm, heart failure or arrest during surgery, puerperal cerebrovascular disorders, pulmonary edema or acute heart failure), acute renal failure, respiratory SMM (adult respiratory distress syndrome, temporary tracheostomy, ventilation, severe anesthesia complications), eclampsia, sepsis, shock, hemorrhagic SMM (blood transfusion, disseminated intravascular coagulation), thromboembolic SMM (air and thrombotic embolism, sickle cell disease with crisis, amniotic fluid embolism), and hysterectomy.

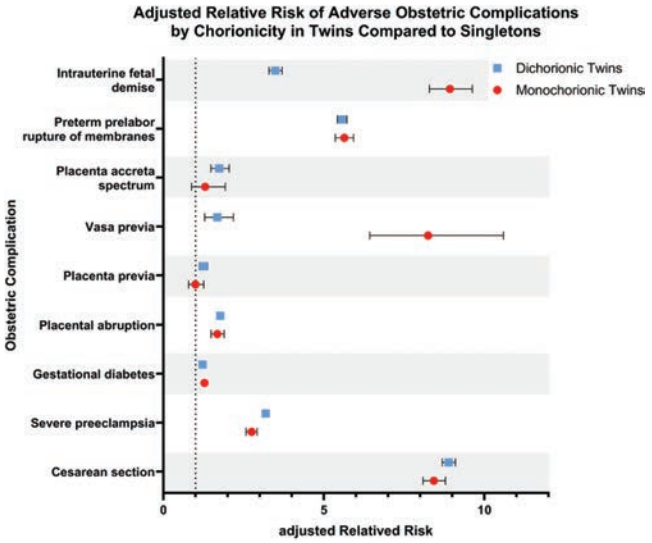

Figure 2: Adjusted relative risk of adverse pregnancy outcomes by chorionicity in twins compared to singleton gestations (dotted line).

210 | Severe Maternal Morbidity and Mortality With Periviable and Preterm Birth

Heather N. Czarny[1]; Stefany Hernandez[1]; Isabella Toledo[2]; Elizabeth Kelly[1]; William Moravec[1]; Carri Warshak[1]; Emily A. DeFranco[3]; Robert M. Rossi[1]

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10:30 AM - 12:30 PM

Objective: Preterm and periviable birth are associated with adverse maternal outcomes, yet the association between severe maternal morbidity (SMM) and mortality risk with gestational age at delivery is limited. We aimed to assess the risk of SMM among those with periviable or preterm birth.

Study Design: This was a population-based cohort study of U.S. delivery hospitalizations from 2015-2021 using data from the National Inpatient Sample database. ICD-10 codes were used to identify delivery hospitalizations and gestational age at delivery. SMM was defined by CDC criteria (excluding transfusion). The primary outcome was the risk of SMM and mortality in patients with a periviable (20-25 weeks) or preterm (26-36 weeks) compared to term (37-42 weeks) birth. Secondary analyses included risk assessment by organ system-based SMM indicators. Subgroup analyses of outcomes were also performed for 3-week gestational age groupings (i.e. 20-22 weeks). Adjusted relative risks (aRR) were estimated using multivariable logistic regression analysis.

Results: Among 22,193,863 delivery hospitalizations, 0.6% were periviable, 9.4% preterm, and 90.0% term births. The rate and risk of SMM and mortality were significantly higher with periviable (4.4%, aRR 6.7, 95% CI 6.3-7.2 and 0.1%, aRR 27.0, 95% CI 17.1-42.6, respectively) and preterm birth (2.3%, aRR 3.5, 95% CI 3.4-3.7 and 0.03%, aRR 8.7, 95% CI 6.4-11.7, respectively) compared to term (0.5% and 0.0027%). Risk for nearly all individual morbidity indicators were increased with periviable or preterm birth (Figure 1). Periviable birth was associated with the highest risk of cardiovascular, renal, respiratory, sepsis, shock, and hemorrhagic

events, while preterm birth had the highest risk of eclampsia. Previable deliveries (20-22 weeks) had a disproportionate burden of maternal death among those with an SMM event (Figure 2).

Conclusion: Periviable and preterm deliveries are associated with increased risk of SMM and mortality compared to term deliveries. This study highlights the substantial dual burden of preterm and periviable delivery on patients and their infants.

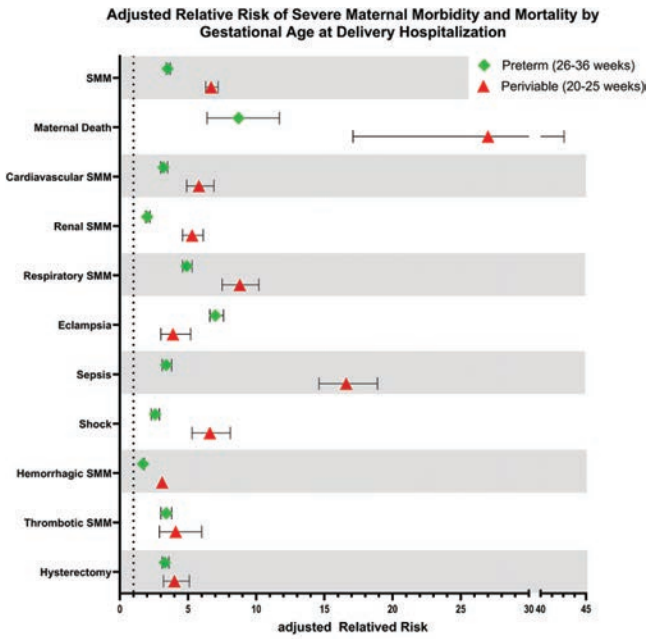

Figure 1: Adjusted relative risk of severe maternal morbidity (SMM), maternal death, and SMM indicator category in perivable (20-25 weeks) and preterm (26-36 weeks) births at delivery hospitalization compared to term births (37-40 weeks, dotted line). SMM indicates any event falling within the following categories (excluding blood transfusion): Cardiac SMM (acute myocardial infarction, aneurysm, cardiac arrest or ventricular fibrillation, conversion of cardiac rhythm, heart failure or arrest during surgery, puerperal cerebrovascular disorders, pulmonary edema or acute heart failure), acute renal failure, respiratory SMM (adult respiratory distress syndrome, temporary tracheostomy, ventilation, severe anesthesia complications), eclampsia, sepsis, shock, hemorrhagic SMM (blood transfusion, disseminated intravascular coagulation), thrombotic SMM (air and thrombotic embolism, sickle cell disease with crisis, amniotic fluid embolism), and hysterectomy.

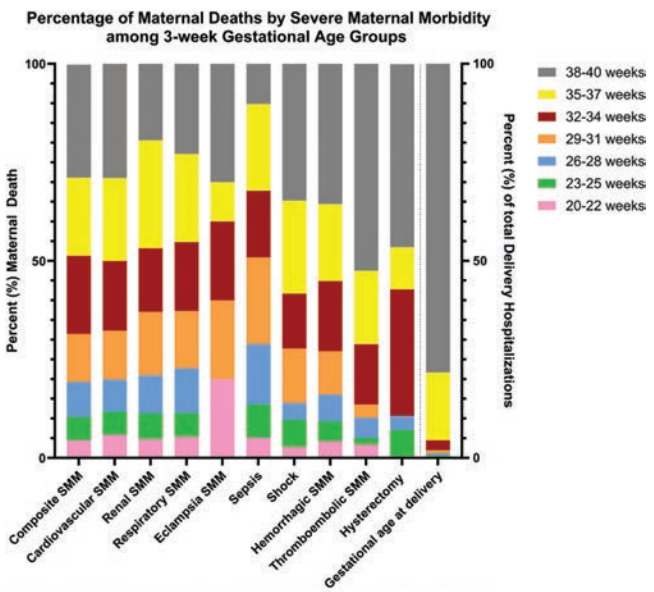

Figure 2: Percentage of maternal deaths within each category of severe maternal morbidity (SMM) by 3-week gestational age group at delivery hospitalization. Total population by 3-week gestational age group proportion indicated on the far right as comparison. Composite SMM includes all of the following SMM indicators (except blood transfusion): Cardiac SMM (acute myocardial infarction, aneurysm, cardiac arrest or ventricular fibrillation, conversion of cardiac rhythm, heart failure or arrest during surgery, puerperal cerebrovascular disorders, pulmonary edema or acute heart failure), acute renal failure, respiratory SMM (adult respiratory distress syndrome, temporary tracheostomy, ventilation, severe anesthesia complications), eclampsia, sepsis, shock, hemorrhagic SMM (blood transfusion, disseminated intravascular coagulation), thromboembolic SMM (air and thrombotic embolism, sickle cell disease with crisis, amniotic fluid embolism), and hysterectomy.

211 | Age as an Independent Risk Factor for Cesarean Delivery

Hillary Kroll[1]; Elena Martinez[2]; Jane C. Lin[3]
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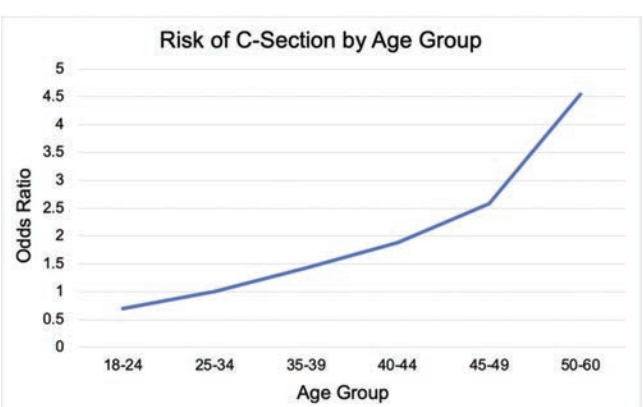
10:30 AM - 12:30 PM

Objective: Few studies have examined the impact of maternal age on risk of C-section, especially at very advanced maternal ages. We sought to evaluate the association between maternal age at delivery and risk of C-section.

Study Design: This is a multicenter retrospective cohort study within a large integrated healthcare system. We examined all live births that occurred between 2012-2022. We excluded preterm deliveries, multifetal gestations, scheduled C-sections, patients with infrequent prenatal care, and patients not between the ages of 18-60 years old. We carried out a logistic regression analysis adjusted for race and ethnicity, parity, BMI, hypertension, pre-eclampsia, gestational diabetes, pre-gestational diabetes, fetal distress, fetal growth restriction, large for gestational age fetuses, macrosomia, APGAR scores, chorioamnionitis, meconium staining, and pregnancies resulting from assisted reproductive technology. We compared the risk of C-section in 5-year age intervals to a reference group of ages 25-34 using odds ratios.

Results: A total of 328,145 participants were included in the study. The rate of C-section in the reference group was 16.1%. The age range of 18-24 years old had a C-section rate of 13% with an odds ratio of 0.7 (95% CI [0.68, 0.72]), yielding a 30% decreased risk of C-section compared to the reference group. The rate of C-section in 35-39-year-olds was 20.7% with an odds ratio of 1.43 (95% CI [1.40, 1.47]) or a 43% increased risk of C-section. The rate of C-section in 40-44-year-olds was 25.7% with an odds ratio of 1.88 (95% CI [1.80, 1.96]) or an 88% increased risk of C-section. The rate of C-section in 45-49-year-olds was 33.5% with an odds ratio of 2.58 (95% CI [2.21, 3.01]) or a 158% increased risk of C-section. The rate of C-section in 50-60-year-olds was 50% with an odds ratio of 4.54 (95% CI [2.55, 8.06]) or a 354% increased risk of C-section.

Conclusion: After adjusting for other factors, age appears to be an independent risk factor for C-section. The risk of C-section increases with increasing age.



212 | Association of Hemoglobin A1c and Glycosylated Albumin with Adverse Neonatal Outcomes in Gestational Diabetes

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[1]NHO Nagasaki Medical Center, Omura City, Nagasaki; [2]NHO Nagasaki Medical Center, Omura-City, Nagasaki; [3]Kameda Medical Center, Kamogawa, Chiba; [4]Juntendo University, Tokyo

10:30 AM - 12:30 PM

Objective: The predictive value of hemoglobin A1c (HbA1c) and glycosylated albumin (GA) levels for neonatal outcomes in women with gestational diabetes mellitus (GDM) remains controversial. This study aimed to investigate the association between these biomarkers and neonatal composite adverse outcomes and determine if this association depends on gestational age.
Study Design: This retrospective study used the GDM clinical database of a tertiary perinatal care center in Japan. We included singleton pregnant women who had biomarker measurements during late pregnancy, after 30 weeks of gestation (WG). Biomarkers were measured monthly and collected within a three-week window for the periods of 31-33 WG, 33-36 WG, and 37-39 WG. Neonatal composite adverse outcomes included large-for-gestational-age infants, asphyxia, hypoglycemia, respiratory issues, and hyperbilirubinemia. A receiver operating characteristic curve was used to establish a cutoff value. We adjusted for body mass index, insulin therapy, gestational week at diagnosis and delivery, gestational weight gain, and hemoglobin values at 35 WG in assessing the association between the biomarkers and the composite adverse outcomes.
Results: Among 460 neonates, 103 (22%) experienced composite adverse outcomes. HbA1c values at 34-36 WG were significantly associated with composite outcomes, with crude and adjusted odds ratios of 2.58 (95% confidence interval 1.36-4.86) and 2.36 (1.21-4.61) with a cutoff value of 5.9%, respectively. HbA1c values in the other two windows were not associated with adverse outcomes. GA values in any gestational week window showed no significant association with composite adverse outcomes.
Conclusion: In women with GDM, HbA1c values at 34-36 WG were predictive of neonatal composite adverse outcomes. An HbA1c value of < 5.9% by 33 WG was associated with favorable outcomes, while GA measurements in any gestational week window were not useful.

213 | Association between Early Postpartum Appendicular Skeletal Muscle Mass Volume and Insulin Resistance during Pregnancy

Megumi Koga[1]; Katsuhito Hayashi[2]; Ichiro Yasuhi[3]
[1]NHO Nagasaki Medical Center, Omura City, Nagasaki; [2]Ureshino Medical Center, Ureshino, Saga; [3]NHO Nagasaki Medical Center, Omura-City, Nagasaki

10:30 AM - 12:30 PM

Objective: Reduced appendicular skeletal muscle (ASM) mass is linked to insulin resistance and a higher risk of type 2 diabetes, especially in non-obese women. However, the association between ASM volume and insulin dynamics during pregnancy is unclear. This study aimed to investigate if early postpartum ASM is associated with insulin resistance during pregnancy.
Study Design: We conducted a prospective observational study on the association between postpartum trunk and ASM volume and low back pain in Japanese singleton pregnant women recruited at 35 weeks' gestation. ASM was measured using the impedance method (Tanita MC780A-N) at four weeks postpartum. ASM/body mass index (BMI) was calculated as an ASM volume index. We included women who underwent an oral glucose tolerance test (OGTT) during pregnancy due to a positive gestational diabetes (GDM) screen. During the OGTT, HbA1c, fasting, and postprandial insulin levels were measured to calculate the homeostatic model assessment for insulin resistance (HOMA-IR) and the insulin sensitivity index (ISI). We examined the association between ASM/BMI and fasting glucose, HbA1c, and insulin sensitivity indices during pregnancy.
Results: We included 226 women who underwent an OGTT at 25 weeks' gestation. Postpartum ASM/BMI was significantly and negatively correlated with fasting glucose ($r^2 = 0.04$, $p = 0.0042$), HbA1c ($r^2 = 0.04$, $p = 0.0045$), and HOMA-IR ($r^2 = 0.20$, $p < 0.001$), while positively correlated with ISI ($r^2 = 0.16$, $p < 0.0001$). These correlations remained significant after controlling for age, gestational age at OGTT, and GDM status. ASM/BMI < 25th percentile was associated with >75th percentile HOMA-IR and < 25th percentile ISI, with adjusted odds ratios (95% confidence interval) of 6.27 (3.15-12.90) and 4.73 (2.40-6.57), respectively.
Conclusion: This is the first report demonstrating that early postpartum ASM volume is associated with hyperglycemia and insulin resistance during pregnancy. Reduced ASM volume may contribute to gestational glucose intolerance.

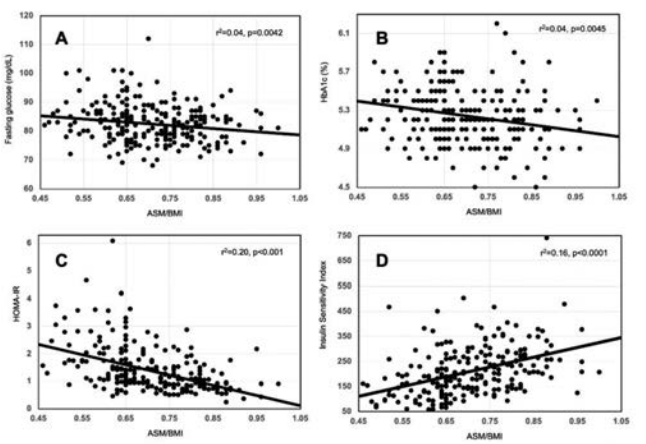

Figure. Relationship between early postpartum ASM/BMI and fasting glucose (**A**), HbA1c (**B**), HOMA-IR (**C**), and ISI (**D**) during pregnancy

ASM, appendicular skeletal muscle; BMI, body mass index; HOMA-IR, homeostatic model assessment for insulin resistance; ISI, insulin sensitivity index

214 | Early Pregnancy Metal Levels in Maternal Blood and Pregnancy Outcomes

Ifat Baram Goldberg[1]; Eyal Sheiner[2]; Maayan Hagbi Bal[3]; Doron Bergman[3]; Ron Rosenbaum[3]; Ayal Haimov[4]; Noam Tomasis Damri[3]; Tamar Wainstock[2]
[1]Ben Gurion University Of The Negev, beer sheva, HaDarom; [2]Department of Obstetrics and Gynecology, Soroka University Medical Center, Ben-Gurion University of the Negev, Beer-Sheva, Israel., Beer Sheva, HaDarom; [3]Ben Gurion University of the

Negev, Beer Sheva, HaDarom; [4]Ben Gurion University of the Negev, Ramat Gan, HaMerkaz

10:30 AM - 12:30 PM

Objective: This study examines the association between early pregnancy maternal blood levels of Lead (Pb), arsenic (As), cadmium (Cd), and selenium (Se) and adverse pregnancy outcomes, while also addressing the differences between low-risk and high-risk groups based on having a history of preterm birth (PTB).

Study Design: This prospective cohort study recruited multigravida women at 11-13 gestational weeks, categorized into low-risk and high-risk groups. Participants completed a questionnaire, and heavy metal levels were measured in blood samples. Pregnancy outcomes were recorded following delivery. Multivariable analyses were conducted to evaluate the independent associations between heavy metal levels and pregnancy outcomes, while adjusting for variables associated with the metals levels based on the univariable analyses.

Results: Among 404 participants, the mean (±SD) levels were Pb: 3.12±1.82 µg/L, As: 0.41±0.4 µg/L, Cd: 0.26±0.34 µg/L, and Se: 119.84±21.05 µg/L. Significant differences in Pb, Se, Cd and As levels were observed between the low-risk and high-risk groups, with higher levels in the low-risk group. However, no significant associations were found between heavy metal levels and PTB, low birth weight (LBW), gestational age at delivery, birth weight, and head circumference in either univariable comparison or multivariable models, which adjusted for maternal age, BMI, employment, smoking, fertility treatments, and education.

Conclusion: While significant differences in heavy metal levels were found between low-risk and high-risk groups, early pregnancy heavy metal levels showed no association with adverse pregnancy outcomes. These findings highlight the need for further research to understand the potential impact of these metals on pregnancy, considering population-specific factors and exposure timing.

Table 1- Maternal mean ±SD levels of the studied metals by history of PTB

Heavy metal level mean±SD (µg/L)	Low risk	High risk	P-value
Pb	3.58±2.02 (n=189)	2.7±1.49 (n=187)	<0.001
Se	122.7±22.25 (n=201)	117±19.43 (n=203)	0.006
Sqrt_Cd*	0.5±0.26 (n=198)	0.36±0.26 (n=192)	<0.001
Sqrt_As*	0.62±0.31 (n=198)	0.51±0.32 (n=203)	<0.001

*Square root transformation was applied to achieve normal distribution

215 | Maternal Morbidity and Mortality at Delivery Hospitalization Among Patients with Cardiac Disease

Isabella Toledo[1]; Heather N. Czarny[2]; Emily A. DeFranco[3]; Carri Warshak[2]; Robert M. Rossi[2]

[1]*Indiana University School of Medicine, Indianapolis, IN;* [2]*University of Cincinnati College of Medicine, Cincinnati, OH;* [3]*Department of Obstetrics and Gynecology, University of Kentucky, Lexington, KY*

10:30 AM - 12:30 PM

Objective: Cardiovascular disease (CVD) is associated with maternal mortality and adverse perinatal outcomes. Although cardiac outcomes in pregnancy are well defined in those with CVD, there are limited studies evaluating the risk of non-cardiac severe maternal morbidity (SMM). We evaluated the prevalence and association of CVD and SMM.

Study Design: This was a population-based, retrospective cohort study of U.S. delivery hospitalizations from 2010-2020 utilizing the National Inpatient Sample database. International Classification Diagnoses codes (9th and 10th edition) identified delivery hospitalizations and pre-existing CVD. SMM was defined by the Centers for Disease Control and Prevention criteria. Adjusted relative risks (aRR) and 95% confidence intervals (CI) were estimated using multivariate logistic regression analyses. Subgroup analyses were performed by CVD subtype, race and ethnicity, and individual SMM indicators.

Results: Among the 38,374,326 deliveries included in this study, 203,448 (0.5%) had CVD. CVD was associated with an increased risk of SMM (aRR 12.5, 95% CI 12.0-13.1) and maternal death (aRR 44.1, 95% CI 35.4-55.0) compared to those without CVD. Risk for each individual SMM indicator was increased among those with CVD. Those with chronic heart failure had the highest risk of SMM (aRR 354, 95% CI 301-417) and death (aRR 688, 95% CI 525-902), while those with non-rheumatic valvular heart disease (SMM: aRR 8.1, 95% CI 7.5-8.8; death: aRR 23.9, 95% CI 15.9-35.7) had the lowest risk. Black individuals in this study had a disproportionately increased burden of high-risk cardiac lesions and had the highest SMM risk (aRR 15.9, 95% CI 14.7-17.1). CVD accounted for 7.3% (95% CI 7.1-7.6) of the observed SMM in the study population, as calculated by the population attributable risk (PAF) and was associated with more than 1 in 3 maternal deaths at delivery hospitalization.

Conclusion: CVD in pregnancy is associated with a nearly 5-fold increased risk of non-cardiac-related SMM and 44-fold increased risk of death, with Black individuals bearing a disproportionate risk for SMM.

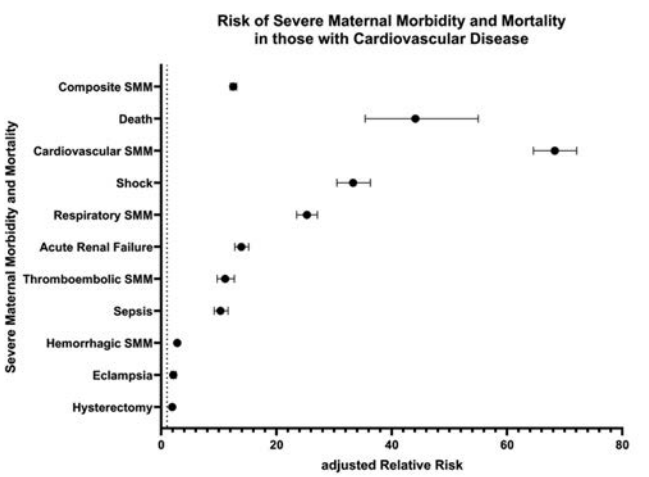

Figure 1: Adjusted relative risk of severe maternal morbidity (SMM) and mortality in those with cardiovascular disease compare to those without at delivery hospitalization. Composite SMM indicates any event falling within the following categories (excluding blood transfusion): Cardiac SMM (acute myocardial infarction, aneurysm, cardiac arrest or ventricular fibrillation, conversion of cardiac rhythm, heart failure or arrest during surgery, puerperal cerebrovascular disorders, pulmonary edema or acute heart failure), acute renal failure, respiratory SMM (adult respiratory distress syndrome, temporary tracheostomy, ventilation, severe anesthesia complications), eclampsia, sepsis, shock, hemorrhagic SMM (blood transfusion, disseminated intravascular coagulation), thrombotic SMM (air and thrombotic embolism, sickle cell disease with crisis, amniotic fluid embolism), and hysterectomy.

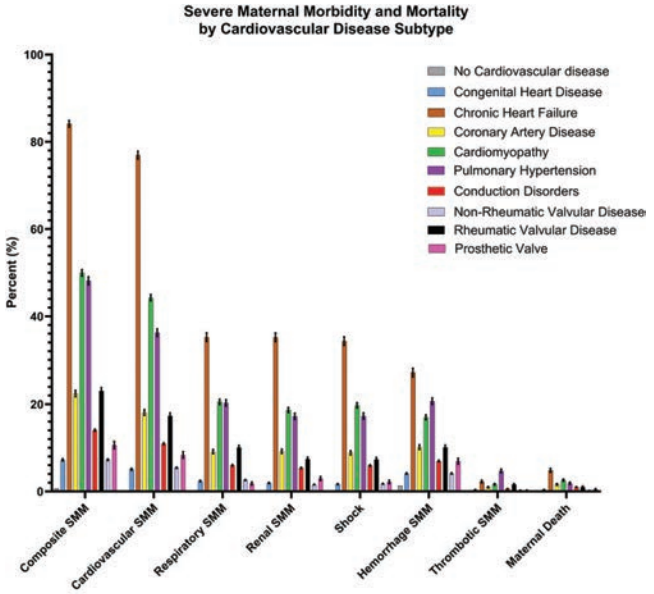

Figure 2: Incidence of severe maternal morbidity (SMM) indicator and mortality by cardiovascular disease subtype. Error bars represent 95% confidence intervals. Composite SMM includes all of the following SMM events (except blood transfusion): Cardiac SMM (acute myocardial infarction, aneurysm, cardiac arrest or ventricular fibrillation, conversion of cardiac rhythm, heart failure or arrest during surgery, puerperal cerebrovascular disorders, pulmonary edema or acute heart failure), acute renal failure, respiratory SMM (adult respiratory distress syndrome, temporary tracheostomy, ventilation, severe anesthesia complications), eclampsia, sepsis, shock, hemorrhagic SMM (blood transfusion, disseminated intravascular coagulation), thrombotic SMM (air and thrombotic embolism, sickle cell disease with crisis, amniotic fluid embolism), and hysterectomy.

216 | The Association between Term Stillbirth and Maternal Care Access at the US County Level

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10:30 AM - 12:30 PM

Objective: Access to comprehensive maternal care is associated with a reduction in stillbirth rates, yet maternal care access is decreasing across the US. We aim to study the association of maternal care access with stillbirth at term.

Study Design: This is a cross-sectional study using CDC Vital Statistics birth certificate data from 2016-2019. All non-anomalous, singleton births ≥ 37 weeks were included. Maternal care access level was defined by the 2020 March of Dimes Maternal Care Access Report County data using their classification of maternal care access (full, moderate, low, or desert), which is based on proximity to hospitals providing obstetric care, number of obstetric providers per 10,000 births, and percent of uninsured women. The primary outcome was stillbirth at term (≥ 37 weeks gestational age). Mixed effects multivariable models were used and adjusted for clinical, demographic and county level factors, including access to community resources using the CDC's Social Vulnerability Index (SVI).

Results: A total of 3,138 counties were included in this analysis with 1,100 (35%) of those counties located in maternity care deserts. Out of 13,304,743 births, term stillbirth occurred in 16,402 deliveries (0.12%); 13% of these stillbirths occurred in counties without full access to maternity care. In mixed effects multivariable models, there were increased odds of stillbirth in maternity care deserts (OR 1.13, 95% CI 1.04-1.22) when compared to full maternity care access. However, this was not statistically significant after adjusting for individual and county level factors (aOR 0.99, 95% CI 0.89-1.09).

Conclusion: More than a third of US counties are in maternal care deserts and 13% of term stillbirths occur in areas without full access to maternal care. Further studies are needed to identify underlying factors of maternal care access that may contribute to this adverse pregnancy outcome.

Table 1. Crude and Adjusted Odds Ratio of Stillbirth by Maternal Care Access Level at the US County Level from 2016-2019 (N= 13,304,743)

Still birth	OR (95% CI)	*p*-value	aOR (95% CI)[1]	*p*-value
Total Still Births				
Maternal care desert	1.13 (1.04 , 1.22)	0.003	0.99 (0.89 , 1.09)	0.89
Low access to maternal care	1.08 (0.99 , 1.16)	0.055	1.01 (0.93 , 1.09)	0.79
Moderate access to maternal care	1.07 (0.97 , 1.18)	0.19	1.06 (0.96 , 1.18)	0.24
Full access to maternal care	*Referent*	*Referent*	*Referent*	*Referent*

[1]Adjusted for advance maternal age (>35 years), BMI >30, GDM, diabetes, smoking, FGR, hypertensive disorders of pregnancy, rural county, SVI

217 | Prediction Model for Intrapartum Cesarean Delivery among Women with Gestational Diabetes Mellitus

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10:30 AM - 12:30 PM

Objective: To identify risk factors and develop a predictive model for intrapartum cesarean delivery (CD) in women with gestational diabetes mellitus (GDM).

Study Design: This retrospective cohort study was conducted at a university-affiliated tertiary medical center with approximately 12,000 deliveries annually from 2011-2023. Inclusion criteria included all patients with GDM who had a trial of vaginal delivery. Exclusion criteria included multiple gestations, non-viable fetuses, and elective cesarean delivery. Univariate and multivariate analyses compared characteristics of women delivering vaginally (control group) with those having intrapartum CD (study group). A risk prediction score model was developed.

Results:

1. Out of 11,817 women, 782 (6.6%) underwent intrapartum CD, while 11,605 (93.4%) delivered vaginally.
2. Independent risk factors for CD included: maternal age ≥40 years (OR = 1.9, 95%CI 1.4-2.6, p < 0.001); pre-gestational BMI >30kg/m^2 (OR = 1.4, 95%CI 1.1-1.8, p = 0.003); gestational weight gain >15kg (OR = 1.6, 95%CI 1.3-1.9, p < 0.001); maternal height < 1.6m (OR = 2.0, 95%CI 1.6-2.4, p < 0.001); nulliparity (OR = 4.0, 95%CI 3.2-5.2, p < 0.001); previous cesarean delivery (OR = 19, 95%CI 12.8-28.1, p < 0.001); induction of labor (OR = 2.7, 95%CI 2.2-3.3, p < 0.001); use of oxytocin (OR = 1.6, 95%CI 1.2-2.1, p < 0.001); antibiotics during labor (OR = 5.9, 95%CI 4.9-7.2, p < 0.001); preeclampsia (OR = 2.7, 95%CI 1.8-3.9, p < 0.001); birthweight ≥3,750g (OR = 1.6, 95%CI 1.2-2.0, p < 0.001); and male fetus (OR = 1.3, 95%CI 1.1-1.6, p = 0.003).

3. Reduced risk factors for intrapartum CD included previous VBAC (OR = 0.05, 95%CI 0.01-0.2, p < 0.001), and epidural analgesia (OR = 0.7, 95%CI 0.9-1.5, p = 0.005).
4. The score model demonstrated an AUC of 0.856 (95%CI 0.84-0.87, p < 0.001), with a cutoff score of 9, sensitivity of 82%, and specificity of 76%.

Conclusion: The predictive model for intrapartum CD in GDM patients aids caregivers in providing informed consultations and identifying high-risk patients for optimal delivery planning.

TABLE 1. Prediction Score Model for Intrapartum CD among Women with GDM.

Age ≥40 years	
Yes	2
No	0
BMI ≥30	
Yes	1.5
No	0
Gestational weight gain ≥15	
Yes	1.5
No	0
Nulliparity	
Yes	3
No	0
Maternal height < 1.6m	
Yes	2
No	0
Previous CD	
Yes	19
No	0
Previous VBAC	
Yes	
No	-20
	0
Induction of labor	
Yes	2.5
No	0
Epidural anesthesia	
Yes	-2
No	0
Oxytocin during labor	
Yes	1.5
No	0
Antibiotics during delivery	
Yes	6
No	0
Pre-eclampsia	
Yes	2.5
No	0
Birthweight ≥3,750 gram	
Yes	1.5
No	0
Male sex	
Yes	1.5
No	0

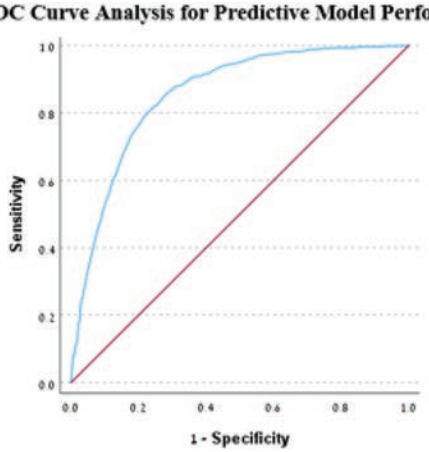
CUTOFF = 9

AUC 86%

Sensitivity 82%

Specificity 76%

Figure 1. ROC Curve Analysis for Predictive Model Performence



218 | Incidental Meconium-Stained Amniotic Fluid During Elective Cesarean Deliveries: A Potential Concern?

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10:30 AM - 12:30 PM

Objective: To evaluate the association of meconium-stained amniotic fluid (MSAF) incidentally found during elective cesarean delivery (CD) with maternal morbidity and adverse neonatal outcomes.

Study Design: A retrospective cohort study in a single university affiliated tertiary center with approximately 12,500 deliveries annually, including all women who underwent elective CD with singleton and twin pregnancies between 2011 and 2023. Data analysis encompassed demographic, pregnancy, intraoperative, postoperative and neonatal characteristics. Deliveries with clear amniotic fluid (CAF), MSAF, and thick MSAF were compared for singletons and twins.

Results:

1. During the study period, 13,111 patients with singleton pregnancies and 884 patients with twin pregnancies underwent elective CD.
2. The incidence of MSAF and thick MSAF was 452 (4.4%) and 21 (0.16%) in singleton deliveries and 14 (1.6%) and 2 (0.2%) in twin deliveries, respectively.
3. In singleton pregnancies, patients with MSAF underwent CD at a more advanced gestational age, were more likely to be nulliparous and have had no history of previous cesarean section compared with patients with CAF.
4. Intraoperative complications were comparable between the groups (Table 1).
5. Postoperative maternal morbidity did not differ between the groups, with similar rates of postpartum fever, need for RBC transfusion, postpartum hemorrhage, ICU admission, PE/DVT, surgical site infection, relaparotomy and readmission (Table 1).
6. In singleton pregnancies, NICU admission rates were higher in the thick MSAF group (24%) compared to CAF (3%) and MSAF (4%) groups (p < 0.001). (Table 2).
7. MSAF and thick MSAF remained a significant risk factor for NICU admission in multivariate analysis, with OR of 2.08 (CI 1.259 to 3.274) and 14.84 (CI 4.462 to 42.79), respectively.

Conclusion: In singleton pregnancies, a more advanced gestational age is associated with incidental MASF in elective CD. However, the later seem to not impact adverse maternal outcomes. In singleton pregnancies, MSAF is linked to increased risk of adverse neonatal outcomes.

Table 1: Intra- and Post-operative Maternal Complications in the Study Cohort.

	Clear amniotic fluid (n=12,638)	Meconium-stained amniotic fluid (n=452)	Thick meconium (n=21)	P-value
Surgery duration (minutes), median (IQR)	57.6 (44.0-67.0)	57.9 (43.0-67.7)	56.0 (42.0-70.5)	0.64
Inverted T incision, n (%)	7 (0%)	0 (0%)	0 (0%)	0.877
Hysterectomy, n (%)	3 (0%)	1 (0.2%)	0 (0%)	0.061
Red blood cell transfusion, n (%)	38 (0.3%)	2 (0.4%)	0 (0%)	0.838
Blood loss > 1000 ml, n (%)	178 (1.4%)	4 (0.9%)	0 (0%)	0.557
General anesthesia, n (%)	162 (1.3%)	4 (0.9%)	0 (0%)	0.664
Post-operative red blood cell transfusion, n (%)	94 (0.7%)	3 (0.7%)	0 (0%)	0.907
Postpartum hemorrhage, n (%)	348 (2.8%)	8 (1.8%)	0 (0%)	0.335
Postpartum fever, n (%)	59 (0.5%)	0 (0%)	0 (0%)	0.330
Surgical site infection, n (%)	45 (0.4%)	3 (0.7%)	0 (0%)	0.546
Pulmonary embolism, n (%)	4 (0.0%)	0 (0%)	0 (0%)	0.928
Deep vein thrombosis, n (%)	5 (0.0%)	1 (0.2%)	0 (0%)	0.206
Endometritis, n (%)	31 (0.2%)	1 (0.2%)	0 (0%)	0.970
Intensive care unit admission, n (%)	40 (0.3%)	1 (0.2%)	0 (0%)	0.908
Readmission within 6 weeks, n (%)	222 (1.8%)	11 (2.4%)	0 (0%)	0.466
Relaparotomy within 6 weeks, n (%)	37 (0.3%)	1 (0.2%)	0 (0%)	0.933
Composite maternal outcome, n (%)	503 (4.0%)	13 (2.9%)	0 (0%)	0.322

SD=standard deviation;

Composite maternal outcome = either of the following: post-operative red blood cell transfusion; postpartum hemorrhage (PPH); postpartum fever; surgical site infection (SSI); pulmonary embolism (PE); deep vein thrombosis (DVT); Endometritis; intensive care unit admission (ICU); readmission within 6 weeks, relaparotomy within 6 weeks

Table 2: Adverse Neonatal Outcomes in Singleton Pregnancies in the Study Cohort.

	Clear amniotic fluid (n=12,638)	Meconium-stained amniotic fluid (n=452)	Thick meconium (n=21)	P-value
Arterial PH< 7.1, n (%)	33 (0.3%)	1 (0.2%)	1 (5.0%)	<0.001
5-minutes Apgar <7	22 (0.2%)	2 (0.9%)	0 (0%)	0.415
RDS, n (%)	108 (0.9%)	0 (0%)	0 (0%)	0.130
NICU admission, n (%)	435 (3.4%)	20 (4.4%)	5 (1.1%)	<0.001
Neonatal death, n (%)	9 (0.1%)	1 (0.2%)	0 (0%)	0.521
Composite neonatal outcome, n (%)	537 (4.2%)	21 (4.6%)	5 (1.1%)	<0.001

RDS = Respiratory distress syndrome; NICU = Neonatal intensive care unit

Composite neonatal outcome = either of the following: arterial ph<7.1; 5-minutes Apgar<7, NICU admission, RDS, neonatal death

219 | Microplastic and Microparticle Pollutants in Fetal Growth Disorders

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10:30 AM - 12:30 PM

Objective: Microplastic and microparticle pollutants have been increasingly detected in a variety of human tissues including lung, gut, kidney, atherosclerotic plaque and the placenta. The effects of these microparticles on human health, reproduction, and development are poorly understood. We aimed to examine if the accumulation of microparticle pollutants contributes to fetal growth disorders.

Study Design: To investigate the effects of microplastics (MPs) and micropollutants on fetal growth disorders 150 term placenta samples were retrieved for analysis from the Hawaii Reproductive Biospecimen Repository. Samples were matched by gestational outcomes and clinical data. Samples included controls (n = 50), macrosomia (n = 50), and fetal growth restriction (n = 50). Samples were weighted (~13g), washed in glass-microfiltered water, and digested in glass-microfiltered 10% KOH solution for 7 days at room temperature. A rigorous environmental control protocol was utilized, where biospecimen tube effluents, bench-air-exposed glass filters, and working solution controls were analysed. Digested tissue was glass-filtered and microparticles identified with Micro Raman spectroscopy and analysed with Know-it-all software. ANOVA, T-test, and descriptive analysis were performed were appropriate.

Results: Microplastic particles, polymeric dyes, and inorganic dyes were identified among all groups. Our analysis revealed no differences between the FGR and the control group. The macrosomia samples on the other hand showed a significantly higher incidence of inorganic dye particles compared to the control samples ($p < .001$).

Conclusion: Our study reveals that microparticle pollutant accumulation, and in particular inorganic dyes may be associated with certain fetal growth disorders such as in macrosomia. Further research is required to elucidate the underlying mechanisms and effects of microplastics and microparticles on placental and fetal health.

220 | Effect of the Dobbs Decision on Severe Maternal Morbidity in Wisconsin

Jacqueline M. Powell[1]; Janine S. Rhoades[1]; Ronald E. Gangnon[2]; Kara K. Hoppe[1]
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10:30 AM - 12:30 PM

Objective: With maternal mortality rates increasing in the US, efforts to reduce perinatal morbidity and mortality are imperative. Recent policy changes have restricted abortion access which is a pillar of perinatal care. Wisconsin (WI) was significantly affected by the Dobbs decision. The aim of this study is to examine the effect of the Dobbs decision on the rate of severe maternal morbidity (SMM) in WI.

Study Design: A retrospective cohort of all births from 1/1/2021 to 11/1/2023 in WI was constructed using Wisconsin Hospital Association coding data. Pre Dobbs was defined as 1/1/2021–6/23/2022 and post Dobbs was defined as 6/24/2022–11/1/2023. Generalized additive logistic regression models were constructed for the change in the SMM rate as a function of geographic location (ZIP code). Statistical analyses were performed using the mgcv package in R.

Results: There were 160,649 births– 79,796 pre Dobbs and 80,853 post Dobbs and 8,426 SMM events (5.2%)–4,148 (5.2%) pre Dobbs and 4,278 (5.3%) post Dobbs (RR 1.02, 95% CI 0.97-1.06, p = 0.47). There was modest evidence (p = 0.07) of geographic variation in the impact of the Dobbs decision on the SMM rate. There were nominally significant (p < 0.05) elevations in the SMM rate for 101 ZIP codes in southeast WI and nominally significant reductions in the SMM rate for 1 ZIP code in northwest WI.

Conclusion: There is little evidence for a statewide effect of the Dobbs decision and restricted abortion access on the rate of SMM in WI. However, there is modest evidence of geographic variation in the effect (a SE to NW gradient) with elevated rates of SMM in southeastern WI. Given that geographic variation exists, this suggests that location of residence may impact rates of SMM with limited abortion access during pregnancy. SMM should be evaluated in each state to identify vulnerable areas with limited abortion access. Future work will analyze all 2024 births as there may be more SMM given incomplete data for patients unrepresented in this data set, but affected by the Dobbs decision during early pregnancy.

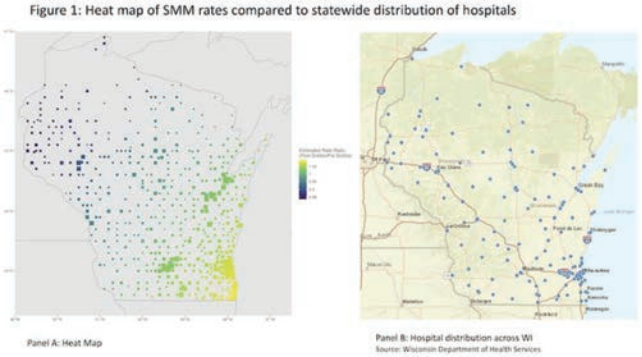
Table 1. Demographic Data

Characteristic	N	Overall, N = 160,649[1]	Pre/Post Dobbs Decision		p-value[2]
			Pre, N = 79,796[1]	Post, N = 80,853[1]	
Race/Ethnicity	156,313				<0.001
AI/AN		1,780 (1.1%)	892 (1.1%)	888 (1.1%)	
Asian/PI		7,673 (4.9%)	3,825 (4.9%)	3,848 (4.9%)	
Black		17,958 (11%)	9,044 (12%)	8,914 (11%)	
Hispanic		18,385 (12%)	8,121 (10%)	10,264 (13%)	
White		110,517 (71%)	55,842 (72%)	54,675 (70%)	
Unknown		4,336	2,072	2,264	
Payer	160,060				<0.001
Medicaid		55,873 (35%)	27,603 (35%)	28,270 (35%)	
Other Government		3,110 (1.9%)	1,625 (2.1%)	1,485 (1.8%)	
Private Insurance		99,733 (62%)	49,445 (62%)	50,288 (62%)	
Self Pay		1,344 (0.8%)	557 (0.7%)	787 (1.0%)	
Unknown		589	566	23	
Language	99,383				<0.001
English		94,523 (95%)	39,888 (96%)	54,635 (95%)	
Hmong		299 (0.3%)	145 (0.3%)	154 (0.3%)	
Other		811 (0.8%)	336 (0.8%)	475 (0.8%)	
Spanish		3,750 (3.8%)	1,262 (3.0%)	2,488 (4.3%)	
Unknown		61,266	38,165	23,101	
Severe Maternal Morbidity	160,649	8,426 (5.2%)	4,148 (5.2%)	4,278 (5.3%)	0.4

[1] n (%)

[2] Pearson's Chi-squared test

Figure 1: Heat map of SMM rates compared to statewide distribution of hospitals



221 | Effect of the Covid-19 Pandemic on Severe Maternal Morbidity Based on Location in Wisconsin

Jacqueline M. Powell[1]; Janine S. Rhoades[1]; Ronald E. Gangnon[2]; Kara K. Hoppe[1]

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10:30 AM - 12:30 PM

Objective: Access to obstetrical care is of concern to millions of women, especially those living in rural areas, which is estimated to be 49% of Wisconsin females. National emergencies have a disproportionate impact on rural areas especially when access to tertiary care centers is limited. The aim of this study is to examine the effect of the COVID-19 pandemic on the rate of severe maternal morbidity (SMM) across Wisconsin (WI) based on geographic location.

Study Design: A retrospective cohort study of all births in Wisconsin from March 1, 2017 to March 31, 2023 was constructed using Wisconsin Hospital Association coding data. The pre COVID-19 pandemic was defined as March 1, 2017–February 29, 2020, and the COVID-19 pandemic was defined as March 1, 2020 to March 31, 2023. Generalized additive logistic regression models were constructed for the change in the SMM rate as a function of geographic location (ZIP code). Statistical analyses were performed using the mgcv package in R.

Results: There were 334,366 births in WI during the study period–172,737 pre pandemic and 161,629 during the pandemic. There were 17,598 SMM events (5.3%) during the study period–9,173 (5.3%) pre pandemic and 8,425 (5.2%) during the pandemic (RR 0.98, 95% CI 0.96-1.01, $p = 0.28$). There was very strong evidence ($p < 0.0001$) of geographic variation in the impact of the pandemic on the rate of SMM. There were nominally significant ($p < 0.05$) elevations in the SMM rate for 33 ZIP codes in north central WI and nominally significant reductions in the SMM rate for 75 ZIP codes in south central and northwest WI.

Conclusion: North central WI, a rural area with fewer hospitals compared to urban areas, had increased rates of SMM during COVID-19. Rural areas are known to have worse health outcomes and these data show that the obstetric population is no exception. When access to tertiary care centers is limited, novel ways to increase access to critical care services for obstetric population needs to be developed to optimize perinatal outcomes.

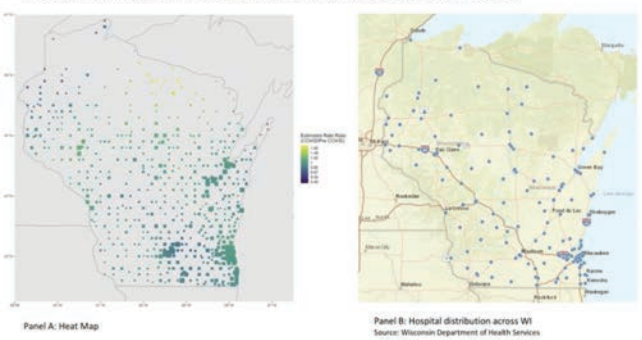
Table 1. Demographic Data

Characteristic	N	Overall, N = 334,366[1]	Pre/During COVID: Pre, N = 172,737[1]	Pre/During COVID: During, N = 161,629[1]	p-value[2]
Race/Ethnicity	325,260				<0.001
AI/AN		3,943 (1.2%)	2,103 (1.3%)	1,840 (1.2%)	
Asian/PI		16,579 (5.1%)	8,733 (5.2%)	7,846 (5.0%)	
Black		39,516 (12%)	20,793 (12%)	18,723 (12%)	
Hispanic		31,259 (9.6%)	14,719 (8.8%)	16,540 (11%)	
White		233,963 (72%)	121,406 (72%)	112,557 (71%)	
Unknown		9,106	4,983	4,123	
Payer	332,938				0.071
Medicaid		116,990 (35%)	60,649 (35%)	56,341 (35%)	
Other Government		6,397 (1.9%)	3,216 (1.9%)	3,181 (2.0%)	
Private Insurance		207,079 (62%)	106,840 (62%)	100,239 (62%)	
Self Pay		2,472 (0.7%)	1,266 (0.7%)	1,206 (0.7%)	
Unknown		1,428	766	662	
Language	94,008				0.2
English		89,801 (96%)	5,755 (95%)	84,046 (96%)	
Hmong		338 (0.4%)	22 (0.4%)	316 (0.4%)	
Other		779 (0.8%)	56 (0.9%)	723 (0.8%)	
Spanish		3,090 (3.3%)	226 (3.7%)	2,864 (3.3%)	
Unknown		240,358	166,678	73,680	
Severe Maternal Morbidity	334,366	17,598 (5.3%)	9,173 (5.3%)	8,425 (5.2%)	0.2

[1] n (%)

[2] Pearson's Chi-squared test

Figure 1: Heat map of SMM rates compared to statewide distribution of hospitals



222 | Chatgpt and Prenatal Diagnosis: is There a Role for Artificial Intelligence in Fetal Ultrasound?

Jacqueline A. Erler[1]; Emily E. Daggett[2]; Haylea S. Patrick[3]
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10:30 AM - 12:30 PM

Objective: Anecdotal evidence indicates a rising popularity of generative machine learning models, like ChatGPT, as adjunct diagnostic tools in clinical medicine. Current evidence is limited for ChatGPT's utility in diagnosing fetal syndromes when given ultrasonographic findings. We sought to assess ChatGPT's ability to give an accurate fetal diagnosis based on standardized imaging vignettes for prenatal conditions with well-described fetal ultrasound findings.

Study Design: We wrote 50 vignettes on a broad scope of prenatal conditions. Each vignette included up to 5 characteristic ultrasound findings adapted from *Callen's Ultrasonography in Obstetrics and Gynecology* and peer-reviewed literature. A second-year Maternal-Fetal Medicine (MFM) fellow and board-certified MFM physician reviewed vignettes for clinical accuracy. Vignettes were entered into ChatGPT-4o, and the program was asked to generate a differential diagnosis in decreasing order of likelihood. ChatGPT responses were scored on the inclusion of an accurate diagnosis anywhere in the differential, in the top three most likely conditions, and as the single most likely diagnosis.

Results: The differential diagnosis generated by ChatGPT included the correct prenatal diagnosis in 82% (n = 41) of the 50 tested cases. The correct diagnosis was in the top three most likely conditions in 76% (n = 38) of cases and was selected as the single most likely diagnosis in 68% (n = 34). The correct diagnosis was generated more frequently for common chromosomal abnormalities, including Trisomy 21, Trisomy 18, and Trisomy 13. Vignettes describing rare conditions with nonspecific ultrasound findings were less likely to result in a correct diagnosis.

Conclusion: ChatGPT gave an accurate prenatal diagnosis for a wide variety of fetal syndromes based on standardized descriptions of ultrasound findings. This study validates the use of ChatGPT to assist in prenatal diagnosis. Future studies aim to investigate the accuracy of ChatGPT in diagnosing real de-identified patient cases, and to compare the diagnostic accuracy of ChatGPT to that of expert clinicians.

223 | From Routine to Remarkable: When Carrier Screening Incidentally Reveals a Chromosomal Abnormality

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10:30 AM - 12:30 PM

Objective: Routine preconception care includes expanded carrier screening. We report a case of incidental detection of an unbalanced chromosomal X-autosome translocation after carrier screening identified a sizable deletion.

Study Design: A 22-year-old nulliparous woman underwent preconception expanded carrier screening by the 436 gene panel by gene sequencing with deletion and duplication analysis.

Results: Testing detected a heterozygous 15.6 Mb deletion of the q-arm of X chromosome spanning 10 panel genes (ABCD1, AFF2, EMD, F8, FMR1, G6PD, IDS, L1CAM, MTM1, SLC6A8) in the submitted sample. Genetic counseling and further cytogenic studies, including chromosomal microarray and karyotype analysis, revealed one normal X chromosome and one X chromosome with a 15.73 MB terminal deletion of Xq27.1- >q28 and a 2.03 MB terminal duplication of 3p26.3- >p26.3. This abnormality results in monosomy for part of the X chromosome long arm (Xq27.1->qter) and trisomy for part of the short arm of chromosome 3

(3p26.3- >ter); involving multiple OMIM genes (most proximal SOX3) and genes (CHL1 and CNTN6), respectively. There is a 50% chance of passing this unbalanced X-autosome translocation offspring. Due to the sizable X chromosome deletion, this translocation is expected to be lethal in male offspring. Female offspring who inherit it may exhibit variable phenotypic manifestations, including intellectual disability, developmental delay, and distinct facial features, depending on the ratio of X-inactivation. The patient has no health concerns and plans to proceed with in vitro fertilization (IVF) with preimplantation genetic testing for structural rearrangement (PGT-SR) for conception.

Conclusion: Expanded carrier screening through gene sequencing can detect chromosomal translocations by identifying deletions on chromosomes. Comprehensive genetic evaluation, counseling, and further testing are crucial to understand these findings. Regardless of PGT, IVF patients should receive counseling on prenatal genetic screening and diagnostic testing for chromosomal disorders and undergo a detailed anatomy ultrasound during pregnancy.

224 | Association of Intended Mode of Delivery with Neonatal and Maternal outcomes at 22-25 Weeks' Gestation

Jameaka L. Hamilton; On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network
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10:30 AM - 12:30 PM

Objective: To compare the risk of neonatal and maternal morbidity and mortality among individuals delivered between 22-25 weeks' gestation by planned cesarean delivery (CD) or trial of labor (TOL).

Study Design: Secondary analysis of an observational cohort including participants with a singleton pregnancy delivered via planned CD or after a trial of labor (TOL) from 22w0d through 25w6d. This analysis was limited to those who received both antenatal steroids and neonatal resuscitation. The primary outcome was a composite of neonatal death or severe neonatal morbidity. Secondary outcomes included measures of neonatal and maternal morbidity. Multivariable logistic regression analyses were used to adjust for prespecified covariates. Planned interaction analyses were performed between planned mode of delivery and gestational age (GA) at delivery (22-23 weeks; 24-25 weeks), then within GA groups between planned mode of delivery and presentation.

Results: Among 277 eligible individuals, 149 (53.8%) had a planned CD and 128 (46.2%) had a TOL of which 12 (9.4%) delivered by CD (Table 1). The two groups were similar except for lower birthweight (622g vs. 663g, p = 0.02) and more frequent hypertensive disorders (47.7% vs. 26.6%, p < 0.001) among those with planned CD. There was no difference in the primary neonatal composite outcome (73.8% vs. 79.7%, aOR 0.57, 95% CI 0.30-1.07) between groups. There were no differences in secondary neonatal outcomes except for higher frequency of intraventricular hemorrhage (IVH) in the TOL group (16.8% vs. 30.5%, aOR 0.50, 95% CI 0.28-0.90) (Table 1). Planned CD was associated with eight-fold greater odds of maternal sepsis and 12-fold greater odds of postpartum readmission; other outcomes were more frequent among planned CD but did not achieve statistical significance (Table 2). All interaction analyses were not significant.

Conclusion: In this multi-site registry, there was no difference in composite neonatal mortality or severe morbidity based on intended mode of delivery. Planned CD was associated with increased maternal morbidity but less risk of neonatal IVH.

Table 1: Neonatal morbidity and mortality associated with planned cesarean delivery compared trial of labor at 22-25 weeks[1]

	Planned CD N=149	TOL N=128	aOR (95% CI)
Neonatal primary outcome[2]	110 (73.8%)	102 (79.7%)	0.57 (0.30-1.07)
Neonatal death	44 (29.5%)	41 (32.0%)	0.93 (0.52-1.68)
BPD	21 (14.1%)	24 (18.8%)	0.62 (0.32-1.21)
IVH	25 (16.8%)	39 (30.5%)	**0.50 (0.28-0.90)**
NEC	20 (13.4%)	16 (12.5%)	1.17 (0.56-2.41)
PVL	22 (14.8%)	25 (19.5%)	0.70 (0.67-1.34)
ROP	27 (18.1%)	21 (16.4%)	0.91 (0.47-1.78)
Sepsis	34 (22.8%)	37 (28.9%)	0.64 (0.36-1.13)

[1] All data presented in the table as n (%). All models adjusted for chorioamnionitis, birthweight, and hypertensive disorders.
[2] Defined as any of the following by discharge or 120 days (whichever occurs first): neonatal death, severe bronchopulmonary dysplasia (grade 3), intraventricular hemorrhage (grades III-IV), necrotizing enterocolitis (proven Bell Stage >2A), proven sepsis (early and late), periventricular leukomalacia, and retinopathy of prematurity (Stage III-V)
Abbreviations: CD, cesarean delivery; TOL, trial of labor; aOR, adjusted odds ratio; BPD, bronchopulmonary dysplasia; IVH, intraventricular hemorrhage; NEC, necrotizing enterocolitis; PVL, periventricular leukomalacia; ROP, retinopathy of prematurity

Table 2: Maternal morbidity and mortality associated with trial of labor compared to planned cesarean delivery at 22-25 weeks[1]

	Planned CD N=149	TOL N=128	aOR (95% CI)
Maternal composite[2]	29 (19.5%)	17 (13.3%)	1.46 (0.73-2.90)
Maternal death	1 (0.7%)	0 (0%)	NA
ICU admission	8 (5.4%)	2 (1.6%)	2.86 (0.55-14.86)
Blood product transfusion	18 (12.1%)	7 (5.5%)	2.26 (0.88-5.76)
Postpartum hemorrhage	11 (7.4%)	12 (9.4%)	0.59 (0.24-1.46)
Sepsis	9 (6.0%)	2 (1.6%)	**8.28 (1.32- 51.80)**
Stroke	0 (0%)	0 (0%)	NA
Venous thromboembolism	0 (0%)	0 (0%)	NA
Endometritis	5 (3.4%)	2 (1.6%)	2.32 (0.42-12.84)
Postpartum readmission	12 (8.1%)	1 (0.8%)	**12.03 (1.48-97.47)**

[1] All data presented in the table as n (%). Models adjusted for maternal age, chorioamnionitis, prior CD, and hypertensive disorders.
[2] Defined as maternal death, intensive care unit admission, transfusion of one or more blood products, postpartum hemorrhage, maternal sepsis, stroke or thromboembolism by maternal discharge; individual components of the primary outcome (if appropriate), postpartum endometritis, and maternal readmission following delivery up to 42 days postpartum
Abbreviations: CD, cesarean delivery; TOL, trial of labor; aOR, adjusted odds ratio; ICU, intensive care unit

225 | Is a Refractory Headache with Preeclampsia Under 34 Weeks Associated with High-Grade Maternal Vascular Malperfusion?

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10:30 AM - 12:30 PM

Objective: An unexplained, persistent headache (PH) refractory to medication is a disease-defining characteristic of preeclampsia (PreE) with severe features (SF), requiring delivery regardless of gestational age (GA). High-grade maternal vascular malperfusion (HG-MVM) has been reported in ~95% of cases delivered with very preterm PreE, with its absence suggesting an alternate headache etiology. We sought to assess the prevalence of placental HG-MVM in cases delivered < 34 weeks for a PH associated with PreE, and correlate cases by MVM status with objective clinical values.

Study Design: All placental pathology reports from 2021 and 2022 at our tertiary center were reviewed. 52 cases delivered for PreE with a PH < 34 weeks GA were identified. Two pathologists analyzed placenta histology and noted specific MVM lesions. A score of low or HG MVM was assigned based on lesion frequency from a previously published scale, and correlated with maternal, neonatal and placental demographic values relevant to PreE. Tests of normality, descriptive statistics, and appropriate comparisons via chi-squared or t-test were performed.

Results: HG-MVM was found in 23/52 (44.2%) of cases. Cases with HG-MVM had a significantly lower birth weight percentile (40.4% vs 73.0%) and placental weight percentile (10.8% vs 64.1%), with a higher prevalence of nephrotic range proteinuria (30.4% vs 3.4%), and protein:creatinine ratio [0.5(3.6) vs 0.3(0.8) mg/dL]. Maternal serum values were similar but limited by the absence of abnormal values. A summary of results is provided (Table 1).

Conclusion: Placental HG-MVM prevalence was only 44.2% in this case series, suggesting that most persistent headaches prompting delivery were due to an etiology other than PreE with SF (i.e., migraines). HG-MVM appears likely when objective clinical findings consistent with PreE are seen, and less likely when absent. Placental weight, which is correlated with volumetric measurements on ultrasound, may be particularly informative. This information is useful in considering additional workup or pursing delivery for a refractory headache with known or suspected PreE.

Characteristic / Outcome	High grade MVM present (n=23)	High grade MVM absent (n=29)	Significance
Birth weight percentile	40.4%	73.0%	p<0.001*
Placenta weight percentile	10.8%	64.1%	p<0.001*
Protein: creatinine ratio†	0.5 (3.6)	0.3 (0.75)	p=0.02*
Nephrotic range proteinuria	30.4%	3.4%	p=0.02*
Creatinine†	0.57 (0.23)	0.47 (0.23)	p=0.67
Platelets†	243 (92)	261 (94.5)	p=0.47
AST†	22 (8)	17 (11)	p=0.13
ALT †	16 (10)	12 (12)	p=0.69
BMI‡	37.21 (±5.9)	36.78 (±10.5)	p=0.87
Chronic hypertension	74.0%	48.3%	p=0.06
ASA use	39.1%	65.5%	p=0.06
Any diabetes	21.7%	44.8	p=0.14
Nulliparity	21.7%	20.7%	p=0.9

226 | History of Cured Syphilis Prior to Pregnancy and Risk of Congenital Syphilis

James D. Toppin[1]; Shannon McCloskey[2]; Meena Mishra[2]; Mariella Gastanaduy[3]; Talia Suner[3]; Joseph R. Biggio, Jr[1]; Frank B. Williams[2]
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10:30 AM - 12:30 PM

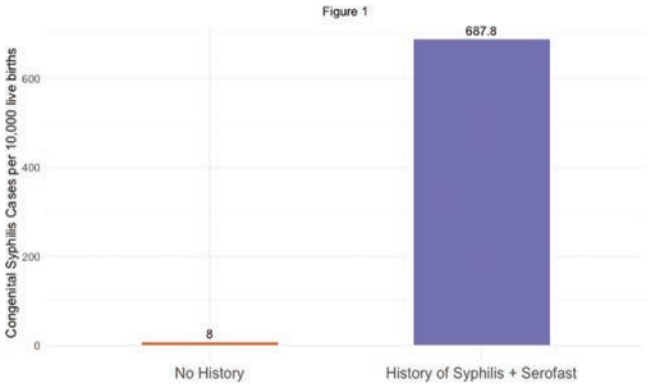
Objective: Syphilis rates have sharply increased in the United States over the past decade, increasing the number of people entering pregnancy with a history of syphilis. Despite well-established and effective treatments, congenital syphilis (CS) has likewise increased over that time. We aim to compare rate of CS among pregnancies with and without history of cured syphilis.

Study Design: We performed a retrospective cohort study of singleton or twin pregnancies care from 2015 to 2023 at a large regional health system. Historical and prenatal laboratory values classified pregnancies as either history of syphilis or no history of syphilis. Patients with new diagnosis of syphilis at initiation of pregnancy care and those with initial prenatal rapid plasmin reagin (RPR) titer ≥ 1:8 were excluded. Pregnancies were stratified based on the history of adequately treated syphilis infection before pregnancy. Patients with history of syphilis and RPR < 1:8 were classified as serofast. Primary outcome was CS, defined by Centers for Disease Control case criteria. Secondary outcome was pregnancies with new or reinfection. Subanalysis evaluated for odds of CS among serofast patients. Chi square or T-test were used evaluate demographics and outcomes.

Results: A total of 57,704 pregnancies were included, of which 189 had a history of adequately treated syphilis infection prior to pregnancy, including 154 serofast patients. Those with history of syphilis were more likely to be Black and have public insurance (Table) CS incidence was significantly higher in pregnancies with a history of treated syphilis infection compared to those without (688 vs 8 per 10,000 live births, OR 93.3, 95% CI: 47.4, 171.7, Figure. CS rate among serofast patients was 779.2 per 10,000 live births (OR 91.1, 95% CI 45.4, 168.6). Maternal syphilis occurred more frequently in those with a positive history (847 vs 30 per 10,000 live births, OR 19.3, 95% CI 10.9–31.6).

Conclusion: History of syphilis before pregnancy is associated with a dramatically increased risk of maternal reinfection and congenital syphilis, particularly among serofast patients.

Table 1	No History	History of Syphilis	
	n = 57704	n = 189	p
Age, mean (SD)	28.36 (5.85)	27.58 (5.32)	0.098
Race, Black (%)	19964 (46.8)	151 (93.2)	<0.001
Tobacco use (%)	5824 (10.5)	38 (21.1)	<0.001
Gestational age (weeks), mean (SD)	38.4 (2.7)	37.3 (3.4)	<0.001
Gestational age at first RPR (SD)	15.4 (10.5)	15.2 (9.5)	0.787
Prenatal visit count (SD)	9.27 (3.6)	6.72 (3.9)	<0.001
Pregestational diabetes, mean (%)	207 (0.4)	0 (0.0)	0.830
Gestational diabetes, mean (%)	303 (0.5)	0 (0.0)	0.621
Public insurance, mean (%)	21251 (49.8)	127 (78.4)	<0.001
Cesarean delivery, mean (%)	11331 (33.2)	53 (37.3)	0.421
Singleton, mean (SD%	56486 (97.9)	183 (96.8)	0.446



227 | Regional Health Unit Presence by Parish and Congenital Syphilis Rate in Louisiana

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10:30 AM - 12:30 PM

Objective: Health units in Louisiana parishes serve as regional access points of essential health services, including screening, treatment, and prevention of syphilis. Clinic location is varied; some parishes have two while others have none. The increased congenital syphilis rate highlights the potential of these state-run clinics to target localities with high burdens of syphilis. We hypothesize that residing in a parish without a health unit increases risk for maternal and congenital syphilis.

Study Design: We performed a retrospective cohort study of pregnancies receiving prenatal and delivery care from 2015 to 2023 in a large health system in Louisiana. Historical and prenatal laboratory values determined syphilis infection status. Patients were compared based on the presence or absence of a health unit in the parish of their home address. The primary outcome was congenital syphilis (CS), as defined by Centers for Disease Control case criteria. A subanalysis of CS limited to maternal syphilis cases was performed. Regression analysis controlling for payor status generated adjusted odds ratios with 95% confidence intervals.

Results: A total of 42,684 pregnancies were included, of which 25.7% resided in a parish with no health unit. Patients in health unit parishes were younger, more likely to use public insurance and more likely to reside in a high-deprivation neighborhood (Table 1). No difference in CS cases were observed between groups (0.1% vs 0.1%, aOR 1.60, CI 0.75–3.93). New maternal syphilis infections were less common in parishes without health units (0.3% vs 0.7%, OR 0.38, 95% CI 0.26–0.56). When limiting analysis to maternal syphilis cases, living in a parish without a health unit was associated with increased odds for CS (51.6% vs 16.5%, aOR 5.42, 95% CI 2.47–11.88).

Conclusion: Parishes with health units had higher area deprivation and higher public insurance, and were associated with increased maternal syphilis infections. Syphilis during pregnancy in non-health unit parishes was associated with substantial increased odds for congenital syphilis compared to health unit parishes.

	No Heath Unit Parish	Health Unit Parish	
	n = 10988	n = 31660	p
Mean age in years (±SD)	29.9 (±5.8)	27.9 (±5.8)	<0.001
Singleton (%)	10652 (96.9%)	30784 (97.2%)	0.122
Black race (%)	5079 (46.3%)	14926 (47.2%)	0.098
Hispanic ethnicity (%)	602 (5.5%)	2444 (7.7%)	<0.001
Mean Area Deprivation Index (±SD)	52.9 (±25.5)	565.4 (±21.6)	<0.001
Public insurance (%)	4171 (38.0%)	17099 (54.0%)	<0.001
Pregestational diabetes (%)	38 (0.3%)	113 (0.4%)	0.940
Mean gestational weeks at initial syphilis screen (±SD)	14.9 (±10.3)	15.1 (±10.4)	0.024
Mean gestational age in weeks (±SD)	38.5 (2.7%)	38.3 (2.8%)	<0.001
Cesarean delivery (%)	2726 (32.4%)	8585 (33.4%)	0.177

SD, standard deviation

228 | The Influence of Social Determinants on Antenatal Anxiety and Physical Activity: A Step Forward

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10:30 AM - 12:30 PM

Objective: Physical activity is important for physical and mental health, yet most pregnant people do not achieve the recommended 150 minutes of aerobic exercise per week. People from lower socioeconomic backgrounds are even less likely to meet this target, yet it is unclear why. To see if socioeconomic stress is a contributing factor, we evaluated whether socioeconomic status (SES) modified the association between anxiety and physical activity.

Study Design: In 2021 and 2022, this prospective study recruited pregnant outpatients with singleton gestations between 16 and 36 weeks. Clinical anxiety was the mental health exposure, defined as State-Trait Anxiety Inventory [STAI] score > 80 at enrollment. The primary outcome was average daily physical activity (steps, metabolic equivalent tasks [METs], and moderate-to-vigorous-physical-activity bursts [MVPAs]), obtained from accelerometer watches worn for 7 days. Socioeconomic variables were self-reported via surveys: low household income, education ≤ high school, or public insurance were defined as low SES. The relationship between physical activity and anxiety was assessed using linear generalized estimating equations adjusting for maternal age, body mass index and low SES. We assessed effect modification between anxiety and SES using interaction terms.

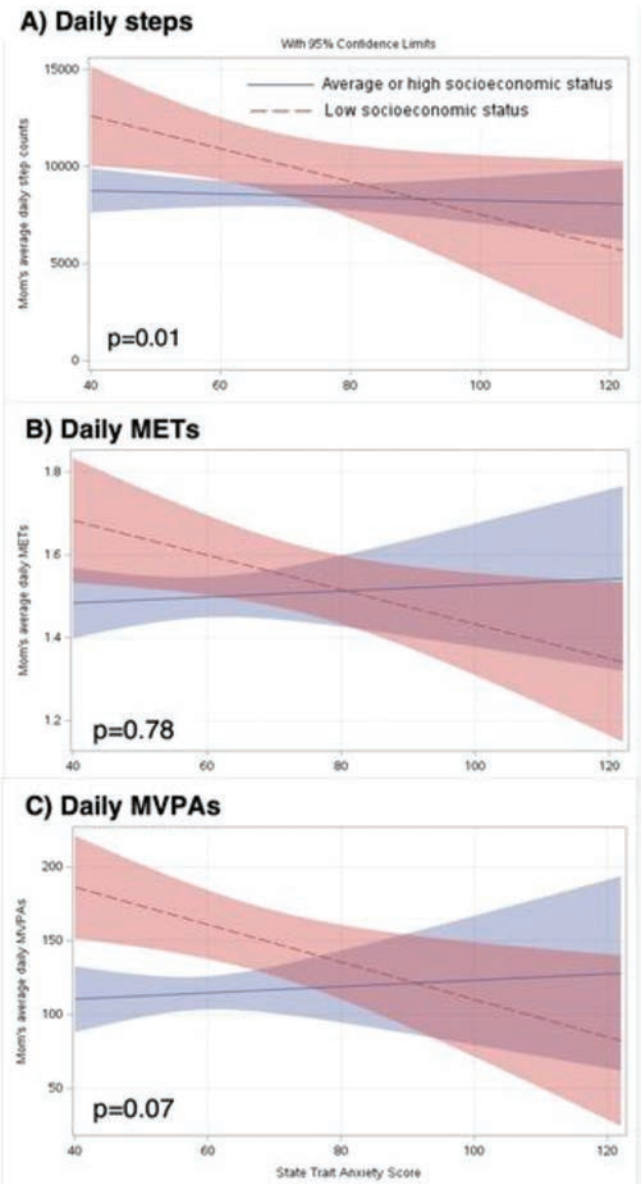
Results: 40 pregnant people were enrolled. Anxiety was significantly associated with lower steps, METs, and MVPAs per day ($p = 0.01$, $p = 0.02$, $p < 0.01$, Table 1). Effect modification was detected, such that people with positive anxiety screening scores and low SES had fewer steps [ß coefficient -3619, 95% confidence interval (CI) -6451, -788, p-interaction = 0.01, Figure 1].

Conclusion: Positive anxiety screening was associated with lower physical activity over the subsequent 7 days. This was heightened for people with anxiety and lower SES, who had 3619 fewer daily steps than those with higher SES and no anxiety. Improving physical activity among pregnant people with anxiety, especially those from lower SES backgrounds, is warranted.

Table 1. Differences in physical activity between pregnant individuals with and without positive anxiety screening scores (N=40).

PHYSICAL ACTIVITY MEASURE	No Clinical Anxiety N = 33 Mean (SD)	Clinical anxiety N = 7 Mean (SD)	ß coefficient (95% Confidence Interval)	p-value[a]
Average steps/day	9236 (2163)	6655 (2430)	-2013 (-3589, -438)	0.01
Average METs/day[b]	1.5 (0.2)	1.5 (0.2)	-0.1 (-0.2, -0.02)	0.02
Average MVPAs/day[c]	85.6 (37.6)	128.7 (40.9)	-42.2 (-67.5, -16.9)	<0.01

[a] Linear GEE regression models adjusting for body mass index, age, and low socioeconomic status (any of: household income below county poverty level, education level high school or less, or public insurance)
[b] METs: metabolic equivalent tasks
[c] MVPAs: moderate-to-vigorous physical activity bursts



229 | Decidual Cell-Mediated Paracrine Inhibition of IL1b Signaling in Extravillous Trophoblasts Contributes to Pregnancy Maintenance

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10:30 AM - 12:30 PM

Objective: Decidual cells (DCs) and extravillous trophoblasts (EVTs) interact at the maternal-fetal interface to establish an anti-inflammatory state and maintain pregnancy. Dysregulation of these interactions causes inflammation and initiates labor. Interleukin 1 receptor 1 (IL1R1) binds IL1b and IL1R antagonist (IL1RN) similarly to cause inflammation or anti-inflammation, respectively. We previously found higher IL1R1 and lower IL1RN levels in DCs from in-labor *vs.* non-in-labor term samples, suggesting a shift in these levels that activates inflammation, initiating labor. We hypothesize a similar shift of IL1R1 and IL1RN expression in EVTs in labor; though prior to, DCs prevent said shift via paracrine mediators to maintain pregnancy.
Study Design: Paraffin sections from gestational age-matched term non-in-labor (n = 7) *vs.* in-labor (n = 6) placentas were immunostained for IL1R1 and IL1RN and analyzed by HSCORE. DC cultures (n = 3) from 1st trimester (FTDC) and term (TDC) were primed for 7d with 10^{-8}M estradiol + 10^{-7}M medroxyprogesterone acetate and condition media supernatants (CMS) collected and used to treat human trophoblast cultures (n = 3) of term placentas. *IL1R1* and *IL1RN* mRNA levels were analyzed by qPCR. Statistical analysis used a *t*-test with $p< 0.05$ considered significant.
Results: Analysis revealed that EVTs from in-labor *vs.* non-in-labor decidua basalis had: 1) higher IL1R1 levels (Mean±SEM 184.1±10.1 *vs.* 120.1±15.6, p = 0.007); 2) lower IL1RN levels (121.3±13.1 *vs.* 186.5±10.1; p = 0.002); and 3) ~two-fold higher IL1R1/IL1RN ratio (0.73±0.1 *vs.* 1.58±0.2; p = 0.002). CMS from TDCs caused 2.28-fold higher *IL1R1* (p = 0.001) and 6.6-fold *IL1RN* (p = 0.03) levels in trophoblast cultures *vs.* untreated controls with similar results from FTDC CMS.
Conclusion: Our *in-situ* results indicate that EVTs undergo a shift to lower IL1RN and higher IL1R1 levels, activating IL1b signaling in the transition to labor. In contrast, *in vitro* results support the thesis that paracrine signals from DCs preferentially induce IL1RN (7-fold) over IL1R1 (2-fold) expression in EVTs to block IL1b signaling across gestation to maintain pregnancy.

230 | Racial and Ethnic Disparities in Cesarean Complication Rates using NSQIP Database

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10:30 AM - 12:30 PM

Objective: This study aims to examine the relationship between patient race and ethnicity and complication rates in cesarean sections while controlling for general surgical risk using the National Surgical Quality Improvement Program (NSQIP) database from the American College of Surgeons (ACS).
Study Design: Women ages 18 and older with a CPT code for cesarean delivery recorded in 2019-2022 in the NSQIP database were included in the analysis. The primary variables were self-reported race and ethnicity. Outcomes of interest were surgical complications reported in the NSQIP database. The association between race (and separately for ethnicity) and complications was assessed using linear regression with robust standard errors for continuous outcomes and modified Poisson regression for

binary outcomes. Models were adjusted for age, body mass index, diabetes, hypertension requiring medication, American Society of Anesthesiologist physical status (ASAPS) class, chronic steroid use, and current smoker within one year.

Results: Among 56,635 patients in the study cohort, the average age was 30.8 (standard deviation of 5.6). Race was significantly associated with all outcomes considered. After controlling for covariates, the major complication rate was significantly higher among all race groups compared to White, and unknown group had a significantly lower major complication rate. Black patients had 43% higher risk of a major complication compared to White patients (95% CI = 1.28, 1.59). Hispanic patients had a 20% higher risk of major complications compared to non-Hispanic patients (95% CI = 1.09, 1.33). Patients with unknown or unreported race had 45% higher risk of a minor complication compared to White patients (95% CI = 1.33, 1.59). There was a notable amount of concurrence between unknown race and unknown ethnicity.

Conclusion: Self-identified race is associated with significantly higher rates of surgical complications following cesarean delivery even after controlling for surgical risk factors. More comprehensive obstetrics data is needed to measure and improve maternal morbidity and mortality nationwide.

Table 1. Adjusted[1] association between race and 30-day surgical outcomes after cesarean delivery.

	White (N=28,259)	Black or African American (N=5,723)	Asian (N=3,548)	Other[2] (N=2,187)	Unknown/Not Reported (N=16,918)
Operation time (minutes), mean (standard deviation)	52.1 (25.5)	58.9 (28.7)	52.1 (28.8)	60.1 (29.6)	48.5 (25.6)
β (95% CI)[3]	Reference	6.26 (5.47, 7.05)	0.74 (-0.26, 1.75)	7.59 (6.34, 8.85)	-3.32 (-3.81, -2.82)
Post-operative length of stay (days), mean (standard deviation)	2.4 (1.0)	2.6 (1.1)	2.5 (1.0)	2.5 (1.2)	2.2 (1.1)
β (95% CI)[3]	Reference	0.18 (0.15, 0.21)	0.11 (0.08, 0.15)	0.07 (0.02, 0.12)	-0.17 (-0.19, -0.16)
Major complication(s)[5], n (%)	1,346 (4.8%)	408 (7.1%)	315 (8.9%)	131 (6.0%)	577 (3.4%)
RR (95% CI)[4]	Reference	1.43 (1.28, 1.59)	1.94 (1.72, 2.20)	1.21 (1.02, 1.44)	0.73 (0.66, 0.80)
Minor complication(s)[6], n (%)	1,033 (3.7%)	152 (2.7%)	86 (2.4%)	84 (3.8%)	828 (4.9%)
RR (95% CI)[4]	Reference	0.67 (0.56, 0.79)	0.83 (0.66, 1.03)	0.98 (0.79, 1.22)	1.45 (1.33, 1.59)

[1] All models adjusted for age, BMI, diabetes, hypertension requiring medication, ASA class, chronic steroid use, and current smoker within one year

[2] Other included American Indian or Alaskan Native, Native Hawaiian or Other Pacific Islander, Other, and Two or more races

[3] β = mean difference; CI = confidence interval

[4] RR = risk ratio

[5] Major complications included unplanned intubation, ventilator use of more than 48 hours, sepsis, septic shock, pneumonia, deep incisional surgical site infection, wound disruption, acute renal failure, organ space surgical site infection, renal insufficiency, pulmonary embolism, myocardial infarction, cardiac arrest requiring CPR, stroke/cerebrovascular accident with neurological deficit, deep vein thrombosis, blood transfusion

[6] Minor complications included urinary tract infection and superficial surgical site infection

Table 2. Adjusted[1] association between ethnicity and 30-day surgical outcomes after cesarean delivery.

	Hispanic (N=7,427)	Non-Hispanic (N=32,904)	Unknown (N=16,304)
Operation time (minutes), mean (standard deviation)	50.8 (29.9)	52.9 (25.8)	45.6 (19.3)
β (95% CI)[2]	-3.00 (-3.70, -2.29)	Reference	-5.73 (-6.21, -5.25)
Post-operative length of stay (days), mean (standard deviation)	2.5 (0.9)	2.6 (1.0)	2.3 (1.0)
β (95% CI)[2]	-0.09 (-0.11, -0.06)	Reference	-0.27 (-0.29, -0.25)
Major complication(s)[4], n (%)	113 (6.3%)	437 (6.1%)	139 (3.3%)
RR (95% CI)[3]	1.20 (1.09, 1.33)	Reference	0.59 (0.53, 0.65)
Minor complication(s)[5], n (%)	54 (3.0%)	228 (3.2%)	193 (4.5%)
RR (95% CI)[3]	1.00 (0.88, 1.15)	Reference	1.53 (1.40, 1.67)

[1] All models adjusted for age, BMI, diabetes, hypertension requiring medication, ASA class, chronic steroid use, and current smoker within one year

[2] β = mean difference; CI = confidence interval

[3] RR = risk ratio

[4] Major complications included unplanned intubation, ventilator use of more than 48 hours, sepsis, septic shock, pneumonia, deep incisional surgical site infection, wound disruption, acute renal failure, organ space surgical site infection, renal insufficiency, pulmonary embolism, myocardial infarction, cardiac arrest requiring CPR, stroke/cerebrovascular accident with neurological deficit, deep vein thrombosis, blood transfusion

[5] Minor complications included urinary tract infection and superficial surgical site infection

231 | Risk Factors for Persistent Hypertension Requiring Anti-Hypertensive Medications Beyond 6 Weeks Postpartum

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10:30 AM - 12:30 PM

Objective: Hypertensive disorders of pregnancy increase risk for developing chronic hypertension. We evaluate risk factors for persistent hypertension at 6 weeks postpartum requiring continuation of anti-hypertensive (anti-HTN) medication.

Study Design: A retrospective cohort study of birthing patients with peripartum hypertension (HTN) at a quaternary care center over 2 years. This study is part of an ongoing postpartum quality improvement project that entails lower BP targets and universal remote BP monitoring. Inclusion criteria were delivery at the study institution, prescription of anti-HTN at some point postpartum, and having BP data at 6 weeks postpartum. Primary outcome was continuation of anti-HTNs past 6 weeks postpartum. We compared maternal and hypertensive risk factors between groups.

Results: Out of 6410 deliveries between April 2022-April 2024, 2019 (31.5%) were affected by HTN disorder of pregnancy, of which 775 (38.4%) met inclusion criteria. Total 211 (27.2%) patients were continued on anti-HTNs past 6 weeks. After adjusting for cesarean delivery and patients on anti-HTN entering pregnancy, we found significantly higher odds of continuing anti-HTN past 6 weeks with non-Hispanic Black race (adjusted odds ratio [aOR], 2.97; 95% confidence interval [CI], 1.91-4.62; $p < 0.001$), prenatal aspirin use (aOR, 1.43; 95% CI, 1.00-2.05, $p = 0.048$), and having public or no insurance (aOR, 1.66; 95% CI, 1.09-2.53, $p = 0.02$). Other risk factors included preeclampsia with severe features (aOR, 1.62; 95% CI, 1.12-2.34, $p = 0.01$), taking more than one antihypertensive (aOR, 2.80; 95% CI, 1.76-4.45; $p < 0.001$), requiring anti-HTN adjustment (aOR, 1.96; 95% CI, 1.37-2.79, $p < 0.001$), and postpartum ED visit or readmission (aOR, 2.45; 95% CI, 1.17-5.11, $p = 0.02$). Compliance with remote BP monitoring had lower odds of persistent HTN (aOR, 0.23; 95% CI, 0.07-0.79; $p = 0.02$).

Conclusion: Rates of persistent HTN requiring anti-HTN past 6 weeks postpartum are notable with certain patient cohorts at significantly higher risk. Continued intervention is needed to lower future cardiovascular morbidity in these high-risk groups.

Table 1. Characteristics by Need for Anti-Hypertensive Medications Beyond 6 Weeks Postpartum

Characteristic	Continuing anti-HTN past 6 weeks (n=211)	No anti-HTN past 6 weeks (n=564)	P-value[a]
Maternal age in years (mean±SD)	35.7±5.4	34.6±5.4	0.10
Maternal age 35 and above	126 (59.7%)	284 (50.4%)	**0.02**
Race/Ethnicity[b]			
Asian	49 (23.2%)	96 (17.0%)	
Black	51 (24.2%)	61 (10.8%)	
Caucasian	46 (21.8%)	223 (39.5%)	**<0.001**
Hispanic/Latina	50 (23.7%)	126 (22.3%)	
None of the above/ Mixed Race	15 (7.1%)	58 (10.3%)	
Nulliparity	113 (53.6%)	415 (73.6%)	**<0.001**
BMI (kg/m^2) at delivery (mean±SD)	33.0±7.19	30.3±6.50	0.056
Obese (>=30 kg/m^2)	130 (61.6%)	255 (45.2%)	**<0.001**
Gestational age (mean± SD)	36w6d±20d	37wd6d±15d	**0.003**
On anti-HTNs entering pregnancy	57 (86.4%)	9 (13.6%)	**<0.001**
Pre-gestational diabetes mellitus	23 (10.9%)	27 (4.8%)	**0.002**
Aspirin use	138 (65.4%)	270 (47.9%)	**<0.001**
Insurance			
Private	163 (77.3%)	472 (83.7%)	**0.038**
Public or No Insurance	48 (22.7%)	92 (16.3%)	
Remote monitoring compliance	170 (95.0%)	526 (99.1%)	**0.001**
Mode of delivery			
Vaginal delivery	103 (48.8%)	320 (56.7%)	**0.049**
Cesarean delivery	108 (51.2%)	244 (43.3%)	
Composite maternal morbidity	3 (1.4%)	12 (2.1%)	0.53
Postpartum LOS in days (mean± SD)	3.0±1.5	2.8±1.5	0.67
Hypertension diagnosis at discharge			
Gestational hypertension	43 (20.4%)	233 (41.3%)	
Preeclampsia without severe features	26 (12.3%)	120 (21.3%)	**<0.001**
Preeclampsia with severe features or HELLP	81 (38.4%)	161 (28.5%)	
Chronic hypertension only	61 (28.9%)	50 (8.9%)	
Type of anti-hypertensive prescribed			
Nifedipine	64 /161 (39.8%)	321/427 (75.2%)	
Labetalol	43 /161 (26.7%)	53/427 (12.4%)	**<0.001**
Both	54/161 (33.5%)	53/427 (12.4%)	
Outpatient medication titration	113 (53.6%)	231 (41.0%)	**0.002**
Postpartum ED visit or readmission	19 (9.0%)	19 (3.4%)	**0.001**

Abbreviations: anti-HTN, anti-hypertensive; SD, standard deviation; BMI, body mass index; LOS, length of stay; HELLP, hemolysis, elevated liver enzymes, low platelets; ED, emergency department

a. *P*-value significance was set at <0.05 and significant values are bolded.

b. Race and ethnicity were self-classified by the patient according to options defined by the study institution. They were assessed due to findings in previous studies of race and ethnicity being a risk factor for postpartum hypertension readmission.

Table 2. Multivariate Logistic Regression of Risk Factors for Continuing Anti-hypertensive Medications Beyond 6 Weeks Postpartum

Risk Factor	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)[a]
Maternal age 35 and above	1.46 (1.06-2.01)	1.19 (0.83-1.69)
Asian Race[b]	1.48 (1.00-2.17)	1.27 (0.82-1.96)
Black Race	2.63 (1.74-3.97)	2.97 (1.91-4.62)
Nulliparity	0.41 (0.30-0.58)	0.48 (0.34-0.69)
Obese (>=30 kg/m^2)	1.95 (1.01-2.69)	1.86 (1.31-2.65)
Chronic hypertension	5.78 (4.06-8.23)	3.01 (1.99-4.54)
Pregestational diabetes mellitus	2.43 (1.36-4.35)	1.64 (0.83-3.21)
Prenatal aspirin use	2.06 (1.48-2.86)	1.43 (1.003-2.05)
Public or No Insurance	1.51 (1.02-2.24)	1.66 (1.09-2.53)
Remote Monitoring Compliance	0.18 (0.06-0.54)	0.23 (0.07-0.79)
Preeclampsia with severe features	1.56 (1.12-2.17)	1.62 (1.12-2.34)
Discharged on more than one anti-HTN	3.32 (2.18-5.04)	2.80 (1.76-4.45)
Required outpatient medication titration	1.66 (1.21-2.29)	1.96 (1.37-2.79)
Postpartum readmission or ED visit	2.84 (1.47-5.48)	2.45 (1.17-5.11)

Abbreviations: CI, confidence interval; anti-HTN, anti-hypertensive; ED, emergency department

a. Logistic regression was performed controlling for cesarean delivery and patients with chronic hypertension who were on anti-hypertensive medication entering pregnancy

b. Race and ethnicity were self-classified by the patient according to options defined by the study institution. They were assessed due to findings in previous studies of race and ethnicity being a risk factor for postpartum hypertension readmission.

232 | Nifedipine is Associated with Improved Postpartum Hypertension Outcomes Compared to Labetalol

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10:30 AM - 12:30 PM

Objective: Postpartum hypertension (HTN) is one of the most frequent reasons for readmissions and has been associated with developing chronic hypertension. We compare labetalol and nifedipine in postpartum hypertension outcomes.

Study Design: A retrospective cohort study of birthing patients with peripartum HTN at a quaternary care center over 2 years. This study is part of an ongoing postpartum quality improvement project that entails lower blood pressure (BP) targets and universal remote BP monitoring. Inclusion criteria were delivery at the study institution, diagnosis of HTN disorder of pregnancy, and discharge on either labetalol or nifedipine. Patients discharged on both medications were excluded. Primary outcome was postpartum readmission for HTN. Secondary outcome was persistent hypertension at 6 weeks postpartum defined by continuation of anti-hypertensives (anti-HTN). Labetalol was compared to nifedipine for both outcomes.

Results: Out of 6410 deliveries between April 2022-April 2024, 2019 (31.5%) were affected by HTN disorder of pregnancy. Of the 541 (26.8%) discharged on a single medication, 105 (19.4%) were labetalol and 436 (80.6%) nifedipine. In baseline characteristics between groups, labetalol was associated with higher rate of chronic hypertension (50.5% vs 17.9%, $p < 0.001$) and prenatal aspirin use (62.9% vs 46.8%, $p = 0.003$), and lower rate of cesarean delivery (34.3% vs 48.6%, $p = 0.008$). After adjusting for these 3 characteristics, labetalol use had significantly higher odds of readmission compared to nifedipine (adjusted odds ratio [aOR], 8.69; 95% confidence interval [CI], 1.45-52.11; $p = 0.02$). Patients on labetalol compared to nifedipine also had significantly higher odds of needing to continue anti-HTN medication past 6 weeks postpartum (aOR, 2.78; 95% CI, 1.62-4.79; $p < 0.001$).

Conclusion: Labetalol was significantly associated with higher odds of postpartum readmission and persistent hypertension at 6 weeks postpartum compared to nifedipine. Further research is needed to help tailor anti-HTN medications to clinical needs of high-risk patients.

Table 1. Baseline Characteristics Between Labetalol and Nifedipine

Baseline Characteristic	Labetalol (n=105)	Nifedipine (n=436)	P-value[a]
Maternal age in years (mean±SD)	34.0±5.8	34.3±5.6	0.59
Maternal age 35 and above	47 (44.8%)	220 (50.5%)	0.30
Race/Ethnicity[b]			
Asian	17 (16.2%)	74 (17.0%)	
Black	12 (11.4%)	58 (13.3%)	
Caucasian	35 (33.3%)	151 (34.6%)	0.90
Hispanic/Latina	28 (26.7%)	112 (25.7%)	
None of the above/ Mixed Race	13 (12.4%)	41 (9.4%)	
Nulliparity	62 (59.0%)	291 (66.7%)	0.14
BMI (kg/m^2) at delivery (mean±SD)	32.3±7.9	30.8±6.9	0.05
Obese (>=30 kg/m^2)	59 (56.2%)	232 (46.8%)	0.08
Gestational age (mean± SD)	37w1d±18d	37w5d±16d	**0.01**
Preterm delivery	75 (28.6%)	87 (20.0%)	0.05
Chronic hypertension	53 (50.5%)	78 (17.9%)	**<0.001**
Pre-gestational diabetes mellitus	9 (8.6%)	34 (7.8%)	0.79
Aspirin use	66 (62.9%)	204 (46.8%)	**0.003**
Insurance			
Private	78 (74.3%)	331 (75.9%)	0.73
Public or No Insurance	27 (25.7%)	105 (24.1%)	
Mode of delivery			
Vaginal delivery	69 (65.7%)	224 (51.4%)	**0.008**
Cesarean delivery	36 (34.3%)	212 (48.6%)	
Chorioamnionitis	9 (8.6%)	41 (9.4%)	0.79
Postpartum hemorrhage	15 (14.3%)	87 (20%)	0.18
Postpartum LOS in days (mean± SD)	3.0±2.3	2.9±1.3	0.57
Hypertension diagnosis at discharge			
Gestational hypertension	15 (14.3%)	164 (37.6%)	
Preeclampsia without severe features	16 (15.2%)	94 (21.6%)	**<0.001**
Preeclampsia with severe features or HELLP	36 (34.3%)	135 (31%)	
Chronic hypertension only	38 (36.2%)	43 (9.9%)	
Proteinuria	39 (37.1%)	176 (40.4%)	0.54
Remote monitoring compliance	81 (77.1%)	362 (83%)	0.16

Abbreviations: SD, standard deviation; BMI, body mass index; LOS, length of stay; HELLP, hemolysis, elevated liver enzymes, low platelets

a. *P*-value significance was set at <0.05 and significant values are bolded.

b. Race and ethnicity were self-classified by the patient according to options defined by the study institution. They were assessed due to findings in previous studies of race and ethnicity being a risk factor for postpartum hypertension readmission.

Table 2. Hypertension Outcomes Between Labetalol and Nifedipine

Risk Factor	Labetalol (n=105)	Nifedipine (n=436)	P from Unadjusted X^2 Test[a]	Adjusted odds ratio (95% CI)[b]
Postpartum readmission	5 (20.8%)	2 (2.4%)	**0.001**	**8.69 (1.45-52.11)**
Postpartum ED visit	2 (8.7%)	6 (6.9%)	0.77	1.03 (0.17-6.23)
Postpartum ED visit or readmission	7 (6.7%)	8 (1.8%)	**0.007**	2.84 (0.91-8.86)
Outpatient Medication Changes	32 (30.5%)	117 (26.8%)	0.45	1.03 (0.62-1.70)
Hypotension[c]	3 (3.1%)	21 (5.3%)	0.37	0.65 (0.18-2.32)
On anti-HTN at 6 weeks postpartum	48 (50%)	87 (22.6%)	**<0.001**	**2.33 (1.39-3.92)**
Continuing anti-HTN past 6 weeks postpartum	43 (44.8%)	64 (16.6%)	**<0.001**	**2.78 (1.62-4.79)**

Abbreviations: CI, confidence interval; ED, Emergency Department; anti-HTN, anti-hypertensive

a. *P*-value significance was set at <0.05 and significant values are bolded.
b. Multivariate logistic regression was performed controlling for chronic hypertension, prenatal aspirin use, and cesarean delivery.
c. Hypotension was defined as blood pressure less than 100/60 while on anti-hypertensive medication.

233 | ELISpot Assay for Fetus-Specific T Cell Response in Human Pregnancy

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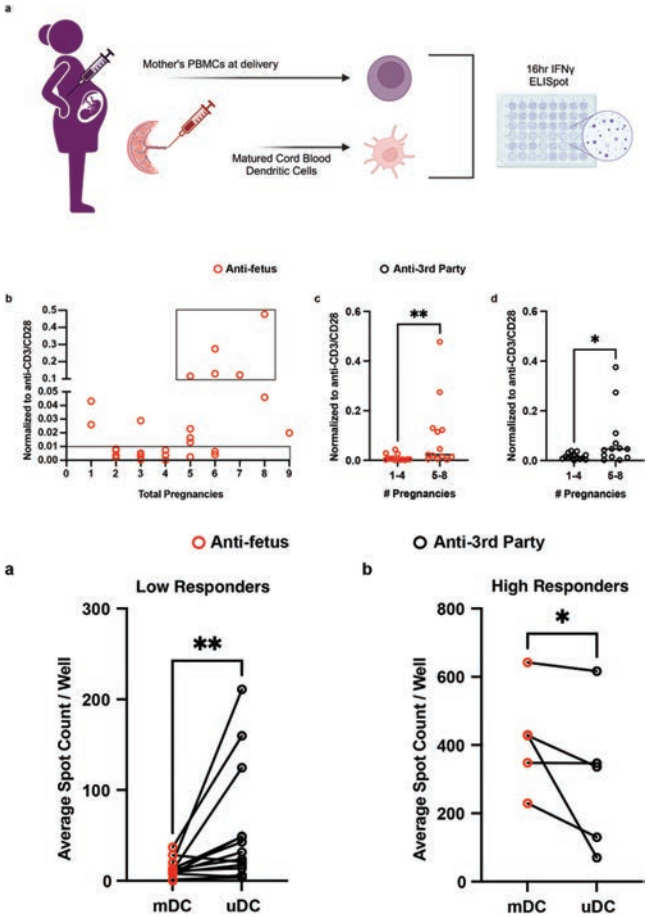
10:30 AM - 12:30 PM

Objective: Evidence from mouse models show that healthy pregnancies induce T cell hypofunction against fetus-specific antigens (FSA) as a mechanism of tolerance to the fetus. Inappropriate regulation of fetus-specific T cells is implicated in obstetric complications such as preterm birth, preeclampsia, miscarriage. Our hypothesis is that maternal T cells are tolerized (hyporesponsive) against FSA in successful human pregnancy, and produce less IFN-gamma (IFNg) when exposed to matched (mDCs) compared to unmatched/3rd-party fetal dendritic cells (uDCs).

Study Design: This is a prospective, proof of concept, pilot study. IRB approval and patient consent was obtained. Maternal peripheral blood and umbilical cord blood (UCB) was collected at delivery. DCs were matured from UCB, and used as stimulators of maternal peripheral blood mononuclear cells (PBMC). ELISpot assay was used to measure IFNg production by maternal T cells against mDC and uDC. The frequency of IFNg-producing cells was normalized against positive control stimulation with anti-CD3/CD28. Additional controls included influenza vaccine ± DCs.

Results: A total of 27 participants were included in analysis. The majority (n = 14 of 27; 55.6%) exhibited no or very low response to mDC, significantly lower than to uDCs. Notably a subset of patients (n = 5 of 12, 41.7%) with high gravidity (≥5 pregnancies) exhibited hyper responsiveness to mDCs compared to uDCs, suggesting aberrant T cell response.

Conclusion: We developed an IFNg ELISpot assay to quantify the magnitude of maternal T cell responses to FSA. T cell IFNg responses to mDC were lower compared to uDCs in a majority of pregnancies. Higher gravidity was associated with sensitized responses to mDCs. In some pregnancies, increased gravidity may override pregnancy-induced T cell tolerance. This suggests that additional mechanisms constrain memory T cell responses to ensure successful pregnancy. Future directions include measuring T cell responses to paternal antigens in patients with obstetric complications, as well as investigating how therapeutically targeting aberrant T cells may treat these complications.



234 | Blood Pressure Machines and Attendance of Follow-up Visit within 10 Days of Delivery

Jessica Greenberg[1]; Ashley Eng[2]; Patricia Greenberg[3]; Chavi Eve Karkowsky[2]; Lama R. Noureddine[4]; Joseph J. Apuzzio[4]; Shauna F. Williams[4]; Lisa N. Gittens-Williams[4]
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10:30 AM - 12:30 PM

Objective: Hypertensive disorders of pregnancy (HDP) contribute to maternal morbidity and mortality in the postpartum period and disproportionately affects Black, Indigenous and people of color (BIPOC). ACOG recommends that women with a HDP have a blood pressure evaluation within 10 days of delivery. This study assessed whether access to a blood pressure machine (BPM) with direction to self-monitored blood pressure (SMPB) increased adherence to this recommendation at our tertiary care center.

Study Design: This was a retrospective chart review of patients with HDP who delivered between July 1, 2020 and June 30, 2021. BPM were provided to HDP patients without one, with recommendation for SMBP. The primary outcome was attendance of follow-up visit within 10 days of delivery. Fisher's exact and Mann-Whitney U tests, and multivariable logistic regression were used. Self-identified race and ethnicity, maternal age, delivery mode, severe features, postpartum day of discharge, prescription

for anti-hypertensive medications at discharge, and ownership of a BPM were included in the model.
Results: 381 patients met inclusion criteria. 211(55.4%) identified as non-Hispanic Black and 146 (38.3%) as Hispanic; 105(27.6%) had severe HDP. 110(28.9%) patients were discharged with anti-hypertensive medication. 270(70.9%) patients had a BPM; 38(14.1%) owned and 232 (85.9%) were provided a BPM. 194 (50.9%) patients attended 10-day follow-up visit. 108(57.8%) patients with a BPM and 86(44.3%) patients without a BPM (p = 0.01) attended follow-up visit. Attendance of 10-day visit was predicted by ownership of a BPM (OR 1.8, 95% CI 1.1-3.0), cesarean delivery (OR 3.2, 95% CI 1.8-5.6), and Hispanic identification (OR 1.7, 95% CI 1.1-2.7).
Conclusion: In patients with HDP, BPM ownership predicted returning for a visit within 10 days. Provision of BPM likely connected patients more effectively to their postpartum care. Universal BPM provision with SMBP guidance could improve postpartum follow and reduce hypertension-related morbidity and mortality in this vulnerable population of historically minoritized patients.

235 | Discharge with Furosemide and Emergency Department Visits for Hypertension-Related Care in Patients with Severe Preeclampsia

Jessica Greenberg[1]; Ashley Eng[2]; Patricia Greenberg[3]; Chavi Eve Karkowsky[2]; Lama R. Noureddine[4]; Joseph J. Apuzzio[4]; Lisa N. Gittens-Williams[4]; Shauna F. Williams[4]
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10:30 AM - 12:30 PM
Objective: Preeclampsia with severe features (PEC-SF) contributes to maternal morbidity and mortality. Prior studies have shown that use of furosemide postpartum leads to a faster reduction in blood pressure (BP) in patients with hypertensive disorders of pregnancy. This study assessed whether prescribing postpartum furosemide to patients with PEC-SF would lead to a decrease in hypertension-related emergency department (ED) visits in our predominantly Black, Indigenous, and people of color population (BIPOC).
Study Design: This was a retrospective chart review of patients with PEC-SF who delivered July 1, 2020 - June 30, 2021. Institutional practice is to prescribe postpartum 20mg furosemide daily for five days to patients with PEC-SF. The primary outcome was ED visit for hypertension-related care within 12 weeks of delivery. Fisher's exact and Mann-Whitney U tests, and Firth multivariable logistic regression were used. Race and ethnicity, maternal age, delivery mode, postpartum day of discharge, furosemide prescription at discharge, other anti-hypertensive medication prescription at discharge, and ownership of a blood pressure machine (BPM) were used in the model.
Results: Among 105 patients with PEC-SF, 54 (51.4%) self-identified as non-Hispanic Black and 47 (44.8%) as Hispanic. 74(70.5%) patients were prescribed furosemide, 63 (60.0%) were prescribed another BP medication, and 76(72.4%) had a BPM. 16(15.2%) patients presented to the ED. Of the patients prescribed furosemide, 5(6.8%) returned to the ED; of those not prescribed furosemide, 11(35.5%) returned ($p < 0.001$). Furosemide prescription at discharge was a predictor of presentation to the ED (OR = 0.11, 95% CI: 0.02-0.38). After adjusting for demographic and clinical factors, the odds of an ED visit were 89% lower in patients who were discharged with furosemide.
Conclusion: Postpartum furosemide significantly decreased the odds of postpartum ED visits in patients with PEC-SF. Standardizing this regimen could decrease the need for ED visits, decrease patient morbidity and healthcare costs, while improving patient experience in a BIPOC community.

236 | Impact of Outpatient Cervical Ripening Prior to Term Induction of Labor - Prospective Randomized Trial

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10:30 AM - 12:30 PM
Objective: To determine if there is an advantage to preadmission outpatient cervical ripening with a transcervical (Foley) balloon (FB) prior to induction.
Study Design: Prospective randomized trial of pregnant persons ≥ 39 wks scheduled for induction requiring cervical ripening (Bishop score < 6). Those with maternal/fetal complications, amniotic fluid abnormalities, and/or non-reassuring non stress test (NST) were excluded. Participants were randomized to FB placement as outpatient 12 hours (h) prior to induction admission (Outpt) or on admission (Inpt). Labor management was otherwise routine. Analysis was intention-to-treat (ITT). Planned sample size was 200; study was ended at 140 due to slow enrollment.
Results: 140 women were randomized from 11/2021-3/2024, 73 Outpt and 67 Inpt. Baseline characteristics between groups were similar (Table 1) with most inductions elective (95%). In the Outpt group, FB placement was successful in 65/73 (84%); 3/65 (4.6%) required immediate admission due to abnormal post-FB NST (2) or labor (1). Of 8 unsuccessful Outpt FB placements, 5 had bleeding or membrane rupture and 3 could not be placed. In the Inpt group, 59/67 (88.1%) had successful FB placement on admission; 5 no longer required cervical ripening and for 3 the FB could not be placed. In ITT analysis, time from FB placement to delivery was longer in Outpt group (28.5 vs 20.2 h, $p < 0.001$). There was no difference in use of other induction agents, mode of delivery, infection, neonatal outcomes, median maternal total length of stay (65.4 vs 65.3 h, $p = 0.762$), admission to delivery time (20.9 vs 21.4 h, $p = 0.507$), or total inpatient charges ($36,843 vs $36,269, $p = 0.899$) (Tables 2-4). When comparing outcomes for those that actually received the FB as planned (62 Outpt, 62 Inpt), there was a trend towards a decrease in median time from admission to delivery (18.6 vs 22.8 h, $p = 0.054$) but no difference in maternal length of stay or cost.
Conclusion: Outpatient cervical ripening with transcervical balloon prior to term induction is safe and feasible but may not be associated with clinical benefit or cost savings.

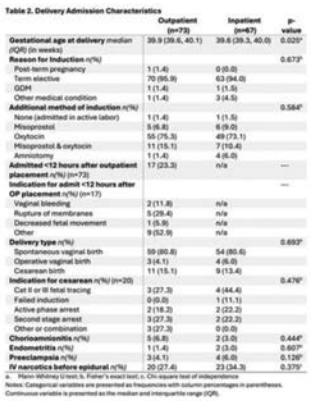

Table 3. Neonatal Outcomes

	Outpatient (n=73)	Inpatient (n=67)	p-value
Birthweight (grams) *mean (sd)*	3425.3 (396.5)	3498.0 (349.7)	0.254[b]
Admission to NICU *n(%)*	5 (6.8)	7 (10.4)	0.447[a]
Arterial cord gas value (pH) *median (IQR)* (n=135)	7.3 (7.2, 7.3)	7.3 (7.2, 7.3)	0.471[c]
Neonatal length of stay *median (IQR)*	2.0 (1.0, 2.0)	2.0 (1.0, 2.0)	0.318[c]

a. Chi-square test of independence; b. Independent-samples t-test; c. Mann-Whitney U test

Notes: Categorical variables are presented as frequencies with percentages in parentheses. Continuous variables are presented as the mean (with standard deviation) or median (with interquartile range (IQR)), as appropriate.

Table 4. Healthcare Utilization Outcomes (intention-to-treat)

	Outpatient (n=73)	Inpatient (n=67)	p-value
Time spent in office for balloon placement (minutes) *median (IQR)* (n=72)	86.0 (80.3, 92.0)	n/a	---
Time of fetal monitoring (hours) *median (IQR)*	20.4 (12.1, 29.3)	20.8 (13.5, 27.1)	0.972[a]
Time on oxytocin infusion (hours) *median (IQR)*	15.3 (7.2, 25.9)	15.3 (8.4, 20.1)	0.569[a]
Oxytocin max rate (mU/minute) *median (IQR)*	12.0 (6.0, 19.0)	12.0 (6.0, 18.0)	0.918[a]
Total charges (dollars) *median (IQR)*	36,843 (29,954, 48,271)	36,269 (31,051, 45,916)	0.899[a]
Maternal length of stay (hours)[a] *median (IQR)*	65.4 (51.8, 86.5)	65.3 (59.0, 87.7)	0.762[a]
Time from admission to delivery (hours) *median (IQR)*	20.9 (11.8, 29.0)	21.4 (14.9, 27.5)	0.507[a]
Maternal time from delivery to discharge (hours) *median (IQR)*	47.1 (36.9, 55.0)	43.3 (35.0, 52.8)	0.257[a]
Time from foley placement to delivery (hours) *median (IQR)* (n=131)	28.5 (21.1, 37.9)	20.2 (13.1, 25.5)	<0.001[a]

a. Mann-Whitney U test; b. Defined as time from admission to discharge.

Notes: Continuous variables are presented as the median and interquartile range (IQR).

237 | Safety of Cerclage Retention after PPROM: International Collaborative for Cerclage Longitudinal Evaluation And Research (IC-CLEAR)

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10:30 AM - 12:30 PM

Objective: Previous IC-CLEAR data suggested an increase in latency from PPROM to delivery with delayed cerclage removal (SMFM 2023). Our objective is to determine the safety of cerclage retention in women who experience PPROM before 34 weeks (w) gestation.

Study Design: Retrospective cohort study of singleton pregnancies with cerclage for history, ultrasound or physical exam indications between 6/2016-6/2020 at 8 sites across United States and Colombia. Primary exposure: time from PPROM to cerclage removal (CR) categorized as early < 48 hours (h)– or delayed (≥ 48 h). Maternal safety outcomes included clinical or histologic chorioamnionitis, postpartum endometritis, hemorrhage, sepsis, and ICU admission. Neonatal safety outcome was a composite of sepsis, prematurity complications and death. Statistical analysis included bivariate and multivariate techniques.

Results: Of 839 singleton pregnancies managed with cerclage, 128 (15.3%) experienced PPROM < 34w. 36 underwent immediate CR for labor, bleeding or chorioamnionitis. 92 patients included in final analysis–60 early CR (65.2%) and 32 delayed CR (34.8%). Clinical chorioamnionitis and postpartum endometritis were higher in delayed CR vs. early CR (40.6% vs. 20.3%, P = 0.04 and 15.6% vs 0%, P = 0.002, respectively). Composite neonatal outcome was similar by CR timing when excluding PPROM < 24w (delayed 81.8% vs. early 64.9%, p = 0.16). Neonatal mortality was higher in early CR, but similar when only including PPROM ≥24w (Table). In adjusted analyses, clinical chorioamnionitis was lower with early CR [AOR 0.36 (95% CI 0.14, 0.94), p = 0.04), composite neonatal outcome was lower with early CR [AOR 0.34 (95% CI 0.12, 0.97), p = 0.04] and neonatal mortality was lower with corticosteroid use [AOR 0.15 (95% CI 0.02, 0.94), p = 0.04] and higher in PPROM< 24w [AOR 10.7 (95% CI 1.90, 60.0), p = 0.007).

Conclusion: Delayed CR after PPROM increases maternal infectious morbidity and neonatal composite morbidity/mortality. Delaying cerclage removal requires careful counseling about maternal and neonatal risks.

Flow Diagram. International Collaborative for Cerclage Longitudinal evaluation and Research (IC-CLEAR)

Table. Characteristics and safety outcomes in pregnancies with cervical cerclage complicated by PPROM before 34 weeks gestation

Baseline characteristics for entire cohort (n = 128)			
Maternal age (years)#	30.7 (31.0 (27.0 – 35.0)		
GA at cerclage placement#	19.6 (15.4 – 21.2)		
Primary indication for cerclage placement, n (%) • History • Ultrasound • Physical exam • Unknown	 32 (25.0%) 61 (47.6%) 34 (26.6%) 1 (0.8%)		
GA at PPROM#	26.0 (22.0 – 29.5)		
PPROM before 24 weeks, n (%)	48 (37.5%)		
GA at cerclage removal#	26.4 (22.5-29.7)		
Immediate CR for labor, chorioamnionitis and/or bleeding, n (%)	36 (28.1%)		
GA at delivery#	26.9 (23.0-30.1)		
Baseline characteristics for patients without labor, chorioamnionitis or bleeding at time of PPROM (n=92)			
Characteristic	**Early removal (n = 60)**	**Removal ≥ 48 h (n = 32)**	**p value**
GA at PPROM#	24.8 (21.6-29.2)	26.6 (22.8-28.3)	0.75
PPROM before 24 weeks, n (%)	23 (38.3)	10 (31.3)	0.50
GA at cerclage removal#	24.9 (21.6-29.2)	28.0 (25.4-29.7)	0.05
Days from PPROM to removal#	0 (0-0.7)	5.6 (3.5–14.4)	<0.001
Days from PPROM to delivery#	0.7 (0 – 2.8)	7 (3.5 – 16.8)	<0.001
Days from removal to delivery#	0.7 (0 – 2.8)	0 (0 – 1.4)	0.27
Corticosteroid administration, n (%)	38 (63.3)	27 (84.4)	0.09
Safety maternal outcomes			
GA at delivery#	26.1 (22.1 – 29.9)	28.7 (25.5 – 30.0)	0.20
Clinical chorioamnionitis, n (%)	12 (20.3)	13 (40.6)	0.04
Histologic chorioamnionitis, n (%)	33 (56.9)	22 (68.8)	0.27
Postpartum endometritis, n (%)	0 (0)	5 (15.6)	0.002
Postpartum hemorrhage, n (%)	5 (8.6)	2 (6.5)	0.25
Maternal sepsis, n (%)	1 (1.7)	2 (6.3)	0.25
Maternal intensive care unit, n (%)	3 (5.2)	0 (0)	0.19
Safety neonatal outcomes			
Admission to neonatal ICU, n (%)	37/48 (77.1)	26/30 (86.7)	0.30
Neonatal weight (grams)#	1227.5 (800-1480)	1327 (1083-1685)	0.19
Composite neonatal morbidity/mortality*, n (%) • All • PPROM ≥24w	 34 (56.7) 24/37 (64.9)	 26 (81.3) 18/22 (81.8)	 0.02 0.16
Perinatal death, n (%) • All • PPROM ≥24w	 13/42 (31.0) 5/31 (16.1)	 3/28 (10.7) 0 (0)	 0.048 0.06

Data analyzed with chi square, Fisher's exact tests, Wilcoxon-Rank sum as indicated.
#Data expressed as median (interquartile range)
*Composite outcomes: one or more of the following: respiratory distress syndrome, bronchopulmonary dysplasia, culture proven sepsis, retinopathy of prematurity, intraventricular hemorrhage, necrotizing enterocolitis or neonatal death

238 | Metal Staples Do not Increase Wound Complications After Cesarean Delivery in Obese Patients: a Meta-Analysis

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10:30 AM - 12:30 PM

Objective: To assess the rate of wound complications when using metal staples versus sutures for post-cesarean wound closure in obese individuals.

Study Design: We conducted a systematic search of electronic databases from inception to December 31, 2022, to identify relevant randomized controlled trials (RCTs). Eligible studies were RCTs comparing metal staples and sutures for wound closure following cesarean delivery in obese individuals. We performed a meta-analysis using random-effects models to report odds ratios (OR) with 95% confidence intervals (CI). Additionally, we assessed 95% prediction intervals to indicate the range of the true effect estimates of future studies. We also conducted a fragility index and a reverse fragility index to assess the robustness of our findings.

Results: This systematic review and meta-analysis included data from 8 RCTs involving 1,748 participants. We found that metal staples were not inferior to subcuticular sutures for post-cesarean wound closure in obese patients regarding wound complications (OR 1.20; 95% CI 0.69-2.09) and wound separation (OR 0.98; 95% CI 0.58-1.65). However, skin closure with metal staples, compared to sutures after cesarean delivery in obese individuals, on average reduced surgical site infection by 54% (OR 0.46; 95% CI 0.25-0.83). Fragility analyses revealed that the statistically insignificant results for wound complications and wound separation were robust, while the statistically significant reduction in surgical site infection with metal staples was fragile.

Conclusion: Our findings suggest that metal staples are not inferior to suture for post-cesarean wound closure in obese patients in terms of wound complications and wound separation. However, the optimal method of wound closure for obese patients remains uncertain. Our study highlights the need for further research in this area to establish the most effective technique for post-cesarean wound closure in obese patients.

Outcome	No. of Studies	Staples Group, n/N (%)	Suture Group, n/N (%)	OR (95% CI)	P-value	FI / Reverse FI	Heterogeneity, I^2
Wound complications	8	120/881 (13.6)	105/867 (12.1)	1.20 (0.69-2.09)	0.51	20	67%
Surgical site infection	4	19/363 (5.2)	38/363 (10.5)	0.47 (0.26-0.84)	0.01	1	0%
Wound separation	4	33/363 (9.1)	34/363 (9.4)	0.98 (0.59-1.63)	0.93	15	0%

239 | Does the Definition of Significant Proteinuria Matter? a Retrospective Cohort Study

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10:30 AM - 12:30 PM

Objective: Preeclampsia poses significant risks to maternal and perinatal health, with proteinuria serving as a key diagnostic criterion. However, the optimal definition of significant proteinuria remains uncertain, prompting this study to compare the impact of two definitions—based on concentration (>300 mg per liter per 24 hours) or per volume (>300 mg per 24 hours)—on maternal and perinatal outcomes in patients diagnosed with preeclampsia. This retrospective cohort study aimed to assess the influence of these two different definitions of significant proteinuria on maternal and perinatal outcomes in patients with preeclampsia.

Study Design: Medical records-based registry data from a teaching hospital in northeast Florida were collected during two distinct periods: March 2007 to November 2010 and January 2017 to December 2022. Pregnant patients diagnosed with preeclampsia were divided into two groups based on two definitions of significant proteinuria. Data analysis compared baseline characteristics, maternal outcomes, and neonatal outcomes.

Results: A total of 242 pregnancies were included in the analysis. Patients with proteinuria of >300 mg per liter per 24 hours were more likely to have severe preeclampsia, elevated systolic blood pressure, require intravenous antihypertensive treatment, undergo cesarean delivery, exhibit abnormal biochemical tests, and deliver at an earlier gestational age compared to patients with proteinuria of >300 mg per 24 hours.

Conclusion: In this study, the concentration-based definition of significant proteinuria in preeclampsia was associated with worse neonatal and maternal outcomes. These findings suggest that the

amount of proteinuria may help stratify risk among pregnant patients. However, further research is needed to corroborate these findings and to refine the diagnostic criteria for preeclampsia to enhance management protocols and improve patient care.

Maternal Outcomes by Proteinuria Definition

Outcome	Proteinuria by volume, (n/N, %)	Proteinuria by concentration, (n/N, %)	p-value
Severe preeclampsia	52/104 (50%)	111/138 (80.4%)	0.00
Maximum SBP >160	67/104 (64.4%)	116/138 (84.1%)	0.00
Maximum DBP >110	32/104 (30.8%)	56/138 (40.6%)	0.15
Need for Acute Antihypertensive Treatment	48/104 (46.2%)	98/138 (71.0%)	0.00
Cesarean Delivery	47/104 (45.2%)	86/138 (62.3%)	0.01

Proteinuria by volume (>300mg protein per volume in 24 hours), Proteinuria by concentration (>300mg protein per liter in 24 hours), SBP (systolic blood pressure), DBP (diastolic blood pressure)

240 | Efficacy and Outcomes of a 4 French Aortic Occlusion Balloon in Complex Placenta Accreta Surgery

Joseph C. Mulhall[1]; Yamely H. Mendez[1]; Christina C. Reed[2]; Arthur Ladron De Guevara[1]; Keneshia Lane[1]; Jonathan Gross[1]; Amir A. Shamshirsaz[1]; Hendrik A. Lombaard[3]; Michael A. Belfort[4]; Claire Hoppenot[1]; Jessian L. Munoz[1]
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10:30 AM - 12:30 PM

Objective: Placenta Accreta Spectrum (PAS) is associated with significant maternal morbidity at time of cesarean hysterectomy. Aortic balloon occlusion is a technique used to reduce blood loss in cases of PAS, yet there is a risk of vascular injury at the point of arterial access. Traditional balloon devices require a 12 French arterial sheath. We evaluated our surgical outcomes using an innovative 4 French balloon occlusion device.

Study Design: This was a retrospective cohort study of patients with ultrasound findings consistent with complex PAS (placenta increta or percreta) who were delivered at a single tertiary care center from January 2020 to June 2024 with confirmed PAS on histopathology. Patients delivered after March 2022 were eligible to receive the 4 French balloon occlusion device. The patients delivered in the 28 months preceding this date served as historical controls. Uni- and multivariate analyses were performed for outcomes and confounding variables.

Results: There were 22 patients who received a 4 French aortic balloon occlusion device during the study period and 25 patients in the control group. There were no differences in baseline demographics between the two groups, and each group had similar distribution of pathologic PAS diagnoses (Table 1). Twelve patients (55%) had the balloon occlusion device deployed during delivery with an average deployment time of 39 minutes. There were no differences in estimated blood loss, transfusion rate, ICU admission, or postoperative length of stay between groups. Patients who received a balloon occlusion device had significantly longer operative time (341 min vs 289 min, p = 0.04) and higher readmission rate (27% vs 4%, p = 0.04). There were no cases of vascular injuries.

Conclusion: In our cohort, placement of a 4 French aortic occlusion balloon was associated with higher operative time and readmission rates, with no difference in other operative outcomes. There were no cases of vascular complications related to balloon placement. Larger studies are needed to identify patients who may benefit from this aortic balloon occlusion device.

Demographics:	Device (n = 22)	Pre-Device (n = 25)	p-value
Age	32.6 (4.9)	34.0 (4.7)	0.32
BMI	36.1 (8.6)	34.8 (7.0)	0.57
Gravidity	5.2 (2.8)	4.5 (1.4)	0.28
Parity	3.2 (2.0)	2.8 (1.4)	0.43
Gestational Age at Delivery	32.1 (2.8)	33.8 (1.8)	0.11
Unscheduled Delivery	11 (50%)	7 (28%)	0.22
Prior Cesarean Delivery (CD)	22 (100%)	25 (100%)	0.99
Pregestational Diabetes	0 (0%)	3 (12%)	0.1
Chronic Hypertension	1 (5%)	3 (12%)	0.38
Anemia	10 (45%)	15 (60%)	0.5
Antenatal Diagnosis:			
Increta	3 (14%)	6 (24%)	0.42
Percreta	19 (86%)	19 (76%)	0.69
Operative Outcomes			
Operative Time (min)	340.7 (77.7)	289.0 (89.8)	**0.04**
Estimated Blood Loss	1790.2 (1384.1)	1530.8 (765.1)	0.42
ICU Admission	9 (41%)	9 (36%)	0.79
ICU Length of Stay (hrs)	7.3 (10.6)	8.6 (16.2)	0.75
Postoperative Length of Stay	4.3 (1.6)	4.1 (1.3)	0.64
Transfusion (any)	19 (86%)	14 (56%)	0.22
Transfusion >4U pRBC	2 (9%)	1 (7%)	0.49
Postoperative Complications			
Readmission	6 (27%)	1 (4%)	**0.04**
Surgical Site Infection	4 (18%)	2 (8%)	0.34
DVT/PE	0 (0%)	0 (0%)	>0.99
Reoperation	2 (9%)	0 (0%)	0.09
Death	0 (0%)	0 (0%)	>0.99

Data expressed as either mean (standard deviation) or n (%)

241 | Antenatal Factors Associated with Inflation of 4 French Aortic Occlusion Balloon in Placenta Accreta Surgery

Joseph C. Mulhall[1]; Yamely H. Mendez[1]; Christina C. Reed[2]; Arthur Ladron De Guevara[1]; Keneshia Lane[1]; Jonathan Gross[1]; Claire Hoppenot[1]; Amir A. Shamshirsaz[1]; Hendrik A. Lombaard[3]; Michael A. Belfort[4]; Jessian L. Munoz[1]
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10:30 AM - 12:30 PM

Objective: Aortic balloon occlusion is a technique used to reduce blood loss in cases of placenta accreta spectrum (PAS). Currently, there is no consensus on which patients would most benefit from aortic balloon device placement. We evaluated differences in antenatal clinical factors between patients who had the device inflated from those who had the device placed but not inflated.

Study Design: This was a retrospective case-control study of patients with ultrasound findings consistent with PAS who were delivered at a single tertiary care center from March 2022 through June 2024 and had a 4 French aortic occlusion balloon placed prior to surgery. Patients who had the balloon inflated intraoperatively were compared to patients who had the device inserted but not inflated. Uni- and multivariate analyses were performed for outcomes and confounding variables.

Results: There were 59 patients who had the 4 French aortic occlusion balloon placed during the study period, 28 of which had the balloon inflated during surgery. The average duration of balloon inflation was 35 minutes. There were no differences in demographic factors and medical histories between groups, including number of uterine surgeries (2.7 vs 2.8, p = 0.80) or timing of delivery (32.4 vs 33.0 weeks, p = 0.40). Additionally, there was no significant difference in the number or type of PAS ultrasound findings between groups. The suspected PAS diagnoses were similar in each group. Patients who had balloon inflated were more likely to have greater than two episodes of antenatal bleeding episodes though this did not reach statistical significance (18% vs 3%, p = 0.08). Antepartum complications were similar between both groups.

Conclusion: In our cohort we were unable to identify demographic, ultrasonographic, or antepartum factors that were associated with inflation of 4 French aortic occlusion balloon. These findings highlight the challenge in identifying patients who would most benefit from this device. Further research is needed to stratify patients for use of aortic occlusion balloon in PAS surgery.

Demographics:	Device Inflated (n=28)	Device Placed (n=31)	p-value
Age	33.3 (5.6)	32.0 (5.1)	0.35
BMI	35.2 (7.4)	33.8 (8.5)	0.50
Gravidity	4.8 (2.5)	4.4 (2.0)	0.50
Parity	2.9 (1.8)	2.6 (1.4)	0.48
Gestational Age (weeks)	32.4 (2.7)	33.0 (2.7)	0.40
Number of Prior Uterine Surgeries	2.7 (1.1)	2.8 (1.8)	0.80
Short Interval Pregnancy	9 (32%)	12 (39%)	0.67
Pregestational Diabetes	0 (0%)	1 (3%)	0.34
Chronic Hypertension	4 (14%)	1 (3%)	0.15
Preoperative Hemoglobin (g/dL)	11.2 (1.5)	10.7 (0.9)	0.12
Unscheduled Delivery	14 (50%)	14 (45%)	0.79
Ultrasound Findings:			
Placenta Previa	27 (96%)	23 (74%)	0.35
Lacunae	21 (75%)	23 (74%)	0.97
Loss of Retroplacental Clear Space	14 (50%)	10 (32%)	0.29
Hypervascularity	21 (75%)	22 (71%)	0.86
Vesicouterine Bulging	16 (57%)	18 (58%)	0.96
Myometrial Thinning	5 (18%)	9 (29%)	0.38
Total Abnormal Ultrasound Findings	3.7 (1.7)	3.6 (1.6)	0.82
Antenatal Diagnosis:			
Accreta	13 (46%)	18 (58%)	0.53
Increta	4 (14%)	3 (10%	0.61
Percreta	11 (39%)	10 (32%)	0.65
Antenatal Complications:			
PPROM	1 (4%)	2 (6%)	0.62
Vaginal Bleeding	8 (29%)	12 (39%)	0.50
>2 Vaginal Bleeding Episodes	5 (18%)	1 (3%)	0.08
Preterm Labor	6 (21%)	7 (23%)	0.93
Hypertensive Disorder of Pregnancy	4 (14%)	2 (6%)	0.35
Gestational Diabetes	4 (14%)	1 (3%)	0.15

Data expressed as either mean (standard deviation) or n (%)

242 | Stage 1 Hypertension Before 20 Weeks of Gestation is Associated with Postpartum Anti-Hypertensive Use

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10:30 AM - 12:30 PM

Objective: Stage 1 hypertension (HTN), as defined by the American Heart Association, is associated with an increased risk of hypertensive disorders of pregnancy (HDP). Our objective was to evaluate if stage 1 HTN before 20 weeks of gestation was associated with persistent anti-hypertensive medication use at 6 weeks postpartum (PP).

Study Design: This was a retrospective cohort study at a single tertiary care center of all patients who delivered singleton gestations after 20 weeks of gestation between 2014-2016. Patients with chronic HTN and those who did not have 6 week PP data were excluded. Stage 1 HTN was defined as a maximum blood pressure (BP) of 130-139/80-89 before 20 weeks of gestation. Normotensive patients were those with all BPs < 130/80 before 20 weeks of gestation. The primary outcome was anti-hypertensive medication use at the 6 week PP visit, and the secondary outcome was PP re-admission for HDP. Multivariable logistic regression was used to adjust for potential confounders.

Results: 1546 normotensive patients were compared to 465 patients with stage 1 HTN before 20 weeks of gestation. Patients with stage 1 HTN were more likely to develop a HDP. Compared to normotensive patients, those with stage 1 HTN were significantly more likely to require anti-hypertensive medication at 6 weeks PP (8.8% vs. 2.9%, aOR 2.23; 95% CI, 1.41-3.54), even when the analysis was restricted to patients who developed a HDP (P = 0.02). Patients with stage 1 HTN were also significantly more likely to be re-admitted for a HDP (3.9% vs. 1.5%, aOR 2.11; 95% CI, 1.10-4.06).

Conclusion: Stage 1 hypertension before 20 weeks gestation should be considered a risk factor for persistent anti-hypertensive use at 6 weeks PP and re-admission for HTN, and targeted for future study.

Table: Maternal outcomes in patients with and without stage 1 hypertension before 20 weeks of gestation

Outcomes	Normotensive (n=1546) *Ref*	Stage 1 HTN before 20 wk (n=465)	OR (95% CI)	aOR[a] (95% CI)
Anti-hypertensive medication at 6 wk postpartum	45 (2.91)	41 (8.82)	**3.22 (2.08, 4.99)**	**2.23 (1.41, 3.54)**
Postpartum re-admission for HDP	23 (1.49)	18 (3.87)	**2.67 (1.43, 4.99)**	**2.11 (1.10, 4.06)**

Values are expressed as n (%)
Wk, weeks; HDP, hypertensive disorder of pregnancy
[a]Adjusted for BMI ≥30 kg/m², pre-gestational diabetes mellitus, and history of HDP

243 | The Performance of an Automated Risk Stratification Tool for Postpartum Hemorrhage Prediction

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10:30 AM - 12:30 PM

Objective: PPH is one of the most common causes of morbidity during labor and delivery. Most current risk stratification tools rely on manual completion of checklists at multiple time points, increasing non-patient-facing tasks for the care team and relying on information recorded in multiple places in the EHR. Our objective was to automate a common PPH risk stratification tool using data routinely captured in the EHR and assess its performance to predict PPH.

Study Design: We automated the assignment of the AWHONN PPH Risk Tool designation using structured, real-time data in

the EHR at the time of admission, pre-delivery, and postpartum. Individuals were classified as low, medium, or high risk using the AWHOON PPH Tool risk factor framework (v1.2). We assessed the performance of the automated tool to predict PPH (EBL≥1,000 mL) by measuring sensitivity, specificity, PPV, and NPV for the high-risk group at each timepoint using data from all individuals who delivered at a single academic institution between July 2023 and April 2024.

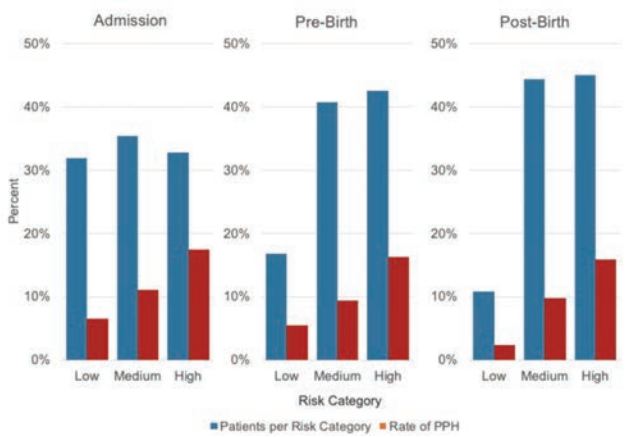
Results: 1208 participants were included, of which 141 (11.8%) had a PPH. The distribution of patients between the risk categories at the three timepoints and the rate of PPH are shown in the Figure. 32.8%, 42.5%, and 45.0% were high-risk on admission, pre-birth, and post-birth, respectively. The rate of PPH increased with corresponding risk categories at each time point, demonstrating the tool's value in stratifying risk. On admission, the rate of PPH in the low risk compared to the high-risk group was 6.5% vs. 17.4%. Among those classified as high risk, the sensitivity increased from 48.9% to 61.0% from admission to post-birth, and the PPV decreased from 17.4 to 15.8%.

Conclusion: A real-time, automated version of a common PPH risk assessment tool can stratify the PPH risk using clinical EHR data. Future work is focused on the ability of this tool to reduce administrative burdens of the team and improve team awareness and communication through the triggering of real-time, automated alerts for PPH risk.

Table: Performance Characteristics of the Automated High-Risk Designation at Three Time Points during the L&D Admission

Time Point	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value
Admission	48.9%	69.3%	17.4%	91.1%
Pre-birth	59.6%	59.8%	16.3%	91.8%
Post-birth	61.0%	57.2%	15.8%	91.7%

Figure: Distribution of Patients per Risk Category and the Rate of Postpartum Hemorrhage at Three Time Points during the L&D Admission



244 | Effect of a High Dose Oxytocin Protocol for Management of Labor

Kaitlyn M. Dorn[1]; Sarah Oliver[1]; Maggie Ross[1]; Le'Nisha Williams[1]; Frank B. Williams[1]; Joseph R. Biggio, Jr[2]; Jane Martin[1]

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10:30 AM - 12:30 PM

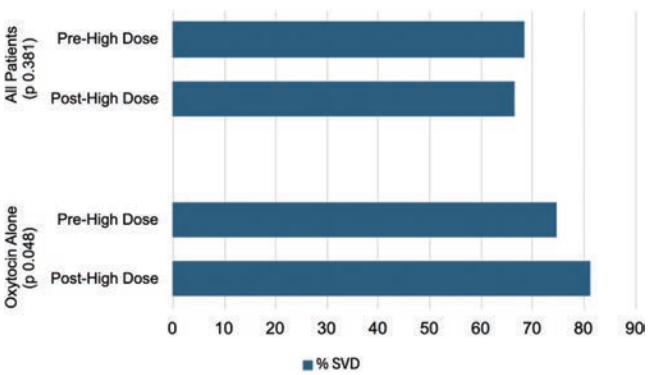
Objective: Randomized data suggest high dose oxytocin reduces duration of labor without increasing adverse outcomes. Among nulliparous patients without contraindications to labor, we compared low versus high dose oxytocin on rate of spontaneous vaginal delivery (SVD) within 24 hours of oxytocin initiation.

Study Design: We conducted a retrospective cohort study of nulliparous women 36w0d gestation or greater undergoing labor induction or augmentation at a single tertiary care center from April 2021 to August 2023. Patients with a history of uterine surgery or non-cephalic presentation were excluded. Low dose oxytocin protocol was standard of care prior to September 2022 and consisted of a starting dose of 2 mU/minute, titrated by 2 mU/minute every 30 minutes. Patients delivering after September 2022 received high dose oxytocin protocol, which consisted of a starting dose of 4 mU/minute, titrated by 4 mU/minute every 30 minutes. Primary outcome was SVD within 24 hours of oxytocin initiation. Secondary outcomes included median duration of labor, delivery mode, intra-amniotic infection (IAI), postpartum hemorrhage (PPH), and five-minute Apgar less than 7.

Results: There were 2,147 patients eligible for enrollment: 1058 in the low dose oxytocin arm and 1089 in the high dose oxytocin arm. There was no difference in rate of SVD within 24 hours according to oxytocin dose protocol (69 vs 67%, p 0.381). Similarly, there were no differences in secondary outcomes. A sub-analysis was performed to assess patients who received oxytocin alone without exposure to other methods of induction or augmentation. Rate of SVD within 24 hours increased (81 vs 75%, p 0.048) and labor duration decreased (10.5 vs 12.7 hours, $p < 0.001$) with high dose oxytocin when compared to low dose oxytocin.

Conclusion: When assessing all nulliparous patients admitted for labor induction or augmentation, implementation of a high dose oxytocin protocol did not result in increased rates of SVD within 24 hours. Rates of SVD within 24 hours were increased and median labor duration was shorter with oxytocin exposure alone.

	Pre-High Dose (N=1058)	Post-High Dose (N=1089)	p-value
Black, N (%)	267 (25.3)	288 (26.5)	0.555
Hispanic, N (%)	64 (6.1)	77 (7.1)	0.385
Age, Median (IQR)	30 (26, 33)	30 (25, 33)	0.985
BMI, Median (IQR)	31.24 (27.83, 36.04)	31.84 (28.22, 36.63)	0.029
EGA, Median (IQR)	276 (270, 281)	275 (269, 280)	0.063
Maximum Oxytocin Dose, Median (IQR)	14 (8, 22)	16 (8, 24)	< 0.001
Induction, N (%)	700 (85.6)	768 (85.5)	1.000



245 | Establishing the Most Accurate Due Date in Twin Gestation by Second and Third Trimester Ultrasound

Katelyn J. Rittenhouse[1]; Ambika V. Viswanathan[2]; Teeranan Pokaprakarn[2]; Yuri Sebastião[2]; Elizabeth M. Stringer[2]; William H. Goodnight[2]; Jeffrey S.A. Stringer[2]
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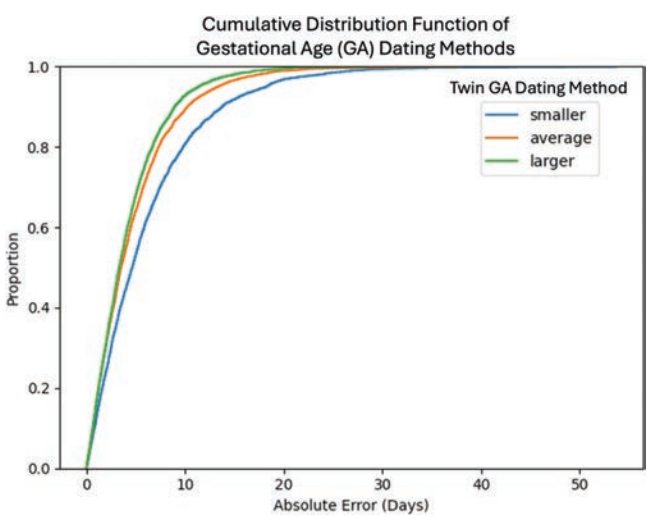
10:30 AM - 12:30 PM

Objective: We assessed the optimal sonographic dating approach for twin gestations presenting to antenatal care beyond the first trimester.

Study Design: We studied twin pregnancies receiving care at the University of North Carolina between Nov 2017 and Aug 2023 whose gestational age (GA) had been definitively established by first trimester ultrasound or in vitro fertilization ("ground truth"). We included all ultrasound studies with complete biometry conducted after 14 weeks gestation. We assessed the accuracy of Hadlock IV GA dating using the smaller, average, and larger twin's biometric data against "ground truth" gestational age.

Results: Our analysis dataset consisted of 2,103 studies from 593 twin pregnancies. 27% (161) pregnancies were monochorionic and 1% (8) were monoamniotic. The mean absolute error ± standard error (MAE ± SE) was 5.77 ± 0.12 days for the smaller twin, 4.41 ± 0.09 days for the average twin, and 4.06 ± 0.07 days for the larger twin. The average error (AE) showed that all three measurements underestimated gestational age when compared to ground truth, with the larger twin having the least bias (smaller twin -4.53 ± 0.14; average twin -2.28 ± 0.12; larger twin -0.03 ± 0.12). These results held across sensitivity analyses including only one ultrasound scan per pregnancy and stratifying by chorionicity.

Conclusion: In the 2nd and 3rd trimesters, gestational age dating is more accurate and less biased when using the biometry of the larger twin, as compared to the smaller twin or an average of the two twins. Guidelines should be updated to provide clear guidance on establishing twin GA when the dating ultrasound is performed beyond the first trimester.



Comparison of twin gestational age using the smaller, average, and larger twin biometric data

		Twin Gestational Age Comparison (N = 593 pregnancies, 2,103 studies)		
		Smaller	Average	Larger
Mean Absolute Error (SE), days		5.77 (0.12)	4.41 (0.09)	4.06 (0.07)
Mean Error (SE), days		-4.53 (0.14)	-2.28 (0.12)	-0.03 (0.12)
2nd trimester†	Mean Absolute Error (SE), days	4.18 (0.11)	3.27 (0.08)	3.11 (0.07)
	Mean Error (SE), days	-3.02 (0.14)	-1.35 (0.12)	0.32 (0.11)
3rd trimester‡	Mean Absolute Error (SE), days	8.08 (0.22)	6.06 (0.17)	5.43 (0.14)
	Mean Error (SE), days	-6.73 (0.27)	-2.28 (0.23)	-0.53 (0.23)
Absolute Error < 7 days (SE), %		70.28 (1.0)	80.65 (0.86)	84.02 (0.80)
Absolute Error < 14 days (SE), %		92.49 (0.57)	96.72 (0.39)	98.05 (0.30)

†2nd trimester is defined as 98-195 days, 557 pregnancies, 1,246 studies
‡3rd trimester is defined as 196 days to 280 days, 431 pregnancies, 857 studies

246 | Association Between Abnormal Umbilical Artery Doppler and Stillbirth in a Zambian Cohort

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10:30 AM - 12:30 PM

Objective: We sought to estimate the association between abnormal 3rd trimester UAD and stillbirth in an unselected, well-characterized Zambian cohort.

Study Design: The Zambian Prematurity Prevention Study (ZAPPS) is a prospective antenatal cohort in Lusaka with continuous enrollment since 2015. Since 3/2020, UAD were routinely obtained during 3rd trimester ultrasound. FGR was defined as an estimated fetal weight (EFW) < 10%ile. Abnormal UAD was defined as 1) reversed or absent end diastolic flow (EDF) or 2) systolic/diastolic (S/D) ratio >95%ile for gestational age. FGR and S/D ratio were estimated using INTERGROWTH-21st standards. The primary outcome was stillbirth, defined as fetal death ≥20wks gestation. Using marginal standardization, we estimated crude and adjusted risk of stillbirth among singleton gestations. We also estimated risk of NICU admission and 5 minute APGAR < 7.

Results: Between 9/2020-12/2022, 988 singletons were enrolled in ZAPPS with a 3rd trimester growth ultrasound performed (range: 31-34wks). Delivery outcome was available on 978 pregnancies (99%) with 11 (1%) cases of stillbirth. During 3rd trimester ultrasound, 92 (9%) pregnancies were diagnosed with FGR and 77 (8%) had abnormal UAD (absent EDF: 32; S/D >95%ile: 45). Both FGR (ARR: 4.1; 95%CI: 1.1,15.1) and abnormal UAD (ARR: 5.5; 95%CI: 1.6, 18.7) were associated with increased risk of stillbirth in analyses adjusted for advanced maternal age and hypertension. The association between abnormal UAD and stillbirth was present even among normally grown fetuses (ARR: 6.6; 95%CI: 1.6,27.3). Abnormal UAD were also associated with NICU admission (RR: 2.0 95%CI 1.1 3.4) and 5 minute APGAR < 7 (RR: 3.1 95%CI: 1.3,7.6).

Conclusion: In this well characterized urban African cohort, abnormal UAD was common, only rarely comorbid with FGR, and independently associated with stillbirth. Further research is needed to understand the role of screening for abnormal UAD in this population.

Table 1: Association between stillbirth and three stratified sonographic groups

Group	Sonographic Findings	N	Risk	Unadjusted RR	Adjusted RR*
1	EFW≥10%	886	1% (8)	1.0 (reference)	1.0 (reference)
	EFW<10%	92	3% (3)	3.6 (0.98, 13.4)	4.1 (1.1, 15.1)
2	Normal UAD	901	1% (7)	1.0 (reference)	1.0 (reference)
	Abnormal UAD	77	5% (4)	6.7 (2.0, 22.3)	5.5 (1.6, 18.7)
3	EFW≥10%, normal UAD	817	1% (5)	1.0 (reference)	1.0 (reference)
	EFW≥10%, abnormal UAD	69	4% (3)	7.1 (1.7, 29.1)	6.6 (1.6, 27.3)
	EFW<10%, normal UAD	84	2% (2)	3.9 (0.8, 19.8)	5.2 (1.1, 25.5)
	EFW<10%, abnormal UAD	8	13% (1)	20.4 (2.7, 155.7)	11.5 (1.2, 112.7)

EFW: estimated fetal weight; UAD: umbilical artery dopplers; RR: risk ratio
*Adjusted for advanced maternal age and hypertension

Table 2: Association between stratified sonographic groups and NICU admission and 5 minute APGAR <7

		NICU Admission			5 minute APGAR <7		
Group	Sonographic Findings	N	Risk	RR	N	Risk	RR
1	EFW≥10%	888	9% (76)	1.0 (reference)	463	4% (20)	1.0 (reference)
	EFW<10%	89	11% (10)	1.3 (0.7, 2.4)	40	8% (3)	1.8 (0.5, 5.6)
2	Normal UAD	903	8% (74)	1.0 (reference)	452	4% (17)	1.0 (reference)
	Abnormal UAD	74	16% (12)	2.0 (1.1, 3.4)	51	12% (6)	3.1 (1.3, 7.6)
3	EFW≥10%, normal UAD	821	8% (65)	1.0 (reference)	417	4% (15)	1.0 (reference)
	EFW≥10%, abnormal UAD	67	16% (11)	2.1 (1.2, 3.7)	46	11% (5)	3.0 (1.2, 7.9)
	EFW<10%, normal UAD	82	11% (9)	1.4 (0.7, 2.7)	35	6% (2)	1.6 (0.4, 6.7)
	EFW<10%, abnormal UAD	7	14% (1)	1.8 (0.3, 11.2)	5	20% (1)	5.6 (0.9, 34.4)

EFW: estimated fetal weight; UAD: umbilical artery dopplers; RR: risk ratio; NICU: neonatal intensive care unit

247 | Implementation Barriers of a Community-Based Doula Program in an Academic Medical Center

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[1]*Medical College of Wisconsin, Milwaukee, WI;* [2]*African American Breastfeeding Network Inc., Milwaukee, WI*

10:30 AM - 12:30 PM

Objective: Community-based doula care is an evidence-based strategy to improve maternal and child health outcomes. However, building equitable partnerships between doulas and hospital-based labor and delivery clinicians presents challenges. Laying the groundwork for a collaborative clinician-doula program, this study aimed to identify multi-level barriers to developing and implementing a doula program for Black pregnant patients.

Study Design: In spring 2024, we conducted 19 in-depth interviews with obstetric clinicians (n = 13) and nurses (n = 6) from a single academic medical center and two focus groups with doulas (n = 11), from a local community-based non-profit organization. Conversations were audio-recorded, transcribed verbatim, and coded in MAXQDA qualitative analysis software. We used thematic analysis to understand program feasibility, acceptability, and key implementation barriers.

Results: Overwhelmingly, providers and doulas recognized the need for a collaborative clinician-doula program and believed it could improve patient experiences and outcomes. They described potential implementation barriers: 1) inconsistencies in doula training and knowledge across organizations; 2) lack of clarity around roles and expectations, particularly between nurses and doulas; 3) lack of trust between doulas and clinicians; and 4) hospital policies that limit collaboration. Overcoming these barriers will require developing a robust, collaborative training and implementation model that ensures equity between all partners.

Conclusion: Although community-based doulas improve equity in maternal and child health outcomes, the multi-level barriers identified in this formative study must be addressed to realize the full benefits of a collaborative clinician-doula program. To achieve equity goals, developing and implementing a clinician-doula collaborative model should be grounded in a health equity implementation science framework, informed by local data, and cooperatively led by doulas and healthcare providers.

248 | Single-Nucleus Transcriptomic Analysis of Placental Membranes Reveals Metabolic Dysregulation and Increased Trophoblast Proliferation in COVID-19

Katherine B. Le[1]; Natalie N. Lanners[1]; Rachel Keuls[2]; Tina Findley[1]; Ron Parchem[2]; Jacqueline G. Parchem[1]
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10:30 AM - 12:30 PM

Objective: Recent work showing that placental membrane trophoblasts expand in the context of severe preeclampsia suggests a role for membrane trophoblasts in placental disease. Yet, the biology and function of membrane trophoblasts are poorly understood. We sought to determine the effects of inflammatory stress from maternal COVID-19 on membrane cytotrophoblast (CTB) and extravillous trophoblast (EVT) gene function.

Study Design: We analyzed placenta single-nucleus RNA sequencing data from patients with symptomatic COVID-19 at birth (n = 4) and healthy gestational age-matched controls (n = 4). To evaluate the effects of COVID-19 on membrane CTBs and EVTs, we identified differentially expressed genes (DEGs) in COVID-19 vs. control samples for each cell population using Seurat in R. GO Biological Process gene set enrichment analysis (GSEA) was conducted using the Fgsea R package (q-value threshold < 0.1).

Results: EVTs showed downregulation of mitochondrial genes (*MT-ND4, MT-ND5*) and matrix metalloproteinase inhibitors (*TIMP2, TIMP3*), which regulate tissue remodeling and apoptosis. EVTs also exhibited upregulated *PAPPA2,* a growth factor regulator, and *EGLN3*, a hypoxia inducible factor. CTBs showed similar downregulation of mitochondrial genes and upregulation of *EGLN3*, in addition to *PPARG*, whose increased expression has been linked to ameliorating placental dysfunction. GSEA of EVT DEGs revealed the upregulation of pathways involved in signal transduction and cell proliferation, including MAPK cascade. Oxidative phosphorylation and cellular respiration were downregulated (**Fig 1**). GSEA results for CTBs showed pathways involved in carbohydrate metabolism and cell proliferation, although these were not significant.

Conclusion: In the setting of placental stress due to COVID-19, membrane EVTs and CTBs demonstrate mitochondrial dysfunction, response to hypoxia, downregulation of aerobic respiration pathways, and upregulation of cell proliferation pathways, primarily observed in EVTs. This study uncovers adaptations of understudied membrane trophoblasts in the context of COVID-19.

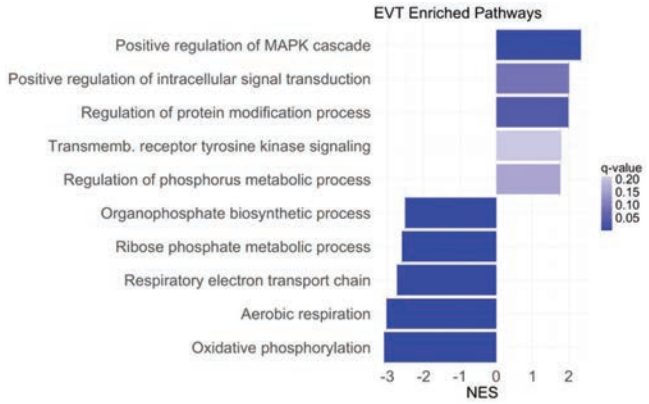

Figure 1. Gene Set Enrichment Analysis of the top 10 dysregulated pathways for EVTs, accompanied by normalized enrichment scores (NES) and q-values.

249 | Association of Maternal Serum 25-Hydroxyvitamin D Level in Mid-Gestation with Fetal Adiposity: a Longitudinal Study

Keisuke Akita[1]; Satoru Ikenoue[1]; Junko Tamai[1]; Naotsugu Ishikawa[1]; Yasuhiko Ogata[1]; Kaoru Kajikawa[1]; Yuka Fukuma[1]; Yuya Tanaka[1]; Toshimitsu Otani[2]; Yoshifumi Kasuga[1]; Mamoru Tanaka[1]
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10:30 AM - 12:30 PM

Objective: 25-Hydroxyvitamin D (25(OH)D) regulates lipid metabolism, and its decrease is proposed as a pathogenesis of metabolic syndrome. Fetuses are dependent on supply of 25(OH)D from maternal circulation though pregnant women are described as a population at risk for decreased 25(OH)D. Recently, quantitative evaluation of fetal adiposity using ultrasonography has been established, and clinical investigations revealed that gestational diabetes mellitus (GDM) is associated with increased fetal adiposity. However, the influence of maternal serum 25(OH)D on fetal fat deposition remains unclear. This study aimed to investigate the association of maternal serum 25(OH)D level in mid-gestation with fetal adiposity.

Study Design: A prospective study was conducted in a cohort of 89 (including 22 GDM) singleton pregnancies. Maternal blood sample was obtained at 24 weeks. Fetal ultrasonography was performed serially at 24, 30 and 36 weeks. Estimated fetal adiposity (EFA) was calculated by integrating measurements of cross-sectional arm and thigh percentage fat area and anterior abdominal wall thickness as previously reported. The association between maternal serum 25(OH)D and EFA were determined by multiple linear regression adjusted for potential covariates including maternal age, parity, pre-pregnancy BMI, gestational weight gain and fetal sex. GDM was diagnosed by the national clinical practice guideline based on the 75g oral glucose tolerance test.

Results: Maternal serum 25(OH)D at 24 weeks was 16.2±7.7 ng/ml (mean±S.D.). Maternal serum 25(OH)D was not associated with EFA at 24 and 30 weeks, but significantly and inversely correlated with EFA at 36 weeks ($r = -0.223$, $p = 0.032$). The magnitude of this association was pronounced particularly in GDM group ($r = -0.447$, $p = 0.033$), and not significant in non-GDM group ($r = -0.147$, $p = 0.227$).

Conclusion: Maternal serum 25(OH)D level in mid-gestation was inversely associated with fetal adiposity in late gestation. Maternal 25(OH)D could be an early biomarker of fetal adiposity especially in the diabetic pregnancies.

250 | Optimal Interpregnancy Interval after Periviable Birth

Kelli M. McFarling[1]; Sarayu Parise[2]; Brittany Austin[2]; Rebecca Crowe[2]; Matthew M. Finneran[2]
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10:30 AM - 12:30 PM

Objective: ACOG and SMFM recommend advising patients to avoid interpregnancy intervals of less than six months and to counsel regarding the risk and benefits of interpregnancy intervals of less than 18 months. The WHO specifies that after live births an interpregnancy interval of at least 24 months is recommended while after miscarriage an interpregnancy interval of at least 6 months is recommended. However, no guidelines specifically target patients who deliver periviable neonates, many of which do not survive. Our objective was to evaluate the impact of the interpregnancy interval on birth outcomes in women with a prior periviable birth.

Study Design: We performed a retrospective cohort study of women with a history of periviable birth (22w0d to 24w6d) from 2001-2020 with a subsequent singleton pregnancy with available outcome data. The primary outcome was gestational age at delivery while secondary outcomes included percent of miscarriage and mode of delivery. Categorical data was evaluated with Chi-square analysis and continuous data was analyzed with Kruskal-Wallis tests.

Results: 148 patients were included; 34 with an interpregnancy interval of < 6 months, 35 with an interpregnancy interval of 6-18 months and 79 with an interpregnancy interval of >18 months. Most patients were black, multiparous and delivered their index pregnancy due to preterm labor, preterm premature rupture or membranes or cervical insufficiency. Demographics were similar between groups. There were no significant differences in the primary outcome with the median gestational age at delivery for each groups at 37.1 weeks ($p = 0.898$). In addition, the risk of miscarriage (20.6%, 25.7% and 27.7%, $p = 0.776$) and mode of delivery (57.7%, 62.5% and 48.2%, $p = 0.453$) were similar between groups.

Conclusion: Our study does not indicate a higher risk of preterm birth or miscarriage in patients with short interpregnancy intervals after periviable birth.

	<6 mo (n=34)	6-18 mo (n =35)	>18 mo (n=79)	p value
Race				
Black	25 (73.5%)	25 (71.43%)	55 (69.6%)	
White	5 (14.7%)	9 (25.7%)	20 (25.3%)	
Hispanic	2 (5.9%)	0 (0.0%)	2 (2.5%)	
Asian	1 (2.9%)	1 (2.9%)	1 (1.3%)	
Other	1 (2.9%)	0 (0.0%)	1 (1.3%)	p = 0.737
Multiparous	24 (70.6%)	25 (71.4%)	50 (63.3%)	p = 0.607
Mode of Index Birth SVD	29 (85.3%)	30 (85.7%)	61 (77.2%)	p = 0.438
Indication for Index Birth				
PTL/CI/PPROM	32 (97.0%)	31 (88.6%)	73 (97.3%)	
Intact Chorioamnionitis	0 (0.0%)	1 (2.9%)	1 (1.3%)	
Abruption	0 (0.0%)	0 (0.0%)	1 (1.3%)	
Placenta Previa	0 (0.0%)	1 (2.9%)	0 (0.0%)	
Severe Preeclampsia	0 (0.0%)	2 (5.7%)	0 (0.0%)	
Other	1 (3.0%)	0 (0.0%)	0 (0.0%)	p = 0.143
Index Pregnancy Multi-gestation	4 (12.1%)	1 (2.9%)	7 (9.3%)	p = 0.354

	<6 mo (n=34)	6-18 mo (n =35)	>18 mo (n=79)	P value
Outcome				
Term Delivery	16 (47.1%)	14 (40%)	62 (41.9%)	
Preterm Delivery	11 (32.4%)	12 (34.3%)	45 (30.4%)	
SAB	7 (20.6%)	9 (25.7%)	41 (27.7%)	P = 0.776
Mode of Delivery SVD	15 (57.7%)	15 (62.5%)	26 (48.2%)	P = 0.453
GA at Delivery	37.1 (34.0-39.0)	37.1 (32.4-38.9)	37.1 (34.9-39.0)	P = 0.898

251 | Closing the gap: Postpartum Transition of Treatment for Chronic Hypertension in the United States, 2008-2022

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10:30 AM - 12:30 PM

Objective: Medication treatment of chronic hypertension (cHTN) is effective for blood pressure control during and after pregnancy, which is imperative to reduce the risk of adverse outcomes. However, postpartum challenges, including switching to first-line antihypertensive medications that are recommended outside of pregnancy and transitions in primary care providers, may affect the use of antihypertensive medications during this time. We examined patterns of postpartum antihypertensive medication use among people with cHTN requiring medication.

Study Design: We used the Merative™ MarketScan Database of people in the U.S. with private insurance who gave birth between 2008-2022. The study included people with livebirths complicated by cHTN in pregnancy requiring labetalol, nifedipine, or methyldopa for treatment during the first 20 weeks of gestation. We analyzed prescription fills of all antihypertensive medications from 0-6 months postpartum, and examined differences in medication use by comorbidities and in each month postpartum.

Results: Among 20,168 people with cHTN requiring treatment during pregnancy, 83% received an antihypertensive medication in the first 6 months postpartum and 17% did not (Table 1). Labetalol was the most common medication used (47%), with < 10% use of antihypertensive medications other than nifedipine (23%) or methyldopa (17%). Use of lisinopril was higher in people with diabetes (14%), chronic renal disease (14%), class 3 obesity (11%), or lupus (13%) compared with the overall cohort (9.2%). Use of any medication was 60% in the first month postpartum, then decreased to 41% by six months postpartum (Figure 1).

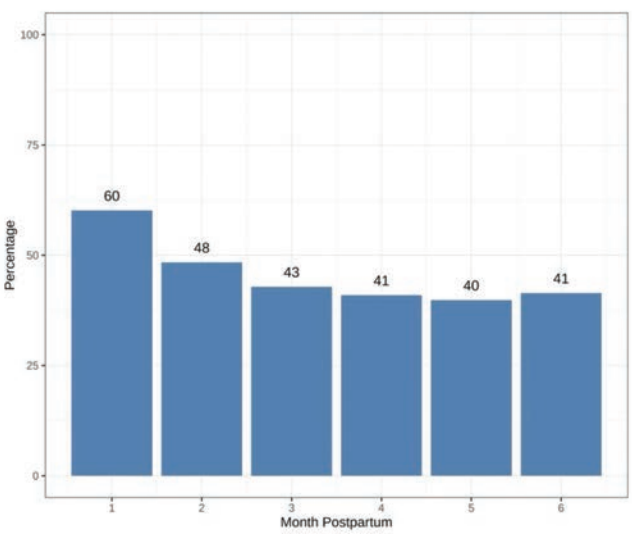
Conclusion: In this national, contemporary cohort, 17% of people with cHTN who required treatment early in pregnancy did not receive an antihypertensive medication in the first 6 months postpartum. Use of any medication fell to less than 50% by 2 months postpartum. These findings show the need to improve adherence and transition to appropriate antihypertensive medications postpartum.

Table 1: Postpartum antihypertensive medication prescription fills, from delivery through six months postpartum, among people with chronic hypertension requiring treatment with labetalol, nifedipine, or methyldopa during the first 20 weeks of pregnancy.

Antihypertensive Medication	Total population N =20,168 (100%)	Diabetes (type 1 or 2) N =2,978 (14.8%)	Chronic renal disease N = 599 (3.0%)	Class 3 obesity N = 3,039 (15.1%)	Systemic lupus erythema-tosus N = 127 (0.6%)
	n (%) [a]	n (%) [a]	n (%) [a]	n (%) [a]	n (%) [a]
Any medication	16,684 (82.7)	2,518 (84.6)	541 (90.3)	2,544 (83.7)	108 (85.0)
Labetalol	9,549 (47.3)	1,357 (45.6)	326 (54.4)	1,575 (51.8)	64 (50.4)
Methyldopa	3,440 (17.1)	503 (16.9)	82 (13.7)	397 (13.1)	15 (11.8)
Nifedipine	4,547 (22.5)	732 (24.6)	183 (30.6)	751 (24.7)	41 (32.3)
Hydrochlorothiazide	3,041 (15.1)	525 (17.6)	73 (12.2)	549 (18.1)	13 (10.2)
Metoprolol	967 (4.8)	142 (4.8)	39 (6.5)	142 (4.7)	<11*
Amlodipine	1,398 (6.9)	216 (7.3)	73 (12.2)	208 (6.8)	<11*
Lisinopril	1,857 (9.2)	421 (14.1)	83 (13.9)	327 (10.8)	17 (13.4)
Captopril	22 (0.1)	<11*	<11*	<11*	<11*
Enalapril	217 (1.1)	48 (1.6)	22 (3.7)	29 (1.0)	<11*
Other medication	2,810 (13.9)	510 (17.1)	125 (20.9)	431 (14.2)	26 (20.5)

[a] Column percentages sum to >100% if more than one medication was dispensed postpartum.
*Cells <11 not shown per data use agreement to protect confidentiality.

Figure 1: Rates of postpartum prescription fills of antihypertensive medications in each month postpartum, among people with chronic hypertension requiring treatment with labetalol, nifedipine, or methyldopa during the first 20 weeks of pregnancy.



252 | 6-Month Mental Health Outcomes Among Participants in a Postpartum Care in the NICU (PeliCaN) Trial

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10:30 AM - 12:30 PM

Objective: To compare mental health outcomes among individuals randomized to a co-located postpartum care delivery model in the Neonatal Intensive Care Unit (NICU) (PeliCaN) to controls randomized to usual postpartum care.

Study Design: This was a secondary analysis of the PeliCaN trial in which postpartum parents of preterm infants < 34 weeks gestation admitted to the NICU with an expected length of stay >1 week were included. Doulas provided comprehensive informational and emotional support tailored to the unique needs of NICU parents and facilitated the coordination of a midwifery postpartum visit within the NICU. Mental health outcomes were assessed including Edinburgh Postnatal Depression Scale (EPDS) scores at enrollment and at 6 months postpartum and post-traumatic stress disorder (PTSD) Checklist for DSM-5 (PCL-5), an assessment of PTSD symptoms, at 6 months postpartum.

Results: 34/37 of the participants in the parent trial completed mental health screening and were included in this analysis. Participants in the intervention arm had lower mean EPDS scores (4.82 vs. 5.82, p = 0.56) and PCL-5 scores (18.7 vs. 22.2, p = 0.40) at 6 months postpartum compared to usual care though this did not reach significance. No participants in either group indicated thoughts of self-harm on question 10 of the EPDS at baseline or 6 months postpartum. However, two patients in the intervention arm experienced neonatal deaths and reported acute suicidality to the supporting doulas outside of screening. Both patients were connected to appropriate emergency psychiatric care.

Conclusion: While no significant differences in mental health screening scores were detected between intervention and control participants of the PeliCaN trial, doulas were able to successfully identify and intervene on acute suicidal symptoms of two patients. This underscores the value of the doula-led postpartum care model for vulnerable NICU parents, highlighted by the trusting relationships developed and the willingness of parents to seek assistance when facing mental health emergencies.

Table 1: Baseline characteristics of participants of the Postpartum Care in the NICU (PeliCaN) Trial

	Intervention	Usual Care	*p*-value
	n=17	n=17	
Age (years), mean (SD)	28.3 (6.6)	31.1 (5.6)	0.20
Gestational age at birth, mean (SD)	30.6 (3.6)	29.3 (3.0)	0.26
Insurance			0.29
Public	14 (82.4)	16 (94.1)	
Private	3 (17.6)	1 (5.9)	
Education			0.98
< High school	2 (11.8)	2 (11.8)	
High school graduate	7 (41.2)	8 (47.1)	
Some college	5 (29.4)	4 (23.5)	
College graduate or more	3 (17.6)	3 (17.6)	
Multiple gestation	2 (11.8)	1 (5.9)	0.55
Nulliparous	8 (47.1)	2 (11.8)	0.02
Prior preterm birth among multiparous	4 (23.5)	4 (23.5)	1.00
Race and ethnicity			0.63
Black, non-Hispanic	14 (82.4)	11 (64.7)	
Hispanic	2 (11.8)	3 (17.6)	
Multiple, non-Hispanic	0 (0.0)	1 (5.9)	
Prefer not to answer, non-Hispanic	0 (0.0)	1 (5.9)	
White, non-Hispanic	1 (5.9)	1 (5.9)	
Partnership status			0.27
Married or partnered	10 (58.8)	13 (76.5)	
Not partnered	7 (41.2)	4 (23.5)	
Cesarean birth	10 (58.8)	10 (58.8)	1.00
Infant length of stay (days), mean (SD)	81.35 (92.4)	76.82 (53.2)	0.86

Data presented as n (%) unless indicated

Table 2: Postpartum mental health screening among participants in the Postpartum Care in the NICU (PeliCaN) Trial

	Intervention	Usual Care	*p*-value
	n=17	n=17	
Depression screening (EPDS)			
EPDS score at baseline, mean (SD)	5.47 (4.57)	6.29 (5.57)	0.64
High baseline EPDS (≥13)	2 (11.8)	2 (11.76%)	1.00
EPDS at 6 months postpartum, mean (SD)	4.82 (5.11)	5.82 (4.76)	0.56
High 6 months postpartum EPDS (≥13)	1 (5.9)	3 (17.6)	0.29
Change in EPDS from baseline to 6 months postpartum	-0.65 (4.18)	-0.47 (4.93)	0.91
PTSD screening (PCL-5)			
PCL-5 at 6 months postpartum, mean (SD)	18.7 (13.4)	22.2 (9.86)	0.40
High 6 month postpartum PCL-5 (≥31)	3 (17.6)	3 (17.6)	1.00
High 6 months postpartum PCL-5 (≥33)	3 (17.6)	2 (11.8)	0.63

Data presented as n (%) unless indicated
EPDS, Edinburgh Postnatal Depression Scale
PTSD, Posttraumatic Stress Disorder
PCL-5, PTSD Checklist for DSM-5

253 | Is Low Maternal Bp Associated with SGA in Those Treated for Chronic Hypertension in Pregnancy?

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10:30 AM - 12:30 PM

Objective: In pregnant patients with mild chronic hypertension (CHTN), maintaining blood pressure (BP) < 140/90 optimizes perinatal outcome. However, treatment that leads to maternal hypotension could lead to placental hypoperfusion and subsequent poor fetal growth. Our objective was to estimate the association between maternal hypotension ('low BP') and a small for gestational age infant (SGA) infant in patients treated for mild CHTN in pregnancy.

Study Design: This is a secondary analysis of the Chronic Hypertension and Pregnancy (CHAP) Study, which randomized pregnant patients with mild CHTN to treatment to achieve BP < 140/90 versus < 160/105. For each participant we calculated mean BP between 28-34 weeks and excluded those with mean BP >140/90. We defined 'low BP' as either average BP < 110/70 or mean arterial pressure (MAP) < 80 and compared participants with low BP to those with average SBP 110-139 and/or DBP 71-89 or MAP > 80. Our primary outcome was SGA (birthweight < 5th percentile). Logistic regression was used to estimate association between low BP and SGA.

Results: Of 2408 CHAP participants, 1205 (50%) met analysis criteria [most common exclusions: 301 for mean BP > 140/90; 125 for missing birthweight]. Of 1205, 31 (2.6%) had mean BP < 110/70, and 33 (2.7%) had MAP < 80. SGA occurred in 62 (5.1%). Low BP by either mean BP or mean MAP was not associated with an SGA infant (Table). We found a nonlinear relationship between MAP as a continuous variable and probability of SGA. As shown in the Figure, lower MAP was associated with lower probability of an SGA infant (p = 0.02). As MAP increased from 80 to 97.5 the probability of SGA increased and then plateaued.

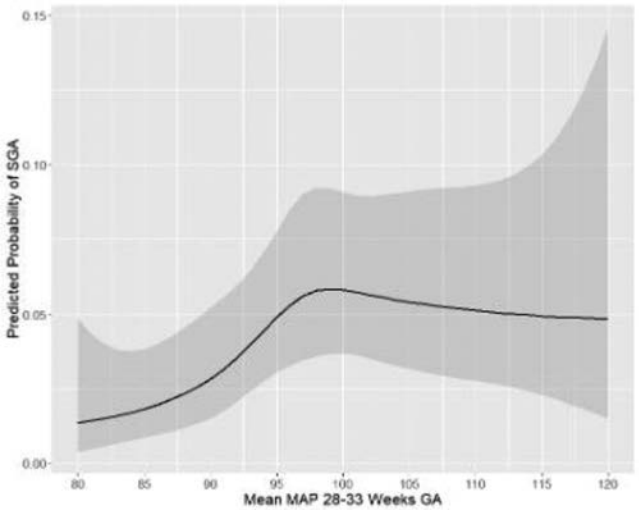
Conclusion: Less than 3% of patients treated for mild CHTN in pregnancy achieve average BP < 110/70 or MAP < 80, and those with low BP did not have increase in odds of an SGA infant. Patients can be reassured that pharmacologic treatment

of hypertension infrequently results in BP < 110/70 or MAP < 80 and low BP does not appear to increase risk for SGA.

Table. Association between low BP and SGA in CHAP participants with mean BP < 140/90 at 28-34 weeks (N=1205)

	N (%)	SGA <5th percentile, N(%)	OR (95% CI)	*Adjusted OR (95% CI)
Mean BP <110/70	31 (2.6)	1 (3.2)	0.61 (0.08-4.53)	0.46 (0.06-3.58)
Mean BP ≥ 110/70 and <140/90	1174 (97.4)	61 (5.2)	Referent group	
Mean MAP <80	33 (2.7)	1 (3.0)	0.57 (0.08-4.24)	0.53 (0.07-4.01)
Mean MAP ≥ 80	1172 (97.3)	61 (5.2)	Referent group	

*Adjusted for BMI, smoking, diabetes, maternal age, aspirin use, and group assignment



254 | A Model to Predict Latency in Preterm Prelabor Rupture of Membranes (PPROM)

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10:30 AM - 12:30 PM

Objective: We sought to develop a model to predict length of latency in patients with PPROM.

Study Design: This was a retrospective cohort study of singleton gestations presenting with PPROM between 24w0d-32w6d from 2017-2022 at two large academic centers. Patients presenting with active labor, clinical chorioamnionitis, contraindications to expectant management, or known fetal anomalies were excluded. Primary outcomes were latency ≥2 days and ≥7 days. We collected data on maternal and obstetric history, prenatal course, and symptoms, labs, vitals, and fetal data at presentation via individual chart review. Multivariable logistic regression was used to produce prediction models.

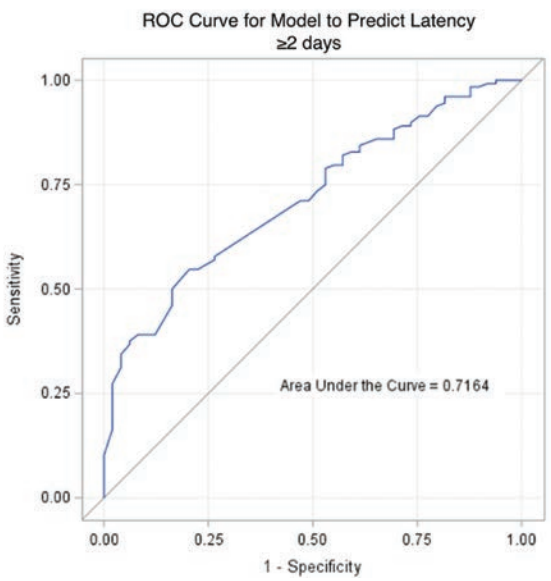
Results: Of 304 patients who presented with PPROM between 24w0d and 32w6d, 192 (63.1%) met inclusion criteria, with most exclusions due to active labor or fetal anomalies. Gestational age (GA; p = 0.02), presence of contractions (p = 0.02), and cervical dilation (p = 0.03) were significantly associated with latency ≥2 days. (Table 1.) After adjusting for confounders, patients presenting with contractions had 62% lower odds of a ≥2 day latency. Each additional centimeter of dilation and week of gestation reduced the odds of ≥2 day latency by 27% and 17%, respectively. Together, these variables achieved moderate prediction of the outcome (AUC: 0.72. Figure 1). Examples of variables not determined to be significant in the model included parity, obstetric history, maternal vitals and basic lab markers, and fetal heart rate patterns. For latency ≥7 days, only GA (p = 0.01) and cervical dilation (p = 0.01) were found to be significant, yielding an adjusted model with an AUC of 0.68.

Conclusion: In patients presenting with PPROM, it is possible to generate a predictive model for odds of latency ≥2 days. This can be used to individualize counseling and help set patient expectations, as well as to assist in guiding resource utilization and necessity or timing of hospital transfer.

Table 1: Multivariable regression odds estimates for latency > 2 days

	Latency > 2 days		Latency > 7 days	
Characteristic	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Gestational age (weeks)	0.832 (0.715-0.968)	0.017	0.676 (0.506-0.904)	0.008
Dilation on presentation (cm)	0.727 (0.542-0.976)	0.03	0.859 (0.761-0.969)	0.131
Presence of contractions	0.381 (0.170-0.857)	0.02	N/A	N/A
AUC	0.716 +/- CI		0.679 +/- CI	

Figure 1: Area under the ROC curve (AUC) for latency ≥ 2 days



255 | Neonatal Outcomes of Patients in Cases of Gestational Hypertension with Proteinuria

Kristen Warncke; Alesha M. White; Donald D. McIntire; C. Edward Wells
University of Texas Southwestern Medical Center, Dallas, TX

10:30 AM - 12:30 PM

Objective: Hypertensive disorders of pregnancy are associated with increased rates of adverse neonatal outcomes. The severity of these outcomes is greatest in patients with pre-eclampsia with severe features (SPE). Proteinuria was once considered a diagnostic criterium for SPE, however as of the 2013 ACOG Task Force of Hypertension In Pregnancy, it is no longer considered a diagnostic marker. The objective of this study was to evaluate the effects of maternal proteinuria in the presence of gestational hypertension (gHTN) on subsequent neonatal outcomes.

Study Design: This was a retrospective cohort study to evaluate neonatal outcomes of infants delivered to mothers with gHTN,

gHTN with proteinuria and SPE who delivered after 37 weeks gestation at a large public hospital between 2013 to 2022. Proteinuria was determined based on catheterized urine samples and defined as 2+ or greater. Patients with chronic hypertension were excluded. A multivariable logistic regression model was used to analyze rates of 5-minute Apgar < 3, pH < 7, birthweight less than the 3rd percentile, and neonatal intensive care unit (NICU) admission after adjusting for race, age, parity and body mass index.

Results: Of 94,115 live born infants 7,595 (8.1%) were delivered to mothers diagnosed with gHTN, 1,831 (1.9%) to mothers with gHTN with proteinuria, and 3,444 (3.7%) to mothers diagnosed with SPE. Infants from mothers with gHTN, when compared to gHTN with proteinuria, were significantly less likely to have birthweights less than the 3rd percentile (OR 0.53 95% CI 0.42,0.66) and less likely to be admitted to the NICU (OR 0.61, 95% CI 0.51,0.73). There were no significant differences between infants born to mothers with gHTN with proteinuria when compared to infants born to mothers with SPE (Table).

Conclusion: Although no longer considered a diagnostic criterium for SPE, maternal proteinuria in the setting gHTN is associated with significant adverse outcomes of neonatal growth restriction and NICU admission. The finding of proteinuria remains an important diagnostic marker when evaluating hypertensive disorders in pregnancy.

Table 1: Neonatal outcomes among infants born to mothers with hypertensive disorders of pregnancy

	GHTN N = 7,595	GHTN with proteinuria N = 1,831	Pre-eclampsia with severe features N = 3, 444	OR (95% CI)*	OR (95% CI)^
5-minute Apgar <3	21 (0.3)	7 (0.4)	21 (0.6)	0.72 (0.31,1.70)	0.63 (0.27,1.47)
PH <7	33 (0.5)	14 (0.8)	27 (0.8)	0.56 (0.30,1.05)	0.99 (0.52,1.88)
Birthweight <3rd %ile	254 (3.3)	113 (6.2)	258 (7.5)	0.53 (0.42,0.66)	0.81 (0.65,1.02)
NICU admission	447 (5.9)	170 (9.3)	318 (9.2)	0.61 (0.51,0.73)	1.01 (0.83,1.22)

Data reported as n (%).
*Odds ratio comparing gHTN to gHTN with proteinuria.
^Odds ratio comparing gHTN with proteinuria to pre-eclampsia with severe features.
GHTN Gestational HTN. *NICU* Neonatal intensive care unit.

256 | Uptake of Prenatal Diagnostic Testing Before and After Implementation of Non-Invasive Prenatal Screening

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10:30 AM - 12:30 PM

Objective: To compare the rate of invasive diagnostic testing before and after implementation of non-invasive prenatal screening (NIPS).

Study Design: We conducted a retrospective observational study 12 months before and after implementation of NIPS at a large county hospital. Prior to the availability of NIPS, all patients between 15-22 weeks were offered serum screening through the quadruple screen. Starting August 2023, this was replaced by universal implementation of NIPS for patients ≥ 10 weeks gestation using a non-sequencing based rolling circle replication on-site assay (Vanadis system, PerkinElmer, Waltham, MA, USA). In both groups, individuals with abnormal screening results were offered invasive diagnostic testing. Diagnostic testing rates following abnormal screening and other indications including fetal anomalies or targeted gene analysis were compared using Chi-square.

Results: From August 2022 to August 2023, of 13,533 patients receiving prenatal care, 7,149 patients underwent quadruple screening. In this group, 466 screened positive for trisomy 18 or trisomy 21, and 26 (5.6%) of these patients elected invasive diagnostic testing. Of the patients who elected diagnostic testing following an abnormal quad screen, aneuploidy was confirmed in 6 (23.1%). From August 2023 through July 2024, 11,631 (82.3%) of 14,127 patients receiving prenatal care underwent NIPS. In this group, 106 screened positive for either trisomy 13, 18, or 21. Diagnostic testing was elected by 22 (20.8%) of these patients, and aneuploidy confirmed in 10 (45.5%). The rate of invasive diagnostic procedures performed for any indication in the overall population did not change between the time epochs (116/13,533 vs 100/14,127, p = 0.16).

Conclusion: The rate of invasive diagnostic testing remained unchanged following the implementation of NIPS. However, following an abnormal screening result, the rate at which patients opted for invasive diagnostic testing increased fourfold, while the rate of diagnostic confirmation of aneuploidy through invasive testing rose twofold compared to the use of the serum screen.

Table 1: Uptake of diagnostic testing before and after implementation of non-invasive prenatal screening

	Screen positive	Diagnostic testing following abnormal screening	Aneuploidy confirmed on diagnostic testing	Diagnostic testing for any indications
Quad screen	466/7149 (6.5)	26/466 (5.6)	6/26 (23.1)	116/13533 (0.9)
NIPS	106/11631 (0.9)	22/106 (20.8)	10/22 (45.5)	100/14127 (0.7)
OR (95% CI)		4.43 (2.40-8.19)	2.78 (0.80-9.60)	0.82 (0.63-1.08)
P-value		< 0.001	0.106	0.159

Data reported as n (%). NIPS, non-invasive prenatal screening.

257 | Perfluorochemicals Paradoxically Exert Immunosuppressive Effects in Fetal Membranes: Implications for Preterm Premature Rupture of Membranes

Emilie M. Stylli[1]; Kristin M. Klohonatz[1]; Briana Ferguson[1]; Rita Leite[1]; Rachel Ledyard[2]; Heather Burris[2]; Lauren Anton[1]; Kristin D. Gerson[1]
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10:30 AM - 12:30 PM

Objective: Perfluorochemicals (PFCs) are ubiquitous xenobiotics used in the manufacturing of common household products. These "forever chemicals" persist in human tissues for many years and can exert immunomodulatory effects. Select PFCs have been implicated in adverse pregnancy outcomes, with higher concentrations detected in amniotic fluid and cord blood in spontaneous preterm birth. We leveraged a human pregnancy cohort and *in vitro* methodology to test the hypothesis that PFCs induce inflammation in fetal membranes, thus compromising membrane integrity and risk of preterm premature rupture of membranes (PPROM).

Study Design: Relative PFC abundance was assessed by untargeted metabolomics in amnion and chorion from cases of PPROM

(n = 25) and term controls (n = 25) in a prospective pregnancy cohort. Data were log_2 transformed and analyzed by two-way ANOVA ($p < 0.05$) with calculation of false discovery rates ($q < 0.1$). For *in vitro* experiments, amnion epithelial cells (AECs) were treated with PFCs (PFOS, PFOA, PFNA, or PFHxS) for 24h with doses based on physiologic concentrations. Proinflammatory cytokine IL-8 was measured in cell culture media (n = 3/condition) by ELISA. One-way ANOVAs with correction for multiple comparisons were performed.

Results: Demographic characteristics were similar between groups (Fig. 1). Amnion and chorion from PPROM had higher abundance of PFOS versus term though the difference did not persist after correction for multiple comparisons (Fig. 1). A similar trend was seen for PFOA. Unexpectedly, PFOS, PFOA, PFNA, and PFHxS all decreased basal levels of IL-8 in AECs in a dose-dependent manner (Fig. 2, $p < 0.05$).

Conclusion: PFC accumulation in fetal membranes, an understudied reproductive tissue, may drive immune perturbations underlying PPROM. Contrary to our hypothesis, these xenobiotics exert an immunosuppressive effect in the amnion, potentially rendering fetal membranes more susceptible to other sources of physiologic stress, including microbial challenge. Mechanisms by which PFCs drive reproductive outcomes, including preterm birth, warrant future investigation. Harrison Award (KG, LA)

Characteristic	Term (n=25)	PPROM (n=25)
	range (mean)	
Age (years)	20 – 40 (29)	18 – 37 (30)
Delivery gestational age (weeks)	39 – 40 (40)	24 – 35 (32)
	n (column %)	
Race		
Black	12 (48)	12 (48)
White	12 (48)	12 (48)
Other	1 (4)	1 (4)
Nulliparous	11 (44)	11 (44)
Male fetal sex	11 (44)	11 (44)

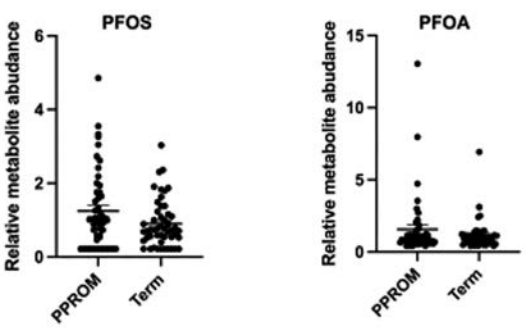

Figure 1. Relative abundance of PFOS and PFOA in fetal membranes from cases of preterm premature rupture of membranes (PPROM) vs term controls.

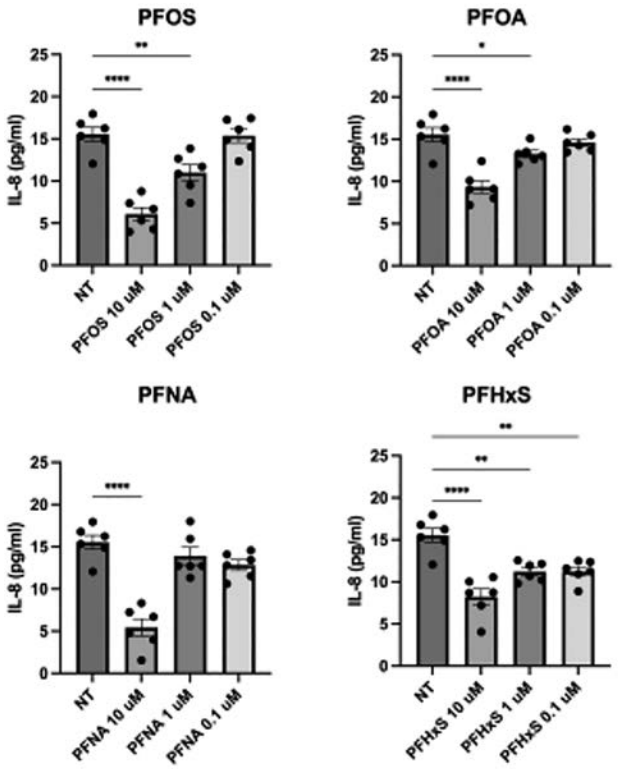

Figure 2. IL-8 concentration in cell culture media after treatment of amnion epithelial cells with PFOS, PFOA, PFNA, or PFHxS. *p<0.05, **p<0.01, ****p<0.0001

258 | Common Vaginal Microbes Modify Energy Metabolism and Oxidative Balance: Potential Implications on Reproductive Health

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[1]University of Pennsylvania Perelman School of Medicine, Philadelphia, PA; [2]Dartmouth College, Hanover, NH

10:30 AM - 12:30 PM

Objective: Host-microbial interactions in the cervicovaginal space modify reproductive outcomes. While *Lactobacillus crispatus* (LC) supports vaginal health, anaerobes like *Gardnerella vaginalis* (GV) have been implicated in pathologic processes, such as preterm birth. Our study leveraged global metabolomics as a biochemical window into these complexities.

Study Design: We used an *in vitro* host cell-microbial coculture model. Vaginal, ectocervical, and endocervical epithelial cells, and THP-1-derived macrophages (MØs) were treated with 10^5-10^7 CFUs of LC or GV for 24h. We conducted untargeted metabolomics on cell culture media (n = 3/condition). Log_2 transformed batch-normalized data were analyzed by two-way ANOVA ($p < 0.05$) with calculation of false discovery rates ($q < 0.1$). Primary component analysis was performed with total variance as a sum of variances of predicted values of each component.

Results: Experimental groups clustered by treatment for epithelial cells, while MØs grouped separately (Fig. 1). Compared to non-treated control, both LC and GV increased numerous metabolites across pathways; fewer metabolites were decreased

by microbial exposure (data not shown). While both LC and GV increased branched chain amino acid metabolites, GV exerted a more robust effect, suggesting increased GV-utilization of nitrogen energy sources. LC increased lactate derivatives, reflecting rapid glucose utilization. GV increased polyamine, phospholipid, and oxidative stress metabolites, potentially signifying cell membrane breakdown or turnover. Top differentially detected metabolites, all increased by microbial exposure, are presented in Table 1.

Conclusion: Our data reveal differences in energy metabolism and oxidative balance in response to common vaginal microbes. As metabolites may serve as chemical messengers, our findings provide a biochemical lens through which the complexities of host-microbial communication may be more clearly discerned. Modification of this metabolic milieu carries translational potential to mitigate risk of adverse reproductive outcomes. University of Pennsylvania Research Foundation Award (KG)

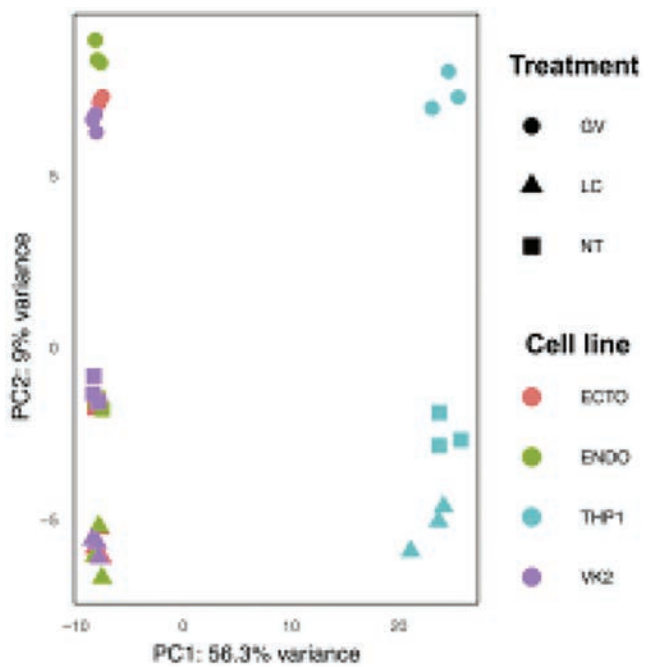

Figure 1. Primary component analysis (PCA) plot of metabolite profiles for ectocervical (ECTO), endocervical (ENDO), and vaginal (VK2) epithelial cells, and THP-1 derived macrophages treated with *Gardnerella vaginalis* (GV), *Lactobacillus crispatus* (LC) or non-treated (NT).

Table 1. Top differentially detected metabolites across cell lines and treatments by p-value*

Cell line	Microbial Treatment	Metabolite	p-value
Ectocervical epithelial cells	GV	uridine	3.28E-08
	GV	N-acetylglutamate	7.03E-07
	GV	glycerophosphoserine	9.40E-07
	GV	alpha-hydroxyisovalerate	1.76E-06
	LC	phenyllactate (PLA)	9.39E-09
	LC	succinate	1.32E-07
	LC	2-hydroxy-4-(methylthio)butanoic acid	2.65E-07
	LC	ribulose/xylulose	1.02E-06
Endocervical epithelial cells	GV	alpha-hydroxyisovalerate	7.71E-08
	GV	glycerophosphorylcholine (GPC)	1.09E-07
	GV	N-acetylglutamate	8.68E-09
	GV	phosphoenolpyruvate (PEP)	9.42E-08
	LC	2-hydroxy-4-(methylthio)butanoic acid	1.79E-11
	LC	dihydroxyacetone phosphate (DHAP)	6.13E-08
	LC	mevalonate	1.30E-08
	LC	phenyllactate (PLA)	1.25E-09
THP-1-derived macrophages	GV	alpha-hydroxyisocaproate	1.12E-09
	GV	nicotinate ribonucleoside	2.78E-07
	GV	orotate	1.73E-07
	GV	pyruvate	3.30E-09
	LC	3-(4-hydroxyphenyl)lactate	1.63 E-04
	LC	cytosine	6.34E-10
	LC	N-acetyltyrosine	3.59E-07
	LC	ribulose/xylulose	3.91E-08
Vaginal epithelial cells	GV	glycerophosphoserine	3.91E-07
	GV	guanosine 3'-monophosphate (3'-GMP)	6.25E-07
	GV	N-acetylaspartate (NAA)	2.25E-07
	GV	uridine	1.59E-08
	LC	2-hydroxy-4-(methylthio)butanoic acid	3.36E-08
	LC	cytosine	9.02E-07
	LC	mevalonate	6.63E-07
	LC	phenyllactate (PLA)	3.34E-09

*Presenting top 4 metabolites by p-value for each treatment per cell line, all with $q < 0.1$, and all incidentally noted to be increased following microbial treatment

Gardnerella vaginalis (GV), *Lactobacillus crispatus* (LC)

259 | Fetal Growth Trajectories in Pregnancies Complicated by Type 2 Diabetes

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10:30 AM - 12:30 PM

Objective: We evaluated factors associated with small for gestational age (SGA) and large for gestational age (LGA) birth weight and ultrasound growth trajectories to better understand fetal growth among pregnancies with type 2 diabetes (T2DM).

Study Design: We conducted a retrospective cohort study of individuals with T2DM and a singleton gestation between 2018-2020 who had biometry measured between 16-23 weeks gestation. Maternal demographics, clinical factors, and serial ultrasound measurements were abstracted from the electronic health record. Birth weight was classified as small for gestational age (SGA), large for gestational age (LGA), and appropriate for gestational age (AGA) using a US birth weight standard. Multinomial logistic regression was used to assess the relationship between maternal characteristics and newborn birth weight category. Covariance pattern models with linear and quadratic terms were used to assess differences in fetal growth trajectories.

Results: LGA birth weight occurred in 81/300 (27%) and SGA birth weight in 25/300 (8.3%). After adjustment for covariates, a higher BMI at the first prenatal visit (aOR 0.91, 95% CI 0.83-0.99) and higher maternal weight gain across gestation (aOR 0.88, 95% CI 0.79-0.98) were associated with reduced risk for SGA birth weight, and a higher HbA1c after 20 weeks' gestation was associated with increased risk for LGA birth weight (aOR 1.41, 95% CI 1.06-1.87). In the mid-trimester, the EFW was higher in LGA birth weight infants compared to those born AGA, but there were no differences between those born AGA and SGA. EFW trajectories differed significantly over time by birth weight categories (Figure 1). Similar patterns were seen for the abdominal circumference, with no differences in head circumference and femur length either at baseline or over time.

Conclusion: Patterns of fetal overgrowth in pregnancies complicated by T2DM are established in early pregnancy. Further studies are needed to assess whether interventions to improve maternal glycemia in the second half of pregnancy can reduce the risk for LGA birth weight.

Figure 1. Estimated Fetal Weight (mean)

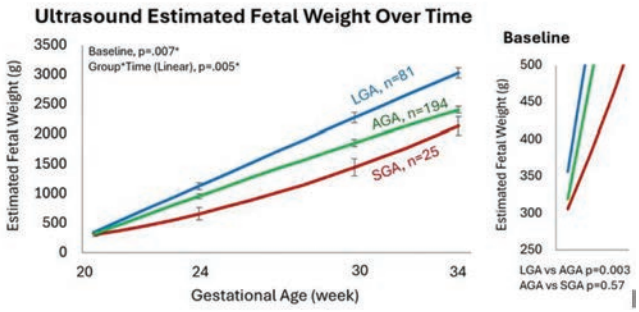

Table 1: Maternal demographics

	AGA (n=184)	SGA (n=23)	LGA (n=73)	p-value
Maternal age (years)	36.1 ±6.0	37.3 ±5.2	35.7 ±6.5	0.53
Maternal race/ethnicity (n=345)				
White	54 (30)	4 (17)	31 (43)	0.15
Black	64 (35)	11 (48)	16 (22)	
Hispanic	40 (22)	6 (26)	15 (21)	
Other	24 (13)	2 (9)	10 (14)	
Insurance				
Public	144 (78)	17 (74)	48 (66)	0.12
Private	40 (22)	6 (26)	25 (34)	
Nulliparity	45 (25)	9 (39)	14 (19)	0.15
Chronic hypertension	67 (36)	10 (44)	31 (43)	0.59
Retinopathy	10 (5)	4 (17)	2 (3)	0.03
Nephropathy	20 (11)	4 (17)	7 (10)	0.58
BMI at 1° prenatal visit (kg/m^2)(n=272)	37.4 ±10.8	36.1 ±8.2	37.7 ±8.3	0.79
Weight gain (kg)(n=266)	7.5 ±7.5	5.7 ±7.3	9.5 ±7.5	0.06
Gestational age at 1° prenatal visit (weeks) (n=277)	11.8 ±4.4	10.5 ±3.1	11.6 ±4.1	0.40
First HbA1c (%) (n=269)	7.4 ±1.9	7.8 ±2.5	7.7 ±1.6	0.53
Gestational age at 1° HbA1c (weeks) (n=271)	12.1 ±7.0	10.7 ±5.8	11.0 ±5.6	0.39
>= 12 prenatal visits (n=278)	105 (57)	10 (43)	50 (70)	0.04
Medications at 1° prenatal visit (n=267)				
None	67 (38)	7 (30)	22 (33)	0.27
Oral agents	62 (35)	5 (22)	21 (31)	
Insulin	48 (27)	11 (48)	24 (36)	
Medications at delivery (n=273)				
None	15 (8)	3 (13)	2 (3)	0.02
Oral agents	27 (16)	7 (30)	6 (8)	
Insulin	137 (77)	13 (57)	63 (89)	
Mean HbA1c across gestation (%)(n=271)	6.9 ±2.3	6.6 ±1.1	7.1 ±1.1	0.70
HbA1c after 20 weeks (%)(n=193)	6.3 ±1.2	5.8 ±0.7	6.7 ±1.2	0.01

Table 2: Mid-trimester growth ultrasound findings by newborn birth weight category

	17-23 6/7 weeks			
Birth Weight Category	AGA (n=184)	SGA (n=23)	LGA (n=73)	
GA at visit (weeks)	19.8 ±1.3	19.7 ±1.3	20.2 ±1.4	0.10
Head circumference (mm)	166.9 ±16.2	164.2 ±15.5	174.4 ±18.4	0.004
Abdominal circumference (mm)	146.6 ±19.1	141.6 ±12.9	157.1 ±18.6	<0.001
Femur length (mm)	30.9 ±4.1	34.7 ±21.7	32.8 ±4.0	0.03
Estimated fetal weight	322.4 ±90.4	299.0 ±66.6	367.8 ±101.1	<0.001
AC category				
<10th	3 (1.7)	0	2 (3)	0.05
10-90th	166 (96.5)	20 (100)	58 (88)	
>90th	3 (1.7)	0	6 (9)	
EFW category				
<10th	10 (6)	2 (11)	0 (0)	0.13
10-90th	155 (89)	17 (90)	62 (91)	
>90th	10 (6)	0	6 (10)	

260 | Subclinical Hypothyroidism in Pregnancy: Assessment of Severe Maternal Morbidity

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10:30 AM - 12:30 PM

Objective: To assess the association between subclinical hypothyroidism and severe maternal morbidity at delivery.
Study Design: This cross-sectional study queried the Healthcare Cost and Utilization Project's National Inpatient Sample. The study population included 21,517,317 delivery hospitalizations from 2016-2021. Subclinical hypothyroidism was identified with the World Health Organization's International Classification of Disease 10th revision code of E02. Severe maternal morbidity followed the Centers for Disease Control and Prevention definition (20 indicators). Multivariable log-Poisson generalized linear model was created to examine the association of subclinical hypothyroidism and severe maternal morbidity.
Results: A total of 11,885 patients had a diagnosis of subclinical hypothyroidism, corresponding to 5.5 per 10,000 or one in 1,810 deliveries. Older maternal age, White / Asian race, hypertensive disorder (pregestational, gestational, and pre-eclampsia), diabetes mellitus (pregestational and gestational), obesity, asthma, fetal growth restriction, and early preterm delivery (< 34 weeks) were associated with subclinical hypothyroidism in multivariable analysis. After controlling for clinico-obstetric factors, subclinical hypothyroidism was independently associated with an increased risk of severe maternal morbidity at delivery (185.1 vs 81.1 per 10,000, adjusted-odds ratio [aOR] 1.48, 95% confidence interval [CI] 1.33-1.64). Among the individual indicators, the risk of eclampsia (25.2 vs 7.8, aOR 3.18, 95%CI 2.22-4.55), pulmonary edema (25.2 vs 7.0, aOR 2.34, 95%CI 1.63-3.34), and acute respiratory distress syndrome (29.4 vs 12.3, aOR 2.08, 95%CI 1.49-2.90) were particularly increased among patients with subclinical hypothyroidism (all, aOR >2.00).
Conclusion: The results of this contemporaneous nationwide assessment suggest that subclinical hypothyroidism may be associated with an increased risk of severe maternal morbidity at delivery. Whether or not universal thyroid testing in early pregnancy and treatment improve outcome in at risk-populations warrants further evaluation prospectively.

261 | Participation in a Remote Blood Pressure Monitoring Program and Engagement in Postpartum Care

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10:30 AM - 12:30 PM

Objective: Remote postpartum (PP) blood pressure (BP) monitoring programs may improve postpartum visit (PPV) attendance for patients with hypertensive disorders of pregnancy (HDP). This study aims to compare patient characteristics and overall PP care utilization between patients who do and do not engage in a telehealth-based PP remote BP monitoring program.
Study Design: This was a retrospective study of participants in our institutional PP remote BP monitoring program from 11/1/2022-10/31/2023. Eligibility criteria included a diagnosis of chronic hypertension (HTN) or HDP. Patients were given a BP cuff, instructed on home BP monitoring, and scheduled for a telehealth visit within 1 week of discharge. Patients graduated when BP normalized off therapy or at 12 weeks PP. Participants were divided into 3 groups based on participation: 1) declined

or enrolled but never attended; 2) attended ≥1 visit but did not graduate; 3) graduated. Patient characteristics and PP care were extracted from the electronic health record. Primary outcomes were attendance at a PPV and a visit for HTN management within 6 weeks PP. Groups were compared using chi-square or Fisher exact tests for categorical and ANOVA for continuous variables. Logistic regression was used to determine the odds of the primary outcomes.

Results: 772 patients were approached for enrollment, of which 348 (45.1%) were in group 1, 126 (16.3%) in group 2, and 298 (38.6%) in group 3. Patients were similar between groups with two exceptions: the proportion of non-English language (6.9% v 7.9% v 14.1%, p = 0.007) and the proportion of HDP diagnosis (70.4% v 77.8% v 83.9, p = 0.0003). Odds of attending a PPV were greater in patients that initiated the program than those that did not (Group 2 adjusted odds ratio [aOR] 2.11; 95% CI 1.12-3.97, Group 3 aOR 1.67, 95% CI 1.02-2.72) as were the odds of attending a visit for HTN (Group 2 aOR 1.56, 95% CI 1.02-2.40, Group 3 aOR 1.82, 95% CI 1.26-2.63).

Conclusion: Participation in a remote BP monitoring program appears to improve rates of postpartum visit attendance and health care utilization up to 6 weeks postpartum.

Table 1. Patient baseline characteristics and postpartum care

	Group 1 N = 348	Group 2 N = 126	Group 3 N = 298	p value
Patient baseline characteristics, N(%)				
Age ≥35 years old	117 (33.6)	42 (33.3)	106 (35.6)	0.85
Public Insurance / Uninsured	181 (52.0)	65 (51.6)	139 (46.6)	0.36
Race and ethnicity				0.43
- Hispanic	77 (22.1)	25 (19.8)	73 (24.5)	
- Non, Hispanic Black	107 (30.8)	44 (34.9)	85 (28.5)	
- Non-Hispanic white	145 (41.7)	45 (35.7)	124 (41.6)	
- Other, unknown	19 (5.5)	12 (9.5)	16 (5.4)	
Non-English Primary Language	24 (6.9)	10.7 (7.9)	42 (14.1)	0.007
Nulliparity	172 (49.4)	55 (43.7)	144 (48.3)	0.54
Smoking	31 (8.9)	13 (10.3)	24 (8.1)	0.75
BMI				0.61
- <30	67 (19.6)	29 (23.0)	66 (22.2)	
- 30-40	170 (49.7)	67 (53.2)	150 (50.5)	
- ≥40	105 (30.7)	30 (23.8)	81 (27.3)	
Chronic hypertension	204 (58.6)	79 (62.7)	170 (57.1)	0.56
Hypertensive disorder of pregnancy	245 (70.4)	98 (77.8)	250 (83.9)	0.0003
Gestational diabetes mellitus	64 (18.4)	21 (16.7)	69 (23.2)	0.19
Pregestational diabetes mellitus	31 (8.9)	17 (13.5)	29 (9.7)	0.33
Depression/Anxiety	176 (50.6)	68 (54.0)	135 (45.3)	0.20
Delivery Outcomes, N(%)				
Mode of Delivery				0.35
- Vaginal Delivery	174 (50.4)	55 (44.0)	153 (51.5)	
- Cesarean Delivery	171 (49.6)	70 (56.0)	144 (48.5)	
Preterm Birth	77 (22.2)	32 (25.4)	76 (25.5)	0.57
Maternal ICU Admission	6 (1.7)	1 (0.8)	2 (0.7)	0.42
Neonatal ICU Admission	118 (33.9)	38 (30.2)	97 (32.6)	0.74
Postpartum Care				
Postpartum visit*	280 (80.5)	113 (89.7)	258 (86.6)	0.02
Postpartum encounter for hypertension	243 (69.8)	100 (79.4)	240 (80.5)	0.004
Postpartum days at postpartum visit	24.5 (17.3)	22.2 (16.4)	22.1 (17.2)	0.18
Postpartum days at postpartum encounter for hypertension	17.4 (21.2)	13.7 (17.8)	15.6 (23.8)	0.33
Max MAP within 6 weeks postpartum	101.7 (13.5)	103.2 (13.4)	104.7 (13.0)	0.03

Note: Data shown as n (%) for categorical variables and as mean(SD) for postpartum days at PP visits and max MAP
BMI = body. Mass index (kg/m²), ICU = intensive care unit, MAP = mean arterial pressure, *Identified by ICD code Z39 or V24

Table 2. Odds of attendance at postpartum encounters

	Postpartum visit*		Postpartum HTN visit	
	Unadjusted OR (95% CI)	Adjusted** OR (95% CI)	Unadjusted OR (95% CI)	Adjusted** OR (95% CI)
Group 1	Ref	Ref	Ref	Ref
Group 2	2.11 (1.12-3.97)	2.11 (1.12-3.97)	1.66 (1.02-2.71)	1.67 (1.02-2.72)
Group 3	1.57 (1.02-2.40)	1.56 (1.02-2.40)	1.79 (1.24-2.58)	1.82 (1.26-2.63)

OR = odds ratio
*identified by ICD code Z39 or V24, **adjusted for primary language

262 | Fetal Heart Rate Tracing Characteristics Among Preterm Birth at 22.0-31.6 Weeks and Adverse Neonatal Outcomes

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10:30 AM - 12:30 PM

Objective: There is a paucity of evidence on the characteristics and significance of fetal heart rate tracings (FHRT) in the very preterm (22.0-31.6 weeks) period. We sought to address this and the associated neonatal outcomes.

Study Design: A retrospective review of all deliveries from January to December 2023 at a tertiary referral hospital. Criteria for inclusion were non-anomalous singleton deliveries at 22.0-31.6 weeks, where at least 10 minutes of FHRT was available, and neonatal resuscitation was initiated. A physician—blinded to all outcomes—reviewed the FHRT (0-120 min proximal to delivery, at 20 min epochs), and outcome data was obtained from chart review. The primary outcome was long term neonatal morbidity or mortality (LTNMM); the secondary outcomes were 5-min Apgar score of 4-6 and short-term neonatal morbidity or mortality (STNMM). Descriptive statistics with 95% confidence intervals (CI) were calculated with non-overlapping CI as significant.

Results: Among the 6,521 deliveries, 169 (2%) occurred at 22.0-31.6 weeks, of which 99 (58%) met the inclusion criteria. Intrapartum magnesium sulfate was administered in 97% of deliveries and antenatal corticosteroids in 98%. Moderate variability preceded delivery in 37.9% (95% CI 28.2-48.7%) of those with LTNMM; in 14.9% (95% CI 8.8-24.2%) of those with a 5-min Apgar score of 4-6; in 42.6% (95% 32.5 to 53.2%) of those with STNMM. Individuals with all types of decelerations–variable, late, and prolonged–had overlapping CI for all outcomes (Table 1). There were no cases of bradycardia or sinusoidal rhythm. Of the 38 newborns who met criteria for LTNMM, 20 (52.6%) also experienced STNMM while only 8 (21.1%) had Apgar of 4-6 at 5 min (Fig 1).

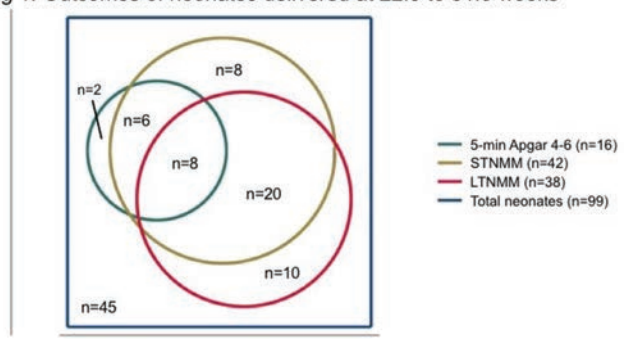
Conclusion: Among newborns delivered at 22.0-31.6 weeks, the likelihood of Apgar score 4-6 at 5 minutes and short- or long-term morbidity or mortality were similar irrespective of presence of moderate variability or decelerations. If confirmed, the reliance on moderate variability as a reassuring aspect to identify neonatal well-being at 22.0 to 31.6 weeks should be revisited.

Table 1. Fetal heart rate tracing within 2 hrs. of delivery of newborns at 22.0 and 31.6 weeks

	Apgar score of 4-6 at 5 min (N=16)			Short Term Neonatal Morbidity or Mortality* (N=42)			Long Term Neonatal Morbidity or Mortality** (N=38)		
	N	%	95%CI	N	%	95%CI	N	%	95%CI
Moderate Variability (no minimal)	13/87	14.9	8.8 -24.2	37/87	42.6	32.5-53.2	33/87	37.9	28.2-48.7
Minimal Variability	3/12	25.0	7.1-59.1	5/12	41.6	16.4-72.1	5/12	41.6	16.4-72.1
Accelerations	12/75	16.0	9.23-26.2	29/75	38.6	28.2-50.2	27/75	36.0	25.8-47.6
Tachycardia	6/33	18.1	8.1-35.7	16/33	48.5	31.6-65.7	13/33	39.3	23.9-57.3
Variable Decelerations (No late or prolonged)	3/24	12.5	3.8-33.8	9/24	37.5	20.0-58.9	6/24	25.0	11.1-46.9
Late but not prolonged	2/14	14.3	3.1-46.4	8/14	57.1	29.3-81.0	9/14	64.3	35.0-85.7
Prolonged	8/38	21.0	10.6-37.3	18/38	47.3	31.8-63.4	17/38	44.7	29.5-61.0
Variable + Late decelerations (not Prolonged)	2/14	14.2	3.1-46.5	8/14	57.1	29.3-81.0	9/14	64.3	35.0-85.7
Variable + Late + Prolonged	7/33	21.2	10.1-39.0	17/33	51.5	34.3-68.4	16/33	48.5	31.6-65.7

Data presented at N or %
CI, confidence intervals.
*Apgar ≤ 3 at 5 min (n=8, NICU pH < 7.00 (n=1) or BE > 12 (n=3), chest compression (n=1) or intubation in delivery room (n=41), neonatal death in delivery room (n=0)
**Bronchopulmonary dysplasia grade 1, 2, 3 (n=25), intraventricular hemorrhage, grade III or IV (n=11), mortality during hospitalization (n=6)

Fig 1. Outcomes of neonates delivered at 22.0 to 31.6 weeks



263 | Variation in Toxicology Testing and Consent Practices Among United States Birthing Hospitals: A National Survey

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10:30 AM - 12:30 PM

Objective: Current recommendations from professional organizations for ordering and obtaining consent for peripartum toxicology testing remain broad and best practices for both are lacking. We aimed to describe peripartum toxicology testing practices across birthing hospitals in the United States (US).

Study Design: A cross-sectional online survey was distributed through perinatal quality collaboratives, publicly available birthing hospital contacts, and professional organization electronic mailing lists. The survey captured birthing hospital characteristics and toxicology testing practices for both birthing people and neonates, including indication(s) for testing and consent practices. One response per hospital was included in the final analysis. Descriptive statistics were used to analyze responses.

Results: Respondents from 219 birthing hospitals across 42 states were included. 81.7% of hospitals reported risk-based testing, whereas 11.4% reported universal testing. Among hospitals employing a risk-based approach, the most common indications for ordering birthing person toxicology testing at delivery included: 1) disclosure of substance use in current pregnancy (96.6%), 2) positive toxicology test in current pregnancy (91.6%), 3) birthing person with signs of intoxication or withdrawal (89.4%), 4) neonate with signs of withdrawal (83.2%), and 5) late or limited prenatal care (80.4%). 69.4% and 28.3% of hospitals reported obtaining consent for birthing person and neonate toxicology testing, respectively; among hospitals who ordered testing without consent, 42.3% and 28.8% reported lack of disclosure for birthing person and neonate toxicology testing, respectively.

Conclusion: Our data reveal wide variations in toxicology testing and consent practices among US birthing hospitals. Given the unique and potentially harmful consequences of toxicology testing in this setting, clearer guidance from professional organizations is needed on clinically appropriate indications for testing and standardized approaches for obtaining consent.

Table 1. Survey Respondent and Hospital Characteristics

Question	n	%
Professional Role of Respondent		
Social work (e.g., LCSW, MSC, etc.)	4	1.8
Nursing (e.g., RN, NP, MSN, etc.)	148	67.6
Clinician	67	30.6
Career Stage of Respondent		
In training (student, intern, resident, fellow)	4	1.8
Early career (fewer than 10 years)	42	19.2
Mid-career (11-20 years)	85	38.8
Late career (21 or more years)	88	40.2
Birthing hospital delivery volume		
Less than 500 births per year	73	33.3
501-1500 births per year	73	33.3
1501-2500 births per year	36	16.4
>2500 births per year	37	16.9
Types of Nursery Care (highest level)		
Level 1 (Basic)	84	38.4
Level 2 (Specialty)	61	27.9
Level 3 (Subspecialty)	48	21.9
Level 4 (Advanced subspecialty)	26	11.9
Birthing Hospital Location (US Census Regions)		
Northeast	47	21.5
Midwest	85	38.8
South	44	20.1
West	43	19.6
Type of Geographic Area		
Rural	102	46.6
Suburban	61	27.9
Urban	56	25.6
Greater than 20% Hispanic/Latino		
No	135	64.0
Yes	76	36.0
Greater than 20% Black/African American		
No	133	63.3
Yes	77	36.7
Medicaid		
0-40%	60	28.2
41-60%	90	42.3
61-100%	63	29.6
Affiliation with Medical School or University		
No	149	68.0
Yes	70	32.0
Dedicated Perinatal Social Worker on Staff		
Yes	96	43.8
No	116	53.0
Not sure	7	3.2

Table 2. Birthing Person and Neonate Toxicology Testing and Consent Practices			
Question		n	%
Approach to birthing person toxicology testing			
	Universal toxicology testing	25	11.4
	Risk-based toxicology testing	179	81.7
	Random toxicology testing	3	1.4
	Other	11	5.0
	Not sure	1	0.5
Is informed consent obtained before performing birthing person toxicology testing?			
	Yes, verbal consent for all testing	110	50.2
	Yes, written consent for all testing	42	19.2
	No	27	12.3
	Other	17	7.8
	Not sure	23	10.5
If no consent is obtained, is the birthing person informed prior to performing testing?			
	Yes	8	30.8
	No	11	42.3
	Not Sure	7	26.9
Approach to neonate toxicology testing			
	Universal toxicology testing	3	1.4
	Risk-based toxicology testing	193	88.1
	Random toxicology testing	3	1.4
	Does not perform neonate toxicology testing	1	0.5
	Other	5	2.3
	Not sure	10	4.6
Is informed consent obtained before performing neonate toxicology testing?			
	Yes, verbal consent for all testing	44	20.1
	Yes, written consent for all testing	18	8.2
	No	120	54.8
	Other	7	3.2
	Not sure	25	11.4
If no consent is obtained, is the parent informed before performing testing?			
	Yes	68	61.3
	No	32	28.8
	Not sure	11	9.9

264 | Administering Antibiotics to Women with Isolated Maternal Fever During Labor: a Decision-Tree Model

Michal Rosenberg-Friedman[1]; Omri Dominsky[2]; Daniel Gabbai[3]; Emmanuel Attali[3]; Moshe Leshno[4]; Yariv Yogev[5]; Lee Reicher[6]
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10:30 AM - 12:30 PM

Objective: The ACOG recommends considering antibiotic treatment for women with isolated maternal fever during labor, when there are no other risk factors. However, there is limited information on the maternal and neonatal impacts of antibiotic treatment in this context of isolated maternal fever during labor. We used a decision-tree model to evaluate if antibiotic treatment for isolated maternal fever during labor yields better maternal and neonatal outcomes. Additionally, we conducted a cost-effectiveness analysis.

Study Design: A decision-tree model using the Expected Utility Theory (EUT) was employed to compare two strategies for managing isolated fever in women during labor:

1. Antibiotic Treatment: Administration of antibiotics.
2. No Treatment: Observation without antibiotics.

The Expected Utility Theory by Von Neumann and Morgenstern was used for theory of decision making under uncertainty (when the probabilities of the outcomes are known).

The assumptions used in the decision model, including the costs, probabilities, and utilities of various outcomes associated with the management of isolated maternal fever during labor were based on a study by Bank et al. (Bank TC et l. Am J Obstet Gynecol. 2022 Feb;226(2):255.e1-255.e7. (**Table 1**).

A one-way sensitivity analysis was conducted to explore the impact of variations in key variables. Outcome measures included expected utility (equivalent to QALYs) and cost effectiveness analysis.

Results:

1. The expected utility of the no-antibiotic strategy is 0.854, which is greater than the expected utility of the antibiotic strategy (0.797).
2. Among all the assumptions made in the model, the utility value assigned to the Neonatal Intensive Care Unit (NICU) has the most significant impact on the overall expected utility of the decision strategies (**Figure 1**).
3. The cost-effectiveness analysis shows that the no-antibiotic strategy is less costly and has better clinical outcomes.

Conclusion: The recommendation to administer antibiotics is questionable. Further clinical studies, including randomized clinical trials, should be conducted before drawing robust conclusions.

Table 1. Assumptions used in the decision model.

Name	Description	Value	Low	High
c_endometritis	cost of endometritis	4,000	0	3,956
c_NICU	cost of NICU	4,500	0	5,000
c_PPH	cost of PPH	3,500	0	3,500
p_Endometritis_antib	probability of Endometritis with antibiotics	0.0353	0.01	0.05
p_Endometritis_no_antib	probability of Endometritis without antibiotics	0.1131	0.08	0.13
p_NICU_antib	probability of NICU with antibiotics	0.4118	0.35	0.45
p_NICU_no_antib	probability of NICU without antibiotics	0.1788	0.15	0.2
p_PPH_antib	probability of PPH with antibiotics	0.0706	0.05	0.1
p_PPH_no_antib	probability of PPH without antibiotics	0.0657	0.05	0.1
u_endometritis	utility of endometritis	0.52	0	1
u_NICU	utility of NICU	0.6	0	1
u_PPH	utility of PPH	0.7	0	1

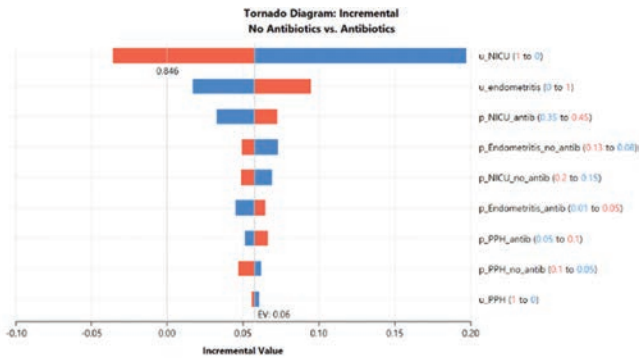

Figure 1. Tornado diagram of the utility analysis. A Tornado Diagram, which is used to display the results of a one-way sensitivity analysis, compares the incremental expected value of the "No Antibiotics" strategy versus the "Antibiotics" strategy for managing isolated maternal fever during labor. The utility of NICU (u_NICU) is the most critical assumption in determining the incremental expected value of the "No Antibiotics" strategy compared to the "Antibiotics" strategy. Changes in this parameter result in the largest variations in the model's outcome, highlighting its importance in the decision-making process.

265 | Cesarean Delivery in Life-Limiting Fetal Anomalies: All Risk and no Benefit?

Lena A. Shay; Madison Montgomery; Diana Crabtree; Anitra Beasley; April D. Adams
Baylor College of Medicine, Houston, TX

10:30 AM - 12:30 PM

Objective: Life-limiting anomalies (LLA) are a heterogeneous group of congenital malformations at high risk of poor outcomes. Pregnancy management options in LLA cases are limited in states with restrictive abortion laws, likely contributing to increased rates of infant and neonatal death. In these cases, conventional medical ethics call for maximization of maternal benefit. When pregnancy continues, avoidance of cesarean delivery (CD) is a harm-reduction strategy. Our objectives were to determine the CD rate, adverse pregnancy outcomes, and clinical drivers of CD in a cohort with LLA.

Study Design: Retrospective cohort study of pregnancies complicated by LLA from 2011-2023 (n = 131) (Table 1). Eligibility was determined by ultrasound findings or genetic testing. Spontaneous abortion, non-lethal anomaly, molar and ectopic pregnancy were excluded. Descriptive statistics were calculated, and Chi-square used for analysis.

Results: 37 cases underwent CD. CD rate did not differ from the institutional rate (28% vs. 29%, p = 0.86). Among CD cases, the average gestational age at delivery was 37.5 weeks (SD±2.6), with mean interval from diagnosis to delivery of 15.1 weeks (SD±5.2). Common indications for CD were fetal (46%) followed by elective repeat (30%) (Figure 1). 73% of patients received mode of delivery (MOD) counseling. 57% were offered palliative care, of which 62% accepted. Severe hypertension and postpartum hemorrhage rates did not differ from the institutional rate (16% vs. 21%, p = 0.52; 19% vs. 17%, p = 0.79). Fetal or neonatal death rate was 73%. All surviving children have significant medical comorbidities or developmental delays.

Conclusion: Cesarean delivery in pregnancy affected by LLA did not demonstrate increased morbidity related to hypertension or hemorrhage. Although CD rate was not higher, any maternal morbidity unbalanced by fetal benefit poses an ethical challenge. Fetal pathology, particularly cranial, played a significant role in MOD. This should be factored into candidacy for vaginal delivery and weighed against the surgical risks of CD. Further study of obstetric management of LLA is warranted.

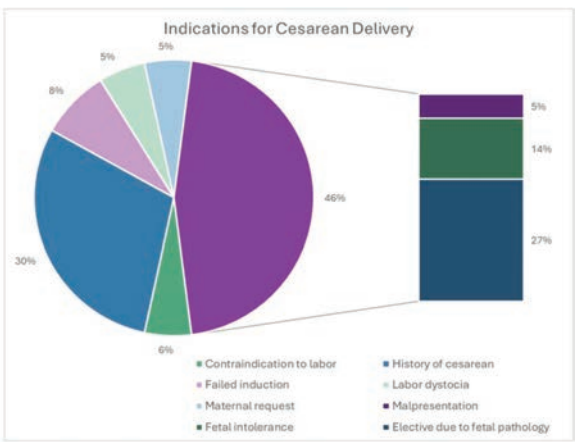

Figure 1. Indications for cesarean delivery performed in study cohort of life-limiting anomalies

Table 1. Types and distribution of life-limiting fetal anomalies within study cohort.

Anomaly Type	SVD (n =81)	CD (n =37)	Termination (n = 20)
CNS Anomaly (ex. Anencephaly, Hydrocephalus, Schizencephaly, HPE)	30	14	10
Cardiac Anomaly (ex. Ectopia Cordis, Heterotaxy, Rhabdomyoma)	2	4	0
Multiple Congenital Anomalies/Genetic Syndrome (ex. Limb-Body Wall, T18, T13)	40	14	6
Renal (ex. bilateral renal agenesis, bilateral MCDK)	4	3	1
Skeletal Dysplasia	2	2	1
Hydrops	3	0	2

266 | Modeling Stillbirth Using Machine-Learning

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10:30 AM - 12:30 PM

Objective: Stillbirth, defined as fetal death at ≥20 weeks' gestation, complicates about 1 in 160 pregnancies. Methods to prevent stillbirth are lacking, in part, due to the inability to predict when stillbirth will occur. Machine learning (ML) offers an opportunity to develop sophisticated models to accurately predict stillbirth. Our objective was to develop a predictive model for stillbirth using contemporary data with patient-level detail not found in larger national datasets.

Study Design: A retrospective database of stillbirths was created from two tertiary care hospitals with delivery date-matched live births from 2016-2022. Data from stillbirths (n = 425) and livebirths (n = 440), were imported, preprocessed (centered, scaled, one-hot encoded) and split into training and testing sets (80-20 split), followed by training a Random Forest model using 10-fold cross-validation, repeated five times. Model evaluation was performed using confusion matrix metrics and variable importance scores were calculated.

Results: The model identified variables of interest and achieved an accuracy of 91% (sensitivity 91%, specificity 92%) using the testing data. Key variables of importance included the number of prenatal care visits, maternal age, gestational age at care entry, and the presence of fetal comorbidities, specifically structural anomalies (Figures 1 & 2).

Conclusion: Results provide additional support for using machine learning in stillbirth prediction with a contemporary cohort. The model revealed a strong association between fewer prenatal visits and stillbirth, irrespective of entry to care, suggesting that merely attending prenatal care may help reduce stillbirth risk. Continued refinement of this and other predictive models with additional clinical or biological data will enhance robustness. Ultimately, use of ML to generate a clinically useful risk calculator for stillbirth will allow for better identification of vulnerable patients and opportunities for prevention or intervention. As single-site data limits our model, future studies to validate this model against other stillbirth cohorts are planned.

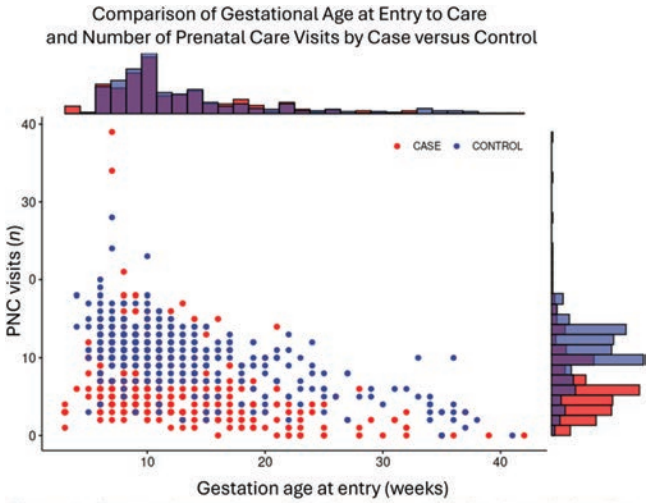

Figure 1: Scatter plot and marginal histograms showing the relationship between gestational age at entry to care and number of prenatal care visits (PNC) categorized by record type (case vs control)

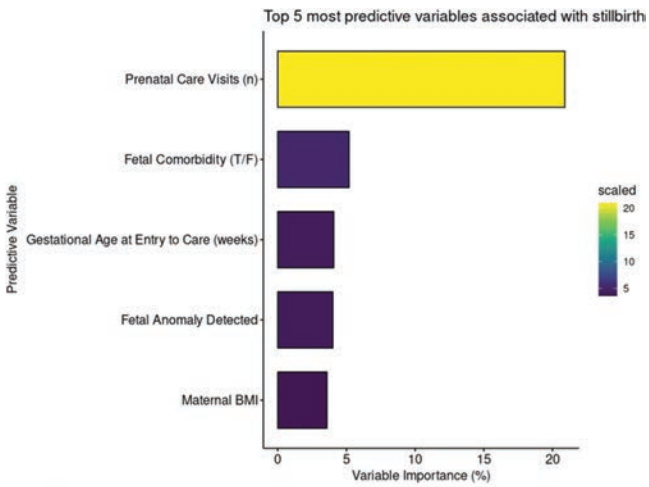

Figure 2: Top 5 Most Predictive Variables Associated with Stillbirth based on Random Forest modeling Variable Importance Scores

267 | Management of Incidental Cardiac Disease Findings on Screening Maternal Echocardiograms for Advanced Maternal Age

Lilly Liu[1]; John Perino[2]; Anita Lasala[2]; Jason D. Wright[3]; Jennifer Haythe[2]; Sonia Tolani[2]; Mary E. D'Alton[4]; Stephanie Purisch[2]

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10:30 AM - 12:30 PM

Objective: The objective of this study is to investigate the utility of screening maternal echocardiograms for the diagnosis of incidental cardiac abnormalities in pregnancy in women of advanced maternal age.

Study Design: This is a retrospective study examining the diagnosis of incidental cardiac abnormalities and associated pregnancy outcomes in women over the age of 40 who received screening maternal echocardiograms for the sole indication of advanced maternal age at a single academic institution from 2020-2023. Clinical outcomes included significant incidental cardiac findings on echocardiogram, including decreased left ventricular ejection fraction (LVEF < 55%), moderate to severe valvular disease, diastolic dysfunction, abnormal left ventricular end diastolic diameter (LVEDD > 50mm), and elevated pulmonary artery systolic pressures (PASP > 30mmHg); as well as whether these findings necessitated referral to cardiology or initiation of cardiac medications, and whether they were associated with adverse cardiovascular outcomes.

Results: A total of 27 women met inclusion criteria during the study period. The LVEF was normal for all women in the study, which ranged from 55-70%. Incidental cardiac findings included mild valvular disease in 30% of cases (with no cases of moderate or severe valvular disease), left ventricular hypertrophy in 11% of cases, and elevated PASP >30mmHg in 27% of cases. None of these women experienced adverse cardiovascular outcomes such as postpartum cardiomyopathy, pulmonary edema, maternal ICU admission, or maternal or neonatal death as a result of these findings.

Conclusion: Screening maternal echocardiograms for the sole indication of advanced maternal age in women with no prior cardiovascular history did not result in significant cardiac findings that changed clinical management or affected maternal or neonatal outcomes. Thus, it may be more cost effective to use validated screening tools such as the California Cardiovascular Disease screening algorithm for pregnant and postpartum women to identify those at highest risk for cardiovascular complications in pregnancy.

Table 1: Cohort demographic and clinical characteristics for 27 women receiving screening echocardiograms in pregnancy for advanced maternal age (age ≥ 40)

Characteristic	Frequency
Maternal age (years)	44.9 ± 3.84
Parity, median (Q1-Q3)	1 (0-1.5)
Delivery year	
2020	1 (4%)
2021	5 (19%)
2022	12 (44%)
2023	9 (33%)
Race/ethnicity	
Non-Hispanic White	10 (37%)
Non-Hispanic Black	6 (22%)
Hispanic	6 (22%)
Asian	0 (0%)
Other/Unknown	5 (19%)
Private insurance	25 (93%)
Obesity (BMI ≥ 30 kg/m²)*	5 (27%)
Pre-gestational diabetes	0 (0%)

BMI, body mass index *BMI recorded in 18 of 27 women
Data reported as N(%) or mean ± standard deviation.

Table 2: Maternal cardiovascular outcomes and echocardiogram findings for 27 women receiving screening echocardiograms in pregnancy for advanced maternal age (age ≥ 40)

Echocardiogram Findings	Frequency
LVEF	
55-60%	16 (59%)
60-65%	10 (37%)
65-70%	1 (4%)
Valvular disease	
Mild	8 (30%)
Moderate to severe	0 (0%)
Diastolic dysfunction	0 (0%)
Left ventricular hypertrophy	3 (11%)
LVEDD (mm), median (Q1-Q3)	45.5 (41-48.8)
Elevated PASP (>30mmHg)	3 (27%)
Outcomes	**Frequency**
Referral to cardiologist	1 (4%)
Additional cardiac imaging required	0 (0%)
Initiation of cardiac medications	0 (0%)
Antepartum admission	0 (0%)
Intrapartum telemetry monitoring	0 (0%)
High-risk obstetric unit monitoring	0 (0%)
Mode of delivery	
Cesarean delivery	20 (74%)
Spontaneous vaginal delivery	7 (26%)
Operative vaginal delivery	0 (0%)
Preeclampsia	10 (37%)
Postpartum cardiomyopathy	0 (0%)
Pulmonary edema	0 (0%)
Maternal ICU admission	0 (0%)
Maternal death	0 (0%)
Gestational age at delivery (weeks)	38.5 ± 1.70
1-minute APGAR score < 7	1 (4%)
5-minute APGAR score < 7	0 (0%)
Neonatal birthweight (grams)	3237 ± 529
Neonatal ICU admission	5 (18%)
Intrauterine or neonatal demise	0 (0%)

LVEF, left ventricular ejection fraction; LVEDD, left ventricular end diastolic diameter; PASP, pulmonary artery systolic pressure; ICU, intensive care unit
Data reported as N(%) or mean ± standard deviation.

268 | Cost-Effectiveness of Early vs. Delayed Amniotomy Following Transcervical Balloon Ripening

Lily Ben-Avi[1]; Miranda O'Keefe[2]; Sarah K. Dzubay[3]; Amy Hermesch[1]; Aaron B. Caughey[3]
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10:30 AM - 12:30 PM

Objective: A recent randomized trial found a decrease in the time from balloon removal to the active phase of labor and delivery with an early amniotomy, as well as an increase in postpartum hemorrhage with delayed amniotomy among term pregnant patients undergoing labor induction. Our goal is to demonstrate the cost-effectiveness of early amniotomy (< 2 hours after balloon removal) compared to late (>4 hours after balloon removal) amniotomy.

Study Design: A decision-analytic model was constructed using TreeAge to compare outcomes in patients with induced pregnancies undergoing transcervical balloon ripening followed by early vs. late amniotomy. Our theoretical cohort included 583,231 pregnancies, an estimate of the annual term inductions in the United States. Our outcomes include postpartum hemorrhage, chorioamnionitis, hours saved in labor, costs, and quality-adjusted life years (QALYs). We used a willingness-to-pay for the incremental cost-effectiveness ratio of $100,000/QALY. Model inputs were derived from the literature, and QALYs were generated at a discount rate of 3%. Sensitivity analyses were performed to assess the robustness of our model.

Results: In the one-year theoretical cohort of 583,231 patients, early amniotomy was found to be the dominant strategy. Early amniotomy led to 63,530 fewer cases of chorioamnionitis and 18,971 fewer cases of postpartum hemorrhage. Additionally, in the early amniotomy group, approximately 2.1 million fewer hours were spent in labor, $255 million was saved, and there were 156 additional QALYs. Univariate sensitivity analysis demonstrated that an early amniotomy is cost-saving compared to a delayed amniotomy even if the cost of labor drops to zero (Figure 1).

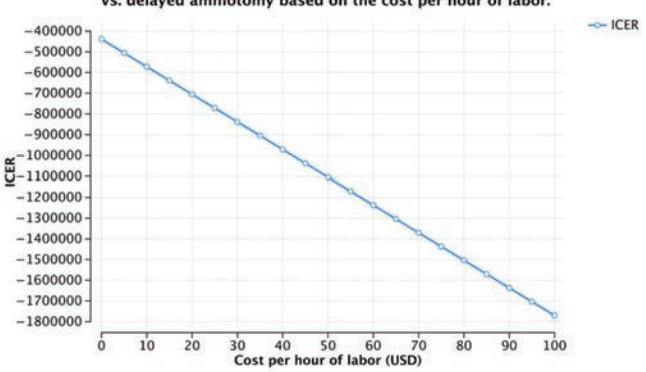
Conclusion: We found that the early amniotomy strategy resulted in savings of $255 million and 156 additional QALYs. Considering the significant decrease in morbidity and cost as well as the time savings associated with early amniotomy, the results of our model support early amniotomy following transcervical balloon ripening for the induction of term labor.

Table 1. Outcomes in a theoretical cohort of 583,231 pregnant patients.

	Early Amniotomy (<2 hours after balloon removal)	Delayed Amniotomy (>4 hours after balloon removal)	Difference (Early - Late)
Chorioamnionitis	54,692	118,222	-63,530
Postpartum hemorrhage	36,200	55,171	-18,971
Hours in labor	6,773,256	8,850,925	-2,077,668
Cost (in USD)	$688,237,646.85	$942,844,929.45	-$254,607,282.59
Effectiveness (QALYs)	15,748,793	15,748,637	156
Strategy	Dominant*	Dominated	

*In cost-effectiveness analysis, dominant strategies are those that are lower in cost and higher in effectiveness.

Figure 1. Univariate sensitivity analysis of the ICER for early amniotomy vs. delayed amniotomy based on the cost per hour of labor.



269 | Safety, Acceptability, and Effectiveness of Penicillin Allergy Testing in Pregnancy: A Systematic Review

Lindsay Reddeman[1]; Justin Lim[1]; Kellie Murphy[1]; David Fahmy[2]; Chris Walsh[3]; Kristin Harris[1]
[1]University of Toronto, Toronto, ON; [2]McMaster University, Hamilton, ON; [3]Mount Sinai Hospital Sidney Liswood Health Sciences Library, Toronto, ON

10:30 AM - 12:30 PM

Objective: An estimated 8-13% of pregnant patients report penicillin allergy (PA). Penicillins and other beta-lactams are widely used in pregnancy but often avoided in these patients, resulting in suboptimal therapy, antimicrobial resistance, higher costs, and increased morbidity and mortality for patients and neonates.

True penicillin allergy is rare and 95% of patients undergoing penicillin allergy evaluation (PAE) are delabelled. Although PAE is safe and recommended for pregnant patients, few are assessed. Recently, research concerning antenatal PAE has accelerated. We undertook a systematic review to summarize this growing body of evidence.

Study Design: A comprehensive search was conducted in collaboration with a medical information specialist, with no restriction on study language, date, or design. All peer-reviewed studies of pregnant people reporting unverified PA undergoing PAE with ≥5 participants were included. Title/abstract review, full text review, and data extraction were completed independently by 2 authors. Conflicts were resolved by a third author. Studies were evaluated using validated quality assessment tools.

Results: Seventeen studies (*N = 1720*) were eligible for inclusion. In total 1639 (95.3%) patients were delabelled through various approaches: direct oral challenge (12.8%), penicillin skin test (PST) and oral challenge (56.5%), PST and intravenous challenge (6.0%), PST alone (22.9%), and history review (1.8%). Acceptance of PAE among patients was 68.9%. Overall, 8 mild allergy-related adverse reactions and 5 mild delayed allergy-related adverse reactions occurred, requiring minimal intervention. There were 2 severe allergy-related adverse reactions which were managed with intramuscular epinephrine; no hospital transfers were required. No adverse antenatal events were recorded.

Conclusion: PAE in pregnancy is safe, acceptable, and effective, and the case for expanding access is strong. To our knowledge, this is the first systematic review to report on antenatal PAE acceptability and effectiveness; it builds on prior safety data drawn largely from low-quality and non-peer-reviewed evidence.

270 | Microbial Signatures in the Oral Cavity Associated with Pregnancy Loss

Ling liu[1]; Fang Wang[2]
[1]*Reproductive Medicine center, Second Hospital of Lanzhou University, Lanzhou, Gansu;* [2]*Lanzhou University Second Hospital, Lanzhou University Second Hospital, Gansu*

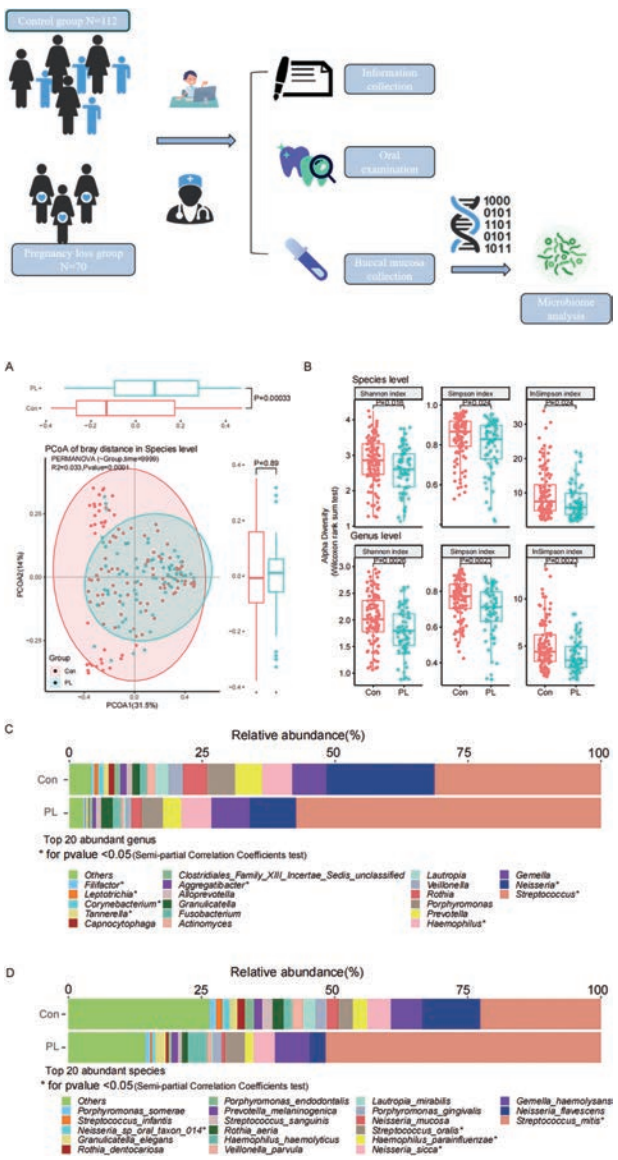
10:30 AM - 12:30 PM

Objective: The study aimed to elucidate the relationship between oral microbiota composition and pregnancy loss in Chinese women of childbearing age, hypothesizing that specific oral microbial signatures may be predictive of pregnancy outcomes.

Study Design: This prospective observational study adhered to the STROBE guidelines and enrolled 182 women of childbearing age. Participants were categorized into a pregnancy loss group (PL group, n = 70) and a control group (Con group, n = 112) based on their pregnancy history. Clinical assessments were conducted, and oral buccal mucosa samples were collected for comprehensive metagenomic analysis using shotgun sequencing. DNA was extracted, and sequencing was performed on the DNBSEQ-T1 platform. Taxonomic and functional profiling was conducted using Metaphlan 3.0 and HUMAnN 3.0. Alpha and beta diversities were assessed with indices and Bray-Curtis distances.

Results: The PL group exhibited lower oral microbiota richness and diversity. Genera such as Faecalibacterium, Roseburia, and Bacteroides were positively associated with pregnancy loss, while Pseudomonas and Leptotrichia were negatively associated. Metabolic pathways like plasminogen degradation and L-arginine degradation II (AST pathway) showed negative correlations with PL. Principal Coordinate Analysis (PCoA) revealed significant differences in oral microbiota composition and function between the groups.

Conclusion: Our findings suggest that specific oral microbiota compositions and metabolic pathways are associated with pregnancy loss, highlighting the potential role of oral microbiota in reproductive health. These insights could inform the development of targeted interventions aimed at modulating the oral microbiota to improve pregnancy outcomes.



271 | Association of Cesarean Characteristics with Opioid Use and Post-Operative Pain Scores

Luke P. Burns[1]; Xiao-Yu Wang[2]; On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network
[1]*University of Chicago, University of Chicago, IL;* [2]*The Ohio State University, Columbus, OH*

10:30 AM - 12:30 PM

Objective: To evaluate the association between cesarean delivery (CD) characteristics, opioid use, and post-operative pain scores among patients who underwent CD.

Study Design: Secondary analysis of a multicenter randomized trial of individuals who underwent CD across 31 U.S. hospitals from 2020-2022. Primary outcome was total in-hospital post-operative morphine milligram equivalents (MME). Secondary outcomes included total postoperative in-hospital MME per day, total number of opioid tablets through 90 days post-discharge, and moderate-severe perceived pain (defined as worst pain score of ≥4 of 10 on Brief Pain Inventory (BPI)) assessed at randomization (within one day prior to discharge). CD characteristics included scheduled or unscheduled; whether done in the presence of labor or not; and primary or repeat. Multivariable modeling estimated the association between CD characteristics and selected outcomes adjusting for age, obesity, and insurance status.

Results: The 5477 participants included in this analysis were categorized into 6 mutually exclusive groups (Table 1). Labor before scheduled CD was excluded due to low frequency (n = 38). Age, BMI, insurance status, concurrent salpingectomy, postpartum hemorrhage, and birthweight differed significantly between groups (data not shown). In the simple multivariable model, total inpatient MME was greater after repeat CD without labor, whether scheduled or unscheduled; in adjusted analyses there was no association between CD characteristics and primary outcome (Table 2). Repeat CD was associated with a greater number of daily opioid tablets taken postoperatively until discharge (aOR 1.2, 95% CI 1.06, 1.4), total number opioids taken post-discharge (aOR 1.2, 95% CI 1.1-1.4) and increased moderate-severe pain (aOR 1.4, 95% CI 1.1, 1.4) compared with primary CD.

Conclusion: The total in-hospital postoperative MME did not differ by any of the evaluated CD characteristics. However, repeat CD was associated with more inpatient opioid use per day, outpatient opioid use, and moderate-severe perceived pain.

Table 1: Outcomes data stratified by cesarean delivery characteristics[1]

	Scheduled, no labor		Unscheduled, no labor		Unscheduled, with labor	
	Primary N=498	Repeat N=1369	Primary N=464	Repeat N=471	Primary N=2201	Repeat N=474
Total postoperative MME during hospitalization –median [IQR]	30 [2.5,82.5]	39 [7.5,82.5]	38.8 [7.5,90.0]	52.5 [15,97.5]	45 [7.5,96.5]	48.8 [11.8,97.5]
Total postoperative MME per day during hospitalization – median [IQR]	10.9 [0.7,27.6]	15.9 [3.5,32.8]	11.6 [2.8,27.5]	18.7 [4.7,32.9]	15.4 [2.9,32.2]	17.1 [4.8,36.3]
Total number of opioid tablets taken through 90 days post-discharge – median [IQR]	3 [0,14]	5 [0,15]	2 [0,12]	6 [0,17]	4 [0,14]	6 [0,16]
BPI Moderate-severe pain[2] – n (%)	434 (87.2)	1235 (90.4)	397 (85.6)	434 (92.3)	1972 (89.6)	439 (92.6)

MME, morphine milligram equivalent; BPI, Brief Pain Inventory

[1]Cesarean delivery characteristic examples:
Scheduled, no labor: planned CD scheduled prior to delivery, e.g., primary elective CD
Unscheduled, no labor: unanticipated CD prior to labor with new indication for delivery, e.g., non-reassuring fetal status
Unscheduled, with labor: CD following attempt at vaginal birth, e.g., 2nd stage arrest of descent
[2]Defined as BPI score of 4+ at baseline, with baseline assessed at randomization (within one day prior to discharge)

Table 2: Simple and adjusted logistic regression modeling of outcomes stratified by cesarean characteristics

	Odds Ratios & 95% CI from logistic regressions models					
	Repeat		Unscheduled		Labor	
Outcome	Simple model	Adjusted	Simple model	Adjusted	Simple model	Adjusted
Total postoperative MME during hospitalization, more than median	**1.25 (1.10, 1.42)**	1.09 (0.95, 1.23)	**1.35 (1.15, 1.59)**	1.19 (0.99, 1.43)	1.02 (0.87, 1.19)	1.02 (0.86, 1.22)
Total postoperative MME per day during hospitalization, more than median	**1.39 [1.22, 1.57]**	**1.23 [1.06, 1.41]**	1.14 [0.97, 1.34]	1.01 [0.84, 1.21]	1.14 [0.98, 1.34]	1.15 [0.96, 1.37]
Total number of opioid tablets taken through 90 days post-discharge, more than median	**1.34 (1.18, 1.52)**	**1.22 (1.06, 1.41)**	1.06 (0.90, 1.25)	1.04 (0.87, 1.24)	1.05 (0.90, 1.23)	0.99 (0.83, 1.18)
BPI Moderate-severe pain[1]	**1.55 (1.26, 1.91)**	**1.40 (1.10, 1.37)**	1.05 (0.81, 1.35)	1.02 (0.76, 1.37)	**1.30 (1.01, 1.66)**	1.20 (0.91, 1.59)

MME, morphine milligram equivalent; BPI, Brief Pain Inventory
Simple multivariable model contained three variables: repeat, unscheduled, and labor.
Adjusted multivariable models includes the three variables in the simple multivariable model with covariates adjusted for maternal age, obesity, and insurance status.
[1]Defined as BPI score of 4+ at baseline, assessed at randomization (within one day prior to discharge)

272 | Sex Differences in Cord Blood Inflammation at Birth in Offspring Exposed to Gestational Diabetes Mellitus

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[1]*Massachusetts General Hospital, San Juan, Puerto Rico;* [2]*Massachusetts General Hospital, Boston, MA*

10:30 AM - 12:30 PM

Objective: Exposure to gestational diabetes mellitus (GDM) *in utero* can lead to adverse offspring cardiometabolic and neurodevelopmental outcomes, with boys and girls at different degrees of risk. Programming of innate immune responses, i.e. "trained immunity," may be a key driver of vulnerability vs resiliency in the face of future immune challenges. Sex-specific mechanisms represent a significant knowledge gap. We have previously shown that in GDM, placental expression of *IGFBP1* – an anti-inflammatory biomarker of maternal insulin sensitivity – is reduced in pregnancies with a male fetus but increased with a female fetus. Here, we tested the hypothesis that cord blood markers of innate immune activation are increased in males exposed to GDM *in utero* but decreased in females.

Study Design: 40 pregnant individuals with live singleton term births enrolled in the MGH pregnancy biorepository (Aug. 2020 - Feb. 2024) were included: 20 with GDM (N = 10 females, 10 males) and 20 without GDM (N = 10 females, 10 males). Proinflammatory cytokines/chemokines associated with innate immune responses were quantified in umbilical cord plasma collected at delivery using a 20-Plex bead-based immunoassay (ThermoFisher). The impact of fetal sex and GDM on cord plasma analyte concentrations was assessed by two-way ANOVA. Spearman correlations were calculated between placental *IGFBP1* expression and cord plasma analytes.

Results: Placental *IGFBP1* is inversely correlated with cord plasma TNF-α ($p = 0.046$), a key proinflammatory cytokine–Fig. 1A. C-C motif chemokine ligand 3 (CCL3) levels are sexually dimorphic: higher in GDM-exposed males and lower in GDM-exposed females (GDM-sex interaction term on 2-way ANOVA $p = 0.007$); CCL4 showed a similar trend ($p = 0.088$)–Fig. 1B. IFN-α, IL-6, and IL-17A levels are elevated in males ($p = 0.029$, $p = 0.007$, $p = 0.047$) independent of GDM–Fig. 2.

Conclusion: In GDM, cord plasma levels of chemokines associated with innate immunity are sexually dimorphic and may relate to proinflammatory signaling pathways in the placenta. These results point to potential sex-specific mechanisms of immune programming in GDM.

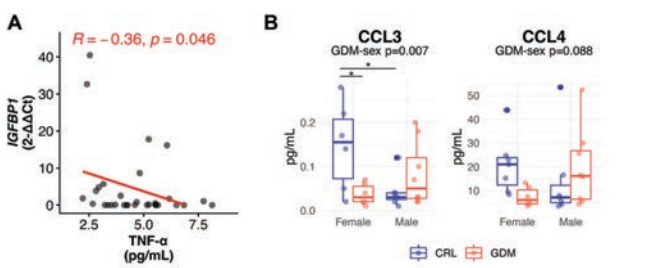

Figure 1: A. Placental *IGFBP1* expression is inversely correlated with cord plasma TNF-α concentration (N=31). B. Cord plasma CCL3 concentration in GDM is sexually dimorphic (2-way ANOVA, GDM-sex interaction term p = 0.007). Similar trend observed with CCL4. N=10 per group. *p<0.05, Tukey post-hoc comparison. GDM: Gestational diabetes mellitus. CRL: control.

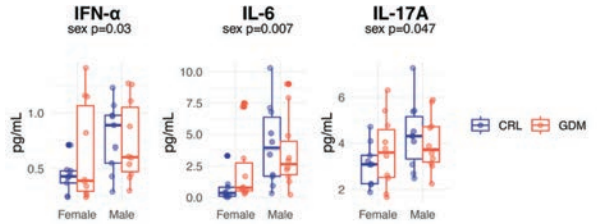

Figure 2: Proinflammatory cytokines IFNα, IL-6, and IL-17A are elevated in male cord plasma compared to females, with no effect of GDM. P-value shown for main effect of sex (2-way ANOVA). N=10 per group. GDM: Gestational diabetes mellitus. CRL: control.

273 | Trends in Risk Factors Associated with Syphilis Infection in Pregnancy from 2013-2023

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10:30 AM - 12:30 PM

Objective: Rates of syphilis infection in pregnancy continue to increase in the United States, despite universal screening and well-defined treatment algorithms. We sought to evaluate the risk factors associated with syphilis infection in pregnancy and changes in these risk factors over a 10-year period at a single tertiary referral center in Alabama.

Study Design: We performed a retrospective case-control study of all pregnant individuals delivering at our institution from 2013-2023. All patients who received prenatal care at our institution and underwent laboratory testing for syphilis were included. We compared patients with confirmed syphilis (cases–definition in Table) to those without syphilis (controls). Baseline demographics, medical comorbidities, and infectious data (Table) were considered potential risk factors and compared between groups using bivariate analysis. Significant risk factors ($p < 0.05$) were analyzed via logistic regression to identify independent risk factors. Tests of heterogeneity were computed to analyze the differential effects of risk factors by year.

Results: During our study period, a total of 40,137 patients were analyzed, of which 114 (0.28%) had confirmed syphilis infection in pregnancy. Pregnant individuals diagnosed with syphilis were more likely to be younger, Black non-Hispanic race, obese, smoke cigarettes, have gonorrhea (GC) or chlamydia (CT) diagnosed during pregnancy, and have public insurance (Table). Of these risk factors, only Black, non-Hispanic race, increasing BMI, cigarette use, and concomitant GC/CT were noted to be independently associated with syphilis infection in multivariable analysis (Table). The only variable to statistically change over time was the increasing association of private insurance with no syphilis infection ($p = 0.046$).

Conclusion: Risk factors associated with syphilis in pregnancy at our institution largely remained stable over the past decade and consistent with known risk factors. Given rising rates of syphilis in pregnancy nationally, new public health strategies are warranted for these known at-risk populations.

Table: Baseline demographics compared between individuals with and without confirmed syphilis in pregnancy* (Data presented as mean ± SD or %).

	Syphilis positive (%) (n=114)	Syphilis negative (%) (n=40,023)	P-value**	aOR (95% CI)***
Age, years	26.4 ± 6.4	27.9 ± 6.0	0.011	1.00 (0.97-1.04)
Race/ethnicity			<0.001	
Black, non-Hispanic	82.0	46.1		**5.68 (2.36-13.68)**
White, non-Hispanic	8.1	33.5		Ref
Hispanic/Other	9.9	20.4		1.52 (0.49-4.70)
BMI, kg/m^2	34.1 ± 20.1	30.0 ± 10.9	0.040	**1.01 (1.01-1.02)**
Relationship status			<0.001	
Single	86.7	58.6		1.55 (0.76-3.17)
Married	13.3	41.4		Ref
Cigarette use	22.1	11.7	<0.001	**1.74 (1.02-2.97)**
Diabetes mellitus	6.1	4.0	0.24	
Type 1	0.0	29.4	0.11	
Type 2	100.0	70.6		
Hypertension	17.5	13.1	0.16	
Payor status			<0.001	
Private	13.2	36.5		Ref
Government/Self Pay	86.8	63.5		1.92 (0.97-3.83)
HIV/AIDS	0.9	0.6	0.48	
Coinfection with Gonorrhea/Chlamydia	27.2	7.5	<0.001	**2.37 (1.42-3.96)**

* Syphilis infection diagnosed by positive syphilis enzyme immunoassay (EIA) with reflex rapid plasma reagin (RPR) titer for new infection or rising RPR titer in patients with known previous infection

***aOR calculated using all characteristics above with p<0.05 in bivariate analysis**

274 | Organ Injury During Primary and Repeat Cesarean: Cross Sectional Analysis from the National Inpatient Sample

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10:30 AM - 12:30 PM

Objective: The incidence of cesarean delivery in the United States is rising. The objective of the present study is to present contemporary nationally-representative data regarding incidence of organ injury and hysterectomy during primary and repeat cesarean deliveries.

Study Design: We conducted a cross-sectional and weighted analysis of delivery admissions included in the National Inpatient Sample from 2019 to 2021. Any organ damage was defined as damage to the bladder, ureter, small bowel, or large bowel. We tested group differences using chi-square and Wilcoxon rank sum tests. We used logistic modeling to compare risk of any organ injury in primary versus repeat cesarean with adjustment for covariates of age, race, income, and year of delivery.

Results: Of the 673,525 cesarean deliveries in the dataset, most (52%) were primary cesareans. Rates of injury and unadjusted odds ratios in primary and repeat cesareans are shown in Table 1. After adjusting for age, race, income and year of delivery, compared to primary cesareans, those undergoing repeat cesarean had adjusted odds (95% CI) of any organ damage of 3.54 (3.13, 4.02), bladder repair of 4.17 (3.62,4.79), ureter repair of 1.65 (0.28, 9.86), small bowel repair of 1.99 (1.36,2.83), large bowel repair of 0.79 (0.45,1.39) and hysterectomy of 1.63 (1.38,1.92).

Conclusion: Rates of any organ injury, bladder repair, small bowel repair, and hysterectomy, but not ureteral repair or large bowel repair, are higher in repeat compared to primary cesarean

deliveries. However, although organ injuries during primary cesarean are less frequent than those in repeat cases, thousands occur annually in the US due to the large number of cesarean deliveries each year.

Table 1: Rates of Injury During Primary and Repeat Cesareans and Cesarean Hysterectomy not Associated with Placenta Accreta Spectrum Disorders

	Primary Cesarean (n = 352,490) n per 10,000	Repeat Cesarean (n = 320,900) n per 10,000	Odds Ratio 95% CI	p-value
Any organ damage*	9.22	29.07	3.54 [3.13, 4.02]	<0.001
Bladder Repair	7.04	29.26	4.17 [3.62,4.79]	<0.001
Ureter Repair	1.36	2.71	1.65 [0.28, 9.86]	0.5806
Small Bowel Repair	0.057	0.09	1.99 [1.36,2.83]	<0.001
Large Bowel Repair	0.82	0.65	0.79 [0.45,1.39]	0.4231
Hysterectomy	6.81	10.09	1.63 [1.38,1.92]	<0.001

*Any organ damage defined as bladder, ureter, small bowel or large bowel repair needed

275 | Association of Post-Cesarean Delivery Pain and Breastfeeding

Mariana Espinal[1]; Alexandra L. Berra[2]; Jeanette Boyce[3]; On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network

[1]for the Eunice Kennedy Shriver National Institute of Child Health and Human Development, Bethesda, MD; [2]Case Western Reserve University Metrohealth Medical Center, Cleveland, OH; [3]University of Pittsburgh, Pittsburgh, PA

10:30 AM - 12:30 PM

Objective: To evaluate whether pain severity after cesarean delivery (CD) is associated with breastfeeding initiation and continuation up to 90 days postpartum, and to evaluate whether there is an association of morphine milligram equivalents (MME) used and breastfeeding up to two-weeks postpartum.

Study Design: Secondary analysis of a multicenter randomized trial of an individualized opioid prescription protocol compared to a fixed quantity of opioids upon discharge after CD. People with a live singleton newborn were included. The primary outcome was breastfeeding initiation before hospital discharge, determined by chart abstraction. Secondary outcomes included participant-reported breastfeeding at several postpartum time points. The primary exposure was pain severity in the 24 hours prior to discharge, assessed using the Brief Pain Inventory (BPI). Secondary analyses evaluated MME used at each corresponding time point. Outcomes were compared using bivariable and multivariable analyses.

Results: Of 5,291 individuals, 56% reported severe pain (BPI 7-10) and 83% reported initiation of breastfeeding prior to discharge. Those who initiated breastfeeding were older, more likely to be non-Hispanic White, married, had higher income, and less likely to be obese, smoke tobacco, or use illicit drugs. Individuals who reported severe pain prior to discharge were less likely to initiate breastfeeding before discharge (81%) compared to individuals who reported moderate (85%) or mild (84%) pain (p = 0.001, Table). Severe pain prior to discharge was associated with lower breastfeeding rates at each postpartum time point (Table), which remained significant in adjusted analyses at and after two-weeks postpartum (Table). Compared to individuals not breastfeeding, those who breastfed took lower MME in the hospital and at one- and two-weeks post-discharge (Figure).

Conclusion: Individuals who experienced severe pain after CD were less likely to initiate and continue breastfeeding up to 90 days postpartum, and those breastfeeding took fewer MME.

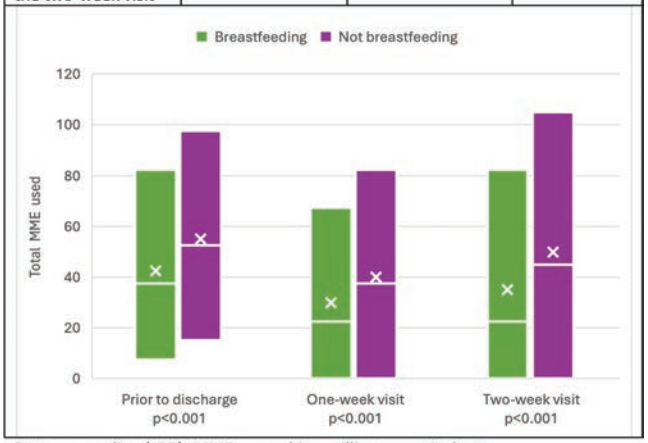
Table: Association of baseline in-hospital pain scores in the 24 hours prior to discharge* with breastfeeding outcomes over the first 90 days postpartum

# Breastfeeding	No/mild pain† N=980	Moderate pain† N=1324	Severe pain† N=2983	Bivariable p-value	aOR (95% CI)§
24 hours prior to discharge N=4,365	822 (83.9)	1129 (85.3)	2414 (80.9)	0.001	0.90 (0.77, 1.06)
One-week visit N=3,969	765 (84.3)	1024 (83.3)	2180 (79.2)	<0.001	0.87 (0.74, 1.03)
Two-week visit N=3,737	723 (81.3)	992 (80.7)	2022 (74.8)	<0.001	0.85 (0.73, 0.99)
Six-week visit N=3,271	650 (72.2)	883 (72.9)	1738 (64.9)	<0.001	0.82 (0.71, 0.94)
90-days visit N=2,534	505 (58.1)	705 (60.2)	1324 (51.6)	<0.001	0.86 (0.75, 0.98)
Ever N=4,686	891 (90.9)	1200 (90.6)	2595 (87.0)	0.001	0.82 (0.67, 0.99)

*In-hospital post-cesarean delivery worst pain score was assessed by Brief Pain Inventory in the 24 hours prior to discharge and categorized: no or mild (0-3), moderate (4-6), or severe (7-10) pain scores.
†Data are N (%). Chi-square compared primary outcome by pain severity.
§Multivariable analyses adjusted for maternal age, body mass index, government insurance, preterm birth, and nulliparity. aOR for severe pain vs. no/mild/moderate pain.

Figure: Association of breastfeeding and total MME used prior to discharge and over two-weeks postpartum

	Participants breastfeeding	Participants not breastfeeding	p-value*
Total MME used prior to discharge	37.5 (7.5, 82.5)	52.5 (15.0, 97.5)	<0.001
Total MME used at the one-week visit	22.5 (0, 67.5)	37.5 (0, 82.5)	<0.001
Total MME used at the two-week visit	22.5 (0, 82.5)	45.0 (0, 105)	<0.001



Data are median (IQR). MME= morphine milligram equivalents
*Differences remained significant after multivariable analyses adjusting for maternal age, BMI, government insurance, preterm birth, and nulliparity.

276 | Association Between Disrespectful Maternity Care and Two-Month Postpartum Depression: A National Population-Based Study

Marianne Jacques[1]; Anne A. Chantry[1]; Sarah Tebeka[2]; Anne Evrard[3]; Alexandra Doncarli[4]; Nathalie Lelong[5]; Camille Le Ray[5]

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Perinatal and Pediatric Epidemiology Research Team (Epopé), Center for Epidemiology and Statistics, FHU PREMA, Université de Paris, Paris, Ile-de-France

10:30 AM - 12:30 PM

Objective: Postpartum depression (PPD) is a common condition, with potential deleterious effects on mother and child. The involvement of disrespectful maternity care in negative childbirth experiences is increasingly studied, but its potential link with PPD remains under-evaluated. The objective was to assess the association between disrespectful maternity care and PPD at 2 months postpartum using national population-based data.

Study Design: Women from the 2021 Enquête Nationale Périnatale (all births in France during one week) who completed the 2-month follow-up questionnaire were included. Two-month PPD was defined as an Edinburgh Postnatal Depression Scale (EPDS) score ≥13. Disrespectful care (healthcare professional's inappropriate words, gestures or attitudes) during childbirth and/or postpartum were reported by women at 2 months postpartum. The association between disrespectful care and PPD was assessed using Poisson regression with robust variance, adjusted for confounders and weighted to account attrition. Sensitivity analyses were conducted using different EPDS cut-off and among subgroups of women at low pre-existing risk for PPD (antenatal well-being and no history of psychological / psychiatric care) or high pre-existing risk. Robustness against unmeasured confounding was assessed using E-value calculation.

Results: Among the 7189 women analyzed, 16.6% (95% confidence interval -CI- 15.7-17.6) had PPD at 2 months, and 24.9% (95% CI 23.8-26.0) reported experiencing disrespectful maternity care. After adjustment, women who reported disrespectful care were more likely to have 2-month PPD (adjusted relative risk –aRR 1.37; 95% CI 1.20-1.57, with E-value 2.08), including those at low pre-existing risk (aRR 1.69; 95% CI 1.34-2.15).

Conclusion: Experience of disrespectful care during childbirth or postpartum was associated with an increased prevalence of 2-month PPD. Given the concerning incidence of PPD and its consequences, these results underline the importance of raising awareness among healthcare professionals and enabling them to provide respectful care.

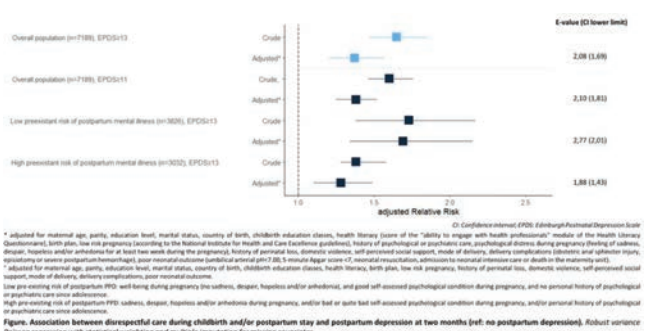

Figure. Association between disrespectful care during childbirth and/or postpartum stay and postpartum depression at two months (ref: no postpartum depression). *Robust variance Poisson regression with statistical weighting and multiple imputation for missing covariates.*

277 | Satisfaction with Continuous Glucose Monitoring and Time in Range Among Individuals with Gestational Diabetes

Marie J. Boller[1]; Lucy Ward[2]; Amy M. Valent[2]
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10:30 AM - 12:30 PM

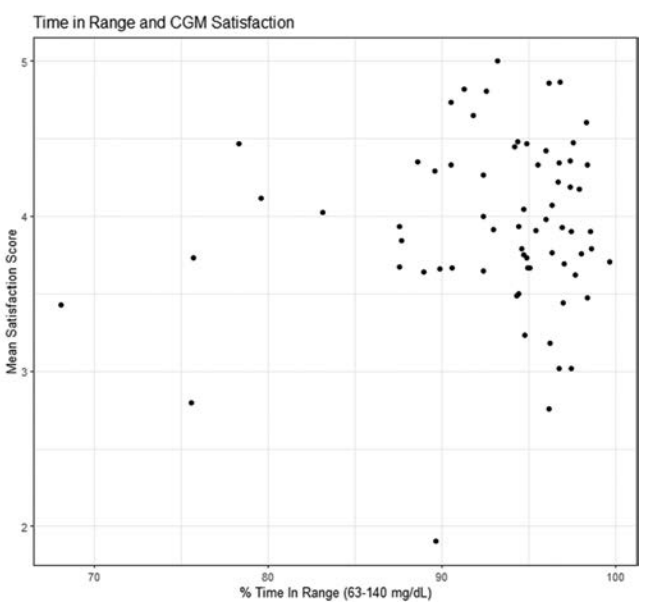
Objective: Satisfaction with continuous glucose monitoring (CGM) for management of diabetes has been shown to correlate with time in range (TIR) in individuals with Type 1 diabetes. Among individuals with gestational diabetes mellitus (GDM) using CGM, degree of satisfaction with use and correlation of satisfaction with TIR is unknown. We sought to describe satisfaction with CGM use and association with TIR among individuals with GDM.

Study Design: This was a secondary analysis of pregnant individuals with GDM randomized to CGM versus capillary blood glucose monitoring for GDM management. Participants randomized to CGM completed a 48-item Likert scale CGM satisfaction survey instrument (CGM-SAT). Among individuals with CGM-SAT responses, we examined the association between CGM-SAT scores and TIR, defined as glucose levels 63-140 mg/dL. We examined associations between CGM-SAT scores and screening instrument scores for food security and health literacy.

Results: Of 111 participants in the trial, 68 individuals were assigned to the CGM arm and provided CGM-SAT responses. Satisfaction with CGM was high with a mean CGM-SAT score of 3.9 ± 0.6. Mean TIR was also high at 93.0% ± 6.1. Degree of satisfaction did not differ between individuals with TIR ≥90% (n = 54), vs TIR <90% (n = 14): mean CGM-SAT scores were 4.0 ± 0.5 and 3.7 ± 0.7, respectively (two sample t-test p-value = 0.138). The cohort included individuals experiencing food insecurity (n = 8, 11.8%) and with limited health literacy (n = 6, 8.8%). Satisfaction did not differ between individuals with food security and adequate health literacy (mean CGM-SAT 3.9 ± 0.5) and individuals with food insecurity and limited health literacy (mean CGM-SAT 3.4 ± 2.1).

Conclusion: This study demonstrated high satisfaction levels and high mean percent TIR among a cohort assigned to CGM for management of GDM that included few individuals with limited health literacy and food insecurity. No significant correlation was identified between mean CGM-SAT scores and TIR in our population. Large clinical trials are needed to evaluate benefits of and barriers to CGM for management of GDM.

Figure: Time in range, defined as glucose levels 63-140 mg/dL and CGM satisfaction by mean CGM-SAT score.



278 | Maternal Morbidity Trends Among Abortion-Banned States Following Dobbs v. Jackson: An Interrupted Time Series Analysis

Marie-Julie Trahan[1]; Gabriela F. Tessler[2]; Yongmei Huang[3]; Jason D. Wright[4]; Alexander M. Friedman[4]
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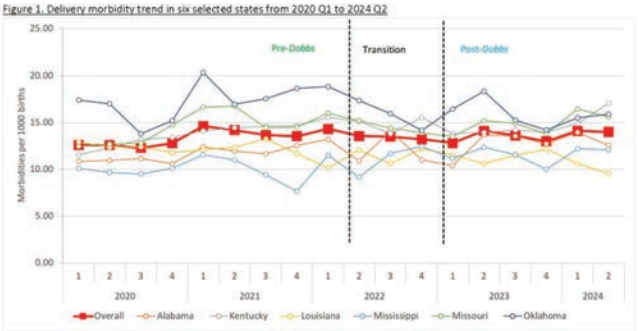
10:30 AM - 12:30 PM

Objective: The objective of this study was to evaluate trends in maternal morbidity among states with the most limited access to abortion following *Dobbs v. Jackson*, the United States Supreme Court Decision, which overruled *Roe v. Wade*, on June 24, 2022.
Study Design: States were characterized as abortion-banned based on categories established by the Center for Reproductive Rights. Six states with the most restrictive laws (classified as illegal) were selected for this study: Alabama, Kentucky, Louisiana, Mississippi, Missouri, and Oklahoma. Maternal morbidity data were obtained from the Centers for Disease Control (CDC) and Prevention Natality on CDC WONDER Online Database for each state from 2020 Q1 to 2024 Q2. Morbidity incidence per 1000 births was measured for each quarter. An interrupted time series analysis was conducted to compare changes in maternal morbidity for selected states, before and after *Dobbs v. Jackson* (2020 Q1-2022 Q1: pre-*Dobbs*, 2022 Q2-2022 Q4: transition period, 2023 Q1-2024 Q2: post-*Dobbs*).
Results: Data from 1,398,504 pregnancies were analyzed. The average maternal morbidity rate for all studied states was 13.5 per 1000 births over the study period. Pre-*Dobbs*, the overall morbidity rate increased between 2020 Q1 and 2022 Q1 (12.5 to 14.3 per 1000 births; baseline trend: $\beta1 = 0.23$, $p = 0.0002$). Immediately post-*Dobbs*, the morbidity rate significantly decreased to 12.8 per 1000 births in 2023 Q1 (level change, $\beta2 = -1.24$, $p = 0.01$). The morbidity trends pre- and post-*Dobbs* did not change significantly ($\beta3 = -0.08$, $p = 0.34$), and the maternal morbidity rate continued to increase significantly post-*Dobbs*, to 14.0 per 1000 births in 2024 Q2 ($\beta1+\beta3 = 0.15$, $p = 0.02$).
Conclusion: Our study findings signal an increase in the rate of maternal morbidity in states with abortion bans prior to and after the overturning of *Roe v. Wade*. This is particularly concerning in the setting of an overall trend of increasing maternal morbidity in the United States.

Table 1. Quarterly morbidity rate per 1000 births in abortion-banned states from 2020 quarter 1 to 2024 quarter 2

Year	Quarter	Overall morbidity rate	Alabama	Kentucky	Louisiana	Mississippi	Missouri	Oklahoma
2020	1	12.59	10.86	11.57	12.92	10.12	12.46	17.41
	2	12.58	10.95	12.3	12.4	9.65	12.72	16.99
	3	12.28	11.15	13.21	12.41	9.52	12.78	13.81
	4	12.77	10.59	13.42	11.82	10.08	14.72	15.19
2021	1	14.61	12.41	14.08	12.11	11.54	16.63	20.31
	2	14.17	11.96	14.43	12.36	11	16.76	16.95
	3	13.65	11.63	14.57	13.24	9.39	14.43	17.54
	4	13.52	12.53	14.65	11.69	7.67	14.51	18.65
2022	1	14.32	13.22	15.52	10.15	11.52	15.99	18.81
	2	13.55	10.91	15.13	12.04	9.15	15.21	17.35
	3	13.50	14.08	13.79	10.6	11.69	14.37	15.96
	4	13.20	10.98	15.53	12.19	12.44	13.91	14.15
2023	1	12.81	10.41	13.78	11.56	11.13	13.48	16.45
	2	14.10	13.66	13.97	10.58	12.37	15.19	18.34
	3	13.61	13.55	14.21	11.49	11.57	14.87	15.26
	4	12.98	12.69	13.97	12.13	9.99	13.8	14.19
2024	1	14.11	13.93	14.87	10.59	12.18	16.44	15.48
	2	13.99	12.56	17.04	9.56	12.12	15.61	15.91

Figure 1. Delivery morbidity trend in six selected states from 2020 Q1 to 2024 Q2



2020 Q1-2022 Q1: pre-*Dobbs*, 2022 Q2-Q4: transition period, 2023 Q1-2024 Q2: post-*Dobbs*
Red line with solid squares: Overall morbidity rate trend from 2020 Q1 to 2024 Q2
Lines with circles: Morbidity rate trend from 2020 Q1 to 2024 Q2 for each individual state

279 | Administration of and Delivery Timing after Antenatal Steroid Exposure: A Population-based Cohort Study

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10:30 AM - 12:30 PM

Objective: Antenatal steroids are administered to individuals at high risk for preterm birth to reduce the risk of neonatal respiratory morbidity. However, predicting who is at high risk for preterm birth is challenging. Our objective was to examine steroid administration practices by gestational age (GA) to inform potential strategies focused on its optimal use.
Study Design: This was a retrospective cohort study of patients who delivered within a large health system between July 2016 and December 2023. Patients were included if they delivered a liveborn neonate ≥24 weeks of gestation. Data were obtained from the health system's EHR. GA at the start of the first course of betamethasone was used in the comparisons. Any prior steroid exposure was reported by GA at delivery. For individuals who received antenatal steroids, we reported the percent who delivered within 7 days and who delivered at term by GA at steroid exposure.
Results: Antenatal steroid administration was observed among 5,037 of 86,884 pregnant individuals (5.8%), including in 50.1% of 7,300 preterm births. Rates of prior steroid administration varied by gestational age at delivery (Figure 1), highest at 89.0% for deliveries between 32-33 completed weeks of gestation. 1.7% of all term deliveries had been exposed to betamethasone during pregnancy. Among those who received antenatal steroids, Figure 2 shows the percent delivered within 7 days, ranging from 22.6% at 24-27 to 67.2% at exposure 34-36 completed weeks of gestation. Across all exposure GAs, 25.1% of patients who received steroids ultimately delivered at term.
Conclusion: Antenatal steroid administration was not observed for 12.5% of births < 34 weeks of gestation and 66% of late preterm births. Conversely, only 38% of individuals received steroids and delivered in the upcoming week. This large cohort of deliveries demonstrates the challenges in optimally timing antenatal steroid administration. Future research should focus on identifying those at the highest risk for delivery who may receive the maximal benefit from appropriately timed steroid administration.

Figure 1:
Antenatal Steroid Exposure by Gestational Age at Delivery

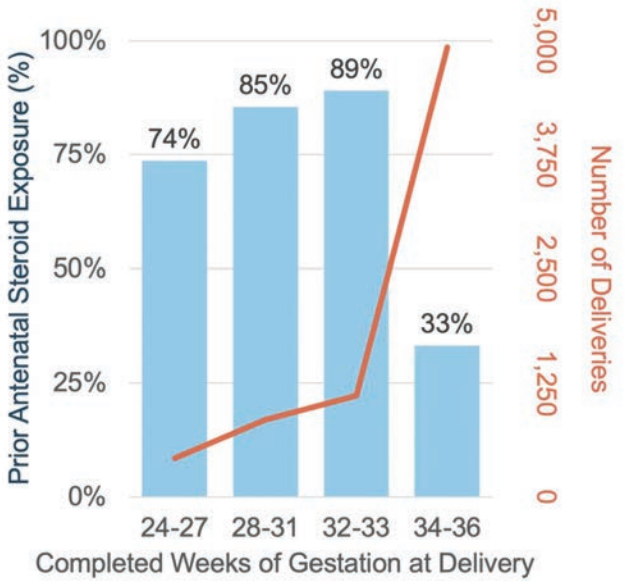
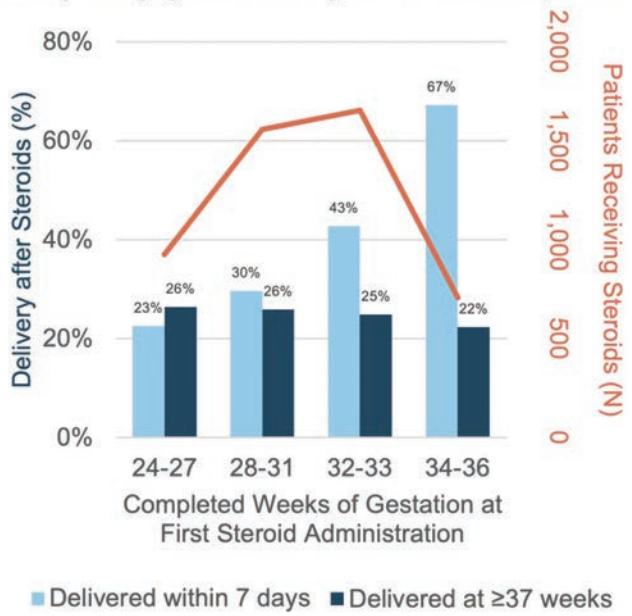


Figure 2:
Delivery Timing by Gestational Age at First Steroid Exposure



280 | Patient-Reported Burdens of Antenatal Fetal Surveillance: Stillbirth Prevention at what cost?

Marta J. Perez[1]; Miriam Alvarez[1]; Sarah Lasater[1]; Alison G. Cahill[2]; Lorie M. Harper[1]
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10:30 AM - 12:30 PM

Objective: Recommendations regarding the type, timing of initiation, and frequency of antenatal fetal surveillance (AFS) are based largely on expert opinion. Patient-centered experiences of AFS to guide AFS strategies that maximize stillbirth prevention and minimize cost and time burdens is lacking.

Study Design: We performed a cross-sectional survey of patients undergoing AFS in a maternal fetal medicine ultrasound unit. The primary aim was to describe the burden of AFS and determine if these burdens differed by frequency of AFS. Patients were eligible for inclusion if undergoing any type or frequency of AFS and were English or Spanish speaking. The survey responses of those undergoing once and twice-weekly testing were compared by creating a burden group (any "agree" response) and no burden group (any "disagree" response) by Chi square and Fisher's exact test as appropriate and by individual response as a continuous variable with student's t-test.

Results: Of 213 unique survey responses, 169 (79.3%) attended once and 44 (20.7%) twice-weekly. Most respondents had children and did not work outside the home. The most common self-reported indication for AFS was obesity. Patients reported that coming to clinic for AFS interfered with daily life (25.8%) and with work (14.6%), and 16.4% reported missing prenatal care to attend AFS. Twice-weekly patients were significantly more likely to report that AFS interfered with work ($p = 0.03$), was too expensive ($p < 0.01$), required cost cutting in other areas ($p < 0.01$), and reported missing AFS visits ($p = 0.03$) (Table 1).

Conclusion: Patients report financial and employment related difficulties attending AFS, and statistically significantly more burdens with twice compared to once-weekly testing. Strategies for stillbirth screening should consider potential harms of such regimens and the clinician should use shared decision-making when deciding on the frequency of AFS. Consideration should be given to innovation that relieves these burdens, such as remote, telehealth administered AFS.

	All	Once weekly	Twice weekly	p-value
Coming to clinic interferes with my day-to-day life.				
No	158 (74.2%)	128 (76.6%)	30 (65.2%)	
Yes	55 (25.8%)	39 (23.4%)	16 (34.8%)	0.12
Coming to clinic interferes with my work.				
No	45 (21.1%)	41 (24.6%)	4 (8.7%)	
Yes	31 (14.6%)	22 (13.2%)	9 (2.4%)	
N/A	137 (64.3%)	104 (62.3%)	33 (49.3%)	**0.03**
It is hard to coordinate care for my other children when I come to my appointments.				
No	108 (50.7%)	83 (49.7%)	25 (54.3%)	
Yes	32 (15.0%)	24 (14.4%)	8 (17.4%)	
N/A	73 (34.3%)	60 (35.9%)	13 (28.3%)	0.82
Coming to the clinic every week is too expensive.				
No	171 (80.3%)	142 (85.0%)	29 (63.0%)	
Yes	42 (19.7%)	25 (15.0%)	17 (37.0%)	**<0.01**
I have to cut costs in other areas (food, medications, entertainment) to come to the clinic every week.				
No	183 (85.9%)	150 (89.8%)	33 (71.7%)	
Yes	30 (14.1%)	17 (10.1%)	13 (28.2%)	**<0.01**
I have had to miss this antenatal screening appointment from time to time.				
No	191 (89.7%)	154 (92.2%)	37 (80.4%)	
Yes	22 (10.3%)	13 (7.8%)	9 (19.5%)	**0.03**
I have had to miss a prenatal care visit appointment with my doctor or midwife from time to time.				
No	178 (83.6%)	141 (84.4%)	37 (80.4%)	
Yes	35 (16.4%)	26 (15.6%)	9 (19.6%)	0.51

281 | Prospective Evaluation of Obstetric Point of Care Ultrasound (POCUS) Competency Training in Bangladesh

Mary Sterrett[1]; Annaliese Neumann[2]; Meghan Beddow[3]; Jeff Pollard[4]

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10:30 AM - 12:30 PM

Objective: To improve knowledge and image acquisition in obstetric ultrasound via remote image review of obstetric POCUS following in person ultrasound education and training program in low resource settings. Secondary objective was to generate preliminary timelines and ultrasound volumes for the skill acquisition of basic obstetric point of care ultrasound.

Study Design: Prospective observational evaluation of a six-physician cohort from October 2023 to April 2024 in Bangladesh, following a 10-day ultrasound training intervention in refugee camps.

Results: 225 ultrasounds were remotely reviewed over a 24-week period. Written examinations assessed pre-intervention knowledge (average score 57%) and post-intervention knowledge (89%) with an average score increase of 36%. Basic obstetric POCUS competency was achieved in 83% (5 of 6) trainees. Median time from completion of training to competency was 133 days (range 55-169). Median number of ultrasounds to reach competency was 40 (range 26-59). A four-month post-intervention written knowledge assessment was performed, with an average score of 91%.

Conclusion: OB POCUS competency following in-person ultrasound education and remote image review was achieved in nearly all trainees, and written knowledge assessment at four months post intervention showed similar scores as immediate post educational assessments. This finding supports adding remote image review in obstetric POCUS education and generates preliminary timelines and ultrasound volumes to achieve competency.

282 | The Association between Use of Preoperative Antibiotics and Gestational Latency After Ultrasound-Indicated Cerclage

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10:30 AM - 12:30 PM

Objective: The use of perioperative antibiotics and indomethacin increase gestational latency (GL) for patients undergoing exam-indicated cerclage. We sought to determine if preoperative antibiotics for ultrasound-indicated cerclage (UIC) have similar benefits.

Study Design: This was a retrospective cohort study of patients undergoing UIC per the operative report within a single health-care system with a linked birth record (>20 weeks' gestation) from 2017 to 2023. Exclusion criteria included multiple gestation, multiple cerclages in the pregnancy, or receipt of postoperative antibiotics. Surgical case details, antibiotic administration, and delivery outcomes were abstracted from the electronic health record with chart review as required. The primary exposure was preoperative antibiotic administration. The primary outcome was GL, or the duration from cerclage placement to delivery. Secondary outcomes included gestational age (GA) at delivery and any preterm birth (PTB) < 28 or < 32 weeks. Multivariable linear and logistic regression analysis were used to control for prior preterm birth, vaginal progesterone use, and cervical length and GA at time of cerclage.

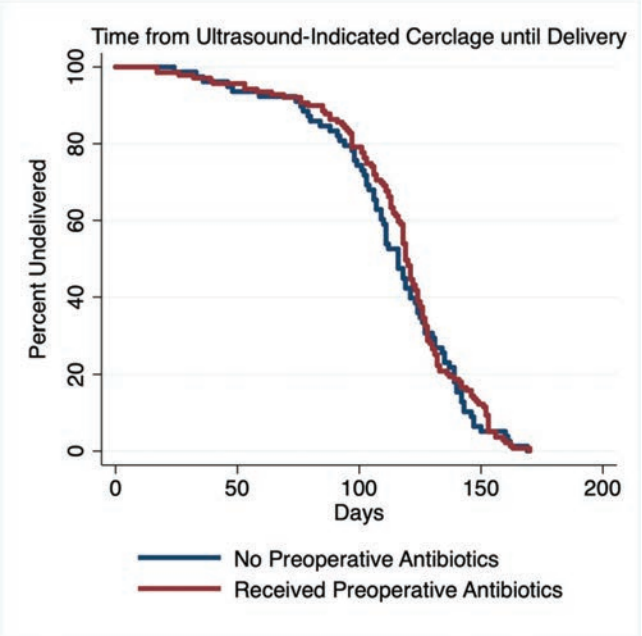
Results: During the study period, 231 patients received an UIC, of whom 219 (94.8%) met inclusion criteria. 140 patients (63.9%) received preoperative antibiotics. The groups were similar on baseline characteristics (Table). There was no difference in GL (116 vs 113 days, p = 0.46, Figure) or GA at delivery (37.0 vs 36.7 weeks, p = 0.62) between those who did and did not receive antibiotics. The PTB rates before 28 and 32 weeks were also similar (3.6 vs 5.1%, p = 0.59, and 10.1 vs 10.3%, p = 0.97, respectively). Results were unchanged in the adjusted analyses and in sensitivity analyses considering patients with and without a prior preterm birth as separate cohorts.

Conclusion: The use of preoperative antibiotics for UIC placement is not associated with increased GL or lower PTB rates compared to no antibiotics. Our findings may help promote antibiotic stewardship.

Table: Baseline Characteristics

	No Preoperative Antibiotics N=79	Received Preoperative Antibiotics N=140	P-value
Age	33.8 (5.2)	33.4 (5.2)	0.53
Self-Reported Race			
White	31 (39.2%)	54 (38.6%)	0.76
Black or African American	26 (32.9%)	40 (28.6%)	
Asian or Pacific Islander	10 (12.7%)	17 (12.1%)	
Other or Unknown	12 (15.2%)	29 (20.7%)	
Hispanic Ethnicity	15 (19.5%)	29 (21.3%)	0.75
Public Insurance	12 (16.0%)	30 (21.7%)	0.31
English Preferred Language	72 (91.1%)	136 (97.1%)	0.05
Nulliparous	34 (43.0%)	59 (42.1%)	0.90
Prior Preterm Birth	40 (50.6%)	56 (40.0%)	0.13
Ga At Time of Cerclage (weeks)	20.7 (18.9-22.4)	20.9 (18.6-22.0)	0.69
Cervical Length at Time of Cerclage (cm)	1.6 (1.1-2.1)	1.5 (1.1-2.0)	0.32
Received Indomethacin	72 (91.1%)	133 (95.0%)	0.26
Vaginal Progesterone Use	56 (70.9%)	109 (77.9%)	0.25

Data represented as n (percent), median (interquartile range), or mean (standard deviation)



283 | The Association between Antibiotic Prophylaxis Duration and Gestational Latency After Exam-Indicated Cerclage Placement

Maryama O. Ismail[1]; Taylor S. Freret[2]; Mark A. Clapp[3]; Malavika Prabhu[3]
[1]Mass General Brigham, Boston, MA; [2]Beth Israel Deaconess Medical Center, Boston, MA; [3]Massachusetts General Hospital, Boston, MA

10:30 AM - 12:30 PM

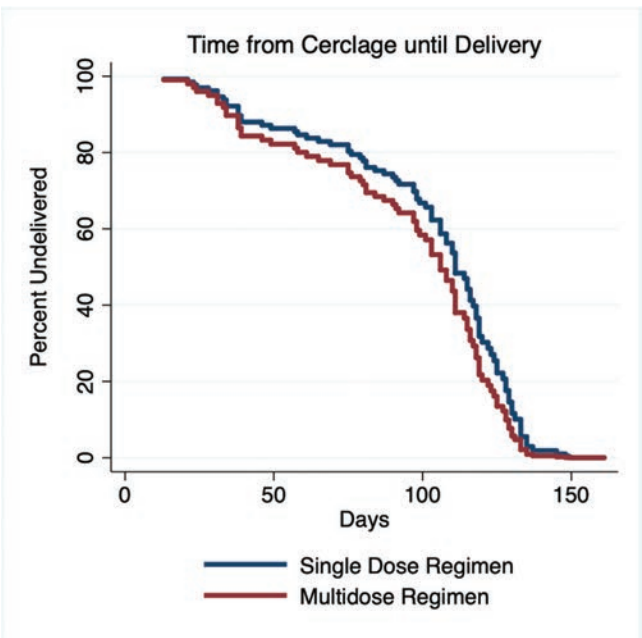
Objective: A 24-hour course of IV antibiotics and indomethacin at the time of exam-indicated cerclage (EIC) is superior to placebo at increasing gestational latency (GL). We sought to determine if a single dose regimen (SDR) of perioperative antibiotic prophylaxis provides similar benefits compared to a multidose regimen (MDR).

Study Design: This was a retrospective cohort study of patients undergoing an EIC within a single healthcare system from 2017 to 2023. Exclusion criteria included multiple gestation, multiple cerclages in the pregnancy, or no perioperative antibiotics. Surgical case details, antibiotic administration, and delivery outcomes were abstracted from the electronic health record. The exposure was antibiotic duration: SDR (preoperative antibiotics only) vs MDR (preoperative antibiotics with at least one postoperative dose). The primary outcome was time from cerclage placement to delivery (GL) among liveborn infants. Secondary outcomes included gestational age (GA) at delivery. Linear regression analyses controlled for amniocentesis prior to EIC, and cervical dilation (cm) and GA at placement.

Results: 122 patients underwent an EIC; 93 (76.2%) met inclusion criteria. 38 patients (40.9 %) received SDR, and 55 (59.1%) received MDR. Ninety-five percent of patients received indomethacin. The MDR group had a higher amniocentesis rate (54 vs 30%, p = 0.02) and baseline cervical dilation (1 cm [IQR 1–2] vs 1 cm [IQR 1–1]). Unadjusted GL (88 vs 106 days, mean difference -18 d, p = 0.02) and delivery GA (33.3 vs. 35.6 weeks, mean difference -2.3 weeks, p = 0.04) were lower in the MDR group. However, in the adjusted model, there was no significant difference in mean GL (-10.5 days, p = 0.20, Figure) or delivery GA (-1.5 weeks, p = 0.19, Table). Results were similar when adjusting for vaginal progesterone use.

Conclusion: A single dose of antibiotic prophylaxis is associated with similar GL to a multidose regimen when adjusting for other clinical factors. Limitations of our study include small sample size and that our model may not fully account for unobserved risk differences between the groups.

Gestational Latency (Days)	Unadjusted		Adjusted	
	Coefficient [95% CI]	p-value	Coefficient [95% CI]	p-value
Multidose Regimen	-17.6 [-32.7 – (-2.4)]	0.02	-10.4 [-26.4 – 5.5]	0.20
Amniocentesis	-10.8 [-26.5 – 4.9]	0.18	-8.9 [-24.9 – 7.1]	0.27
Cervical Dilatation (cm)	-14.9 [-25.9 – (-4.0)]	0.01	-13.5 [-24.7 – (-2.2)]	0.02
GA At Cerclage (weeks)	-2.4 [-6.5 – 1.6]	0.23	-2.8 [-6.9 – 1.4]	0.19
Gestational Age at Delivery (weeks)	**Unadjusted**		**Adjusted**	
	Coefficient [95% CI]	p-value	Coefficient [95% CI]	p-value
Multidose Regimen	-2.36 [-4.55 – (-0.17)]	0.03	-1.51 [-3.78 – 0.75]	0.19
Amniocentesis	-1.99 [-4.23 – 0.25]	0.08	-1.3 [-3.56 – 0.96]	0.25
Cervical Dilatation (cm)	-2.18 [-3.66 – (-0.71)]	<0.01	-1.88 [-3.47 – (-0.30)]	0.02
Ga At Cerclage (weeks)	0.64 [0.06 – 1.22]	0.03	0.59 [-0.01 – 1.19]	0.05



284 | The Impact of an Informative Video on Patient Anxiety at Term Induction-of-labor: Randomized Control Trail

Matan Friedman[1]; Liat Mor[2]; Irit Segman[1]; Yossi Mizrachi[1]; Noa Ben Shushan[1]; Hagit Eisenberg[1]; Tamar Shieldkrot[1]; Eran Weiner[1]; Giulia Barda[1]
[1]Wolfson Medical Center, Wolfson Medical Center, Tel Aviv; [2]Edith Wolfson Medical Center, Holon, HaMerkaz

10:30 AM - 12:30 PM

Objective: Induction of Labor (IOL) is a medical intervention that is associated with discomfort and anxiety. Our aim was to study the impact of a detailed informative video presented prior to IOL on maternal anxiety and satisfaction

Study Design: In this randomized controlled trial, term women with an unfavorable cervix undergoing IOL between April-July 2024 were randomly assigned to either: a "video group", in which an informative video was presented prior to IOL and a "control group", in which women received standard counselling. Otherwise, all patients received the same medical care. A 5-minute video was produced by our staff and included detailed information about IOL methods, what to expect after insertion, and pain management. IOL was performed by either vaginal dinoprostone or extra-amniotic balloon, according to our protocol. The primary outcome was the difference between State-Trait Anxiety Inventory (STAI) score before and after IOL (ΔSTAI). Secondary outcomes included patient satisfaction rated between 1 and 5. The study was powered to detect a 25% difference in the primary outcome (ΔSTAI)

Results: Included were 167 participants: 81 in the video group and 86 in the control group. Demographics were comparable between the groups, as well as baseline STAI scores, indications and methods for IOL. The decrease in anxiety levels (ΔSTAI) was significantly higher in the video group, compared with the control group (4.4 vs. 0.6, p = 0.007). Watching the informative video remained associated with anxiety reduction after adjusting for confounders (β 4.11, 95% CI 1.22-7.0). Furthermore, patients in the video group reported lower anxiety levels after IOL (mean STAI 44.1 vs. 38.9, p = 0.002), and higher satisfaction of the overall IOL experience (4.4 vs. 4.1, p = 0.018)

Conclusion: An informative video prior to IOL significantly reduced patient anxiety and Improved satisfaction. This technology offers a simple, cost-effective and non-pharmacological method to reduce anxiety and improve patient experience during IOL

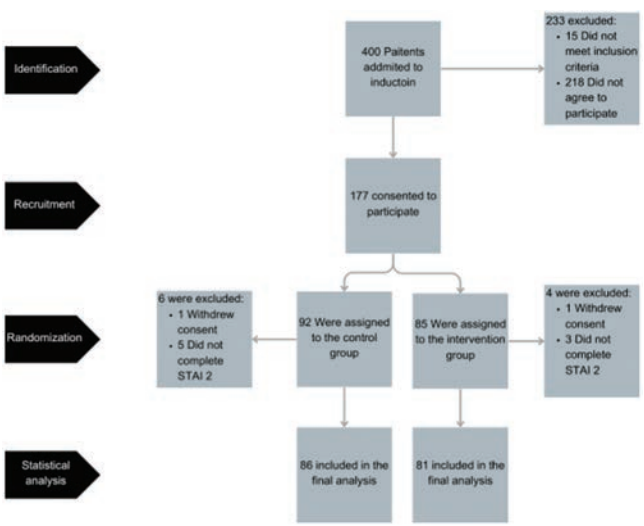


Table. Selected demographics and outcomes of women undergoing induction of labor with and without a pre-induction informative video

	Control group (n=86)	Video group (n=81)	*p*-value
Selected demographics			
Maternal age (years)	30.1 ± 5.7	30.9 ± 5.6	0.382
Gestational age at induction (weeks)	38.8 ± 1.1	38.9 ± 1.1	0.785
Nulliparity	33 (38.3)	32 (39.5)	1.0
Selected outcomes			
Pre-induction STAI score	44.8 ± 11.6	43.4 ± 11.6	0.437
Post-induction STAI score	44.1 ± 11.3	38.9 ± 11.0	0.002
Mean reduction in STAI score	0.6 ± 10.0	4.4 ± 7.9	0.007
Overall Satisfaction (scale 1-5)	4.1 ± 0.9	4.4 ± 0.6	0.018

Data are presented as mean ± SD, or n (%).

STAI - State-Trait Anxiety Inventory

287 | Patient Perceptions of a One-Year Postpartum Patient Navigation Program for Low-income Birthing People

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10:30 AM - 12:30 PM

Objective: Patient navigation, an intervention in which a trained individual supports patients in navigating the healthcare system, has emerged as a means to promote health equity in a variety of healthcare domains. Navigating New Motherhood (NNM) is a randomized trial that implemented a one-year postpartum patient navigation program for low-income birthing individuals. We aimed to understand patient perceptions of the NNM program and describe its implications for future program iterations.

Study Design: In this analysis of qualitative data from the NNM study, a random selection of participants who were receiving the navigation intervention underwent in-depth interviews at 4-6 and 11-13 months postpartum. Interviews focused on participants' perceptions of the relationship with their navigator and activities performed by the navigator. Using a codebook created through an iterative team-based process, two coders independently analyzed sets of interviews using the constant comparative method to identify underlying themes.

Results: In this analysis of 30 interviews from 15 navigated participants (mean age 28.4 years, 100% Medicaid insurance, 53% Black and 40% Hispanic), participants provided feedback regarding their navigators and the program. Major themes included 1) interpersonal connection between navigator and participant, 2) importance of logistical support provided by the navigator, 3) development of participant activation, 4) desired continuation of

the program, and 5) perception of breadth of services provided (Table). Some suggestions for improvement, albeit minimal in nature, were provided. Findings were similar at both time points.
Conclusion: Participant feedback on their experiences with postpartum navigation was overwhelmingly positive at both the mid-point and end of one year of participation. Participants cited navigation activities, program structure, and their relationship with navigators as program strengths. Findings support that patient navigation programs are welcomed by low-income birthing individuals, building on growing evidence for future investment in obstetric navigation.

Table: Patient Perceptions of Postpartum Navigation

Theme	Subtheme	Exemplary Quotation
Interpersonal connection between navigator and participant	Positive relationship with navigator	"I believe that we had a great relationship…It was just like a friend…I like that because it wasn't like she was prying or anything. It was just 'I'm here to help you out, how can I help you.'"
	Emotional support	"She was there to listen to me like if I wanted to text her and say hey, like 'I'm having postpartum depression' or whatever, that she would like help me out…it felt really nice to just have the extra support there."
Importance of logistical support provided by the navigator	Support for healthcare-related activities	"She helped me find a [primary] care physician…she helped me…cancel and reschedule appointments…I had to wait three months, two three months and she'd call and try to get something sooner. Things like that. She was really helpful"
	Navigator reduces participant's cognitive load	"I was so busy being a new mother, trying to finish school, so that kind of took a lot of weight off my shoulders where I had somebody helping me and checking on me. It was good for me."
	Connection to non-healthcare resources	"She let me know like places I can go get diapers, like a lot of resources and stuff that I may need…There's a program through my insurance and everything. I didn't know that…she was just encouraging me to ask them what's available. Without her I wouldn't have even known that."
	Appreciation of navigator attention to detail	"I know she's very detail oriented, so she definitely touches bases on a lot of different things. She brings up stuff that I'm not even thinking about"
Development of participant activation	Decrease in navigation needs at end of program	"…during the last six months, I haven't required so much support from [navigator]. I didn't demand as much support as during the first months of pregnancy and the first months of postpartum."
	Development of self-efficacy	"There's something important that she has done…[she] not only [taught me how] to manage the resources but also…how I can manage those things myself. [For example,] when I went to the clinic, she taught me how to use the MyChart application"
Desired continuation of program	Personal value of program	"I just want to say that the program was real helpful, [it] helped me in many ways…it should go forward"
	Desired future use	"if I get pregnant again I…will make sure I go see you guys office."
Perception of breadth of services provided	Patient satisfaction with breadth of services	"There is nothing that I've asked her that she has not gotten done and heck she even got it done before I asked her."
	Positive perception of attention to detail within program structure	"You're saying this is an early program you guys just start[ed]? You guys dotted a lot of I's and crossed a lot of T's with this."

288 | Integrating Complementary Medicine during Labor Induction: Insights from a Retrospective Cohort Study

Mays Awawdeh[1]; Tzlil Ganon[2]; Bat-Zion Zidenberg[2]; Dani Steinberg[2]; Elad Schiff[2]; Rami sammour[3]; Shlomi Sagi[3]; Inna Bleicher[4]
[1]Bnai Zion medical center, haifa, Hefa; [2]Bnai-Zion MC, Haifa, Hefa; [3]Bnai Zion MC, Bnai Zion MC, Hefa; [4]Bnai Zion medical center, Haifa, Hefa

10:30 AM - 12:30 PM

Objective: The use of acupuncture and reflexology has been rapidly increasing in obstetrics and gynecology. Nevertheless, their effect on maternal and neonatal outcomes remains uncertain. The aim of this study was to compare outcomes between patients who had labor induction with and without complementary medicine integrated into their standard medical care.

Study Design: Retrospective study of patients who had IOL in a single tertiary medical center from 2020-2023. Those receiving acupuncture or reflexology integrated with standard care (study group) were compared to standard care (control group). Data was retrieved from electronic medical records. Inclusion criteria were live singleton fetus, cephalic presentation, > 34 weeks of gestation without contraindication for vaginal delivery. Patients with ruptured membranes before IOL and those lacking data on the IOL method were excluded. Primary outcome was oxytocin use. Secondary outcomes included mode of delivery, indications for immediate delivery, intrapartum maternal fever ≥ 38°C, Apgar at 5 min ≤ 7 and admission to neonatal intensive care unit.
Results: Of 1906 eligible patients, 410 had complimentary treatment and 1496 were in the control group. Nulliparity and induction with prostaglandins were more common in the study group. Complimentary medicine group had lower rates of oxytocin use (17.3% vs 23.6%, p = 0.007) but longer oxytocin to delivery interval. These differences remained significant after adjustment for nulliparity and prostaglandins for labor induction. The rates of cesarean delivery and intrapartum maternal fever were higher in the study group. Other maternal and neonatal outcomes were similar.
Conclusion: Integration of complementary medicine during induction of labor was associated with lower rates of oxytocin use but longer duration of oxytocin administration, higher rates of maternal fever and cesarean deliveries. Selection bias, local practices as well as other confounders warrant prospective studies in order to confirm these findings.

Table 1: Group Characteristics and Study Outcomes

	With complementary medicine (N=410)	Without complementary medicine (N=1496)	P-value	OR (95% CI)
Maternal age	31.2 ± 4.82	31.1 ± 5.20	0.765	1 (1 - 1)
Gestational age (weeks)	39.6 ± 1.30	39.5 ± 1.34	0.315	1 (0.9 - 1)
Cervical ripening balloon	213 (52.0%)	747 (49.9%)	0.469	0.9 (0.7 - 1.1)
Oral Misoprostol	88 (21.5%)	270 (18.0%)	0.117	0.8 (0.6 - 1.1)
Vaginal Dinoprostone	27 (6.6%)	60 (4.0%)	**0.028**	0.6 (0.4 - 0.9)
Membrane sweeping	3 (0.7%)	30 (2.0%)	0.093	2.8 (0.8 - 9.1)
Indication for labor induction				
NRFHR	60 (14.6%)	249 (16.6%)	0.328	1.2 (0.9 - 1.6)
Prolonged pregnancy	85 (20.7%)	293 (19.6%)	0.606	0.9 (0.7 - 1.2)
Oligohydramnios	31 (7.6%)	107 (7.2%)	0.777	0.9 (0.6 - 1.4)
Hypertensive disease	41 (10.0%)	122 (8.2%)	0.237	0.8 (0.6 - 1.2)
Macrosomia	37 (9.0%)	122 (8.2%)	0.573	0.9 (0.6 - 1.3)
GDM or DM	52 (12.7%)	168 (11.2%)	0.415	0.9 (0.6 - 1.2)
Reduced fetal movements	53 (12.9%)	214 (14.3%)	0.477	1.1 (0.8 - 1.6)
IUGR	16 (3.9%)	83 (5.5%)	0.186	1.4 (0.8 - 2.5)
Cholestasis	13 (3.2%)	53 (3.5%)	0.715	1.1 (0.6 - 2.1)
Other indication for induction	72 (17.6%)	255 (17.0%)	0.806	1 (0.7 - 1.3)
Oxytocin during labor	71 (17.3%)	353 (23.6%)	**0.007**	1.5 (1.1 - 2)
Oxytocin to delivery interval (minutes)	698 ± 482	496 ± 322	**<0.001**	1 (1 - 1)
CD	95 (23.2%)	250 (16.7%)	**0.003**	0.7 (0.5 - 0.9)
Instrumental delivery due to fetal distress	18 (4.4%)	83 (5.5%)	0.363	1.3 (0.8 - 2.1)
CD due to fetal distress	48 (11.7%)	133 (8.9%)	0.085	0.7 (0.5 - 1)
Intrapartum maternal fever	34 (8.3%)	77 (5.1%)	**0.018**	0.6 (0.4 - 0.9)
Apgar at 5' < 7	4 (1.0%)	10 (0.7%)	0.522	0.7 (0.2 - 2.2)
NICU admission	7 (1.7%)	41 (2.7%)	0.212	1.7 (0.7 - 3.8)

Data are presented as mean ± SD or n (%) NRFHR - Non reassuring fetal heart rate, GDM - Gestational diabetes mellitus, DM -Diabetes mellitus, IUGR - Intra uterine growth restriction, CD- cesarean delivery, NICU- neonatal intensive care unit

289 | Association of Glycemic Index in Early Pregnancy with GDM and LGA Risk in Nulliparous Individuals

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10:30 AM - 12:30 PM

Objective: We determined whether glycemic index in early pregnancy is associated with the risk of gestational diabetes mellitus (GDM) or large-for-gestational-age (LGA) birth among nulliparous individuals.
Study Design: This is a secondary analysis of data from individuals without pregestational diabetes enrolled in the prospective cohort Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-To-Be (nuMoM2b). The exposure was average glycemic index, which was determined by the Block Food Frequency Questionnaire administered in the first trimester. The glycemic index was categorized in quartiles from Q1 (best or foods with a slower blood sugar rise, reference) to Q4 (worst). Outcomes were GDM based on third trimester screening and LGA at birth per sex- and gestational-age standardized birthweight $\geq 90^{th}$ percentile. Modified Poisson regression was used and adjusted for age, body mass index, insurance status, and area deprivation index. Secondarily, we assessed for effect modification by dietary quality (using the Healthy Eating Index) and neighborhood-level food access (using the USDA Food Atlas).
Results: Among 7,817 assessed participants, the median glycemic index was 49.8 (IQR: 47.4, 52.1), and 94.9% had a low glycemic index score (≤ 55). Overall, 8.2% developed GDM and 4.2% had a LGA infant. The highest glycemic index (Q4) was not associated with an increased risk of GDM, but Q3 was associated a statistically increased risk of GDM versus the lowest quartile (Q3 vs. Q1 8.1% vs 9.0%: ARR: 1.51, 95% CI 1.11-2.05). Glycemic index was not associated with LGA birth. There was no evidence of effect modification by either dietary quality or neighborhood-level inadequate food access ($p \geq 0.05$ for all).
Conclusion: In a cohort of nulliparous individuals with generally good or low-glycemic-diets in early pregnancy, the glycemic index was not consistently associated with GDM or LGA. Further studies are needed to better understand the impact of diet-based glycemic changes on pregnancy outcomes.

TABLE. Association between glycemic index in early pregnancy and GDM and LGA birth in nulliparous individuals

	Frequency (row percentage)		Unadjusted and adjusted analysis	
	Yes	No	Unadjusted risk ratio (95% CI)	Adjusted risk ratio (95% CI)
GDM	N=640	N=7,177		
GI				
Quartile 1	176 (9.0)	1,787 (91.0)	Ref	Ref
Quartile 2	156 (8.0)	1,799 (92.0)	0.94 (0.68 , 1.29)	1.05 (0.76 , 1.46)
Quartile 3	157 (8.1)	1,793 (91.9)	1.34 (1.00 , 1.79)	1.51 (1.11 , 2.05)
Quartile 4	151 (7.7)	1,798 (92.3)	1.09 (0.80 , 1.48)	1.16 (0.84 , 1.60)
LGA	N=330	N=7,487		
GI				
Quartile 1	76 (3.9)	1,887 (96.1)	Ref	Ref
Quartile 2	71 (3.6)	1,884 (96.4)	0.89 (0.72 , 1.09)	0.91 (0.74 , 1.12)
Quartile 3	101 (5.2)	1,849 (94.8)	0.90 (0.73 , 1.10)	0.92 (0.74 , 1.13)
Quartile 4	82 (4.2)	1,867 (95.8)	0.86 (0.70 , 1.06)	0.85 (0.68 , 1.05)

Model adjusted for baseline age (continuous), body mass index (continuous), insurance status, and ADI (quartiles). Data provided as n (%)

290 | Better Maternal and Fetal Outcomes in Women with Self-Monitoring of Blood Pressure and Telemedicine Visit

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10:30 AM - 12:30 PM

Objective: Hypertensive disorders of pregnancy (HDP) affect 13% of pregnancies in the United States. Without monitoring, HDP can rapidly develop and progress. Self-monitoring of blood pressure (SMBP) for timely detection and treatment of HDP in the United States is still limited. We examined maternal and fetal outcomes and health utilization rates among pregnant women with SMBP and telemedicine visits (SMBP+T) and pregnant women with usual care (UC).
Study Design: This multicenter, retrospective cohort study (from 2020 to 2022) included women aged 15-55 years with singleton pregnancies; no prior diabetes, gestational diabetes, or HDP; and no use of low-dose aspirin in prior pregnancies. Women were excluded if there was insufficient information, a severe mental health diagnosis, drug use complicating pregnancies or termination of healthy, viable pregnancies. Eligible women with SMBP and telemedicine visits (n = 533) during prenatal care were assigned to the SMBP+T group. Another matched cohort of eligible women (n = 533) was comprised of the UC group that received only in-person office visits during prenatal care.
Results: At baseline, the sociodemographic, body mass index, comorbidities, history of prior pregnancy outcomes and blood pressure levels were similar across groups (Table 1). During pregnancy, groups had similar rates of new onset of HDP, delivery modes, gestational ages at delivery and pregnancy outcomes such as term birth, preterm birth, and pregnancy termination. In the UC group, those with HDP had higher incidents of maternal cardiovascular events (16.9% UC vs 7.1% SMBP+T; $p < 0.05$) and fetal complications related to HDP (29.6% UC vs 17.1% SMBP+T; $p < 0.05$). In addition, the UC group visited a prenatal office at slightly higher frequency (68.9% UC vs 62.3% SMBP+T; $p < 0.05$).
Conclusion: SMBP with telemedicine visits during pregnancy was associated with lower rates of maternal cardiovascular events and fetal complications related to HDP. SMBP with telemedicine

visits also did not increase health utilization rate in low-risk pregnant women.

Table 1: Sociodemographic and clinical characteristics of pregnant women at baseline

	SMBP + telemedicine visit group	Usual care group
	Median (Q1, Q3)*	Median (Q1, Q3)*
Age (years)	30 (28, 33)	30 (28, 33)
Body mass index (kg/m^2)	24.9 (22.1, 29.2)	26.2 (23.0, 30.1)
Systolic blood pressure (mmHg)	114 (108, 122)	116 (110, 121)
Diastolic blood pressure (mmHg)	71 (67, 77)	72 (68, 78)
	%	%
Current smoker	9.4	10.3
Prior term birth	52.1	51.7
Prior preterm birth	4.5	5.3

*Q1: first quartile, Q3: third quartile

291 | Tiktok and #Maternalmortality: a Content Analysis

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10:30 AM - 12:30 PM

Objective: Nearly 40% of Generation Z use TikTok as their primary search engine before other sites. Reproductive health posts frequently raise awareness and/or provide education. We systematically analyzed TikTok videos using #maternalmortality which has over 37 million views.

Study Design: Web-scraper Apify was used to compile information from the most-liked TikTok posts tagged #maternalmortality on February 6, 2023. Two independent reviewers (M.G. and L.H.) performed standardized coding on the top 100 videos with another reviewer (C.W.) to arbitrate differences. In addition to pre-determined descriptive data points, two standardized scales were used: a modified 5-point DISCERN scale to assess information quality and the Patient Education Materials Assessment Tool (PEMAT) to evaluate understandability and actionability.

Results: The top 100 #maternalmortality TikToks collectively had 11.9 million views and 1.1 million likes. 13 unavailable videos were excluded at the time of arbitration. Most creators were feminine presenting (86%), based in the U.S (99%), and 48% were healthcare professionals. Common themes included racial disparities in maternal deaths (33%) and causes and preventability of maternal deaths (22% and 13%, respectively). 5% of videos highlighted trust in healthcare while 31% highlighted distrust. Health information quality was moderate (median DISCERN score of 2 out of 5, IQR 2-3) and videos were understandable (PEMAT median 71%, IQR 62-83) but not actionable (PEMAT median 0%, IQR 0).

Conclusion: Popular #maternalmortality videos on TikTok highlight race or racism as contributing factors to maternal deaths. High scores in understandability but lower in information quality suggests that, though accessible, these videos may not be totally reliable.

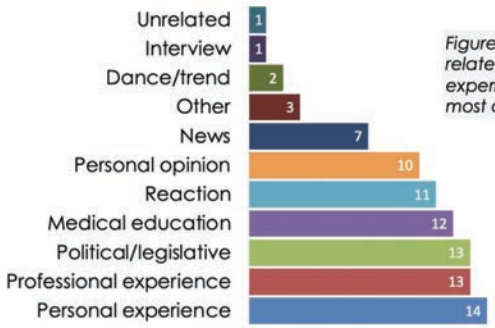

Figure 1: Videos related to personal experience were the most common

Theme	Videos containing theme, n (%)
Racial disparities in maternal deaths	29 (33.0%)
Race or racism as contributing factors to maternal deaths	27 (31.0%)
Causes of maternal deaths	19 (21.8%)
Maternal deaths in the U.S compared to other countries	17 (19.5%)
How healthcare professionals addressed patient concerns	12 (13.8%)
Preventability of maternal deaths	11 (12.6%)
Distrust in healthcare	27 (31.0%)
Trust in healthcare	6 (6.9%)

Table 1: Prominent themes among the videos included race, causes and preventability of deaths, U.S maternal mortality compared to other countries, and if & how healthcare professions addressed the patient's concerns. Distrust in healthcare was more common than trust in healthcare.

292 | Association of Primary Language with Pain and Opiate Use Following Cesarean Birth

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10:30 AM - 12:30 PM

Objective: Non-English speakers are at risk of experiencing healthcare disparities. The impact of patients' primary language on pain assessment and treatment is understudied. This study compared pain scores and opioid use in the first 48 hours post-Cesarean between English and Spanish-speaking patients.

Study Design: We conducted a pilot prospective cohort study that included postpartum patients over 18 years old with singleton pregnancies who underwent a low-transverse cesarean and were literate in English or Spanish. Primary language was self-reported. Pain assessments were based on 1) average daily standardized nursing evaluations and 2) the Short Form Brief Pain Inventory (SF BPI) 24-48 hours postpartum. Opioid use was measured by 1) total milligram morphine equivalents (MMEs) used within 48 hours postpartum, 2) total MMEs during postpartum admission, and 3) MMEs prescribed at discharge. Multivariable multinomial regression models were used to analyze the data.

Results: The study included 134 patients (94 English-speaking, 40 Spanish-speaking). Pain scores were similar in English and Spanish speakers, with the only difference seen related to the distribution of median Day 2 pain scores (English 3/10, Q1-Q3 2-5 versus Spanish 3/10, Q1-Q3 1.75-4.00; p = 0.04, Table 1). No significant differences were identified in median MME use in the first 48 hours postpartum (15 [Q1-Q3 0-38] in English speakers and 9 [Q1-Q3 2-23] in Spanish speakers, p = 0.13, Table 1). Similarly, no differences were seen after adjusting for confounders (Table 2). The median MMEs prescribed at discharge were identical in both groups (113, Q1-Q3 90-135; p = 0.93).

Conclusion: This study found no differences in pain scores or opioid use between Spanish and English-speaking patients post-cesarean. However, this may be related to our institution's efforts to standardize postpartum care, such as using language-concordant staff, in-person interpreters, and uniform opioid prescribing protocols. Additional research among larger cohorts is needed to explore the effectiveness of these standardized protocols in promoting equitable postpartum care.

Table 1. Pain and opiate outcomes compared by primary language in post-cesarean birth cohort, N=134

	N	English N = 94[1]	Spanish N = 40[1]	p-value[2]
Total MMEs used 0-48 hours postpartum	134	15 (0, 38)	9 (2, 23)	0.13
No Opioids used 0-48 hours postpartum	134	28 (30%)	10 (25%)	0.68
Total MMEs during postpartum admission	134	19 (0, 59)	15 (3, 26)	0.19
Total MMEs at discharge	133	113 (90, 135)	113 (90, 135)	0.93
SF BPI B6 Score	134	5.00 (3.00, 7.00)	4.00 (2.00, 6.00)	0.21
Average Day 1 Pain Scores	119	2.00 (1.00, 3.00)	2.00 (1.00, 2.25)	0.74
Average Day 2 Pain Scores	119	3.00 (2.00, 5.00)	3.00 (1.75, 4.00)	0.04
Average Day 3 Pain Scores	111	3.00 (2.00, 4.00)	2.00 (2.00, 4.00)	0.15
Overall Pain Score Averages During Postpartum Admission	133	2.00 (2.00, 4.00)	2.00 (1.00, 3.00)	0.11

[1]Median (Q1, Q3); n (%)
[2]Wilcoxon rank sum test; Fisher's exact test

Table 2. Multinomial regression model for the association between primary language and quartile of postpartum opiate use, N=134

Quartile of MME use 0-48 hours postpartum	English N=94	Spanish N=40	Spanish (vs. English)	p-value	Spanish (vs. English)	p-value
	N (%)	N (%)	Crude OR (95% CI)		Adjusted OR[b] (95% CI)	
1st (0 MME[a])	28 (30%)	10 (25%)	Ref[c]	Ref	Ref	Ref
2nd (3-15 MME)	21 (22%)	18 (45%)	2.40 (0.92, 6.26)	0.073	1.69 (0.50, 5.64)	0.40
3rd (18.8-33.8 MME)	18 (19%)	7 (18%)	1.09 (0.35, 3.38)	0.883	0.59 (0.15, 2.35)	0.45
4th (37.5-169.5 MME)	27 (29%)	5 (13%)	0.52 (0.16, 1.72)	0.282	0.36 (0.08, 1.62)	0.18

[a] MME = milligram morphine equivalents. The 1st MME quartile has the lowest use, and the 4th MME quartile has the highest use.
[b] The model is adjusted for age, parity, and socioeconomic constructs (highest level of education and insurance type)
[c] Ref = Reference group

293 | Effect of the Dobbs Decision on Sterilization Rates Based on Location Across Wisconsin

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10:30 AM - 12:30 PM

Objective: On June 24, 2022, the US Supreme Court's decision in *Dobbs v. Jackson* overturned the federal right to abortion established by *Roe v. Wade*, resulting in a ban on abortions in Wisconsin (WI) for 15 months. This structural barrier to managing pregnancy options may impact contraceptive decision-making. This study aims to examine the effect of the Dobbs decision on the rate of immediate and 3-month postpartum (PP) sterilization procedures in WI based on geographic location.

Study Design: A retrospective cohort of all births from 1/1/2021 to 9/30/2023 in WI was constructed using WI Hospital Association coding data. Pre-Dobbs was defined as 1/1/2021 - 6/23/2022 and post-Dobbs was defined as 6/24/2022 - 9/30/2023. Generalized additive logistic regression models were constructed for the rates of sterilization at birth and at 3 months PP as a function of geographic location (ZIP code). Statistical analyses were performed using the mgcv package in R.

Results: There were 147,877 births–79,806 pre-Dobbs and 68,071 post-Dobbs. There were 6,679 sterilization events at the time of birth (4.5%)–3,591 (4.5%) pre-Dobbs and 3,088 (4.5%) post-Dobbs (RR 1.01, 95% CI 0.96-1.06, p = 0.81). There was weak evidence (p = 0.15) of geographic variation in the impact of the Dobbs decision on the rate of immediate sterilization. There were nominally significant (p < 0.05) elevations in the immediate sterilization rate in 55 ZIP codes in southeast WI and nominally significant reductions in the immediate sterilization rate in 39 ZIP codes in western WI. Similar results were seen for sterilization at 3 months PP.

Conclusion: There was no change in overall sterilization rates across WI after Dobbs. There were subtle changes in the sterilization rate based on location, which contributes to evidence that location of residence impacts receipt of health services. Provisions to increase equitable access to care are needed. Further analysis is needed to determine if factors such as hospital religious affiliation, Medicaid status, or access to a surgical provider may influence this geographical difference in sterilization rates across WI.

Table 1. Participant Characteristics

Characteristic	N	Overall, N = 147,877[1]	Pre/Post Dobbs Decision		p-value[2]
			Pre, N = 79,806[1]	Post, N = 68,071[1]	
Race/Ethnicity	143,928				<0.001
AI/AN		1,619 (1.1%)	893 (1.1%)	726 (1.1%)	
Asian/PI		7,066 (4.9%)	3,825 (4.9%)	3,241 (4.9%)	
Black		16,570 (12%)	9,044 (12%)	7,526 (11%)	
Hispanic		16,680 (12%)	8,124 (10%)	8,556 (13%)	
White		101,993 (71%)	55,848 (72%)	46,145 (70%)	
Unknown		3,949	2,072	1,877	
Payer	147,291				<0.001
Medicaid		51,363 (35%)	27,610 (35%)	23,753 (35%)	
Other Government		2,853 (1.9%)	1,625 (2.1%)	1,228 (1.8%)	
Private Insurance		91,892 (62%)	49,448 (62%)	42,444 (62%)	
Self Pay		1,183 (0.8%)	557 (0.7%)	626 (0.9%)	
Unknown		586	566	20	
Language	89,315				<0.001
English		85,076 (95%)	39,894 (96%)	45,182 (95%)	
Hmong		279 (0.3%)	145 (0.3%)	134 (0.3%)	
Other		702 (0.8%)	336 (0.8%)	366 (0.8%)	
Spanish		3,258 (3.6%)	1,263 (3.0%)	1,995 (4.2%)	
Unknown		58,562	38,168	20,394	
Immediate Sterilization	147,877	6,679 (4.5%)	3,591 (4.5%)	3,088 (4.5%)	0.7
Sterilization at 3 mo	147,877	7,837 (5.3%)	4,205 (5.3%)	3,632 (5.3%)	0.6

[1] n (%)
[2] Pearson's Chi-squared test

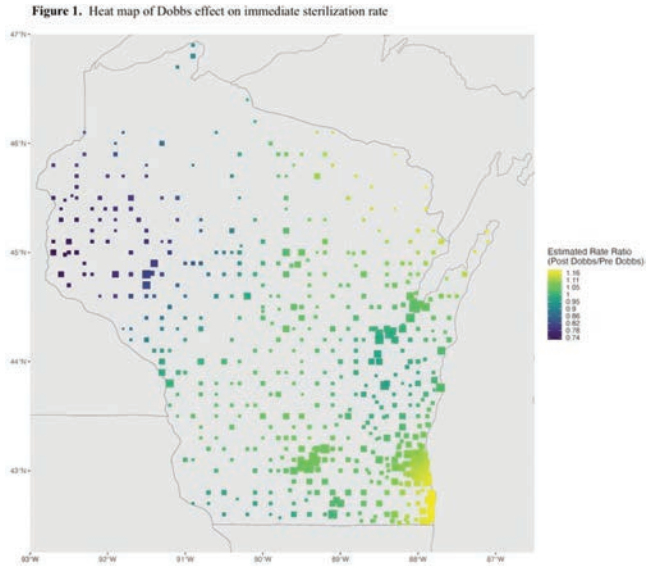

Figure 1. Heat map of Dobbs effect on immediate sterilization rate

294 | Understanding Maternal Infection in Late Preterm Prelabor Rupture of Membranes by Time of Ruptured Membranes

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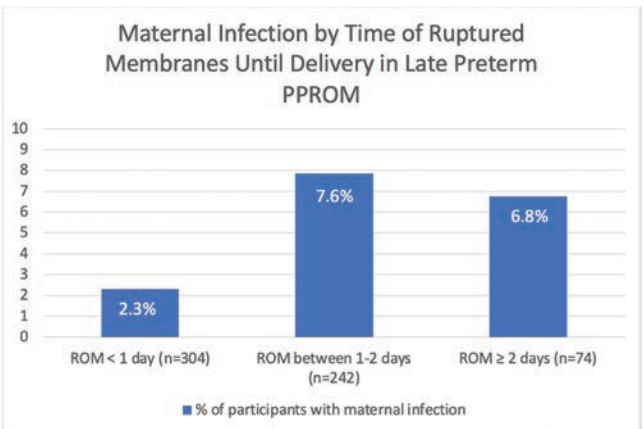
10:30 AM - 12:30 PM

Objective: Expectant management (EM) of late preterm PPROM is thought to improve neonatal outcomes without increasing the risk of neonatal sepsis. European clinical trials have described the median duration of EM as ~3-4 days, and suggest increased risk of maternal infection with EM. However, more data are required to corroborate these findings in a US population and to stratify risk based on time of rupture of membranes (ROM). We investigated the association between the length of time from ROM to delivery and maternal infection after PPROM between 34-36 weeks.

Study Design: Secondary analysis of RCT of singleton pregnancies at risk for preterm delivery between 34-36 weeks. Parent trial included subjects with PPROM occurring ≥34 weeks without signs of infection/plan for induction at ≤12 hours. Primary outcome, maternal infection composite (chorioamnionitis +/- endometritis), was compared in participants with ROM < 1 day (< 24 hours), between 1-< 2 days (24-< 48 hours), and ≥2 days (≥48 hours). Secondary outcomes: mode of delivery and selected neonatal outcomes. Baseline characteristics were compared between groups; multivariable logistic regression models were fit to control for confounders

Results: Of 620 individuals with PPROM, 31 (5.0%) had maternal infection: 2.3% of individuals with ROM < 1 day, 7.8% with ROM between 1-2 days, and 6.8% in those with ROM ≥ 2 days (p = 0.01, Figure 1). Participants with maternal infection had significantly more time with ROM. After adjusting for confounders, ROM between 1-2 days and ≥ 2 days was significantly associated with maternal infection compared to ROM < 1 day (Table). Cesarean delivery, neonatal sepsis, and NICU admission were more common with increasing time from ROM. Neonatal respiratory outcomes were not different between groups.

Conclusion: Maternal infection and cesarean delivery rates increased with time after ROM. Increasing time was associated with neonatal sepsis and provided no short-term respiratory benefits with a trend towards greater NICU admission. Our findings prompt further evaluation of delivery delay after late preterm PPROM in a larger US population.



Maternal outcomes			
	ROM < 1 day (n=304)	ROM between 1-2 days (n=242)	ROM ≥ 2 days (n=74)
Maternal infection (n, %) p=0.01	7 (2.3%)	19 (7.6%)	5 (6.8%)
Cesarean delivery (n, %), p=0.002	25 (8.2%)	31 (12.8%)	19 (25.7%)
Time (hours) with ruptured membranes			
	Median, interquartile range		
With maternal infection	32.2, 15.2		
Without maternal infection, p<0.01	23.6, 19.3		
Adjusted Odds Ratio Estimates for Maternal Infection			
	(OR, 95% CI)		
ROM between 1-2 days*	3.92, (1.58-9.74)		
ROM ≥ 2 days*	4.91, (1.44-16.76)		
Neonatal outcomes			
	ROM < 1 day (n=304)	ROM between 1-2 days (n=242)	ROM ≥ 2 days (n=74)
Birth weight (mean), p=0.38	2566g	2561g	2500g
NICU Admission (n, %), p for trend=0.02	150 (49.3%)	139 (57.4%)	46 (62.2%)
Major respiratory morbidity (n, %), p=0.95	30 (9.9%)	22 (9.1%)	7 (9.5%)
RDS (n, %), p=0.30	15 (4.9%)	14 (5.8%)	1 (1.4%)
TTN (n, %), p=0.62	32 (10.5%)	21 (8.7%)	9 (12.2%)
Neonatal sepsis, p=0.01	1 (0.3%)	2 (0.8%)	3 (4.1%)

*Adjusted for age, BMI, gestational age at randomization, intervention vs. placebo group

295 | Adverse Outcomes Associated with Time from Neuraxial Anesthesia to Delivery: A Retrospective Cohort Study

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10:30 AM - 12:30 PM

Objective: Although studies have shown an inverse association between time from spinal anesthesia to delivery and umbilical

artery pH, these studies have been relatively small or excluded patients receiving other neuraxial anesthesia.

Study Design: Retrospective cohort study from 2013-2019 of singleton, term, non-anomalous births via planned cesarean delivery with neuraxial anesthesia. We assessed rates of adverse pregnancy outcomes associated with different time intervals from neuraxial placement to delivery: 1) < 20 minutes, 2) 20-39 minutes, 3) 40-59 minutes, and 4) ≥ 60 minutes. We further analyzed the time intervals for key portions of the surgical procedure among neonatal umbilical artery pH cohorts: 1) pH ≤ 7.00, 2) pH 7.01-7.10, 3) pH 7.11-7.20, 4) pH 7.21-7.30; and 5) pH ≥ 7.30. All statistical analyses were performed on STATA IC 15.1 and a p-value < 0.05 was considered statistically significant.

Results: Of the 5255 planned cesarean deliveries, 645 (12.3%), 4067 (77.4%), 468 (8.9%), and 75 (1.4%) delivered within 20 minutes, 20-39 minutes, 40-59 minutes, and ≥ 60 minutes from neuraxial anesthesia, respectively. As delivery time interval increased, there was positive association with number of prior cesarean delivery, BMI, and rates of multiparity, chronic hypertension, and diabetes. Increased time from neuraxial placement to delivery was associated with umbilical artery pH ≤ 7.1 and ≤ 7.2, umbilical artery base deficit > 8, and meconium-stained amniotic fluid (all p < 0.05). After adjusting for confounders and using > 20-minutes as a base comparator, increased time from neuraxial placement to delivery remained associated only with umbilical artery pH ≤ 7.2 (adjusted OR 1.83; 95% CI 1.01-3.28). In our secondary analysis, as the pH cohort decreased, there was association with increased time from neuraxial placement to delivery, skin incision to uterine incision, and uterine incision to delivery (all p < 0.01).

Conclusion: Findings suggest that during scheduled cesarean delivery, increased time from neuraxial anesthesia to delivery was associated with lower umbilical artery pH.

Table 1. Maternal and neonatal baseline demographics and characteristics

	< 20 min (n=645, 12.3%)	20-39 min (n=4067, 77.4%)	40-59 min (n=468, 8.9%)	≥ 60 min (n=75, 1.4%)	p-value
Time from Neuraxial Placement to Delivery (min), mean ± SD	16.6 ± 2.5	27.8 ± 5.0	46.0 ± 5.1	74.9 ± 17.4	<0.01
Post Neuraxial Nadir Systolic Blood Pressure, mean ± SD	100.8 ± 14.0	99.9 ± 13.1	100.5 ± 12.7	99.8 ± 16.7	0.34
Post Neuraxial Nadir Diastolic Blood Pressure, mean ± SD	51.0 ± 9.1	50.1 ± 7.9	50.0 ± 7.3	49.5 ± 9.6	0.05
Post Neuraxial Nadir MAP, mean ± SD	67.6 ± 10.0	66.7 ± 8.8	66.8 ± 8.5	66.3 ± 11.4	0.12
Post Neuraxial Acute Pressors, n (%)	443 (68.7)	3158 (77.8)	351 (75.5)	63 (85.1)	<0.01
Age, mean ± SD	34.2 ± 4.8	35.0 ± 5.2	33.9 ± 5.3	33.8 ± 5.5	0.02
BMI at Time of Delivery, mean ± SD	30.2 ± 5.1	30.7 ± 5.8	33.8 ± 7.7	35.3 ± 8.1	<0.01
Multiparity, n (%)	345 (53.5)	2731 (67.2)	380 (81.2)	60 (80.0)	<0.01
Number of Prior CS, interquartile ranges	0 [0,1]	1 [0,1]	1 [1,2]	1 [1,2]	<0.01
Gestational Age at Delivery, mean ± SD	39.2 ± 0.9	39.0 ± 0.9	38.9 ± 0.9	38.8 ± 1.0	0.09
Gestational Hypertension, n (%)	20 (3.1)	97 (2.4)	10 (2.1)	0 (0.0)	0.35
Chronic Hypertension, n (%)	15 (2.3)	99 (2.4)	31 (6.6)	12 (16.0)	<0.01
Pre-eclampsia without severe features, n (%)	12 (1.9)	48 (1.2)	4 (0.9)	1 (1.3)	0.44
Gestational Diabetes, n (%)	29 (4.5)	310 (7.6)	50 (10.7)	4 (5.3)	<0.01
Pre-gestational Diabetes, n (%)	3 (0.5)	37 (0.9)	13 (2.8)	4 (5.3)	<0.01
Neonatal Birthweight (g), mean ± SD	3400 ± 472	3424 ± 454	3397 ± 457	3407 ± 441	0.57
Small for Gestational Age, n (%)	18 (2.8)	52 (1.3)	6 (1.3)	1 (1.3)	0.03
Large for Gestational Age, n (%)	55 (8.5)	433 (10.7)	44 (9.4)	7 (9.3)	0.36
Type of Neuraxial Anesthesia, n (%)					<0.01
Spinal	599 (92.9)	3416 (84.0)	266 (56.8)	24 (32.0)	
Epidural	4 (0.6)	48 (1.2)	29 (6.2)	14 (18.7)	
Combined Spinal-Epidural	42 (6.5)	603 (14.8)	173 (37.0)	37 (49.3)	

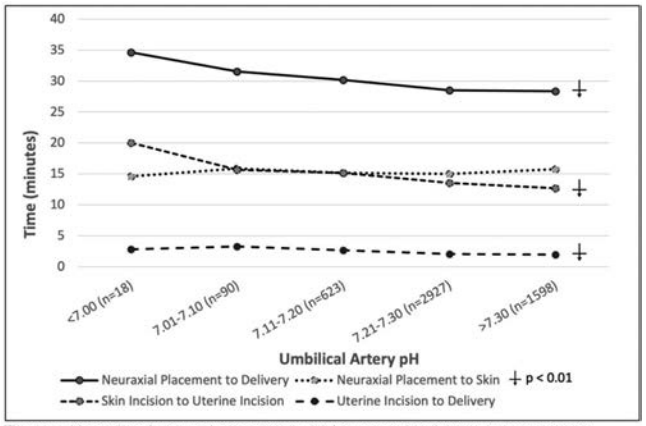

Figure 1. Mean time (minutes) associated with key cesarean delivery steps amongst different umbilical artery pH cohorts.

296 | Maternal Age and Elective Inductions of Labor in Nulliparous Patients: A Multicenter Cohort Study

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10:30 AM - 12:30 PM

Objective: We aimed to investigate whether advanced maternal age is associated with adverse outcomes in nulliparous women undergoing elective induction of labor (eIOL).

Study Design: We queried a multicenter outpatient electronic medical record to perform a retrospective cohort study of nulliparous women undergoing eIOL between 39w0d to 40w6d from January 2017 to June 2024. To investigate the relationship between age and eIOL, we created multiple study cohorts: 1) age < 35, 2) age 35-39, and 3) age ≥ 40. We excluded pregnancies complicated by multifetal gestation, oligohydramnios, hypertensive disorders, diabetes requiring treatment, autoimmune disorders, or fetal growth restriction. The primary outcome of interest was the rate of cesarean delivery (CD). Chi-square, ANOVA, and Mann-Whitney U tests were performed to determine statistical significance, and a multivariable logistic regression determined the strength of associations. All statistical analyses were performed on SPSS version 29.

Results: Of the 84,156 eligible patients, 932 met our inclusion criteria with 728 (78.1%), 141 (15.1%), and 63 (6.8%) with age< 35, age 35-39, and age ≥ 40, respectively. We noted a difference in rates of in vitro fertilization (IVF) but otherwise no baseline differences (Table 1). We found an increased incidence of CD with increasing age (25.8% for age< 35, 41.1% for age 35-39, and 55.6% for age ≥ 40, p < 0.01) (Table 2). After adjusting for confounders including pre-pregnancy BMI, diet-controlled gestational diabetes, and IVF and using age < 35 as the base comparator, this relationship remained consistent (age 35-39 adjusted OR 1.82 (95% CI 1.14-2.91) and age ≥ 40 adjusted OR 3.70 (95% CI 1.90-7.22)) (Table 2). Aside from cesarean for arrest of dilation, there were no significant differences noted in the indications for CD or other adverse outcomes (Table 2).

Conclusion: Although similar to trends seen in CD rates with maternal age in the overall population, this specific insight into the nulliparous population undergoing eIOL can be incorporated into counseling for nulliparous pregnancies complicated by advanced maternal age.

Table 1. Baseline Demographics and Characteristics

	Age <35 (N = 728)	Age 35-39 (N = 141)	Age ≥ 40 (N = 63)	p-value
Maternal Age at Delivery, mean +/- SD	27.5 +/- 4.5	36.6 +/- 1.5	41.4 +/- 1.7	<0.01
Pre-Pregnancy BMI (m/kg^2), mean +/- SD	27.8 +/- 6.5	27.1 +/- 6.2	27.3 +/- 5.1	0.76
Maternal Race, N (%)				0.07
American Indian or Alaska Native	3 (0.4)	2 (1.4)	1 (1.6)	
Asian	25 (3.4)	6 (4.3)	5 (7.9)	
Black or African American	45 (6.2)	7 (5.0)	1 (1.6)	
Hawaiian	1 (0.1)	0 (0.0)	0 (0.0)	
Other Race	72 (9.9)	3 (2.1)	5 (7.9)	
White	431 (59.2)	99 (70.2)	39 (61.9)	
Declined	151 (20.7)	24 (17.0)	12 (19.0)	
Ethnicity, N (%)				0.07
Hispanic	116 (15.9)	12 (8.5)	5 (7.9)	
Not Hispanic	442 (60.7)	98 (69.5)	44 (69.8)	
Declined	170 (23.4)	31 (22.0)	14 (22.2)	
History of any tobacco use, N (%)	70 (13.2)	11 (10.4)	3 (7.1)	0.41
Renal disease, N (%)	28 (3.8)	8 (5.7)	1 (1.6)	0.36
Diet-Controlled Gestational Diabetes, N (%)	16 (2.2)	7 (5.0)	3 (4.8)	0.12
In Vitro Fertilization, N (%)	33 (4.5%)	28 (19.9%)	21 (33.3%)	<0.01

Table 2. Outcomes Associated with Advanced Maternal Age and Elective Induction of Labor

	Age <35 (N = 728)	Age 35-39 (N = 141)	Age ≥ 40 (N = 63)	p-value
Rates of Cesarean Delivery, N (%)	188 (25.8)	58 (41.1)	35 (55.6)	<0.01
Unadjusted Odds Ratio (95% CI)	Ref	2.01 (1.38-2.92)	3.59 (2.13-6.06)	
Adjusted Odds Ratio (95% CI)*	Ref	1.82 (1.14-2.91)	3.70 (1.90-7.22)	
Indication for Cesarean Delivery, N (%)**				
Non-reassuring fetal heart rate tracing	52 (27.7)	17 (29.3)	11 (31.4)	0.89
Arrest of Dilation	55 (29.3)	10 (17.2)	2 (5.7)	0.01
Arrest of Descent	28 (14.9)	11 (19.0)	9 (25.7)	0.27
Failed Induction of Labor	36 (19.1)	14 (24.1)	10 (28.6)	0.39
Other	17 (9.0)	6 (10.3)	3 (8.6)	0.95
Peripartum Hysterectomy, N (%)	1 (0.1%)	0 (0.0)	0 (0.0)	N/A
Postpartum Readmission, N (%)	5 (0.7)	3 (2.1)	2 (3.2)	0.06
Apgar 1-minute, mean +/- SD	7.9 +/- 1.3	8.1 +/- 1.1	7.8 +/- 1.5	0.39
Apgar 5-minute, mean +/- SD	8.9 +/- 0.6	8.9 +/- 0.4	8.8 +/- 0.6	0.62
5-minute Apgar <7, N (%)	9 (1.3)	0 (0.0)	1 (1.6)	0.41
NICU Admission, N (%)	21 (2.9)	6 (4.3)	2 (3.2)	0.11

*Multivariable logistic regression adjusting for maternal pre-pregnancy BMI, diet-controlled gestational diabetes, and in vitro fertilization.
**Only includes patients delivered by cesarean section (Total N = 188, 58, and 35 for maternal age <35, 35-39, and ≥ 40, respectively).

297 | Nitrous Oxide: Safe, Effective Labor Analgesia in Patients Treated with Medications for Opioid Use Disorder

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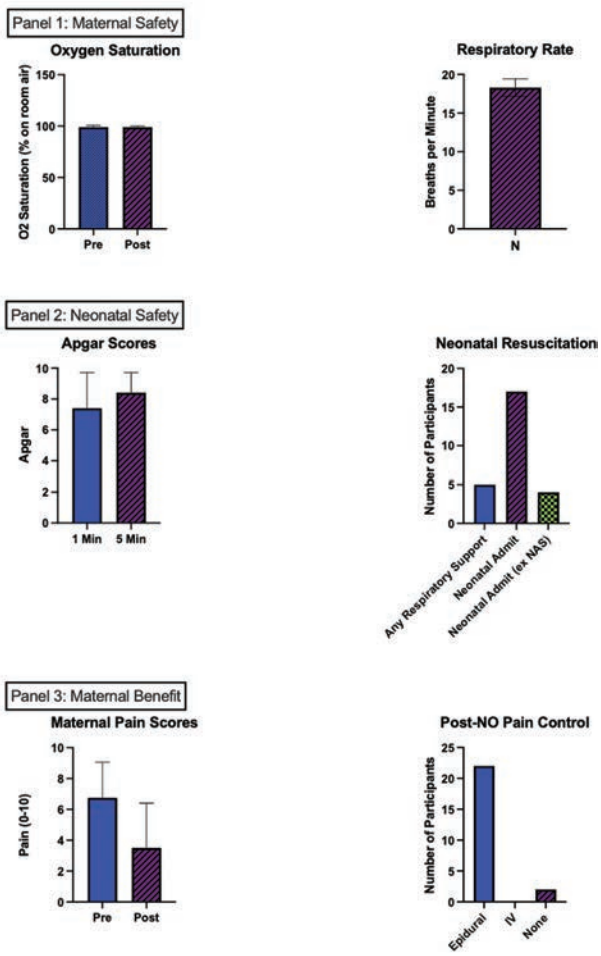
10:30 AM - 12:30 PM

Objective: Nitrous oxide (NO) is an effective analgesic option for labor and postpartum laceration repair, but obstetric and anesthesia professional societies caution against its use in individuals treated with systemic opioids, including medications for opioid use disorder (MOUD), due to theoretical concerns about respiratory depression and sedation. We aimed to evaluate the safety of NO for labor analgesia in patients treated with MOUD.
Study Design: We evaluated a retrospective cohort of patients prescribed MOUD who received NO for labor analgesia utilizing an established dataset of opioid exposed pregnancies at an academic urban hospital from 2016-2023. Maternal demographic characteristics, respiratory status, delivery and neonatal outcomes were evaluated with univariate analyses.
Results: 26 patients treated with buprenorphine (17) or methadone (9) were included (Table) from a total of 361 opioid exposed pregnancies (7.2%). Safety data and maternal benefit are summarized in the Figure. There was no difference in maternal mean oxygen saturation before and after initiation of NO ($p = 0.87$). There was no maternal hypoxemia (lowest oxygen saturation 95%), respiratory depression (lowest respiratory rate 16), or documentation of maternal respiratory distress or somnolence related to NO therapy. Pain scores on 10-point scale significantly improved before and after NO (mean pain pre-NO 7 SD 2.2 vs post 3.5 SD 2.8, $p < 0.005$). Three (12.5%) had documented fetal intolerance of labor, all 4 or more hours after NO, which has a five-minute half-life. Six (25%) were admitted to the neonatal intensive care unit (NICU) and 13 (56.5%) to the special care nursery (SCN), most for neonatal abstinence syndrome (15/19, 78.9%). No NICU or SCN admissions were related to NO therapy.
Conclusion: Patients on MOUD are known to require higher doses of pain medication for adequate analgesia and have limited pain control options due to medication interactions. Our data suggests that NO is a safe and effective option for labor analgesia in patients treated with MOUD and should not be withheld.

Table: Participant Characteristics

Characteristic	
Age, mean years (SD)	31.4 (6.3)
Parity	
Nulliparous, n (%)	12 (46.2%)
Multiparous, n (%)	14 (53.9%)
Gestational age at delivery, mean weeks (SD)	38.4 (2.8)
Medication for Opioid Use Disorder	
Buprenorphine, n (%)	17 (65.4%)
Methadone, n (%)	9 (34.6%)
Other Known Substance Use	
Benzodiazepine, n (%)	6 (23.1%)
Marijuana, n (%)	1 (3.8%)
Non-prescribed opioid, n (%)	2 (7.7%)
None, n (%)	20 (76.9%)
Urine toxicology testing performed on admission, n (%)	20 (76.9%)
Non-prescribed substance detected on urine toxicology, n (%)	3 (11.5%)
Time from NO administration to Delivery, mean hours (SD)	17.4 (13.3)
Epidural Anesthesia, n (%)	22 (91.7%)
Intravenous or Local Analgesia, n (%)	0 (0%)
Mode of Delivery, n (%)	
Spontaneous vaginal delivery	17 (65.4%)
Cesarean section	5 (19.2%)
Operative vaginal delivery	2 (7.7%)

Figure: Maternal and Neonatal Outcomes



298 | FGR Resolution Trends by Gestational Age at Diagnosis

Mona M. Makhamreh[1]; Sascha Wodoslawsky[2]; Madeline V. Smith[3]; Emily Ferguson[3]; Samantha Mauser[3]; Lucy Qi[3]; Rodney A. McLaren, Jr., Jr.[4]; Huda B. Al-Kouatly[4]

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10:30 AM - 12:30 PM

Objective: There is little data on the incidence of resolution for fetal growth restriction (FGR) diagnosis. Thus, the objective was to determine the incidence of FGR resolution in women diagnosed with FGR, stratified by the gestational age (GA) at diagnosis.

Study Design: This was a retrospective cohort study at a single institution that included all singleton, non-anomalous pregnancies diagnosed with FGR (defined as estimated fetal weight (EFW) < 10th percentile or abdominal circumference (AC) < 10th percentile) and followed with subsequent ultrasounds. Data were stratified by the GA at FGR diagnosis. Cases were classified as resolved if follow-up ultrasounds demonstrated EFW and AC both at, or above the 10th %. Cases were categorized as persistent if follow-up ultrasounds continued to show FGR without resolution before birth. Data was presented as percentages.

Results: Of the 4900 records reviewed, 666 had FGR. Of these, 637 (95.6%) had follow-up ultrasounds. Among these, 178 (27.9%) resolved before birth. Figure 1 demonstrates the trends of FGR resolution by GA at diagnosis. Table 1 details the course of FGR by GA. The resolution rates varied by gestational age at diagnosis. For cases diagnosed before 20 weeks' GA, the resolution rate was 53.6%, while cases diagnosed with FGR at 36 weeks GA onwards, the resolution rate was 7.4%. Of 178 FGR cases that resolved, only 2 (1.1%) had elevated UA dopplers that later resolved with FGR resolution.

Conclusion: The incidence of FGR resolution varied with the timing of diagnosis. Early diagnosis was linked to higher resolution rates, while later diagnoses were associated with lower resolution rates. These findings offer valuable insights for counseling patients about FGR and emphasize the importance of follow-up ultrasounds in monitoring fetal growth progression.

Figure 1. FGR Resolution Trends by Gestational Age at Diagnosis

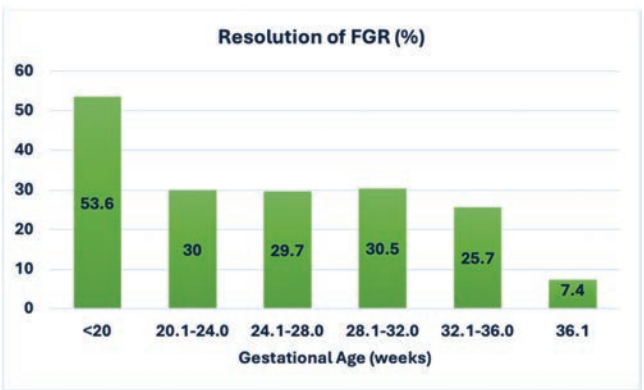

Table.1 FGR Resolution Trends by Gestational Age at Diagnosis

GA (weeks)	FGR cases	FGR that persisted	FGR that resolved	Resolution of FGR (%)
<20	69	32	37	53.6
20.1-24.0	30	21	9	30.0
24.1-28.0	64	45	19	29.7
28.1-32.0	170	118	52	30.5
32.1-36.0	210	156	54	25.7
≥36.1	94	87	7	7.4
Total	637	459	178	27.9

299 | Adverse Outcomes of the Second Twin Associated with Trial of Labor in Early Preterm Births

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10:30 AM - 12:30 PM

Objective: The Twin Birth trial demonstrated that there were no differences in neonatal outcomes between twins who had a trial of labor and those who had a planned cesarean delivery. However, twins < 32 weeks were excluded. Therefore, the objective of this study was to evaluate whether a trial of labor is associated with an increased risk of adverse outcomes of the second twin (Twin B) in preterm births < 32 weeks gestation.

Study Design: Retrospective analysis of the United States Centers for Disease Control and Prevention Natality Live Birth Database (2016-2022). All twin live births between 23 0/7-31 6/7 weeks were eligible for inclusion. Pregnancies initiating prenatal care >16 weeks' gestation, congenital anomalies, and unknown data were excluded. The primary adverse neonatal composite outcome of Twin B was compared between two groups: twin gestations who underwent a trial of labor (TOL) and those who underwent a cesarean delivery without labor (CD). A subgroup analysis of live births between 24 0/7-27 6/7 weeks' gestation was performed. Multivariable logistic regression was performed to adjust for potential confounders. Data were presented as adjusted odds ratios (aOR) with 95% confidence intervals (CI).

Results: Of the 39,769 twin live births included, 12,397 (31.2%) underwent a TOL. Baseline characteristics compared between the two groups are displayed in Table 1. TOL was associated with an increased risk of composite neonatal adverse outcome of Twin B compared to CD (45.1% vs 36.3%; aOR 1.28, 95% CI 1.22-1.35). The association remained statistically significant in twin live births between 24 0/7-27 6/7 weeks' gestation (TOL: 49.9% vs. CD: 47.7%; aOR 1.17, 95% 1.07-1.29).

Conclusion: This study suggests that TOL is associated with an increased risk of adverse neonatal outcomes for Twin B in preterm births < 32 weeks of twin gestation. Providers should consider these risks while counselling this patient population that was excluded from the Twin Birth trial. Future research evaluating outcomes associated with trial of labor in early preterm twins is needed.

Table 1. Baseline characteristics compared between the two groups.

	Trial of labor (n=12,397)	Cesarean delivery without labor (n=27,372)	*P* value
Maternal age, years	29.3 ± 5.7	29.9 ± 6.1	<0.001
Maternal body mass index, kg/m^2	28.9 ± 10.8	29.0 ± 10.6	0.4
Nulliparity	1,108 (8.9)	1,842 (6.7)	<0.001
Gestational age at birth, weeks	28.1 ± 4.1	29.3 ± 2.7	<0.001
Infertility treatment used	1,736 (14.0)	3,960 (14.5)	0.2
Presence of maternal comorbidity	2,207 (17.8)	7,492 (27.4)	<0.001
Chronic hypertension	419 (3.4)	1,402 (5.1)	<0.001
Hypertensive disorders of pregnancy	1,044 (8.4)	4,225 (15.4)	<0.001
Pregestational diabetes	173 (1.4)	456 (1.7)	<0.001
Gestational diabetes	842 (6.8)	2,482 (9.1)	<0.001
Antenatal corticosteroid exposure	5,157 (41.6)	13,431 (49.1)	<0.001
Mode of delivery			
Vaginal	8,916 (71.9)	--	--
Cesarean delivery	3,481 (28.1)	--	--
Birthweight, grams	1330.2 ± 653.3	1404.8 ± 516.3	<0.001
Neonatal male sex	6,650 (53.6%)	13,745 (50.2)	<0.001

Data are presented as number (percentage) and mean (standard deviation).

Table 2. Neonatal outcomes of twin B compared between twins undergoing trial of labor versus cesarean delivery without labor.

	Trial of labor (n=2,620)	Cesarean delivery without labor (n=7,678)	OR with 95% CI	aOR* with 95% CI
Composite adverse neonatal outcome	1,307 (49.9)	3,660 (47.7)	1.09 [1.00-1.19]	1.17 [1.07-1.29]
Assisted ventilation >6hr	970 (37.0)	3,004 (39.1)	0.91 [0.83-1.00]	0.98 [0.89-1.07]
5 min Apgar score <5	414 (15.8)	951 (12.4)	1.33 [1.17-1.50]	1.26 [1.10-1.44]
Neonatal seizures	6 (0.2)	8 (0.10)	2.20 [0.76-6.35]	--**
Neonatal mortality	238 (9.1)	313 (4.1)	2.35 [1.97-2.80]	2.09 [1.73-2.53]

*Models adjusted for maternal age, nulliparity, gestational age at birth, maternal comorbidity, birthweight, neonatal male sex, and antenatal corticosteroid exposure.
**Low event outcome, thus only univariable analysis was performed

300 | Optimizing Antenatal Corticosteroid Timing in Patients at Risk of Spontaneous Preterm Birth

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[1]Sidney Kimmel Medical College of Thomas Jefferson University, Philadelphia, PA; [2]Columbia University, New York, NY; [3]University of Utah, Salt Lake City, UT; [4]Northwestern University Feinberg School of Medicine, Chicago, IL; [5]University of California- Irvine, Irvine, CA; [6]Indiana University School of Medicine, Indianapolis, IN

10:30 AM - 12:30 PM

Objective: To develop a prediction model aimed at optimizing the timing of antenatal corticosteroid (ACS) administration in patients at risk of spontaneous preterm birth (sPTB).

Study Design: Secondary analysis of a prospective cohort study evaluating mechanisms and prediction of adverse outcomes in singleton nulliparas (nuMoM2b). All participants who received ACS during their clinical care after presenting with preterm labor or preterm prelabor rupture of membranes (PPROM) were eligible for inclusion. Cases were stratified into 3 groups based on time interval from ACS (first dose) to delivery: < 2, 2-7, and >7 days. Multiclass multivariable logistic regression was utilized to assess clinical characteristics at the time of first dose of ACS as candidate predictors for optimal ACS timing (2-7 days). The first model differentiated patients who delivered 0-7 compared to >7 days after ACS, while the second differentiated those who delivered < 2 compared to 2-7 days after ACS. A leave-one-out approach was used validate our results. Predictive performances were assessed using the area under the receiver operating curve (ROC AUC), precision, and recall scores.

Results: Of 133 participants included, 28 (21.1%) delivered 2-7 days after ACS. Clinical characteristics compared among the 3 groups are displayed in the Table. The first model (0-7 vs. >7 days) achieved an AUC of 0.85, while the second model (< 2 vs. 2-7 days) achieved an AUC of 0.72 (Figure). Top predictors were PPROM, cervical dilation and effacement at admission, maternal age, gravidity, and self-reported non-Hispanic White race and ethnicity. Prediction results across the 3 time intervals (< 2, 2-7, and >7 days) yielded precision scores of 0.68, 0.36, and 0.81, and recall scores of 0.75, 0.32, and 0.80, respectively.

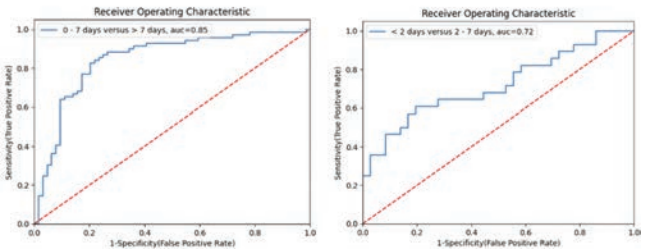
Conclusion: Among nulliparas, clinical characteristics in patients at risk of sPTB can be used to predict time to delivery after ACS with reasonable performance. Incorporating such a model into clinical practice may assist clinicians with optimizing the timing of ACS.

Table. Clinical characteristics compared among groups stratified by time interval from ACS administration to delivery

	Time interval from ACS administration to delivery			
	< 2 days (n=36)	2-7 days (n=28)	>7 days (n=69)	*P* value
Maternal age (y)	27.9 ± 6.3	27.3 ± 6.7	26.0 ± 5.6	0.7
Body mass index (kg/m²)	27.4 ± 6.3	27.6 ± 6.5	26.9 ± 7.5	0.9
Race and ethnicity				
Non-Hispanic White	27 (75)	12 (43)	29 (42)	0.1
Non-Hispanic Black	4 (11)	8 (29)	16 (23)	
Hispanic	4 (11)	6 (21)	15 (22)	
Asian	0 (0)	1 (4)	5 (7)	
Multiracial	1 (3)	1 (4)	4 (6)	
Gravidity				
1	30 (83)	20 (71)	48 (70)	0.06
2	5 (14)	4 (14)	19 (28)	
3 or more	1 (3)	4 (14)	2 (3)	
Gestational age at ACS administration (wk)	31.4 ± 3.4	30.2 ± 3.1	29.1 ± 4.9	0.12
Preterm labor	30 (83)	19 (68)	60 (87)	0.08
PPROM	33 (92)	23 (82)	16 (23)	<0.01
Cervical dilation at ACS administration	2.4 ± 2.2	1.6 ±1.5	1.0 ± 1.0	1
Cervical effacement at ACS administration				
0-25% or 3cm in length	1 (4)	6 (27)	15 (26)	<0.01
26-50% or 2cm in length	3 (11)	6 (27)	21 (36)	
51-75% or 1cm in length	4 (15)	2 (9)	12 (21)	
76-90% or 0.5cm in length	10 (37)	7 (32)	9 (16)	
91-100% or completely effaced	9 (33)	1 (5)	1 (2)	

Data are presented as mean ± standard deviation or number (percentage). Range given in parentheses for gestational age.
ACS, antenatal corticosteroids; *PPROM*, preterm prelabor rupture of membranes.

Figure. Area under the receiver operating curve for both models.



301 | Risk of Ischemic Placental Disease in Pregnant Individuals with Insomnia

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10:30 AM - 12:30 PM

Objective: While obstructive sleep apnea (OSA) is known to be associated with ischemic placental disease (IPD), we sought to ascertain the association between insomnia and IPD and to compare the magnitude of the associations between these sleep disorders and IPD.

Study Design: We performed a cross-sectional study of liveborn singleton births in California (2011-2020). Birth certificates were linked to hospital discharge records for birthing people and their infants. Insomnia and OSA were identified using ICD-9 and 10 codes. The primary outcome was IPD, defined as hypertensive disorders of pregnancy (HDP), placental abruption, and small for gestational age (SGA) birth. Secondary outcomes included components of IPD and preterm birth. The relative risks and corresponding 95% confidence intervals (CI) were reported by sleep disorders using Poisson regression models.

Results: During the study period, there were 4,145,166 singleton live births with linked hospital and neonatal records. People with sleep disorders in pregnancy were predominantly age 18-34 at delivery, Hispanic, well educated, and BMI 18.5 to < 25 kg/m^2 (Table 1). There was minimal overlap between sleep disorder groups; only 72 (0.7%) of 10,497 patients with sleep disorders had comorbid insomnia and OSA. Patients with insomnia had higher rates of tobacco smoking (13.6% vs 6.6%) and depression (29.6% vs 17.1%) compared to those with OSA. Compared to patients with no sleep disorders, the risk of IPD was 1.7 fold higher (95% CI 1.6, 1.7) for those with insomnia and 1.8 fold higher (95% CI 1.8, 1.9) for those with OSA. The risk of IPD was 2.2 fold higher for those with comorbid insomnia and OSA (95% CI 1.5, 3.2). The magnitude of risk for abruption and SGA birth was greater for insomnia versus OSA, but the magnitude of risk was comparable for the other components of IPD and preterm birth (Table 2).

Conclusion: Similar to OSA, insomnia is associated with an increased risk for IPD and its components, especially abruption and SGA birth. Further study is needed to determine if identification and treatment of insomnia may prevent adverse pregnancy outcomes.

Table 1
Maternal factors by sleep disorder during pregnancy in a cross-sectional study of singleton live births in California (2011-2020)

	No insomnia or OSA	Insomnia	OSA
	n (%)	n (%)	n (%)
Sample	4,134, 671 (99.7)	4,855 (0.1)	5,714 (0.1)
Age at delivery, years			
< 18	61,545 (1.5)	39 (0.8)	23 (0.4)
18 – 34	3,193,377 (77.2)	3,351 (69.0)	3,310 (57.9)
>34	879,634 (21.3)	1,465 (30.2)	2,381 (41.7)
Race/ethnicity			
Hispanic	2,013,601 (48.7)	1,624 (33.5)	2,180 (38.2)
Non-Hispanic			
White	1,092,356 (26.4)	2,045 (42.1)	1,673 (29.3)
Black	200,004 (4.8)	387 (8.0)	619 (10.8)
Asian	603,771 (14.6)	359 (7.4)	639 (11.2)
Other	224,939 (5.4)	440 (9.1)	603 (10.6)
Expected payer for delivery			
Private	2,002,713 (48.4)	2,911 (60.0)	3,904 (68.3)
Medi-Cal	1,863,731 (45.1)	1,748 (36.0)	1,647 (28.8)
Other	268,227 (6.5)	196 (4.0)	163 (2.9)
Mode of delivery			
Vaginal	2,828,831 (68.4)	2,964 (61.1)	2,489 (43.6)
Cesarean	1,236,372 (29.9)	1,877 (38.7)	3,219 (56.3)
Education, years			
<12	655,931 (15.9)	464 (9.6)	401 (7.0)
12	1,007,214 (24.4)	1,126 (23.2)	1,229 (21.5)
>12	2,279,758 (55.1)	3,009 (62.0)	3,675 (64.3)
Pre-pregnancy BMI (kg/m^2)			
<18.5	150,172 (3.6)	165 (3.4)	38 (0.7)
18.5 to <25	1,838,502 (44.5)	2,063 (42.5)	605 (10.6)
25 to <30	1,057,141 (25.6)	1,214 (25.0)	853 (14.9)
≥30	940,245 (22.7)	1,263 (26.0)	4,044 (70.8)
Smoked during pregnancy	116,513 (2.8)	658 (13.6)	379 (6.6)
Chronic HTN	92,352 (2.2)	383 (7.9)	1,271 (22.2)
Preexisting diabetes	50,457 (1.2)	142 (2.9)	581 (10.2)
Gestational diabetes	411,983 (10.0)	624 (12.9)	1,428 (25.0)
Depression	92,621 (2.2)	1,436 (29.6)	975 (17.1)

OSA: obstructive sleep apnea; BMI: body mass index; HTN: hypertension

Table 2
Risk of ischemic placental disease and preterm birth by sleep disorder in a cross-sectional study of singleton live births in California (2011-2020)

	No Insomnia or OSA	Insomnia		OSA	
	n (%)	n (%)	RR (95% CI)	n (%)	RR (95% CI)
No IPD	3,396,011 (82.1)	3,421 (70.5)	*Reference*	3,838 (67.2)	*Reference*
Any IPD	738,660 (17.9)	1,334 (29.5)	1.7 (1.6, 1.7)	1,876 (32.8)	1.8 (1.8, 1.9)
HDP	173,229 (4.2)	506 (10.4)	2.7 (2.4, 2.9)	1,140 (20.0)	4.7 (4.5, 5.0)
PEC with severe features	93,247 (2.3)	367 (7.6)	3.6 (3.3, 4.0)	867 (15.2)	6.9 (6.4, 7.4)
PEC without severe features	85,651 (2.1)	173 (3.6)	2.0 (1.7, 2.3)	334 (5.9)	3.3 (2.9, 3.6)
Placental abruption	40,194 (1.0)	98 (2.0)	2.4 (2.0, 2.9)	103 (1.8)	2.2 (1.8, 2.7)
SGA birth[a]	359,678 (8.7)	505 (10.4)	1.3 (1.2, 1.5)	405 (7.1)	1.0 (0.9, 1.1)
Preterm birth (<37 weeks)[b]	279,364 (6.8)	721 (14.9)	2.3 (2.1, 2.5)	880 (15.4)	2.5 (2.3, 2.6)
<28 weeks	14,639 (0.4)	47 (1.0)	3.2 (2.4, 4.2)	55 (1.0)	3.3 (2.5, 4.3)
28 0/7–31 6/7 weeks	21,380 (0.5)	93 (1.9)	4.2 (3.5, 5.2)	97 (1.7)	3.9 (3.2, 4.8)
32 0/7–33 6/7 weeks	27,063 (0.7)	98 (2.0)	3.5 (2.9, 4.3)	135 (2.4)	4.3 (3.6, 5.1)
34 0/7–<37 weeks	216,282 (5.2)	483 (10.0)	2.1 (1.9, 2.3)	593 (10.4)	2.2 (2.1, 2.4)

[a]Birth weight <10th percentile per Talge 2014.
[b]Versus term birth (37–44 weeks)
HDP: hypertensive disorders of pregnancy; IPD: ischemic placental disease; OSA: obstructive sleep apnea; PEC: preeclampsia; RR: relative risk; SGA: small for gestational age.

302 | Reducing Contamination of Midstream Voided Urine Specimens in an Obstetric Population: a Randomized Controlled Trial

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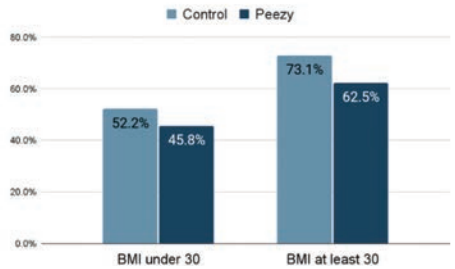
10:30 AM - 12:30 PM

Objective: Screening for asymptomatic bacteriuria in pregnancy has been part of routine prenatal care for decades, as untreated bacteriuria can lead to acute pyelonephritis and adverse pregnancy outcomes, typically complicated via the clean catch midstream urine collection method (CC). CC can be difficult to obtain and often results in contamination, making interpretation of a urine culture difficult. The Peezy urine collection device (Peezy) has shown promise in reducing contamination rates compared to CC but has not been studied in the pregnant population. This study aims to compare the rates of contamination in urine cultures collected early in prenatal care between the CC and Peezy urine collection methods.
Study Design: This randomized controlled trial at Loyola University Medical Center enrolled adult, English-speaking pregnant patients < 20-weeks gestation from August 2022 to January 2024. Exclusion criteria were urinary tract anomalies, ongoing antibiotic treatment, or recurrent urinary tract infections. Participants were randomized to either Peezy or CC for urine collection. The primary objective was to compare contamination rates of urine specimens collected using the Peezy versus CC. Logistic regression was used to compare the odds of contamination between Peezy and CC.
Results: 218 patients were included in our analysis. The contamination rate was not different between the 2 groups; 61.3% (n = 73/119) for CC and 52.5% (n = 52/99) for Peezy, (p = 0.19) There was no difference in rates of contamination between CC and Peezy, regardless of BMI status. There was no difference in ASB detection rate between CC and Peezy, p >0.05. Among our patients with contamination of their urine culture, 4% had a repeat sample.
Conclusion: Overall, the Peezy collection device did not demonstrate a significant advantage over CC in detecting ASB and reducing contamination of screening urine cultures in pregnant patients, and our study indicates that the Peezy device is more difficult to use, resulting in more sample collection failures.

Figure 3. *Frequency of urine contamination by assignment and BMI strata among randomized participants (N = 218)*



303 | Pregnancy Termination Outcomes in Singletons with Fetal Anomaly Using Mifepristone and Misoprostol Versus Misoprostol Alone

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10:30 AM - 12:30 PM

Objective: Mifepristone (MIFE) and misoprostol (MISO) in combination has been shown to be more effective for induction terminations than MISO alone in the general population, however outcome data specific to singleton pregnancies with fetal anomaly or genetic disorder is lacking. Here, we compare the effectiveness and safety of the two regimens in this subpopulation.
Study Design: We conducted a retrospective cohort study in 66 induction terminations of singleton pregnancies with fetal anomaly between 2009-2023 at a single tertiary medical center. Induction characteristics and maternal outcomes were compared between inductions using MISO and MIFE (N = 45, 68%) versus MISO alone (N = 21, 32%).
Results: There was no significant difference in incidence of infection, post-partum hemorrhage, retained products requiring dilation and curettage (D&C) and six-week readmission; or median in induction duration, estimated blood loss and antibiotic duration. When stratified by early versus late gestational age (GA) at the time of induction (defined in relation to the median of 24w0.5d), a significant reduction in induction duration was found amongst patients who received both MIFE and MISO versus MISO alone only in the earlier gestational age strata.
Conclusion: The addition of MIFE is safe and has a trend to expedite termination induction when compared to MISO alone, although we did not observe a significance in outcome measures likely due to small sample size. The significant decrease in induction duration seen in the patients who received both MIFE and MISO in the earlier GA stratum supports that MIFE may have stronger effect on reducing induction duration when used earlier in pregnancy. Single center data and rarity of cases were

main limitations. A multicenter or state database should be used to further validate findings.

Table 1. Baseline Characteristics

	MISO alone	MIFE & MISO	Total
N	21	45	66
Median Gestational Age at termination (Median, Q25%, Q75%)	22w6d (21w1.5d, 28w2d)	25w2d (22w4.5d, 28w0d)	24w0.5d (22w1d, 27w6)

Q25% = 25% quartile; Q75% = 75% quartile.
w=weeks d=days

Table 2. Termination Outcomes Comparing MIFE & MISO versus MISO alone

		p-value
Induction duration (U-value, Z-score)	369, -1.42	0.08
Induction duration, GA ≤ 24w0d (U-value, Z-score)	78, -2.04	0.02*
Induction duration, GA ≥ 24w1d (U-value, Z-score)	66, -0.68	0.25
Retained products requiring D&C (RR, 95%CI)	0.82 (0.27-2.49)	0.72
Infection (RR, 95%CI)	0.23 (0.02-2.43)	0.22
Duration of antibiotics (U-value, Z-score)	437.5, -0.47	0.32
Post Partum Hemorrhage (RR, 95%CI)	0.68 (0.12-3.77)	0.66
Estimated Blood Loss (U-value, Z-score)	437, 0.04	0.48
Six-week readmission (RR, 95%CI)	0.93 (0.09-9.73)	0.95

*p<0.05
GA = Gestational age; w=weeks; d=days; D&C = Dilation and Curettage; RR = Relative risk; 95%CI = 95% confidence interval

304 | Maternal COVID-19 is Associated with Increased Proliferation of Placental Cytotrophoblasts

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10:30 AM - 12:30 PM

Objective: Damage to the maternal-fetal interface can lead to cytotrophoblast (CTB) proliferation. Our objective was to determine how COVID-19 induced inflammation and stress affects CTB proliferation in the placental villi and membranes. **Study Design**: This study analyzed a single-nucleus RNA sequencing dataset and tissue from gestational age-matched COVID-19 (n = 4) and control (n = 4) placentas. We used the cell cycle scoring program in Seurat to quantify the proportion of trophoblasts in S phase (DNA replication phase) by trophoblast cell type in COVID-19 vs. control groups. Tissue immunostaining for Ki67 (proliferation marker) and KRT7 (trophoblast marker) was performed to validate trophoblast proliferation in the chorionic villi and membranes. To assess the consequences of trophoblast proliferation, the thickness of the membrane trophoblast layer was quantified by analyzing 5+ regions of interest per H&E slide using a novel cell-classification program to detect trophoblasts. **Results**: Analysis of RNA sequencing data revealed an increase in the proportion of trophoblasts in S phase in COVID-19 placentas compared to control placentas for villous syncytiotrophoblasts (1.56-fold change [FC]), villous CTBs (1.51 FC), membrane CTBs (1.79 FC), and membrane extravillous trophoblasts (2.48 FC). Consistent with the transcriptomics data, we observed an increased number of Ki67-positive trophoblast nuclei in the villi (mean 13 ± 5 nuclei for COVID-19 vs. 4 ± 1 for control per high power field, p = 0.0171) and membranes (mean 10 ± 2 nuclei for COVID-19 vs. 3 ± 1 for control, p = 0.0006; Fig 1). Increased proliferation was associated with a thickened membrane trophoblast layer (mean 178 ± 97.5 µm for COVID-19 vs. 123 ± 72.8 µm for control, p = 0.0127; Fig 2). **Conclusion**: COVID-19 induced damage in the placenta is correlated with proliferation of CTBs and thickening of the membrane trophoblast layer. Alterations in trophoblast proliferation suggest a compensatory response to inflammatory stress and imply further injury to the maternal-fetal interface.

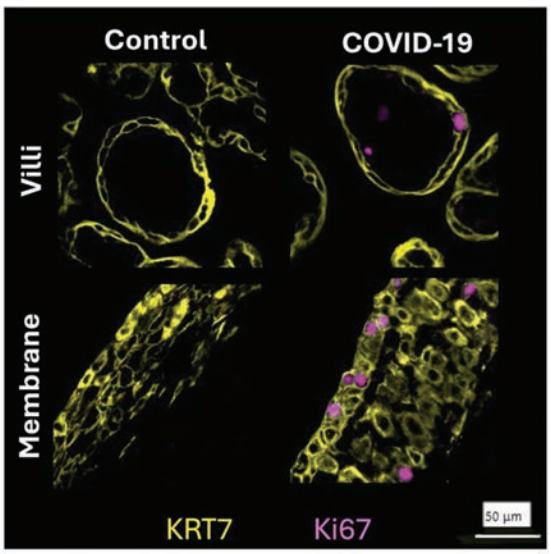

Figure 1. Increased number of Ki67-positive trophoblast nuclei seen in COVID-19 placental villi and membrane tissue compared to control tissue.

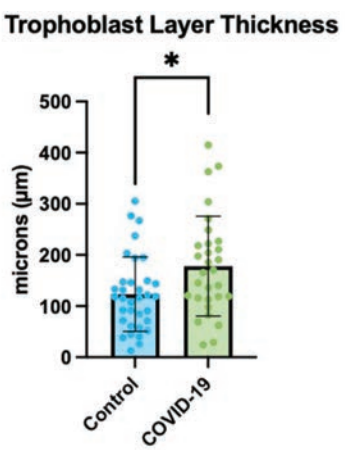

Figure 2. Quantification shows significantly increased trophoblast layer thickness in microns comparing COVID-19 (mean 178 ± 97.5 µm) to control (123 ± 72.8 µm) membranes (p=0.0127).

305 | Fetal Heart Rate Tracings and Adverse Outcomes Among Term Small- versus Appropriate for Gestational Age

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10:30 AM - 12:30 PM

Objective: The purpose of this study was to compare the characteristics of fetal heart rate tracing (FHRT), and outcomes among small- (birthweight [BW] < 10% for gestational age [GA]; SGA) versus appropriate- (BW at 10-89% for GA; AGA) who labored at term (≥ 37 weeks).

Study Design: This is a large retrospective cohort study performed within a 15-month period at a Level IV center. FHRTs of all consecutive deliveries were reviewed by physicians blinded to maternal and neonatal outcomes. The inclusion criteria for the analysis were non-anomalous singletons, who labored at term, and were SGA or AGA using Alexander et al. nomogram. In 20 minute segments, the last 60 minutes of tracing were characterized. Rates of cesarean delivery and composite neonatal adverse outcomes (CNAO) were compared. Chi-square test was used to compare groups, with p-value < 0.05 considered significant.

Results: Of 5,160 consecutive deliveries, 3,029 (58.7%) met the inclusion criteria and among them, 422 (13.9%) were SGA and 2,607 (86.1%) AGA. Baseline characteristics were similar between groups, however SGA compared to AGA were more likely to be nulliparous (52.6% vs. 41.5%, p < 0.01), self-describe as Non-Hispanic Black race (49.8% vs 35.9%, p < 0.01), and have a BMI < 30 kg/m^2 (48.3% vs 35.2%, p < 0.01). There were no differences in FHRT baseline, variability or accelerations. Compared to AGA, SGA was more likely to have prolonged decelerations (1.2% vs. 2.9%, p = 0.04), variable plus late decelerations (53.1% vs. 47.8%, p = 0.04), recurrent decelerations (38.6% vs. 30.9%, p < 0.01), and category II FHRT (76.1% vs. 68.3%, p < 0.01). AGA was more likely to exhibit category I FHRT (p < 0.01). Cesarean delivery for non-reassuring FHRT occurred similarly in the two groups (p = 0.18). CNAO occurred in 0.7% of SGA and 0.8% of AGA neonates (p = 0.90). CMAO occurred in 6.4% of SGA and 7.6% of AGA neonates (p = 0.37).

Conclusion: In our cohort, category II fetal heart rate tracing was significantly more common in small for gestational age neonates, however we were not able to link these abnormalities with adverse outcomes.

Table 1. Individual Features of Fetal Heart Rate Tracings

	SGA		AGA		
	N=422	%	N=2607	%	P value
Baseline					0.20
Normal	413	97.9	2520	96.7	
Tachycardia	9	2.1	87	3.3	
Variability					
Absent	2	0.5	5	0.2	0.26
Minimal	57	13.5	328	12.6	0.60
Moderate	347	82.2	2205	84.6	0.22
Marked	3	0.7	14	0.5	0.66
Acceleration Present	260	61.6	1661	63.7	0.41
Prolonged	2	0.5	3	0.1	0.09
Early Decelerations	14	3.3	119	4.5	0.25
Late Decelerations	69	16.4	373	14.3	0.27
Variable Decelerations	189	44.9	1043	40.0	0.06
Prolonged Decelerations	5	1.2	75	2.9	**0.04**
Combinations of Decelerations					
Variable with Late	224	53.1	1245	47.8	**0.04**
Variable with Late and Prolonged	239	56.6	1357	52.1	0.08
Decelerations > 50% of contractions	163	38.6	806	30.9	**<0.01**
ACOG FHRT Category					
I	98	23.2	795	30.5	**<0.01**
II	321	76.1	1780	68.3	**<0.01**
III	2	0.5	6	0.2	0.37

Data presented as N (%), Pearson's Chi-squared test used as appropriate.

SGA, small-for-gestational age (birthweight < 10th percentile using Alexander et al nomogram; AGA, appropriate for gestational age (birthweight at 10-89th percentile using Alexander et al nomogram).
ACOG, American College of Obstetricians and Gynecologist (using Practice Bulletin #106 and # 116); FHRT, fetal heart rate tracing.

Table 2. Neonatal Adverse Outcomes

	SGA		AGA		
	n=422	%	n=2607	%	P value
Cesarean delivery					
Arrest	30	7.1	258	9.9	0.07
Non-Reassuring FHRT	47	11.1	237	9.1	0.18
Umbilical arterial pH < 7.00[1]	2	0.9	11	0.8	0.87
Composite neonatal adverse outcome	6	1.4	36	1.4	0.95
Apgar score < 7 at 5 min	3	0.7	20	0.8	0.90
Mechanical ventilation > 6 hours	4	0.9	8	0.3	
Seizures	0	0	2	0.1	
Bronchopulmonary dysplasia	0	0	0	0	
Intraventricular hemorrhage	0	0	0	0	
Necrotizing enterocolitis	0	0	1	0	
Neonatal sepsis	0	0	7	0.3	
Brachial plexus palsy	0	0	4	0.2	
Hypoxic ischemic encephalopathy	1	0.2	3	0.1	
Neonatal death	0	0	0	0	
Composite maternal adverse outcome	27	6.4	199	7.6	0.37
Blood loss ≥ 1,000 mL	13	3.1	134	5.1	
Transfusion	16	3.8	76	2.9	
Endometritis	4	0.9	21	0.8	
Wound infection	1	0.2	7	0.3	
Thromboembolism	0	0	0	0	
Intensive care unit admission	2	0.5	9	0.3	
Death	0	0	0	0	

Data presented as N (%), Pearson's Chi-squared test used as appropriate.

SGA, small-for-gestational age (birthweight < 10th percentile using Alexander et al nomogram); AGA, appropriate for gestational age (birthweight at 10-89th percentile using Alexander et al nomogram).
[1]Obtained in 201 (47.6%) of SGA and 1227 (47.1%) of AGA.

306 | Assessing the Impact of Digital Patient Navigation Tool for Antepartum Anemia: a Hybrid Effectiveness-Implementation Trial

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10:30 AM - 12:30 PM

Objective: While intravenous iron infusions (IVFe) are safe and effective in pregnancy, < 50% of patients with severe iron

deficiency anemia (IDA) receive a dose. Here we evaluated the impact of prospectively implementing a digital patient navigation tool for IDA on clinical and patient-reported outcomes.

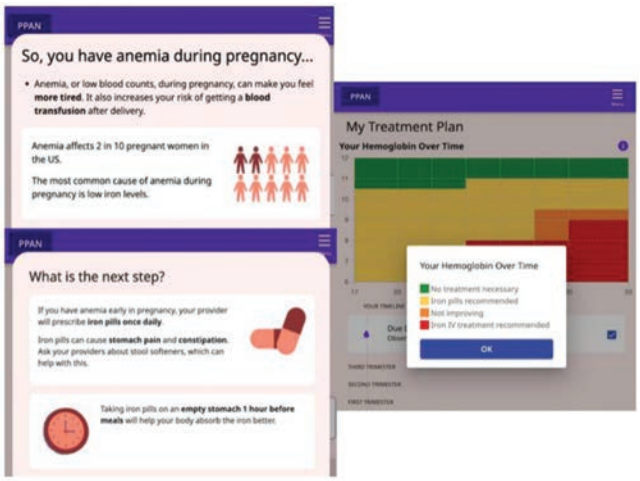
Study Design: This type 1 hybrid effectiveness implementation trial utilized difference-in-differences (DiD) design to compare the pre- and post-implementation outcomes at an intervention site to a control site. The digital navigation tool, designed using a multi-phase qualitative, patient-centered approach, included logistics, education, and treatment mapping (Figure). While all patients with antepartum IDA could use the tool starting in the 1st trimester, only patients with severe IDA (3rd trimester Hgb < 9.5g/dL) were institutionally eligible for IVFe and thus included in this analysis. The dual primary outcomes were completion of at least 1 IVFe and perceived health competence (validated 8-item survey, score 0-5). Multivariable logistic and linear regression models controlled for differences within sites over time, using interaction terms to estimate DiD. Implementation outcomes included initial use of the tool and continued tool engagement.

Results: 378 patients were included in the study. In-group differences were noted in hypertension history and insurance status over time. While completion of IVFe increased at both sites (66% to 84% of patients at the intervention site vs 78% to 83% at the control site), there was no statistical difference between these increases (DiD 0.12, p-value 0.26; Table). Perceived health competence remained similar at both sites (DiD 0.15, p-value 0.21). There were no significant differences in secondary outcomes. 66% (n = 229) of eligible patients enrolled in the tool, but, of those, only 30% (n = 71) accessed the tool more than once.

Conclusion: While implementation of a digital patient navigation tool for IDA increased IVFe completion by 18%, this result was not significant. Future work optimizing continued tool engagement may further improve clinical outcomes.

Outcomes[a]	Intervention Site		Control Site		DiD Analysis[b]
	Pre-Implementation N=94	*Post-Implementation N=69*	*Pre-Implementation N=138*	*Post-Implementation N=77*	*P value*
Primary Outcomes					
IV iron infusion completion	62 (66.0%)	58 (84.1%)	107 (77.5%)	64 (83.1%)	0.26
Perceived health competence[c]	3.3 (3.0-3.5)	3.3 (3.0-3.4)	3.3 (3.1-3.5)	3.1 (3.0-3.4)	0.21
Secondary Maternal Outcomes					
Change in hemoglobin from nadir to delivery	1.1 (0.3-1.9)	1.6 (0.6-2.4)	1.7 (0.7-2.6)	2.1 (1.1-3.0)	0.23
Postpartum blood transfusion	8 (8.5%)	3 (4.4%)	11 (8.0%)	5 (6.5%)	0.80
Number of IV iron infusions	2 (1-3)	2 (2-3)	2 (2-3)	2 (2-3)	0.87
Time to IV iron initiation (days)	15.5 (7.0-30.0)	20.0 (11.8-41.8)	14.0 (7.0-29.0)	16.0 (9.8-30.3)	0.09
Patient satisfaction[c]	32.0 (25.0-40.0)	29.5 (24.0-35.0)	30.0 (24.0-40.0)	31.0 (27.0-37.0)	0.39
Secondary Neonatal Outcomes					
Preterm delivery	14 (14.9%)	6 (8.7%)	7 (5.1%)	10 (13.0%)	0.06
Neonatal birthweight (grams)[d]	3227.5 (2787.5-3526.3)	3190.0 (2877.5-3433.8)	3215.0 (2917.5-3497.5)	3060.0 (2820.0-3495.0)	0.91

[a] Categorical variables are reported as n(%) and continuous variables are reported as median(IQR).
[b] Multivariable regressions controlled for in-group differences in each hospital (chronic hypertension and insurance status). Difference in difference (DiD) estimator (interaction term) is not shown.
[c] Perceived health competence was measured using the Perceived Health Competence Scale and patient satisfaction was measured using the Patient Satisfaction Questionnaire Short Form.
[d] Twins were accounted for with a repeated measures adjustment in multivariable regressions.



307 | B Cells in Preeclampsia: Hypertension and Endothelial Dysfunction

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10:30 AM - 12:30 PM

Objective: Pre-eclampsia (PE), new onset hypertension in pregnancy is associated with immune activation, agonistic autoantibodies to the angiotensin II type 1 receptor (AT1-AA), endothelial dysfunction and increased vasoconstrictor endothelin. The AT1-AA stimulates ET-1 and is produced 7 years postpartum. Prolonged production of AT1-AA indicates a memory immune response, specifically mature memory B cells, in the pathophysiology of PE. The objective of this study was to determine if these B cells cause hypertension and endothelial dysfunction via production of AT1-AA.

Study Design: Three hundred thousand placental CD20+ B Cells from normal pregnant (NP) or PE patients were isolated and injected i.p. into nude athymic rats on gestational day (GD) 12. Mini-osmotic pumps containing the AT1-AA inhibitor peptide, 'n7AAc', were inserted on GD14. On GD18, carotid catheters were implanted and mean arterial pressure (MAP) was measured on GD19. Renal Preproendothelin (PPET) was quantified using Real Time-PCR. AT1-AA was quantified using a cardiomyocyte bioassay. A one-way ANOVA was used for statistical analysis.

Results: Participants had similar age, BMI, and gestational age (36±1 (PE) vs 39±0 (control) weeks) at delivery. PE participants had higher mean arterial pressure (MAP) at delivery than controls ($p < 0.05$).

MAP was 104±4 mmHg ($n = 8$) in the recipient rats of NP CD20+ B cells which increased to 123±2 mmHg ($n = 8$, $p < 0.01$) in the recipients of PE B cells. This increase in MAP was lower with 'n7AAC', 114±4 mmHg ($n = 3$, $p = 0.070$), an AT1-AA inhibitor peptide. Renal PPET expression increased by 2.60±0.61 fold (ΔΔct) in PE B cell recipients ($p < 0.05$) compared to NP B cell recipients and tended to be lower in 'n7AAc' treated rats 0.85±0.35 Fold ($p = 0.19$). AT1-AA activity was elevated in the PE B cell recipients (14±2 ΔBPM) compared to NP B cell (1±1 ΔBPM,

$p < 0.01$) and 'n7AAc' treated PE B cell recipients (2±3 ΔBPM, $p < 0.05$).

Conclusion: CD20+ B cells from PE women contribute to hypertension and AT1-AA medicated endothelial activation during pregnancy, thereby supporting an important role for B cells in the pathophysiology of PE.

308 | Gestational Lipid Profile and Perinatal Morbidity: A Pilot Study

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10:30 AM - 12:30 PM

Objective: Lipid profile is a key metabolic predictor of risk related to perinatal morbidity. The study's objective was to determine if gestational maternal lipids were associated with composite perinatal morbidity.

Study Design: This was a prospective cohort study of pregnant patients at one urban hospital. We enrolled patients with singleton gestations from July 2022 to February 2024. We excluded patients with hyperlipidemia, hypercholesteremia, and pregestational diabetes. Patients provided two fasting blood samples, one in the second trimester and one in the third trimester. Lipid profile included high-density lipoprotein cholesterol (HDLc), low-density lipoprotein cholesterol (LDLc), very low-density lipoprotein cholesterol (vLDLc), total cholesterol (TC), triglycerides (TG), C-peptides, and free fatty acids (FFA). Composite perinatal morbidity included preterm birth (< 37 weeks' gestation at delivery), gestational diabetes mellitus (GDM), hypertensive disorders of pregnancy (HDP), and a Fenton birth weight percentile < 10% or > 90%. Multivariable logistic regression models estimated odds ratios (aOR) of perinatal morbidity adjusted for maternal age and gestational weight gain.

Results: We included 100 patients in our analyses, and 35 (35.0%) experienced composite perinatal morbidity. Patients with an abnormal second-trimester TG (aOR 1.5) had a higher risk of perinatal morbidity. Patients with an abnormal third-trimester TG (aOR 2.3) had a higher risk of perinatal morbidity. Patients with a greater change in C-peptides (aOR 2.7), and FFA (aOR 36.2) had higher risk of perinatal morbidity. However, patients with a greater change in LDLc (aOR 0.97) had lower risk of perinatal morbidity.

Conclusion: Our results suggest significant associations between gestational lipid levels and composite perinatal morbidity. More detailed analyses among larger prospective cohorts are needed to further investigate these associations and determine the importance of gestational lipids in peripartum risk profiles.

Clinical Characteristics of Study Sample		
	AGA	**non-AGA**
	89	**11**
	N (%)	N (%)
Gestational Age at Delivery, weeks (mean, sd)	38.1 (1.5)	
Preterm Birth	9 (10.1)	1 (9.1)
Gestational Diabetes	10 (11.2)	3 (27.3)
Gestational Hypertension	12 (13.5)	1 (9.1)
Pre-eclampsia	4 (4.5)	1 (9.1)
2nd Trimester Lipids (mmol/L)		
Gestational Age at sample collection, weeks (mean, sd)	26.5 (1.5)	
HDLc		
Normal Range (1.33 - 2.49)	70 (78.7)	11 (100.0)
Abnormal Range	10 (11.2)	0 (0.0)
Missing	9 (10.1)	0 (0.0)
LDLc		
Normal Range (1.97 - 4.36)	59 (66.3)	9 (81.8)
Abnormal Range	21 (23.6)	2 (18.2)
Missing	9 (10.1)	0 (0.0)
TC		
Normal Range (4.64 - 7.56)	68 (76.4)	8 (72.7)
Abnormal Range	17 (19.1)	3 (27.3)
Missing	4 (4.5)	0 (0.0)
TG		
Normal Range (1.14 - 3.49)	75 (84.3)	10 (90.9)
Abnormal Range	10 (11.2)	1 (9.1)
Missing	4 (4.5)	0 (0.0)
3rd Trimester Lipids (mmol/L)		
Gestational Age at sample collection, weeks (mean, sd)	37.1 (0.8)	
HDLc		
Normal Range (1.33 - 2.49)	46 (51.7)	4 (36.4)
Abnormal Range	4 (4.5)	0 (0.0)
Missing	39 (43.8)	7 (63.6)
LDLc		
Normal Range (1.97 - 4.36)	31 (34.8)	2 (18.2)
Abnormal Range	19 (21.3)	2 (18.2)
Missing	39 (43.8)	7 (63.6)
TC		
Normal Range (4.64 - 7.56)	42 (47.2)	4 (36.4)
Abnormal Range	13 (14.6)	0 (0.0)
Missing	34 (38.2)	7 (63.6)
TG		
Normal Range (1.14 - 3.49)	48 (53.9)	3 (27.3)
Abnormal Range	7 (7.9)	1 (9.1)
Missing	34 (38.2)	7 (63.6)

Logistic Regression Models of Abnormal Lipids Predicting Perinatal Morbidity*	
	Multivariable Regression**
2nd Trimester Lipids (mmol/L)	**aOR (95% CI)**
HDLc	
Abnormal Range	0.74 (0.15, 3.02)
LDLc	
Abnormal Range	0.76 (0.27, 2.05)
TC	
Abnormal Range	0.64 (0.20, 1.82)
TG	
Abnormal Range	1.54 (1.41, 5.56)
3rd Trimester Lipids (mmol/L)	
HDLc	
Abnormal Range	***
LDLc	
Abnormal Range	1.81 (0.52, 6.40)
TC	
Abnormal Range	0.20 (0.01, 1.20)
TG	
Abnormal Range	2.32 (1.38, 13.00)
Gestational Change in Lipids	
HDLc	1.03 (0.92, 1.15)
LDLc	0.97 (0.92, 0.99)
vLDLc	1.01 (0.94, 1.08)
TC	0.97 (0.93, 1.01)
TG	0.99 (0.97, 1.01)
C-peptide	2.72 (1.40, 20.02)
FFA	36.24 (2.05, 7658.16)
* perinatal morbidity was defined as presence of ≥ 1 of the following: Preterm Birth, Gestational Diabetes Mellitus, Hypertensive Disorders of Pregnancy, Large for Gestational Age, and Small for Gestational Age	
** multivariable regression models controlled for age at delivery and gestational weight gain	
*** Not enough abnormal third trimester HDLc values to calculate ORs	

309 | Enhancing Postpartum Contraception with QR code Technology in High-Risk Pregnancies

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10:30 AM - 12:30 PM

Objective: With the evolving landscape of abortion laws across the United States, the importance of postpartum contraception has increased, particularly for women experiencing high-risk pregnancies requiring antepartum hospitalization. Conversations about contraception are often overshadowed by the myriad of other discussions related to high-risk pregnancies. This is especially significant for birthing persons of color, given the historical context of systemic racism and coercion related to permanent sterilization. This quality improvement project aimed to address these issues by implementing a novel approach using technology to facilitate patient education and discussion about contraception.

Study Design: A standardized quick response (QR) code was placed in patient rooms, linking a comprehensive website detailing birth control options, safety profiles, and side effects each method. Our objective was to increase the establishment of postpartum contraception plans upon discharge.

Results: The project analyzed pregnancies admitted to our institution's antepartum unit, who delivered during the same admission, over two periods: one year before (n = 72) and one year after (n = 98) QR code implementation. Post-implementation, the proportion of patients establishing a birth control plan increased significantly (71.4% vs. 50%, p = 0.006). Postpartum tubal sterilizations rose from 11.1% to 16.3% (p = 0.379) and post-placental IUD placements from 1.4% to 4.1% (p = 0.397). More Black patients chose permanent contraception after QR education implementation (p = 0.016).

Conclusion: This quality improvement project showed significant improvements in addressing contraception methods and highlight the potential of leveraging technology to enhance patient education and empowerment, particularly in high-risk pregnancy settings. This novel proof-of-concept underscores the importance of innovative approaches to address healthcare gaps.

Table 1. Patient Demographics

	Total (N=170)	Time of admission: Pre-implementation (N=72)	Time of admission: Post-implementation (N=98)
Maternal age, Median (IQR)	31.0 (26.0, 35.0)	30.5 (26.0, 35.0)	32.0 (26.0, 35.0)
Race, n (%)			
Black	85 (50.3%)	39 (54.2%)	46 (47.4%)
White	59 (34.9%)	25 (34.7%)	34 (35.1%)
Other	25 (14.8%)	8 (11.1%)	17 (17.5%)
Missing	1	0	1
Gravida, Median (IQR)	2.0 (1.0, 4.0)	2.0 (1.0, 4.0)	2.5 (1.0, 5.0)
Parity, Median (IQR)	2.0 (1.0, 3.0)	2.0 (1.0, 2.0)	2.0 (1.0, 3.0)
Length of stays (days), Median (IQR)	8.0 (5.0, 13.0)	7.0 (5.0, 11.0)	9.0 (6.0, 15.0)
Type of insurance, n (%)			
Medicaid	97 (57.4%)	41 (56.9%)	56 (57.7%)
Private	56 (33.1%)	23 (31.9%)	33 (34.0%)
Both	14 (8.3%)	6 (8.3%)	8 (8.2%)
None	2 (1.2%)	2 (2.8%)	0 (0.0%)
Missing	1	0	1
Route of delivery, n (%)			
CD	110 (65.1%)	47 (65.3%)	63 (64.9%)
SVD	59 (34.9%)	25 (34.7%)	34 (35.1%)
Missing	1	0	1
Reason for admission, n (%)			
PreESF	55 (32.4%)	28 (38.9%)	27 (27.6%)
PPROM	36 (21.2%)	18 (25.0%)	18 (18.4%)
FGR with abnormal Dopplers	4 (2.4%)	2 (2.8%)	2 (2.0%)
PTL	14 (8.2%)	9 (12.5%)	5 (5.1%)
Vasa previa	3 (1.8%)	0 (0.0%)	3 (3.1%)
NRFHT	1 (0.6%)	1 (1.4%)	0 (0.0%)
Placenta previa	3 (1.8%)	2 (2.8%)	1 (1.0%)
DM	3 (1.8%)	1 (1.4%)	2 (2.0%)
Abruption	1 (0.6%)	1 (1.4%)	0 (0.0%)
Other	10 (5.9%)	0 (0.0%)	10 (10.2%)
Combination	40 (23.5%)	10 (13.9%)	30 (30.6%)
Preterm delivery, n (%)			
Yes	161 (94.7%)	71 (98.6%)	90 (91.8%)
No	9 (5.3%)	1 (1.4%)	8 (8.2%)

Table 2. Post-Partum Contraception Information

	Total (N=170)	Time of admission: Pre-implementation (N=72)	Time of admission: Post-implementation (N=98)	P-value
Birth control plan established, n (%)				**0.0063**[1]
Yes	106 (62.4%)	36 (50.0%)	70 (71.4%)	
No	64 (37.6%)	36 (50.0%)	28 (28.6%)	
Birth control selected, n (%)				0.1636[1]
Tubal	30 (28.3%)	12 (33.3%)	18 (25.7%)	
IUD	24 (22.6%)	10 (27.8%)	14 (20.0%)	
Oral birth control	23 (21.7%)	6 (16.7%)	17 (24.3%)	
Medroxyprogesterone acetate	16 (15.1%)	4 (11.1%)	12 (17.1%)	
Condoms	6 (5.7%)	0 (0.0%)	6 (8.6%)	
Vasectomy	5 (4.7%)	2 (5.6%)	3 (4.3%)	
Etonogestrel vaginal ring	2 (1.9%)	2 (5.6%)	0 (0.0%)	
Missing	64	36	28	
Tubal ligation at time of delivery encounter, n (%)				0.3795[1]
Yes	24 (14.1%)	8 (11.1%)	16 (16.3%)	
No	146 (85.9%)	64 (88.9%)	82 (83.7%)	
Received a post placental IUD, n (%)				0.3971[1]
Yes	5 (2.9%)	1 (1.4%)	4 (4.1%)	
No	165 (97.1%)	71 (98.6%)	94 (95.9%)	
Received post-partum Medroxyprogesterone acetate, n (%)				0.3989[1]
Yes	14 (8.2%)	4 (5.6%)	10 (10.2%)	
No	156 (91.8%)	68 (94.4%)	88 (89.8%)	
Birth control administered at post-partum visit, n (%)				0.3150[1]
Yes	62 (57.9%)	20 (51.3%)	42 (61.8%)	
No	45 (42.1%)	19 (48.7%)	26 (38.2%)	
Missing	63	33	30	

[1]Fisher Exact p-value;

310 | Buprenorphine and Methadone Metabolites in Maternal and Neonatal Milieu: Relationship to Neonatal Opioid Withdrawal Syndrome

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10:30 AM - 12:30 PM

Objective: To evaluate the relationship between maternal dose of medications for opioid use disorder (MOUD) and levels of their metabolites in maternal and neonatal cord blood as well as the association between metabolite levels and neonatal opioid withdrawal syndrome (NOWS).

Study Design: We undertook a prospective observational study of pregnant patients with opioid use disorder (OUD) seeking prenatal care at a tertiary academic medical center between 7/2022 - 6/2024. Maternal blood was collected during the antepartum period and at the delivery admission in addition to neonatal cord blood. Plasma specimen was extracted and analyzed via LCMS/MS techniques to measure levels of the parent compound (buprenorphine/methadone) and their metabolites [norbuprenorphine, buprenorphine glucuronide, norbuprenorphine glucuronide and 2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP)] in each biological pool. Multivariable regression analyses were undertaken to evaluate the relationship between maternal MOUD dose and neonatal cord levels as well as the occurrence of NOWS requiring pharmacologic treatment.

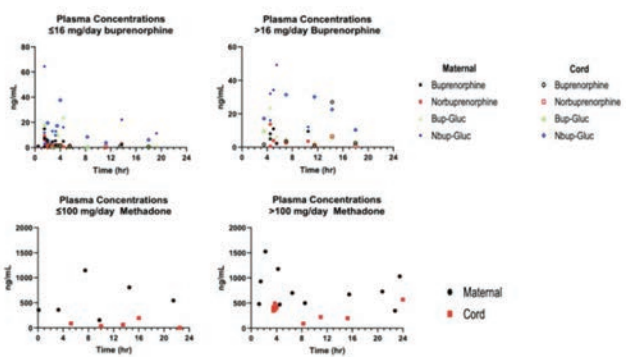
Results: Of the 66 patients recruited, paired maternal-infant dyad specimens were available from 35 patients, including 17 on methadone and 18 on buprenorphine. Overall, 8/35 (22.8%) neonates developed NOWS requiring pharmacologic treatment, including 2/17 (11.7%) in the buprenorphine vs 6/18 (33%) in the methadone group (p = .23). Regression analyses revealed that every 1mg increase in the maternal MOUD dose was associated with a 0.118 ng/ml increase (p< .05) in buprenorphine metabolite level (n = 15) and 1.3128 ng/ml increase (p< .05) of methadone metabolite level (n = 18) in neonatal cord blood. We found no significant differences in maternal or cord plasma metabolite levels among neonates with and without NOWS for any of the metabolites considered.

Conclusion: Our findings reinforce the lack of a relationship between maternal MOUD dose and occurrence of NOWS even at the metabolite level, thereby allaying concerns for impact of MOUD dose on NOWS and providing reassurance for continuation of MOUD in pregnancy.

Table 1: MAT metabolite dose concentrations (ng/mL)

Analyte	Maternal Antepartum Median (IQR)	Maternal Delivery Median (IQR)	Cord Serum Median (IQR)
	N = 17	N = 17	N = 17
Buprenorphine	0.8 (0.0 - 1.7)	2.2 (0.5 - 7.2)	0.7 (0.0 - 2.5)
Norbuprenorphine	0.8 (0.0 - 1.7)	1.8 (0.0 - 3.6)	0.5 (0.0 - 1.2)
Buprenorphine Glucuronide	0.5 (0.0 - 1.4)	1.9 (1.0 - 6.3)	1.4 (0.7 - 2.4)
Norbuprenorphine Glucuronide	9.6 (2.1 - 20.2)	13.0 (11.2 - 22.8)	14.4 (5.3 - 22.6)
	N = 16	N = 18	N = 18
Methadone	1260 (1039.4 - 1559)	686.1 (471.4 - 928.9)	200.4 (89.89 - 365.5)
EDDP	1.3 (0.0 - 13.6)	0.0 (0.0 - 2.5)	0.0 (0.0 - 0.0)

Figure 1: Buprenorphine and methadone plasma concentrations in maternal serum concentrations and cord blood



311 | Perioperative Pain Management and Opioid Prescribing: Impact of Obstetric Enhanced Recovery After Surgery Protocol Implementation

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10:30 AM - 12:30 PM

Objective: To evaluate the effectiveness of an obstetric enhanced recovery after surgery (ERAS) protocol on perioperative pain management practices and postpartum opioid prescribing among patients undergoing cesarean delivery at a tertiary academic medical center.

Study Design: We conducted a retrospective cohort study of pregnant women undergoing cesarean delivery between April 2020 to April 2022–1 year before and after implementation of an institutional obstetric ERAS protocol. Data regarding

demographic characteristics, pregnancy comorbidities (chronic hypertension, hypertensive disorders of pregnancy, pregestational/gestational diabetes, and tobacco use), as well as improvement science-based process and outcome measures related to narcotic administration, postoperative pain scores, multimodal analgesia, and opioid prescribing at hospital discharge were extracted from electronic records and compared across 2 groups - pre- and post-ERAS implementation. Student t-test, Pearson's Chi-square, Mann-Whitney U, and/or Fisher's exact test were used as indicated. Statistical significance was set at $p \leq .05$.

Results: Demographic characteristics and pregnancy comorbidities were similar across pre (n = 494) and post (n = 432) ERAS implementation groups. Patients in the post-ERAS group had significantly higher pain scores at 6 ($p < .001$) and 12 hours ($p < .001$) but significantly lower scores at 48 hours ($p = .035$) postoperatively. Postoperative acetaminophen use was higher ($p < .001$) in the post-ERAS group with no significant differences in the overall postoperative narcotic use, number of narcotic doses needed and morphine milliequivalents (MME) on postoperative day 2, across both groups. While a similar proportion of patients in each group received narcotic prescriptions at discharge, patients in the post-ERAS group were prescribed fewer number of narcotic pills ($p < .001$) and lesser MME overall ($p < .001$) at hospital discharge.

Conclusion: Implementation of an obstetric ERAS protocol has the potential to facilitate more judicious postpartum opioid prescribing at hospital discharge without compromising postoperative pain control.

Table 1: Impact of ERAS on perioperative pain management and opioid prescribing practices

Variable	Pre-ERAS Implementation N= 494	Post-ERAS Implementation N= 432	P Value
Pain score, mean ± SD			
6hr	4.4 ±3.0	5.5 ± 3.0	**<0.001***
12hr	4.5 ±3.0	5.1 ± 3.0	**<0.001***
24hr	5.3 ± 3.0	5.1 ± 2.9	0.199
48hr	4.8 ± 2.9	4.4 ± 2.8	**0.035***
Postop complications, n (%)	78 (15.8)	70 (16.2)	0.862
Preop oral acetaminophen, n (%)	24 (4.9)	340 (78.9)	**<0.001***
Postop ketorolac administration:			
≥ 3 ketorolac doses?, n (%)	425 (86)	346 (80)	**0.016***
Scheduled per protocol?, n (%)	454 (97.8)	403 (97.6)	0.792
Postop Ibuprofen administration:			
≥ 4 ibuprofen doses?, n (%)	426 (86.2)	385 (89.1)	0.184
Scheduled per protocol?, n (%)	451 (96.2)	407 (97.8)	0.148
Postop acetaminophen administration:			
≥ 6 acetaminophen doses?, n (%)	207 (41.9)	404 (93.5)	**<0.001***
Scheduled per protocol?, n (%)	223 (61.8)	420 (99.3)	**<0.001***
Postoperative narcotic administration:			
Received narcotics, n (%)	441 (89.3)	377 (87.3)	0.344
# postoperative narcotic doses, mean ± SD	3.5 ± 2.7	4.2 ± 3.3	0.103
MME POD 1, mean ± SD	26.6 ± 29.8	39.0 ± 64	**<0.001***
MME POD 2, mean ± SD	29.1 ± 30	34.3 ± 68	0.170
Narcotic prescribing at discharge:			
Narcotics prescribed at discharge, n (%)	430 (87)	391 (90.5)	0.097
# narcotic pills prescribed at discharge, mean ± SD	13.2 ± 5.5	11.9 ± 3.6	**<0.001***
MME prescribed at discharge, mean ± SD	99.03 ± 41.14	89.25 ± 27.35	**<0.001***

ERAS, enhanced recovery after surgery; MME, morphine milliequivalents; POD, postoperative day

312 | Association Between Severe Features of Hypertensive Disorders in Pregnancy on the Outcome of Subsequent Gestation

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10:30 AM - 12:30 PM

Objective: History of hypertensive disorders of pregnancy (HDP) is associated with adverse outcomes in subsequent pregnancy. The effect of the severity of the disease on subsequent pregnancy is not well described. This study aims to investigate the outcome of subsequent pregnancy after a diagnosis of HDP and to evaluate the impact of disease severity on recurrent HDP (rHDP) rate and adverse outcomes.

Study Design: This was a retrospective study conducted at a single tertiary care center between 2012 and 2024. Individuals with singleton pregnancy complicated by HDP and a documented subsequent pregnancy were included. Subsequent composite adverse pregnancy outcomes included: rHDP, preterm birth, fetal growth restriction, and placental abruption. Multivariable regression models were used to estimate odds ratio (OR) and 95% confidence interval (95% CI) for rHDP.

Results: During the study period, 1778 individuals had a history of HDP and a documented subsequent pregnancy. Of them, 1724 (97%) met inclusion criteria, 1607 (90%) without severe features (SF) vs 117 (10%) with SF (Table 1). Overall, HDP reoccurred in 36% of pregnancies, and the rate of HDP and HDP with SF was significantly higher in the previous HDP with SF compared to without SF (58% vs 35% $p < 0.01$, and 40% vs 6%, $p < 0.01$, respectively). The rate of subsequent adverse pregnancy outcomes was higher in the previous HDP with SF compared to without SF (66% vs 42%, $p < 0.01$). Nulliparity (63.6% vs 53.7%, OR 0.7, 95% CI 0.57, 0.87) and a later gestational age at HDP diagnosis (37.3 vs 36.3 weeks, OR 0.97, 95%CI 0.95, 0.99) at first pregnancy were associated with a lower rHDP rate. History of preterm birth (15.5% vs. 7.6%, OR 2.05, 95% CI 1.53, 2.76) and HDP with SF (10.8% vs 4.5%, OR 1.79, 95% CI 1.19, 2.7) were associated with a higher rate of rHDP (Table 2).

Conclusion: Four out of ten individuals with a history of HDP will have adverse outcomes in their subsequent pregnancy. History of severe disease, earlier gestational age at diagnosis and preterm birth in the first pregnancy were associated with a higher rate of rHDP.

Table 1: Characteristics and outcomes in first and subsequent pregnancy according to hypertensive disorder of pregnancy with or without severe features

Characteristics and outcomes	HDP without SF 1st pregnancy n=1607	HDP with SF 1st pregnancy n=117	pV
1st pregnancy			
Maternal age (years)	30.6±5.1	30.5±4.4	0.8
BMI (Kg/m²)	**24.6 (21.5-29.1)**	**23 (20.5-26.6)**	**<0.01**
BMI>30	**743 (14.4)**	**32 (6.5)**	**<0.01**
Nulliparity	**981 (61.1)**	**54 (46.2)**	**<0.01**
Chronic hypertension	120 (7.5)	10 (8.6)	0.7
Pregestational diabetes	37 (2.3)	2 (1.7)	0.7
Gestational diabetes	175 (10.9)	10 (8.6)	0.4
Assisted reproductive technology	243 (15.1)	14 (12)	0.4
GA at diagnosis of HDP (weeks)	**37.1(34.6-38.6)**	**35.5(31.35-38)**	**<0.01**
Gestational hypertension	1095 (68.1)	0 (0)	**NC**
Preeclampsia without SF	458 (28.5)	0 (0)	**NC**
HELLP	0 (0)	41 (35)	**NC**
Eclampsia	0 (0)	8 (6.8)	**NC**
Placental abruption	20 (1.2)	4 (3.4)	0.05
Fetal growth restriction	**149 (9.2)**	**20 (17.1)**	**<0.01**
Intrauterine fetal death	8 (0.5)	2 (1.7)	0.09
GA at delivery (weeks)	**38.6(37.3-40)**	**37.2 (35.6-39.1)**	**<0.01**
Preterm<34 (weeks)	**68 (4.2)**	**17 (14.5)**	**<0.01**
Preterm<37 (weeks)	**226 (14.1)**	**43 (36.8)**	**<0.01**
Pregnancy interval, years	2.52(1.9-3.4)	2.5(1.8-3.3)	0.71
Subsequent pregnancy			
Chronic hypertension	120 (7.4)	10 (8.5)	0.66
Pregestational diabetes	37 (2.3)	2 (1.7)	0.67
Gestational diabetes	241 (15)	16 (13.7)	0.69
Composite adverse outcome*	**668 (41.6)**	**77 (65.8)**	**<0.01**
HDP	**559 (34.8)**	**68 (58.1)**	**<0.01**
Preeclampsia without SF	340 (21.2)	18 (15.4)	0.13
Preeclampsia with SF	**98(6.1)**	**47(40.2)**	**<0.01**
Eclampsia	**1 (0.1)**	**6 (5.1)**	**<0.01**
HELLP	**18 (1.1)**	**19 (16.2)**	**<0.01**
GA at diagnosis of HDP (weeks)	36.4 (34-38.4)	36.5 (34.1-38.3)	0.82
Placental abruption	22 (1.4)	2 (1.7)	0.76
Fetal growth restriction	**85 (5.3)**	**12 (10.3)**	**0.02**
Intrauterine fetal death	22 (1.4)	2 (1.7)	0.76
GA at delivery (weeks)	**38.6(38-39.6)**	**38.2(37.2-39.2)**	**<0.01**
Preterm<34 (weeks)	29 (1.8)	5 (4.27)	0.06
Preterm<37 (weeks)	**160 (10)**	**20 (17.1)**	**0.01**

Data are presented as mean ± standard deviation, median (interquartile range) or N(%)
HDP, hypertensive disorders of pregnancy; SF, severe features; GA, gestational age; HELLP, hemolysis elevated liver enzymes low platelets
*Defined as any of the following: placental abruption, fetal growth restriction, HDP, or preterm birth.

Table 2: Regression model of first pregnancy factors associated with recurrent HDP

Characteristics at 1st pregnancy	HDP at 2nd pregnancy n=627	No HDP at 2nd pregnancy n=1097	Odds ratio (CI 95%)	pV
Maternal age > 35 (years)	118 (18.8)	195 (17.8)	0.93 (0.76, 1.29)	0.98
Nulliparity	**337 (53.8)**	**698 (63.3)**	**0.71 (0.58, 0.88)**	**<0.01**
Fetal growth restriction	67(10.7)	102(9.29)	0.78 (0.54,1.13)	0.19
GA at HDP diagnosis (weeks)	**36.3 (33.6-38.3)**	**37.3 (35.2-39.1)**	**0.97 (0.95, 0.99)**	**0.02**
Placental abruption	15 (2.4)	9 (0.8)	1.53 (0.64, 3.65)	0.33
Preterm birth < 37 (weeks)	**97 (15.5)**	**83 (7.6)**	**2.13 (1.58, 2.88)**	**<0.01**
HDP with SF	**68 (10.84)**	**49 (4.46)**	**1.79 (1.18, 2.7)**	**<0.01**

HDP, hypertensive disorders of pregnancy; SF, severe features; GA, gestational age, CI, confidence interval

313 | Intrahepatic Cholestasis of Pregnancy: Outcomes with Subsequent Pregnancy

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10:30 AM - 12:30 PM

Objective: Data regarding the counseling of pregnant people with prior intrahepatic cholestasis of pregnancy (IHCP) on subsequent pregnancy outcomes are based on a questionnaire survey (Williamson, BJOG 2004) and a subgroup analysis of 4 patients (Gonzalez, Journal of Hepatology, 1989). Our objectives were to ascertain the recurrence risk of IHCP (rIHCP), evaluate potential risk factors for rIHCP and adverse outcomes in subsequent pregnancy.

Study Design: This was a retrospective study conducted at a tertiary care center between 2012 and 2024. We included individuals with a history of IHCP and a subsequent documented pregnancy. Individuals with multiple gestation were excluded. The recurrence rate of IHCP maternal and neonatal outcomes were evaluated. Multivariable regression models were used to estimate odds ratio (OR) and 95% confidence interval (95% CI) for rIHCP.

Results: During the study period, 303 individuals had a history of IHCP and a documented subsequent pregnancy with 264 (87%) meeting eligibility criteria. Median gestational age at prior delivery of 37.4 (IQR 37, 38.4), with 67 individuals (26%) delivered preterm (< 37 weeks). Overall, IHCP reoccurred in 35% (95% CI 29-41%) of pregnancies, with 17% having preterm birth. History of in vitro fertilization (4.3% vs 14.6%, OR 0.26, 95%CI 0.08, 0.84) at first pregnancy was related to a lower recurrence rate for IHCP. Elevated liver enzymes at first pregnancy (OR 2.47, 95%CI 1.34, 4.54) and history of IHCP < 34 weeks were associated with a higher rate of rIHCP (OR 2.13, 95% CI 1.17,3.8).

Conclusion: Approximately 1 in 3 individuals with IHCP will develop IHCP in subsequent pregnancy. IHCP onset at < 34 weeks and elevated liver enzymes at first pregnancy were associated with a higher rate of recurrence. This information can be used for counseling and management of such pregnancies, for guidelines and planning trials.

Table 1: A comparison between characteristics of the first pregnancy in those who did or did not develop recurrent IHCP

Characteristics	IHCP at 2nd pregnancy (n=93)	No IHCP at 2nd pregnancy (n=171)	P
1st pregnancy			
Maternal age (years)	**28 (24.7-30.9)**	**30.55 (27.4-34.1)**	**<0.01**
≥ 35 years	**6 (6.4)**	**29 (17)**	**0.01**
< 20 years	2 (2.2)	1 (0.6)	0.25
In vitro fertilization	**4 (4.3)**	**25 (14.6)**	**0.01**
Chronic hypertension	0 (0)	1 (0.6)	0.64
Pregestational diabetes	0 (0)	4 (2.3)	0.13
Gestational diabetes	10 (10.8)	25 (14.6)	0.37
Hypertensive disorders of pregnancy	2 (2.2)	13 (7.6)	0.06
Placental abruption	1 (1.1)	0 (0)	0.35
Intrauterine fetal death	0 (0)	0 (0)	
Gestational age at diagnosis (weeks)	**35.1 (32.4-36.5)**	**35.5 (33.1-37.5)**	**0.03**
Elevated liver enzymes*	**70 (75.3)**	**100 (58.5)**	**<0.01**
Gestational age at delivery (weeks)	**37.2 (37-37.6)**	**37.8 (37.1-39)**	**<0.01**
Meconium	1 (1.1)	3 (1.8)	0.66
Preterm birth < 34 weeks	1 (1.1)	4 (2.3)	0.47
Preterm birth < 37 weeks	29 (31.2)	38 (22.2)	0.11
Male fetus (%)	54 (58.1)	80 (46.8)	0.08
Interpregnancy interval (years)	2.6 (1.8-3.4)	2.4 (1.8-3.5)	0.82
Subsequent pregnancy			
Maternal age (years)	**31.1 (27.5-34.9)**	**33.8 (29.7-36.5)**	**<0.01**
Gestational age at delivery (weeks)	**37.3 (36.4-38.1)**	**39 (37.6-40)**	**<0.01**
Preterm birth < 37 weeks	**28 (30.1)**	**16 (17.2)**	**<0.01**
Hypertensive disorder of pregnancy	4 (4.3)	11 (11.8)	0.47
Intrauterine fetal death	2 (2.2)	1 (1.1)	0.25
Meconium	0 (0)	2 (2.2)	0.29

Data are presented as mean ± standard deviation, median (interquartile range), or N (%).
*Defined as aspartate aminotransferase (AST) and/or alanine aminotransferase (ALT)> 42 U/liter

Table 2: Regression analysis of characteristics of first pregnancy associated with rIHCP in the subsequent pregnancy

Factor	Cholestasis at 2nd pregnancy n=93 (%)	No Cholestasis at 2nd pregnancy n=171 (%)	Odds ratio (CI 95%)	pV
Maternal age > 35 years	6 (6.5)	29 (17)	0.5(0.2,1.26)	0.14
In vitro fertilization	**4 (4.3)**	**25 (14.6)**	**0.26(0.08,0.84)**	**0.02**
Elevated liver enzymes*	**70 (75)**	**100 (58)**	**2.08(1.15,3.8)**	**<0.01**
GA at diagnosis < 34 weeks	**40(43.0)**	**49(28.7)**	**2.08(1.15,3.8)**	**0.01**
HDP	2 (2.2)	13 (7.6)	0.22(0.04,1.08)	0.06
Preterm birth	29 (31.2)	38 (22)	1.28(0.67,2.42)	0.44

Data are presented as mean ± standard deviation, median (interquartile range), or N (%).
GA, gestational age; HDP, hypertensive disorder of pregnancy.
*Defined as aspartate aminotransferase (AST) and/or alanine aminotransferase (ALT)> 42 U/liter

314 | Fetoscopic Laser Outcomes by Placenta Location

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10:30 AM - 12:30 PM

Objective: Among complicated monochorionic twin gestations requiring fetoscopic intervention, it is unclear whether placenta locations affect surgical outcomes and is important in patient counseling. Thus, we aim to compare procedural and pregnancy outcomes from selective fetoscopic laser procedures for complicated monochorionic twin pregnancies by placenta location.

Study Design: We conducted a retrospective analysis of all fetoscopic laser procedures completed in monochorionic twin pregnancies at a single, large fetal center from November 2017 to May 2024. Outcomes were compared by placenta location based on preoperative ultrasound: anterior and posterior. Operative, obstetric, and neonatal outcomes were abstracted from the electronic medical record. Subgroup analysis was completed for twin pregnancies complicated by twin-to-twin transfusion syndrome (TTTS). Bivariate analyses were completed.

Results: Of the 126 fetoscopic laser procedure cases completed, 40.5% had anterior placenta and 59.5% had posterior placenta. The most common indication was selective fetoscopic laser photocoagulation (SFLP) for management of TTTS (108), followed by laser dichorionization for sFGR (18) and diagnostic fetoscopy (8). The total operative time was longer in cases with anterior placenta (75 vs. 68 minutes, respectively, p = 0.04), however laser time was similar (3.42 vs. 2.83 minutes, respectively, p = 0.61). There was no difference in rates of perioperative complications or preterm prelabor rupture of membranes (Table 2). There was no difference in donor or recipient demise or neonatal survival for cases completed for either TTTS by placenta location (Table 2).

Conclusion: Anterior placenta location is associated with increased operative duration for fetoscopic procedures, yet obstetric and neonatal outcomes are similar for procedures completed for both TTTS and sFGR regardless of placenta location.

Table 1: Clinical and operative factors in fetoscopic laser procedures by placenta location

	Anterior placenta (N = 51)	Posterior placenta (N = 75)	p-value	OR (95% CI)
Indication for laser procedure				
Diagnostic	5 (10)	3 (4)	0.20	0.39 (0.89, 1.73)
TTTS	38 (75)	61 (83)	0.59	0.58 (0.23, 1.39)
sFGR	8 (16)	9 (12)	0.22	0.76 (0.27, 2.11)
Port placement location			0.10	0.48 (0.16, 1.42)
Periumbilical	21 (70)	39 (82)		
Upper quadrant	2 (7)	5 (11)		
Lower quadrant	7 (23)	3 (6)		

Data N (%).
OR= Odds Ratio; CI = Confidence Interval; TTTS = Twin-to-Twin Transfusion Syndrome; sFGR = selective Fetal Growth Restriction

Table 2: Operative, obstetric and neonatal outcomes in fetoscopic laser procedures by placenta location

	Anterior placenta (N = 51)	Posterior placenta (N = 75)	p-value	OR (95% CI)
Operative time				
Total operative time (minutes)	75 (62 ,108)	68 (59, 87)	0.04	-14.20 (-26.18, -2.22)
Laser time (minutes)	3.42 (1.7, 5.23)	2.83 (1.8, 5.42)	0.61	-0.78 (-2.18, 0.62)
Perioperative complications				
Composite complications	16 (31)	23 (32)	0.987	1.00 (0.45, 2.17)
Chorioamnion separation	14	23	0.627	1.21 (0.55, 2.67)
Abruption	1	0	-	-
Iatrogenic septostomy	1	0	0.41	-
Intra-amnion bleeding	2	0	0.06	-
Obstetrical outcomes				
PPROM				
<2 weeks post-operation	4 (16)	7 (19)	0.73	1.27 (0.32, 4.89)
<4 weeks post-operation	2 (8)	4 (11)	0.68	1.44 (0.24, 8.52)
Neonatal outcomes for TTTS				
Recipient demise	8 (20)	10 (17)	0.67	0.8 (0.29, 2.24)
Donor demise	10 (25)	16 (27)	0.85	1.1 (0.43, 2.73)
GA at delivery (weeks)	31.1 (28.7-34)	31.2 (27.2-33.75)	0.78	-0.36 (-1.87-1.14)
Live births per pregnancy				
0	4 (10)	4 (7)	0.71	0.64 (0.15, 2.73)
1	12 (30)	18 (30)	-	-
2	25 (63)	38 (63)	-	-
At least 1	37 (90)	56 (93)	0.71	1.55 (0.37, 6.62)
Neonatal survival rate	35 (85)	55 (92)	0.75	1.26 (0.32, 5.00)

Data mean (interquartile range [IQR]) or N (%).
OR= Odds Ratio; CI = Confidence Interval; PPROM = Preterm prelabor Rupture of Membranes; TTTS = Twin-to-Twin Transfusion Syndrome; GA = gestational age; FGR = Fetal Growth Restriction; LGA = Large for Gestational Age.

315 | Group B Streptococcus Colonization: Is it a Risk Factor for Autism Spectrum Disorder of Offspring?

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10:30 AM - 12:30 PM

Objective: The mechanisms driving autism spectrum disorder (ASD) development are not clear. Some obstetric conditions such as infections during pregnancy were linked to ASD, perhaps by affecting in-utero brain development. Group B *Streptococcus* (GBS) is a well-known organism which colonize the genital tract. GBS colonization during pregnancy and near delivery is associated with short-term infant morbidity, sepsis and mortality. Nevertheless, data regarding long-term pediatric effects is scarce. We aimed to study the association between GBS colonization in pregnancy and the risk of ASD development later in childhood.

Study Design: We performed a population based retrospective cohort analysis, in which ASD morbidity was compared between offspring to mothers with GBS colonization in pregnancy and offspring of mothers with negative or unknown GBS status. All singletons born between the years 2005 and 2021 at a single tertiary medical center were included in the study. Infants with known malformations, multiple gestations, and cesarean deliveries were excluded. Diagnoses were retrieved from a predefined set of ICD-9 codes, recorded in community-based clinics

and hospitalization records. Cox proportional hazards model was used to adjust for confounders to assess association between GBS colonization and the risk of ASD.

Results: The study population included 146103 singletons. Of them, positive GBS was recorded in 2225 (1.5%) women. Long-term autism rates were comparable between both groups (0.4% vs. 0.5%, OR 0.99, 95% CI 0.53-1.87, p = 0.995; Table). The cumulative incidence of long-term autism morbidity was higher in the group of positive GBS status (Figure, Log-rank p = 0.03). However, using a Cox proportional hazards model, controlling for maternal age, offspring gender and ethnicity, no association was noted between GBS colonization and ASD of offspring (Table, Adjusted HR = 1.51, 95% CI 0.78-2.93, p = 0.218).

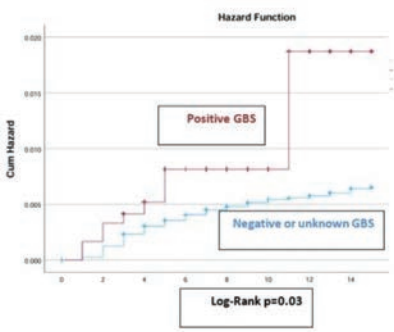
Conclusion: GBS colonization in pregnancy is not independently associated with an increased risk for long-term autism of the offspring.

Table – ASD morbidity in the offspring in positive GBS and negative or unknown GBS groups

	Positive GBS %(2225)	No GBS %(143878)	Crude OR (95% CI)	Adjusted HR* (95% CI)
Autism morbidity	0.4%(10)	0.5%(648)	0.99(0.53-1.87)	1.51 (0.78-2.93)

*Using a Cox proportional hazards model, controlling for maternal age, offspring gender and ethnicity

Figure- A Kaplan-Meier cumulative hazard function of autism morbidity in positive GBS and negative or unknown GBS groups



316 | Balloon Induction in Women with Previous Cesarean Delivery: Maternal and Neonatal Outcomes

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10:30 AM - 12:30 PM

Objective: Patients planning a trial of labor after a previous cesarean (TOLAC) occasionally need to deliver before onset of labor due to maternal or fetal conditions and may require induction. There are concerns that induction might reduce chances of vaginal delivery and may increase the risk of uterine rupture.The ideal method for induction in this population have not been well-established and evidence is inconclusive. Balloon induction gained popularity due to minimal side effects. However, the adverse effects of balloon induction in women with previous CD remains unclear. We aim to study the influence of balloon induction on maternal and neonatal adverse effects in women with previous CD

Study Design: A population-based retrospective cohort study was conducted, including all term (≥37 weeks of gestation) singleton pregnancies that underwent balloon induction between February 2020 and January 2022, who had one previous CD at a tertiary medical center. Women who underwent non-mechanical induction, as well as those with no trial of labor, were excluded. Maternal, neonatal and obstetrical complications were compared based on balloon induction of labor exposure. Logistic regression models were used to adjust for confounders.

Results: The study population included 2352 deliveries. Of these, 285 (12.1%) underwent balloon induction of labor, while 2067 (87.9%) did not. Maternal and neonatal complications in both groups are shown in Table 1. The rate of vacuum delivery was significantly higher in the induction group (7.0% vs. 4.1%, p = 0.022). All other complications, including emergent CD, low Apgar scores, low cord Ph, and neonatal intensive care unit (NICU) admission were comparable between both groups. Logistic regression, controlling for maternal age, parity, ethnicity, epidural analgesia, and gestational age, showed that the association between balloon induction and vacuum delivery is not independently significant (Table 2: adjusted OR 1.32, 95% CI 0.78-2.25, p = 0.298).

Conclusion: Balloon induction of labor at term in women with previous one CD is not associated with obstetrical and neonatal complications.

Table 1:

Maternal and neonatal outcomes of women with prior cesarean delivery with and without balloon induction of labor

Characteristics	With balloon induction of labor n=285 (%)	Without balloon induction of labor n=2,067 (%)	p
Vacuum delivery	20 (7.0)	84 (4.1)	0.022
Emergent CD	75 (26.3)	466 (22.5)	0.149
Arrest of dilatation	7 (9.3)	26 (5.6)	0.199
Arrest of descent	53 (11.4)	4 (5.3)	0.114
CD due to NRFHR	28 (9.8)	141 (6.8)	0.064
1-minute APGAR score ≤7	24 (8.4)	149 (7.3)	0.482
5-minute APGAR score ≤7	4 (1.4)	40 (1.9)	0.526
PH below 7.1	7 (2.6)	53 (2.7)	0.914
NICU admission	3 (1.1)	24 (1.2)	1.000

P P-value, CD cesarean delivery, NRFHR non-reassuring fetal heart rate, NICU neonatal intensive care unit

Table 2:

Results of a multivariable logistic regression analyses for CD due to arrest of descent

Characteristics	Adjusted OR (95% CI)	P
Epidural analgesia	2.19 (1.08-4.42)	0.029
Gestational age	1.37 (0.94-2.00)	0.107
Primiparous	3.19 (1.2-8.48)	0.020
Previous CD	0.98 (0.25-3.83)	0.971
Maternal age	0.26 (0.07-0.99)	0.049
Ethnicity	0.93 (0.54-1.60)	0.782

OR odds ratio, CI confidence interval, P P-value, CD cesarean delivery

317 | Failure Rate of First Trimester Medical Termination of Pregnancy, After Bariatric Surgery–Retrospective Study

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10:30 AM - 12:30 PM

Objective: First trimester termination of pregnancy (TOP) is a common event. Approximately 50% of TOP are medical. Bariatric surgery (BS) is divided into restrictive procedures (adjustable gastric banding or sleeve gastrectomy) and malabsorptive procedures (mini gastric bypass or roux-en-Y gastric bypass). The objective of this study was to compare failure rate of first trimester medical TOP, among women who underwent BS prior to TOP, with women without previous BS.

Study Design: This Retrospective study, conducted on data collected between January 2019 and April 2024, in a single hospital in Israel. Our protocol enables TOP up to 9 weeks of gestation and utilizes oral mifepristone 200 mg followed by buccal misoprostol 800 mg, 48 hours apart. The study cohort consisted of consecutive women who underwent any BS undergoing medical TOP. The control group, matched for gestational age, had no history of BS, were collected in a 1:4 ratio. Exclusion criteria included malabsorption disorder. The primary outcome was failure rate measured by any medical or surgical intervention further needed to achieve complete TOP.

Results: We identified 405 women, 81 of them underwent BS prior to TOP. Restrictive BS was performed in 43 (53.1%) women and malabsorptive BS was performed in 38 (46.9%) women. Failure rate was comparable between the study and the control group (15 (18.5%) vs. 37 (11.4%), p = 0.09). Odds ratio, adjusted for smoking status, number of previous spontaneous abortions, number of previous TOP and previous cesarean section, for failure in women post BS was 1.95, CI 0.99-3.84. Failure rate was comparable between restrictive and malabsorptive BS (9 (23.7%) vs. 6 (14.0%), p = 0.26). Odds ratio, adjusted for less than 2 years elapsing from BS, for failure in women post restrictive BS relative to malabsorptive BS was 3.6 CI 0.81-16.25.

Conclusion: Overall failure rate of medical TOP in women who underwent BS is similar to women who had no history of BS. Failure rate was comparable for both surgical approaches.

318 | Adverse Childhood Experiences are Associated with Higher Opioid use and Pain After Cesarean Delivery

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10:30 AM - 12:30 PM

Objective: Adverse childhood experiences (ACEs) have been linked with increased post-operative pain and opioid use, yet they have been understudied in the postpartum period. We evaluated whether ACEs were associated with opioid use and pain after cesarean delivery (CD).

Study Design: This was a prospective cohort study of pregnant people who delivered a singleton liveborn infant via CD with neuraxial anesthesia in 2023-2024. We included those aged 18-55 years, literate in English or Spanish, and with no second stage of labor. The exposure was a history of any ACEs, derived from a validated questionnaire administered 24-48 hours (h) post-CD. The primary outcome was opioid use 0-48h post-CD in milligram morphine equivalents (MME). Pain was measured from average numerical rating pain scores (every 4h over 72h) and a validated questionnaire (Short-Form Brief Pain Inventory, SF-BPI) 24-48h post cesarean. Multivariable multinomial regression models were used, adjusting for confounders. Sample size was determined using an effect size of 20%.

Results: Among 134 participants, 55 (41%) had ACEs and 79 (59%) did not. Despite similar postpartum lengths of stay, median total MMEs during the postpartum admission was 23 (Q1-Q3 13-62) in people with ACEs and 11 (Q1-Q3 0-44, $p = 0.01$) in those without ACEs. In the first 48h, compared with the 1st (lowest) quartile of MME use, people with ACEs were more likely to use amounts in the 2nd [adjusted odds ratio (aOR) 7.97; CI 2.43-26.2], 3rd (aOR 4.41; CI 1.26-15.5), and 4th (highest) MME quartiles (aOR 3.60; CI 1.09-11.8) than people without ACEs (Table 1). Pain scores also differed; those with ACEs rated their average pain as 3/10 compared with 2/10 in those without ACEs (p = 0.02, Table 1, Figure 1).

Conclusion: Postpartum people with ACEs used more opioids and experienced more pain after CD compared to people without ACEs. These results highlight the importance of integrating trauma-informed care into peri-operative protocols, which could improve pain management and reduce opioid reliance after CD for people with a history of ACEs.

Figure 1: Distribution of opioid use (A) and average pain score (B) after cesarean among postpartum people with and without adverse childhood experiences (ACEs), N=134

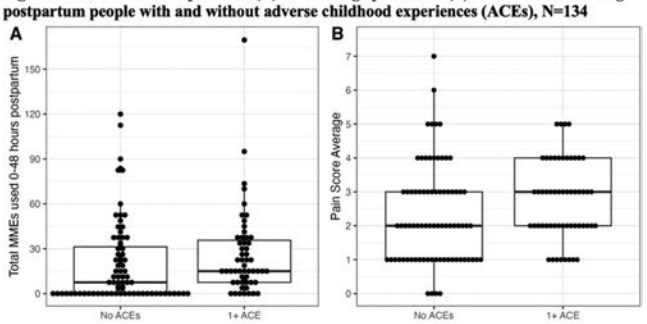

Table 1: MME Use by Quartile in the First 0-48 Post-Operative Hours by ACEs Group

	No ACEs[b] N=79	1+ ACEs N=55	1+ ACEs aOR[b] (95% CI)	p-value[c]
	N (%)	N (%)		
Opioid Use (Primary Outcome)				
Quartile of MME[a] use 0-48 hours postpartum				
1st (0 MME)	31 (39%)	7 (13%)	Ref	Ref
2nd (3-15 MME)	17 (22%)	22 (40%)	7.97 (2.43, 26.2)	<0.001
3rd (18.8-33.8 MME)	13 (16%)	12 (22%)	4.41 (1.26, 15.5)	0.021
4th (37.5-169.5 MME)	18 (23%)	14 (25%)	3.60 (1.09, 11.8)	0.035
Pain (Secondary Outcomes)[d]				
Overall Pain Score Average	2.00 (1.00, 3.00)	3.00 (2.00, 4.00)	-	0.023
Day 1 Pain Score Average	2.00 (1.00, 3.00)	2.00 (1.00, 3.00)	-	0.132
Day 2 Pain Score Average	3.00 (2.00, 4.50)	4.00 (2.75, 5.00)	-	0.120
Day 3 Pain Score Average	3.00 (2.00, 4.00)	3.00 (2.00, 4.75)	-	0.065
Worst Pain, past week (SF-BPI)	6.00 (4.00, 8.00)	7.00 (5.00, 8.50)	-	0.050
Current Pain (SF-BPI)	4.00 (2.50, 6.00)	5.00 (3.00, 7.00)	-	0.148
Length of stay (days)	3.13 (2.91, 3.90)	3.15 (2.91, 3.89)	-	0.602

[a] Opioid milligram morphine equivalent (MME).
[b] Adverse childhood experiences (ACEs), defined using a validated questionnaire.
[c] For the primary outcome (quartile of MME use 0-48 hours postpartum), results obtained from multivariable multinomial regression model adjusting for age, parity, whether labor preceded the cesarean, BMI, insurance type, education level, and primary spoken language as demographic, clinical, and socioeconomic confounders. Presented as adjusted odds ratios (aOR) with 95% confidence intervals (CI) and p-values.
[d] Secondary outcomes compared using Wilcoxon rank sum tests. Reported as median (Q1, Q3). Pain score=numerical pain score 0-10.

319 | Mild Fundal Pressure versus Vacuum Extraction to Shorten the Second Stage of Labor

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10:30 AM - 12:30 PM

Objective: To compare the efficacy and safety of mild fundal pressure (FP) versus vacuum extraction (VE) for shortening the 2nd stage of labor and the impact on maternal and neonatal outcomes.

Study Design: Retrospective cohort study in a university affiliated medical center with approximately 12,500 annual deliveries (2022-2024). Women with singleton pregnancies requiring shortening of the 2nd stage for medical reasons (non-reassuring fetal heart rate or prolonged 2nd stage) were divided into 2 groups: those who received FP and those who underwent VE. Deliveries involving both VE and FP were excluded. Decisions were made based on physician's preference.

Mild FP is performed at our hospital by trained obstetricians only after patient consent. The primary outcome was the duration of the 2nd stage of labor. Secondary outcomes included maternal and neonatal complications: 3rd–4th degree tears, postpartum hemorrhage, Apgar score, umbilical arterial cord pH < 7.1, and hospitalization duration.

Results:

1. During the study, 15,088 delivered vaginally, 1365 (9%) had FP and 624 (4.1%) underwent VE.
2. The 2nd stage of labor was shorter in the FP group (P< 0.001).
3. The rate of 3rd–4th degree tears was higher In the VE group (P = 0.005).
4. Hemoglobin decline and maternal hospitalization duration were lower in the FP group (P< 0.001).
5. Neonatal outcomes showed no significant differences in Apgar scores. However, the FP group had a lower incidence of umbilical arterial cord pH < 7.1 and shorter neonatal hospitalization (P< 0.001).
6. Multivariate analysis showed significant increased risk in the VE group for 2nd stage duration (aOR 1.3), 3rd–4th degree tears (aOR 4.4), Hemoglobin decline (aOR 1.4), maternal hospitalization (aOR 1.0), and umbilical artery cord pH < 7.1 (aOR 3.5).

Conclusion: Mild FP compared with VE may be associated with better maternal and neonatal outcomes, including a shorter 2nd stage of labor, fewer 3rd–4th degree tears, less hemoglobin decline, better umbilical cord pH, and shorter hospitalization for both mother and neonate. It is a safe and effective method when performed by a trained physician.

Table 1: Demographic characteristics

	Mild fundal pressure (n=1365)	Vacuum extraction (n=624)	p-value
Maternal characteristics			
Age (years)	31.55 ± 4.66	32.18 ± 4.32	0.004
Nulliparity, n (%)	978 (71.6%)	469 (75.2%)	0.101
Pre pregnancy BMI	21.94 ± 6.98	22.54 ± 4.74	0.056
BMI > 30, n (%)	51 (3.7%)	42 (6.7%)	0.004
Smoking, n (%)	27 (2%)	8 (1.3%)	0.358
Diabetes mellitus\ GDM, n (%)	139 (10.2%)	57 (9.1%)	0.517
Delivery outcomes			
Gestational age at delivery (weeks)	39.56 ± 1.31	39.74 ± 1.21	.004
Induction of labor, n (%)	381 (27.9%)	193 (30.9%)	0.182
Epidural, n (%)	1179 (86.9%)	572 (91.8%)	<0.001
Second stage duration (hours)	1.51 ± 1.05	1.87 ± 1.15	<0.001
Maternal outcomes			
3rd–4th degree tears, n (%)	4 (0.3%)	9 (1.4%)	0.005
Shoulder dystocia, n (%)	7 (0.5%)	3 (0.5%)	1.000
Postpartum hemorrhage, n (%)	61 (4.5%)	38 (6.1%)	0.148
Delta Hemoglobin decline ≥3 g/dl, n (%)	113 (8.3%)	89 (14.3%)	<0.001
Duration of hospitalization (days)	3.18 ± 1.51	3.59 ± 1.76	<0.001
Neonatal outcomes			
Birth weight (gram)	3253.74 ± 422.35	3236.42 ± 411.98	0.392
Meconium, n (%)	280 (20.5%)	153 (24.5%)	0.047
Apgar 5 min<7, n (%)	2 (0.1%)	2 (0.3%)	0.594
Umbilical artery Cord PH<7.1, n (%)	23 (1.7%)	32 (5.1%)	<0.001
Duration of hospitalization (days)	2.46 ± 2.13	2.83 ± 2.44	<0.001

Table 2: Multivariate Logistic Regression Analysis of Factors Associated with Maternal and Neonatal Outcomes			
	aOR	95% CI	P-value
Age	1.03	1.015 – 1.061	<0.001
BMI>30	1.8	1.16 – 2.79	0.008
Meconium	1.2	0.94 – 1.53	0.135
Gestational age	1.16	1.06 – 1.25	<0.001
Epidural	1.13	0.78 – 1.62	0.503
3rd–4th degree tears	4.44	1.31-15.04	0.017
Delta Hemoglobin >3g/dl	1.43	1.04-1.96	0.024
Cord PH<7.1	3.55	2.02 – 6.32	<0.001
Duration of hospitalization (Mother)	1.08	1.009 – 1.16	0.028
Duration of hospitalization (Neonate)	1.05	0.99 – 1.07	0.057
Second stage duration (hours)	1.31	1.19 – 1.45	<0.001

320 | Postpartum Hypertension Screening at Newborn Visits and Impact on Postpartum Outcomes

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10:30 AM - 12:30 PM

Objective: To assess how a novel maternal postpartum hypertension (HTN) screening program at newborn visits partnered with a remote blood pressure (BP) management program would impact maternal care utilization and outcomes.

Study Design: This is a prospective quality improvement initiative with previously described feasibility at a large academic primary care center that serves a majority non-White (68%) and publicly insured (77%) population. Maternal vital sign screening was performed by pediatric clinic staff. Elevated BP (≥ 140/90 mmHg) triggered algorithms that involved contacting an on-call Maternal-Fetal Medicine or Cardiology physician and/or enrollment into a remote BP management program. Controls were postpartum individuals with newborns receiving care at the same clinic on days when screening was not offered. Postpartum outcomes and care utilization data were compared between the two groups.

Results: Of 140 screened individuals and 248 controls, the screened group was more likely to be diagnosed with new postpartum HTN (16.0% vs. 8.2%; p = 0.049). The screened group was more likely to be initiated on anti-hypertensive medication postpartum (31.0% vs. 26.0%; p = 0.56) and had lower rates of Emergency Department (ED) visits (17.9% vs. 25.0%; p = 0.11) and readmissions (5.7% vs. 8.5%; p = 0.32) compared with controls, though not statistically significant. Postpartum visit rates were similar between groups (65.7% vs. 65.7%; p = 1.0).

Conclusion: Maternal HTN screening in a newborn clinic partnered with a remote BP management program was associated with higher diagnostic rates of postpartum HTN with subsequent treatment, without concomitant increases in ED visits or readmissions among a racially and socioeconomically diverse population. Screening for postpartum HTN during newborn visits may improve diagnosis and treatment of postpartum HTN in an at-risk population, however, more targeted interventions are likely needed to increase attendance at postpartum visits.

Table 1. Rates of Hypertension and Postpartum Care Utilization in Control v. Screened Group

	CONTROL GROUP N= 248	SCREENED GROUP N=140	P-VALUE
HTN DIAGNOSIS BY DISCHARGE OF DELIVERY, N (%)	65 (26.2%)	46 (32.9%)	0.16
ON ANTI-HYPERTENSIVE MEDICATIONS PRIOR TO DISCHARGE, N (%)	18 (28%)	9 (20%)	0.33
RATES OF POSTPARTUM HTN DIAGNOSIS, N (%)	15 (8.2%)	15 (16.0%)	**0.049**
RATES OF POSTPARTUM ANTI-HYPERTENSIVE INITATION, N (%)	16 (26%)	16 (31%)	0.56
POSTPARTUM VISIT ATTENDANCE, N (%)	163 (65.7%)	92 (65.7%)	1.00
EMERGENCY DEPARTMENT VISITS, N (%)	62 (25.0%)	25 (17.9%)	0.11
READMISSIONS RATES, N (%)	21 (8.5%)	8 (5.7%)	0.32
REMOTE BP MONITORING ENROLLMENT WITH HTN DIAGNOSIS, N (%)	51 (64%)	40 (66%)	0.82
REMOTE BP MONITORING PARTICIPATION, N (%)	44 (86%)	34 (85%)	0.86

*HTN= hypertension, BP= blood pressure

321 | Amniocentesis Prior to Mid-Trimester Cerclage: Practice Patterns and Obstetric Outcomes

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10:30 AM - 12:30 PM

Objective: Intraamniotic infection (IAI) is a contraindication to cerclage placement. However, the benefit of amniocentesis to diagnose subclinical IAI must be weighed against the risks of the procedure and the limited accuracy of rapid amniotic fluid test results. We aimed to determine perinatal outcomes associated with amniocentesis compared to no amniocentesis before mid-trimester cerclage.

Study Design: This is a secondary analysis of the international collaborative for cerclage longitudinal evaluation and research (IC-CLEAR), a study that included singleton pregnancies without major anomaly and with mid-trimester cerclage placed at eight

different institutions in the United States and Colombia from June 1st, 2016 to June 1st, 2020. Inclusion criteria were ultrasound- or exam-indicated cervical cerclage at gestational age (GA) >16 weeks. The comparison group consisted of those who did not undergo amniocentesis. The primary outcome was latency to delivery following cerclage. Cerclage indication, maternal baseline characteristics, and maternal/neonatal outcomes were compared between groups in a multivariable analysis.

Results: In this study, a total of 468 participants who had a cerclage placed during pregnancy met inclusion criteria: 119 had an amniocentesis and no evidence of IAI before cerclage placement. Those who underwent amniocentesis had a mean latency to delivery of 12.5 weeks compared to 13.7 weeks without amniocentesis (p = 0.087). In a multivariable regression analysis, amniocentesis was not an independent contributor to decreased latency to delivery after accounting for cerclage indication, GA at cerclage placement, and cervical length at cerclage placement. The rate of premature rupture of membranes < 34 weeks was not significantly different between the two groups (21.2.% vs 21.0%, p = 0.853).

Conclusion: In this analysis, we did not find that amniocentesis before cerclage impacted latency to delivery compared to patients who do not undergo amniocentesis. These findings can be used to guide clinical counseling regarding amniocentesis before cerclage placement.

Table 1 Demographics and patient characteristics

	Combined Sample (n = 468)	Amniocentesis (n = 119)	No Amniocentesis (n = 349)	p-value*
Age	30.5 ± 5.9	29.3 ± 5.8	30.9 ± 5.8	0.009
Race				<0.001
Black	153 (32.7)	28 (23.5)	125 (35.8)	
Caucasian	102 (21.8)	19 (16.0)	83 (23.8)	
Asian	19 (4.1)	4 (3.4)	15 (4.3)	
Latino	176 (37.6)	65 (54.6)	111 (31.8)	
Other	8 (1.7)	0 (0.0)	8 (2.3)	
Unknown	10 (2.1)	3 (2.5)	7 (2.0)	
BMI	29.7 ± 6.4	30.3 ± 6.1	29.6 ± 6.5	0.310
Gravidity				0.024
1	77 (16.5)	27 (22.7)	50 (14.3)	
2	132 (28.2)	38 (31.9)	94 (26.9)	
3+	259 (55.3)	54 (45.4)	205 (58.7)	
Parity				0.055
0	174 (37.2)	55 (46.2)	119 (34.1)	
1	159 (34.0)	40 (33.6)	119 (34.1)	
2	79 (16.9)	15 (12.6)	64 (18.3)	
3+	55 (11.8)	9 (7.6)	46 (13.2)	
Study Site				<0.001
St. Luke's	55 (11.8)	11 (9.2)	44 (12.6)	
Thomas Jefferson	141 (30.1)	27 (22.7)	114 (32.7)	
OHSU	25 (5.3)	11 (9.2)	14 (4.0)	
Cedars Sinai	28 (6.0)	0 (0.0)	28 (8.0)	
Universidad Pontificia Bolivariana	16 (3.4)	8 (6.7)	8 (2.3)	
Clinica de Prado	82 (17.5)	38 (31.9)	44 (12.6)	
Lehigh Valley	68 (14.5)	19 (16.0)	49 (14.0)	
Atrium Health	53 (11.3)	5 (4.2)	48 (13.8)	
Indication for Cerclage				0.077
Ultrasound	341 (72.9)	78 (65.5)	263 (75.4)	
Exam	124 (26.5)	40 (33.6)	84 (24.1)	
GA at Cerclage (weeks)	21.0 ± 2.3	21.3 ± 2.6	20.9 ± 2.2	0.093
Cervical Length pre-Cerclage (mm)	12.8 ± 9.1	9.2 ± 9.8	14.0 ± 8.5	<0.001

*p-values from two sample t-test for continuous variables and Chi-square or Fisher's exact test (if any cell count <5) for categorical variables

Table 2 Outcomes related to amniocentesis prior to mid-trimester cerclage

	Combined Sample (n = 468)	Amniocentesis (n = 119)	No Amniocentesis (n = 349)	p-value*
Time to Delivery (weeks)	13.4 ± 6.0	12.5 ± 6.3	13.7 ± 5.9	0.087
GA at Delivery (weeks)	34.4 ± 5.7	33.8 ± 5.9	34.6 ± 5.7	0.266
Preterm Delivery				
<37 weeks	206 (44.1)	59 (49.6)	147 (42.1)	0.353
<34 weeks	139 (29.7)	40 (33.6)	99 (28.4)	0.501
Premature Rupture of Membranes <34 weeks	99 (21.2)	25 (21.0)	74 (21.2)	0.853

*p-values from two sample t-test for continuous variables and Chi-square test for categorical variables

322 | Evaluating Acceptability of Health Equity Interventions: Providing an Optimized and emPowered Pregnancy for You(POPPY) Pilot

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10:30 AM - 12:30 PM

Objective: Successful interventions for perinatal disparities are sparse. Our objective was to conduct a pilot randomized controlled trial(RCT) to determine the feasibility of randomizing participants in a health equity intervention trial and whether participants were accepting of the interventions.

Study Design: Single-center, parallel 2x2 RCT including participants of Non-Hispanic Black race/ethnicity, between 16-49 years, 8^0-22^6 weeks gestational age(GA), and residing in resource poor communities defined as Area Deprivation Index(ADI) 60-100. Participants were individually randomized to 1 of 4 arms: usual care(UC), UC+digital health intervention(DHI), UC+community health worker(CHW), or UC+DHI+CHW; providers were blinded. The primary outcome for this pilot was acceptability of the intervention defined as participant's affirmative response to: "I would recommend the care I received to someone in a similar situation". Secondary outcomes included participant's intervention satisfaction (1-10 scale, 10 highest satisfaction), number of prenatal care (PNC) visits and clinical outcomes.

Results: Forty participants were randomized from July-October 2023: 10 UC and UC+CHW, 9 UC+DHI, 11 UC+CHW+DHI. All participant data were analyzed. Median age, GA at enrollment and ADI were 29 years, 14 weeks, and 90; 78% were parous, 18% married, 60% ≤high school diploma, and 80% publicly insured. Of those randomized to UC, UC+DHI, UC+CHW, and UC+CHW+DHI, 70%, 89%, 80% and 91% recommended the care they received, respectively. Participants randomized to CHW who completed the satisfaction score were extremely satisfied(100% 10/10; n = 18); DHI participants were also highly satisfied (median satisfaction score 8, IQR 7—10, n = 18). Participants attended a median 11 PNC visits and delivered at a median GA of 37 weeks, but 5 (13%) experienced pregnancy loss and 25% were admitted to the neonatal intensive care unit(Table).

Conclusion: Participants randomized in a pilot health equity intervention trial reported high rates of satisfaction with DHI and CHW interventions, lending support for a large RCT powered for key clinical outcomes.

Table. POPPY Pilot Trial: Acceptability, Satisfaction and Clinical Outcomes					
	Overall	UC n=10	UC+DHI n=9	UC+CHW n=10	UC+CHW+DHI n=11
Acceptability and Satisfaction Outcomes					
Outcome	**n (%) or Median (Q1-Q3)**	**n (%) or Median**			
Community Health Worker (CHW)					
Recommend CHW to others§	18/21 (86%)			8 (80%)	10 (91%)
CHW Intervention Rating§,*	10 (10 - 10)			10	10
Digital Health Intervention					
Recommend DHI to others^	18/20 (90%)		8 (89%)		10 (91%)
DHI Intervention Rating ^,*	8 (7 - 10)		9.5		7.5
Select Clinical Outcomes					
Outpatient Prenatal Care Visits	11 (8 - 12.5)	12.0	13.0	9.5	9.0
GA at Delivery (weeks)†	37.3 (36.9 - 39.1)	37.1	39.1	37.7	37.3
Miscarriage / Stillbirth	5/40 (13%)	1 (10%)	0 (0%)	0 (0%)	4 (36%)
5 minute Apgar score†	8.5 (7 - 9)	9.0	9.0	8.5	8.0
NICU	10/40 (25%)	3 (30%)	1 (11%)	3 (30%)	3 (27%)
Neonatal Birthweight (grams)**	3005 (2780 - 3450)	2920	3160	3150	2815
Vaginal Birth	20/40 (50%)	7 (70%)	2 (22%)	3 (30%)	8 (73%)
Maternal Blood Transfusion	4/40 (10%)	2 (20%)	1 (11%)	0 (0%)	1 (9%)

Abbreviation Key: CHW = community health worker, DHI = digital health intervention, NICU = neonatal intensive care unit, UC = usual care. §18 exposed to CHW responded, 8 UC+CHW and 10 UC+CHW+DWI; *Intervention rating: Scale 1-10 with 10 being the most satisfied. ^18 exposed to DHI responded, 8 UC+DHI and 10 UC+CHW+DWI; †2 missing responses; **6 missing responses.

323 | Nuchal Translucency as a Predictor of Fetal Growth Restriction in the Absence of Genetic Abnormalities

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10:30 AM - 12:30 PM

Objective: To evaluate association between first trimester nuchal translucency (NT) and fetal growth restriction (FGR) in fetuses without suspected aneuploidy or structural anomaly.

Study Design: Singleton gestations with NT of at least 2mm with available third trimester fetal growth scan were included. Multifetal gestations, gestations with abnormal genetic screening, and fetuses with identified genetic or structural anomaly were excluded. Primary outcomes were diagnosis of FGR, as defined by abdominal circumference or estimated fetal weight less than 10th percentile, and severe FGR, as defined by abdominal circumference or estimated fetal weight less than 3rd percentile. NT values were stratified by measurements: 2-2.5mm, 2.5-3mm, and > 3mm and were controlled for crown rump length (CRL) at the time of nuchal translucency measurement. Linear regression was used to analyze first trimester NT and third trimester fetal growth.

Results: 5394 patients met inclusion criteria. Of these, 83.7% had a NT of 2-2.5mm, 10.3% 2.5-3mm, and 6% > 3mm. Compared to fetuses with a normal NT (2-2.5mm), those with borderline (2.5-3mm) and elevated (>3mm) NT did not have a significantly higher incidence of FGR, though an association was seen. When adjusting for CRL, there was also no significant increased likelihood of FGR with an NT at the 95th percentile or higher (OR 1.06, 0.64-1.67). When evaluating severe FGR, there is an association between borderline NT (2.5-3mm) (OR 2.03, 0.75-4.69) and elevated NT (>3mm) (OR 4.77, 1.99-10.26) with a higher incidence of severe FGR. There is also a significant association when adjusting for CRL: NT measurement at the 95th percentile or higher was strongly associated with severe FGR (OR 3.29, 1.58-6.49).

Conclusion: Elevated nuchal translucency is associated with third trimester severe FGR, in the absence of known aneuploidy or structural fetal anomaly. This association is seen both at borderline NT measurements (greater than 2.5mm) and when adjusting for CRL with NT measurements at the 95th percentile or higher.

324 | Perceived Barriers and Facilitators to Implementation of Group Prenatal Care Among Michigan Prenatal Care Providers

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10:30 AM - 12:30 PM

Objective: To characterize the use of group prenatal care across the state of Michigan and describe implementation barriers and facilitators.

Study Design: Stakeholders in prenatal care in Michigan were identified using systemic web searches and snowball sampling. Stakeholders representing 19 clinics completed semi-structured interviews or a survey regarding clinic operations, including basic clinic information, if group prenatal care was offered, and barriers and facilitators of implementation. Open-ended questions regarding barriers and facilitators were summarized using qualitative content analysis.

Results: In total, 19 clinics representing 8/10 regions completed the survey, representing an average of 403 patients per site. One Federally Qualified Health Center of the 19 (5%) clinics interviewed offered group prenatal care. Stakeholders cited social support and efficiency as perceived advantages to a group prenatal care model, and thought that staff and patient buy-in could be important facilitators. Disadvantages included scheduling, space, patient discomfort sharing personal information in a group setting, and issues protecting confidentiality as perceived. Further barriers to implementation included insufficient number of patients, space, and lack of trained providers.

Conclusion: Though many obstetric care stakeholders have identified group prenatal care as an important intervention for improving care experience and outcomes, only one clinic in our sample offered this service. Future work is needed to understand how to overcome the notable barriers to implementing group prenatal care in diverse clinic types and practice settings.

Table 1: Facilitators and Barriers to Group Prenatal Care

	Themes	Sample Quote
Facilitators	Staff buy-in	"just a matter of having the right interested and motivated individuals"
	Patient buy-in	"[challenging] coordinating a group of people with similar gestational ages with interest in doing group prenatal care"
Barriers	Insufficient number of patients	"scheduling and finding enough patients"
	Space	"finding a space for them to all meet in the same place"
	Lack of trained providers	"[staffing] a midwife able to do that or a nurse or medical assistant to be able to facilitate"

325 | Metabolic Dysfunction-Associated Steatotic Liver Disease is Associated with Glucose Intolerance in Pregnancy

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10:30 AM - 12:30 PM

Objective: Metabolic dysfunction-associated steatotic liver disease (MASLD) comprises ultrasound-identified steatotic liver disease (SLD) along with cardiometabolic risk factors. Retrospective data suggests MASLD is independently associated with gestational diabetes (GDM). While both MASLD and GDM have implications for long-term maternal health outcomes, prospective research on MASLD in pregnancy is limited. The objective of this study was to prospectively determine the association between MASLD and GDM.

Study Design: A prospective cohort of pregnant individuals (n = 916) were assessed for MASLD and obstetrical outcomes. During obstetrical sonogram at 18-22 weeks for enrolled participants, images of the maternal liver were captured and evaluated by a radiologist for the presence and grading of SLD. GDM was diagnosed using ACOG guidelines. Logistic regression models evaluated the association of presence and severity of MASLD with GDM.

Results: High grade SLD (grade 2-3) was identified in 34 (4%) patients. The median (IQR) age was 29 (8); Most participants self-identified as Black race (41%) and/or Hispanic ethnicity (48%). 87% of SLD patients met criteria for MASLD with BMI ≥25. A total of 182 (22%) of participants screened positive (≥140 mg/dL) on a 1-hour glucose challenge test (GCT) and 107 (12%) were diagnosed with GDM. Patients with Grade 2/3 SLD were more likely to be of Hispanic ethnicity, have BMI≥25, and screen positive on GCT ($p < 0.01$Table 1). In unadjusted analyses, high grade SLD was associated with GDM (OR 1.8 [0.7-4.1]) and positive GCT (OR 4.0 [1.8-8.7]). In multivariate linear regression analyses controlling for age and BMI, the association between SLD and GDM was attenuated ($p > 0.05$).

Conclusion: Findings from a large, diverse, prospective cohort illustrate altered glucose metabolism with advanced steatosis. This effect was attenuated by BMI and age. Early screening for GDM in patients with hepatic steatosis should be considered. Pregnancy represents an ideal window for MASLD screening, and research into future metabolic health following a diagnosis of MASLD/SLD in pregnancy is needed.

Table 1. Demographic and outcome data by presence of high grade SLD

	Overall	SLD Grade 2-3	Grade 1- No SLD	p value
	n = 916 (%)	n = 34 (%)	n = 882 (%)	
Age (median, IQR)	29 (8)	32 (7.5)	29 (9)	0.03
Race and ethnicity				
Non-Hispanic Black	380 (41.5)	5 (14.7)	347 (39.3)	<0.001
Non-Hispanic White	53 (5.8)	2 (5.9)	52 (5.9)	
Hispanic ethnicity	539 (58.8)	24 (70.5)	515 (58.4)	0.02
Body mass index (BMI) (kg/m²) (median, IQR)	28.7(7.4)	32.2(5.4)	28.5 (7.5)	<0.001
BMI ≥25	697 (76.1)	33 (97)	664 (75.2)	<0.001
History of GDM	52 (5.7)	4 (11.8)	48 (5.1)	0.32
Pregestational DM	3 (0.3)	3 (0.3)	0	
1 hour GCT ≥ 140*	182 (22.3)	14 (51.8)	168 (21.3)	<0.001
1 hour GCT (median, IQR)*	112 (40)	141 (33)	112 (12.7)	<0.001
Fasting glucose >95± (n=196)	33 (16.8)	4 (26.7)	29 (16.0)	<0.001
Gestational DM	107 (11.7)	8 (23.5)	99 (11.2)	0.05

Continuous variables were compared with Student's t test. Categorical variables were compared using a Chi squared test or Fisher exact test.
*n= 817 participant data available, n=27 had SLD grade 2-3, n= 790 without SLD
±n=196 participants had 3 hour GTT data available

326 | Risk Factors for Myocardial Infarction and Coronary Artery Dissection in Pregnancy and Postpartum

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10:30 AM - 12:30 PM

Objective: Analyze the risks for myocardial infarction (MI) and coronary artery dissection (CAD) in a modern cohort of pregnant and postpartum subjects using a large national database.

Study Design: Retrospective case-control study of pregnant and postpartum subjects from the National Inpatient Sample database through HCUP/AHRQ from 2017-2021 using inpatient ICD-10 coding, encompassing antepartum, delivery, and postpartum admissions. We first identified the incidence of MI/CAD from 2017 to 2021 and compared the baseline characteristics of those who experienced MI/CAD to those who did not. Chi2 analysis and student's t-tests were used for comparison. A backwards regression was used to analyze the impact of individual patient characteristics and history on likelihood of MI/CAD.

Results: Over the 5 year period, a total of 1,159 pregnant subjects had an MI or CAD (0.03%). The incidence increased from 2017 to 2021 (0.027% to 0.034%, $p = 0.036$). Those who experienced MI/CAD were more likely to be older, publicly insured, in the lowest income bracket, and identify as non-Hispanic black. They were also more likely to be obese, use tobacco, have pregestational diabetes and experience a hypertensive disorder of pregnancy, in particular preeclampsia with severe features, superimposed preeclampsia, and HELLP or eclampsia. In regression analysis, age, non-Hispanic black race, obesity, tobacco use, DM, hypertensive disorders of pregnancy, public insurance or self-pay, and the lowest income quartile remained associated with MI/CAD in the pregnant and postpartum period.

Conclusion: The incidence of MI/CAD in the peripartum period increased steadily from 2017 to 2021. This increase was associated with identifiable risk factors including age, non-Hispanic black race, obesity, tobacco use, DM, hypertensive disorders of pregnancy, public insurance or self-pay, and the lowest income quartile.

327 | Evaluation of "Low Threshold" Early Diabetes Screening Practices at Mahec

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10:30 AM - 12:30 PM

Objective: This study aims to evaluate if a stepwise approach to early gestational diabetes (GDM)screening, using A1c followed by fasting plasma glucose (FPG), is more predictive of early and overall treatment as compared to an approach using A1c alone. Additionally, if this stepwise approach was more predictive of early insulin use than the algorithm utilized in Sweet Success (SS) guidelines.

Study Design: This was a retrospective cohort study of pregnant patients undergoing GDM screening in the first trimester between 2011-2023 at a single institution. Patients underwent stepwise testing with an initial A1C measurement followed by FPG if A1C was between 5.0 and 6.4. Patients were treated as GDM if both tests were elevated. Patients were then classified into four groups based on A1C and FPG results (table 1). The primary outcomes were the need for insulin at any point in pregnancy and gestational age at initiation.

Results: 887 patients met criteria for inclusion (Table 1). Demographic characteristics were similar across all groups. Patients in group 2 were more likely than patients in group 1 to require insulin during pregnancy (32 v 4.2%, $p < 0.0001$) and required earlier initiation (20 v 32 wks, $p < 0.0001$). Additionally, the stepwise algorithm had a higher specificity for identification of patients who would not require insulin prior to 28 weeks as compared to the SS algorithm (95 v 88%) though the sensitivity was lower (48 v 65%). Negative predictive values were similar (97 v 98%). PPVs for both algorithms were low (32 v 22%).

Conclusion: Stepwise diabetic screening using a lower A1c threshold followed by FPG was associated with overall insulin use and with earlier initiation. However, the overall number of patients who were captured using this technique was low. The poor PPV for both algorithms for insulin initiation prior to 28 weeks when patients would be captured by traditional GDM screening casts doubt on the clinical utility of universal early screening. This is consistent with the results of a recent RCT on early treatment of GDM and revised ACOG guidelines.

Group	n(%)	A1C	FPG	Stepwise Algorithm	Sweet Success Algorithm
1	704 (79)	5.0-5.6	<92	Pass	Pass
2	52 (6)	5.0-5.6	≥92	Fail	Pass
3	117 (13)	5.7-6.4	<92 OR no FPG	Pass	Fail
4	13 (1.4)	5.7-6.4	≥92	Fail	Fail

*Result of screening by SS algorithm, had supplemental screening not been completed.

Algorithm	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Stepwise	44.44	94.90	26.67	97.61
Sweet Success	66.67	87.59	18.32	98.44

328 | Standardizing Induction Management: a Mixed-Methods Evaluation of the Clinician Perspective

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10:30 AM - 12:30 PM

Objective: Standardizing labor induction (IOL) practices may reduce cesarean and improve obstetric disparities. IOL protocols focus on active management with recommendations for frequent cervical exams, early amniotomy, and intervention when no cervical change is made. Here, we aimed to characterize the clinician perspective on feasibility and acceptability of a standardized IOL protocol.

Study Design: This sequential mixed-methods study surveyed clinicians after implementation of a standardized IOL protocol at 2 sites in 2021. We used the 4-question validated Acceptability of Intervention Measure (AIM; total 4-20) as well as a single acceptability item (1-5) for each of 8 specific protocol components (Table). Total AIM scores were grouped into tertiles. Clinicians in the top (High Acceptability) and bottom (Low Acceptability) tertiles were invited to participate in a semi-structured interview. Topics included (a) acceptability of protocol components, (b) barriers/facilitators to adherence, and (c) strategies for overcoming barriers. Interviews were coded using an integrated approach with high inter-rater reliability ($k = 0.83$).

Results: 104 clinicians (57 physicians, 43 RNs, 4 CNMs) completed the survey. Median total AIM score was 15/20 IQR [12-19]. Protocol components with highest acceptability scores focused on not continuing "futile" cervical ripening and interventions for active labor dystocia. Components with less approval included frequent cervical exams and early amniotomy. 24 clinicians were interviewed (12 High, 12 Low Acceptability). Clinicians described barriers to implementation of less acceptable components, including staff/time constraints, best practice disagreements, and concerns around patient aversion. Clinicians recommended more education around the protocol's safety/efficacy, and communication about anticipated IOL steps to overcome barriers.

Conclusion: This work describes the clinician perspective on standardizing IOL and provides concrete recommendations to overcome implementation barriers.

Table: Induction protocol components with associated quantitative and qualitative data

Protocol component	% "comfortable"* N(%)	Exemplar Quote(s) for components with <70% "completely comfortable"
1. If Foley balloon did not expel prior to 12 hours, remove it and initiate/continue oxytocin.	72 (72.3)	*NA*
2. Misoprostol can be repeated for up to 6 and for no >24 hours. If remains in latent labor, initiate oxytocin.	73 (73.7)	*NA*
3. If it has been >6 hours since misoprostol placement, and AROM not yet feasible with no window for another misoprostol, start oxytocin.	56 (57.7)	**Barrier**: *"There is this kind of perpetuated fear of Pitocin in the community"* **Strategy**: *"Open dialogue with the patients and reeducation is the best strategy for patient hesitation"*
4. Latent labor exams at least every 4h.	43 (43.9)	**Barrier**: *"We're all fighting the personnel battle"* **Strategy**: *"...dividing and conquering as a team and then being sure to circle back"*
5. If patient is ≥4cm dilated and has intact membranes, recommend amniotomy.	41 (41.4)	**Barrier**: *"I think there's different provider preferences; they don't necessarily want to follow that step."* **Strategy**: *"I think we just have to go back to the evidence that we have that supports early amniotomy."*
6. Active labor exams at least ever 2h.	49 (50.0)	**Barrier**: *"The barrier is the census and acuity of the floor"* **Strategy**: *"From nursing it's helpful to just touch base with either the chief resident or the attending and be like hey, it's been an hour and 45 minutes are we going to check her in about 15 minutes. So, that I'm doing it ahead of time"*
7. If 2 exams the same in active labor 2h apart and already s/p A/SROM but not on oxytocin, start oxytocin.	73 (74.5)	*NA*
8. If 2 exams the same in active labor 2h apart and already s/p A/SROM and on oxytocin without IUPC in place, place IUPC.	62 (63.3)	**Barrier**: *"I found a lot of resistance to that component."* **Strategy**: *"Just educating them about the safety of an IUPC has been a little bit helpful."*

*"Comfortable" or "Completely comfortable" with this recommendation on Likert scale

329 | An "Equity in Labor Outcomes Dashboard": a 3-Phase Participatory Mixed-Methods Approach to Development

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10:30 AM - 12:30 PM

Objective: Equity dashboards, showing individual clinician outcomes by patient race, may confront clinicians with their own care disparities, driving change. Here, we aimed to develop an acceptable obstetric Equity Dashboard.

Study Design: This 3 phase participatory mixed-methods study developed an Equity in Labor Outcomes Dashboard. In Phase 1, focus groups of obstetric clinicians were divided into nurses, trainees, and attending physicians at 2 sites, to understand: (1) experience with and perspectives on receiving individualized feedback on patient outcomes by race, (2) outcome attribution in a shift- and team-based labor unit, (3) which outcomes to include, (4) ideal distribution method and frequency, and (5) potential impact on care. Transcripts were coded using a structured approach with high inter-rater reliability (k >0.8). Phase 2 convened a multidisciplinary committee to synthesize Phase 1 results and develop a draft Dashboard. Phase 3 surveyed clinicians at the same sites to critically optimize the draft.

Results: In Phase I (1/2023), 5 focus groups (n = 18) were conducted, including nurses, CNMs, OBGYN, family medicine, and MFMs. Most had never received individual outcome feedback before (Table 1). While participants found receiving individual data by patient race "potentially uncomfortable," it was also highly desired. Participants recommended an outcome be attributed to a given clinician if there were "meaningful patient interactions" [e.g. writing a note during labor and/or delivery participation]. Recommended outcomes included cesarean, ICU, hemorrhage, and patient-centered outcomes like birth trauma. Clinicians requested to receive the Dashboard with individual outcomes compared to unit averages by email q4 months alongside a disparity reduction toolkit for actionable response. Phase 2 (4/2023) developed a draft Dashboard. 85 clinicians completed the Phase 3 survey (8-10/2023; Table 2), with high acceptability, affirming Phase 2's design.

Conclusion: This work generated an Equity in Labor Outcomes Dashboard acceptable to clinicians. Its potential to drive reduced disparities should be tested.

Table 1: Sampling of Phase 1 focus topics, with associated themes and exemplar quotes

Interview Topic	Interview Themes	Exemplar Quote
Prior experience with and general perspectives on receiving individualized feedback by patient race	Lack of prior experience	*"not that I know… [there is no] shared data anywhere centrally that talks about our C-section rates"*
	Strong desire for this information	*"I would love to know how I perform as an individual"*
	Potential for discomfort	*"It will feel uncomfortable to get data that says you treat patients inequitably … but I also hope that most of us would want to know that, and recognize that we have unconscious biases that might be influencing our care, and we would want to know that so we can try to fix it."*
Attribution of outcomes	Outpatient care impacts inpatient care	*"That outpatient aspect of things is … really critical, because I think … depending on who sends the patient up, like that really colors how the team receives the information"*
	Even one interaction can meaningfully impact outcomes	*"Because even if you're involved in someone's care 75% of the time, an outcome can be someone that was in the room for a hot second or just happenstance."*
	Trainees and nurses may not have a say in care decisions	*"We are at a hospital where residents are training under the supervision of attendings. And so how much of it is a decision that you're making and the attending is like sounds good … versus an attending making a decision that you don't necessarily agree with, but you are doing it, because you are learning from them."*
Potential to impact care	Potential for use to self-evaluate over time	*"This will prompt self-reflection"*
	Needs a planned actionable response	*"I think the goal probably is both to like identify where you're at and also to figure out ways to improve and to change too. So, I think the numbers on their own are good. I think it's the next component too that's like just as important."*

Table 2: Phase 3 Dashboard optimization survey responses. Distributed to all labor and delivery clinicians at 2 labor sites in a single academic health system.

Role	
Nurse, CNM, or NP	38 (44.7)
Trainee	19 (22.4)
Attending physician	28 (32.9)
Race	
Black	7 (8.2)
White	70 (82.4)
Asian	6 (7.1)
Other/declined to answer	5 (5.9)
Latinx ethnicity	4 (4.7)
Acceptability score[a,b]	16 [15-18]
Should outcomes be attributed to a clinician based on:[c,d]	
You were the last outpatient clinician to see the patient	38 (57.6)
You saw the patient for at least 3 outpatient visits	51 (77.3)
You were the admitting clinician	43 (65.2)
You documented on the patient during labor	49 (74.2)
You were on the delivering team	57 (86.4)
How would you most prefer clinician-level data be presented?[c]	
Outcomes are attached by clinician name and full dashboard distributed to all	9 (13.6)
Each clinician receives an anonymous code so only they can identify their own outcomes; full dashboard listed by code distributed to all	27 (40.9)
Clinicians are shown only their own outcomes compared to an averaged, overall rate	30 (45.5)
If you were to see disparities in your own outcomes, what resources/steps would you want to be available to you?[c,e]	
Nothing I can figure it out myself	1 (1.5)
Link to resources for reducing bias in healthcare and evidence-based practices for improving outcomes	37 (56.1)
Peer group meetings to advance equity in decision-making in obstetrics	39 (59.1)
Meet individually with a coach/mentor/leader to discuss and make personalized plan	47 (71.2)

[a]Median [IQR] [b]out of total 20 [c]n=66 [d]Selected either "somewhat acceptable" or "acceptable" on Likert scale [e]can select more than one

330 | American Heart Association Blood Pressure Classification and Subsequent Risk of Preeclampsia

Rebecca Horgan[1]; Erkan Kalafat[2]; Elena Sinkovskaya[1]; Alfred Z. Abuhamad[1]; George R. Saade[1]

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10:30 AM - 12:30 PM

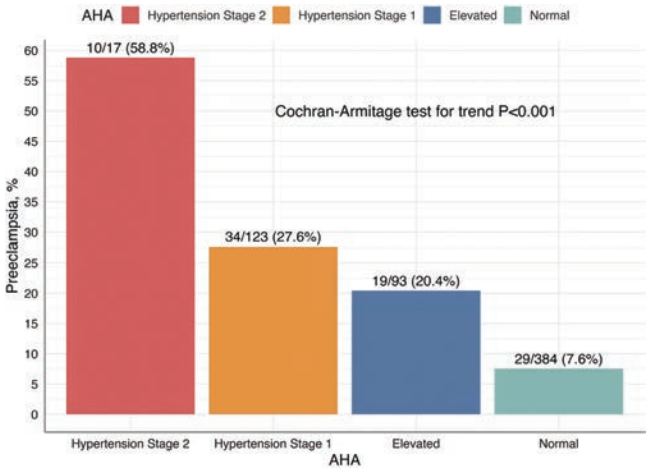
Objective: To assess the relationship between 1st trimester blood pressure (BP) classified according to American Heart Association (AHA) guidelines and risk of preeclampsia.

Study Design: This was a prospective longitudinal cohort study which enrolled patients at ≤ 13+6 weeks' gestation. Data was obtained by trained research coordinators. At the 1st trimester study visit, baseline BP was classified per AHA guidelines (normal, elevated, stage I hypertension (HTN), stage II HTN). The primary outcome was the incidence of preeclampsia, defined per ACOG criteria. Cox-proportional hazard model was used to investigate the association between HTN categories and development of preeclampsia.

Results: 617 patients were included. 92 developed the primary outcome. In the first trimester, 62.2% of patients had normal BP, 15.1% had elevated BP, 20.0% had stage I HTN, and 2.8% had stage II HTN. The incidence of preeclampsia increased based on AHA classification (7.6%, 20.4%, 27.6%, 58.8%, P< 0.001, Figure 1). Compared to AHA normal BP in the 1st trimester, elevated (aHR: 2.55, 95% CI: 1.42- 4.56, P = 0.002), stage I (aHR: 3.52, 95% CI: 2.10-5.89, P< 0.001) and stage II HTN (aHR: 7.58, 95% CI: 3.48-16.5, P< 0.001) had significant association with preeclampsia after adjusting for risk factors, race, and body-mass index. The Cox-regression model using AHA classification had a significantly higher concordance index compared to the model using the current classification of a singular 140mm/Hg systolic and 90mm/Hg diastolic cut-off (0.71±0.028 vs. 0.56±0.019, P< 0.001). The significant associations remained in sensitivity analyses excluding pregnancies with pre-gestational hypertension (7.4%, 20.2%, 26.2%, 33.3%, P< 0.001; 0.67±0.031 vs. 0.51±0.011, P< 0.001).

Conclusion: First trimester BP per AHA guidelines had significant independent association with preeclampsia. AHA classi-

fication outperformed HTN diagnosis based on 140/90 mm/Hg cut-off, with all categories having more than the 10% risk of preeclampsia that was used by the USPSTF to recommend low dose aspirin.



331 | Adjustment of Uta-pi for Maternal Baseline Characteristics Does not Improve Predictive Performance for Preeclampsia

Rebecca Horgan[1]; Erkan Kalafat[2]; Elena Sinkovskaya[1]; Alfred Z. Abuhamad[1]; George R. Saade[1]
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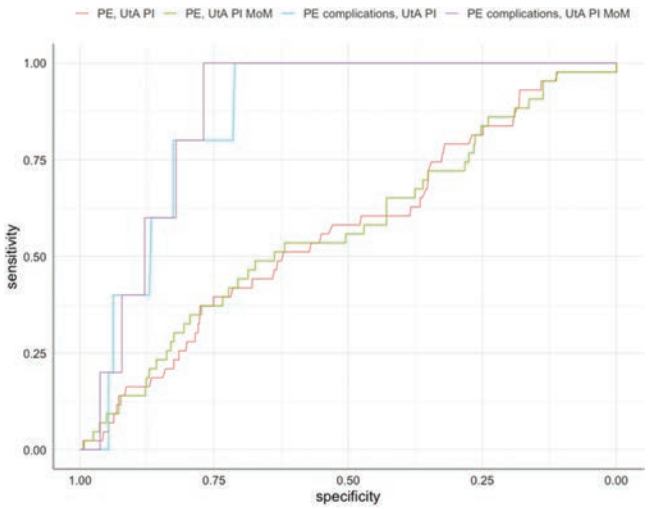
10:30 AM - 12:30 PM

Objective: The evidence regarding first trimester uterine artery (UtA) Doppler as a predictor of preeclampsia (PE) is contradictory. UtA perfusion is sensitive to various factors which were not considered previously. Our objective was to determine whether first trimester UtA Doppler measurements, adjusted for maternal baseline characteristics, predict PE.

Study Design: This was a prospective cohort study which enrolled patients at ≤ 13+6 weeks' gestation. Patients were followed throughout pregnancy and data obtained by trained research coordinators. At the 1st trimester study visit, UtA Doppler pulsatility index (UtA-PI) was obtained. Generalized Additive Models for Location, Scale and Shape were used for modelling UtA-PI, which was found to have distributional properties fitting gamma distribution. Predictive capabilities of raw and maternal characteristics adjusted multiple of median UtA-PI values were tested with area-under the curve values and concordance index. The primary outcome was PE and complicated PE defined as placental abruption, delivery < 34 weeks or HELLP syndrome.

Results: 571 pregnant patients without chronic hypertension were included in the study. Regression analyses showed increasing gestational age at measurement (P = 0.03) and increasing maternal age (P = 0.003) were both associated with lower UtA-PI values. There were no associations with body-mass index (P = 0.36), race (P = 0.7), mean arterial pressure (P = 0.25) and parity (P = 0.4). UtA-PI had poor predictive performance for PE, and there was no improvement after adjusting for gestational age and maternal age (AUC: 0.567 vs. 0.570, P = 0.56, Concordance index: 0.582±0.04 vs. 0.583±0.04, P = 0.98). UtA-PI was a strong predictor of complicated PE, and there was no improvement following adjustment (AUC: 0.871 vs. 0.858, P = 0.56, Concordance index: 0.866±0.03 vs. 0.848±0.03, P = 0.65).

Conclusion: UtA-PI is a strong predictor of complicated preeclampsia but not overall preeclampsia. Adjustment of UtA-PI for maternal baseline characteristics does not improve predictive performance.



332 | Disparities in Prenatal Care Initiation Among Medicaid and Commercially Insured Pregnant Women

Reetam Ganguli[1]; Maguire Anuszewski[2]; Srishti Ganguli[3]; Stephen Wagner[4]
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10:30 AM - 12:30 PM

Objective: Access to prenatal care is critical to improving pregnancy outcomes, yet disparities in its timing and quality persist. Our objective is to elucidate how insurance type is associated with the timing of prenatal care initiation and maternal and neonatal outcomes.

Study Design: A retrospective cohort study was conducted using CDC National Vital Statistics System data from 2018 to 2022. Pregnant women were categorized based on their insurance status: Medicaid or commercially insured. We analyzed variables related to maternal demographics, health behaviors, and birth outcomes. The primary outcome was prenatal care within the 1st trimester. Adjusted odds ratios (aORs) and 95% confidence intervals (CIs) were calculated using logistic regression to account for potential confounders. Chi-squared test for independence to compare the proportions of prenatal care initiation times. Statistical significance was determined with a p-value threshold of < 0.001.

Results: Of 16,828,197 total patients, 9,235,696 were commercially insured and 7,592,501 were on Medicaid. Prenatal care initiation showed significant differences, with 68.05% of Medicaid recipients starting care in the 1st trimester, compared to 86.23% of those commercially insured. A larger proportion of Medicaid recipients initiated care in the 2nd trimester (21.99% vs. 10.11%), the 3rd

trimester (6.26% vs. 2.22%), or had no prenatal care at all (2.77% vs. 0.75%) ($p < 0.001$).

Women on Medicaid are over twice as likely [aOR: 2.118 (95% CI: 2.107-2.130, $p < 0.001$)] to receive prenatal care after the 1st trimester compared to commercial insurance after controlling for maternal age, marital status, ethnicity, and education level. Significant differences ($p < 0.001$) were also observed in: number of prenatal visits, smoking status before pregnancy, NICU admission, maternal ICU admission, postpartum hemorrhage, and preterm labor.

Conclusion: Disparities in the timing of prenatal care initiation between Medicaid and commercially insured pregnant women exist. Innovative engagement strategies may mitigate these disparities, ensuring timely and equitable prenatal care.

333 | Generalizing NICU Admission Predictions for Medicaid Patients Using Machine Learning

Reetam Ganguli[1]; Julia Sroda Agudogo[2]; Stephen Wagner[2]
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10:30 AM - 12:30 PM

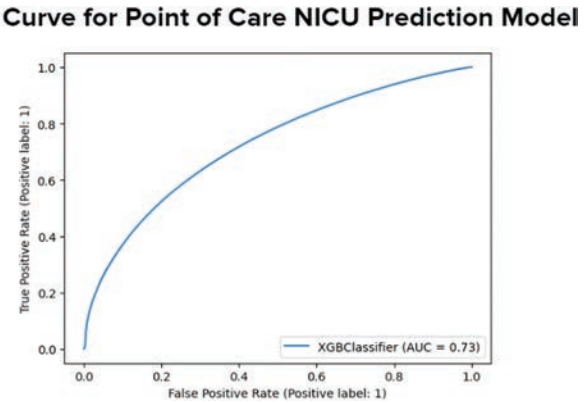
Objective: Medicaid patients have higher rates of maternal and neonatal complications. No models have been designed to specifically examine this patient population. We evaluated the generalizability of a NICU admission prediction model trained on a mixed population of insured patients (commercial, Medicaid, self-pay) when applied specifically to Medicaid patients.

Study Design: An extreme gradient boosting model was trained on data from years 2014-2021 of the Vital Statistics System of mixed insurance coverage with the exclusion of year 2015 due to unavailable data. The model was tested on a mixed insurance and solely Medicaid-covered cohort. Inclusion criteria for the Medicaid testing set were deliveries covered by Medicaid in the year 2022 with available NICU admission data. Inclusion for mixed testing cohort were 2022 deliveries with available NICU admission data. Cases with missing NICU admission data and those from hospitals not reporting NICU admissions were excluded. The primary outcome of interest was NICU admission immediately post-delivery.

Results: 38 clinical variables for 15,782,488 obstetric patients were included in the training data. The testing set consisted of 1,500,152 Medicaid patients, with 157,871 (10.5%) experiencing NICU admissions. The model demonstrated a strong performance on the Medicaid cohort with an AUC of 0.73, 80.3% accuracy, and a 0.80 F1 score.

When tested on the 2022 mixed cohort (self pay, commercially insured, Medicaid, and other) of 3,666,784 patients, of which 347,586 (9.5%) patients had a NICU admission, the model had an AUC of 0.73, 83.3% accuracy, and F1 score of 0.83. The analysis revealed that the most influential factor in predicting NICU admissions was the interval since the last live birth.

Conclusion: The NICU prediction model, initially trained on a mixed population of insured patients, demonstrated strong generalizability and robust performance when applied to Medicaid patients in 2022. By leveraging routinely collected data, the model can aid in reducing NICU admissions and associated healthcare costs, ultimately improving outcomes for Medicaid patients.



334 | Effects of Preconception Weight Loss on Gestational Weight Gain and Obesity-Associated Maternal Morbidities

Richard S. Legro[1]; Karl R. Hansen[2]; Michael P. Diamond[3]; Anne Steiner[4]; Christos Coutifaris[5]; Marcelle I. Cedars[6]; Nanette Santoro[7]; Heping Zhang[8]; Alllen Kunselman[1]; Christina Stetter[1]; On behalf of the Reproductive Medicine Network (RMN)
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10:30 AM - 12:30 PM

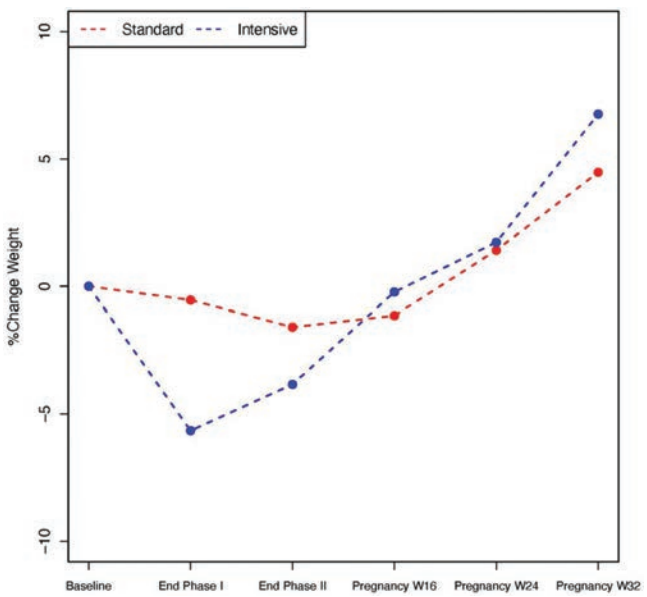
Objective: Preconception Weight Loss(PWL) is recommended in women with obesity (OW), but the effects of PWL on gestational weight gain(GWG) and associated obesity-related maternal morbidities are poorly studied. We examined these parameters in a previous multicenter RCT(FIT-PLESE, NCT02432209) of two types of preconception lifestyle intervention(16 weeks duration) in a population of OW with unexplained infertility($N = 379$)

Study Design: Secondary and subgroup analysis of singleton live birth gestations from FIT-PLESE. Preconception(Phase 1), the intensive lifestyle group($N = 32$) underwent increased physical activity and weight loss(target 7%) through meal replacements and medication(Orlistat) compared to a standard group($N = 39$) with increased physical activity alone without weight loss. Both groups then received standardized infertility therapy consisting of CC/IUI(Phase 2). Singleton pregnancies including GWG were tracked to live birth. The post hoc composite outcome was the prevalence of adverse obesity-related maternal events: PTL, PET, GDM and PROM

Results: The standardized group of singleton pregnancies had no significant mean weight loss from baseline after the lifestyle intervention[-0.5%, 95% CI(-2.4, 1.3)] while the intensive group approached the target with significant weight loss[-5.6% (-7.6, -3.7) P< .001], and significant decreases in waist circumference. However weight in the intensive group rebounded during Phase 2 and was equivalent to the standard group by 16 wks gestation(Fig 1) and continued to have similar weights up to 32 weeks gestation. Despite the rebound weight gain and equivalent maternal weights by this time point, there was a trend towards

decreased obesity-related maternal morbidity in the intensive weight loss group(Tab 1)

Conclusion: Weight rebound is inevitable after weight loss treatment. Pregnancy may further exacerbate weight rebound after PWL. However, there may be maternal pregnancy benefits after PWL despite weight rebound. These data provide trends towards powering a larger study and incorporating pregnancy interventions after PWL to achieve better GWG and obstetric outcomes



Complication	Intensive N/32 (%)	Standard N/39 (%)	P value
Preterm Labor (PTL)	1 (3.1%)	4 (10.3%)	0.37*
Pre-Eclampsia (PET)	4 (12.5%)	6 (15.4%)	1.00*
Gestational Diabetes (GDM)	6 (18.8%)	9 (23.1%)	0.66**
Premature Rupture of Membranes (PROM)	1 (3.1%)	3 (7.7%)	0.62*
Composite Outcome	10 (31.3%)	16 (41.0%)	0.39**

*** Fisher's Exact**
**** Chi-Square**

335 | Effect of Pre-Pregnancy BMI Vs. Total Pregnancy Weight Gain on Trial of Labor After Cesarean

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10:30 AM - 12:30 PM

Objective: To examine whether pre-pregnancy BMI or total pregnancy weight gain is more closely associated with successful vaginal birth after Cesarean delivery (VBAC) in patients with term gestations with no prior history of vaginal delivery.

Study Design: IRB approval was obtained for the study (24-09915-NHSR). The CDC National Center for Health Statistics birth certificate database was utilized to obtain relevant birth information from 2016-2022 in the United States. Inclusion criteria were term, singleton gestations in patients who underwent TOLAC with the following characteristics: second pregnancy with history of one prior Cesarean delivery, BMI >/ = 18.5, and no pre-existing diagnosis of hypertensive disorders (either pre-gestational or gestational). Odds ratios and confidence intervals indicating likelihood of successful VBAC were developed both by (1) pre-pregnancy BMI alone, (2) total pregnancy weight gain alone, and (3) pre-pregnancy BMI stratified by total pregnancy weight gain.

Results: 12,164 patients met inclusion criteria for analysis, of whom 11,919 had data reported for both BMI and weight gain. Of these, 6,096 (51.1%) experienced a successful VBAC and 5,823 (48.9%) were delivered via repeat Cesarean section after TOLAC. Increasing pre-pregnancy BMI was associated with a lower likelihood of successful VBAC when compared to patients with a normal BMI (BMI 25-29.9: OR 0.75 [0.691, 0.825] vs. BMI 30-34.9: 0.56 [0.506, 0.624] vs. BMI 35.0-39.9: 0.56 [0.492, 0.645] vs. BMI >40: 0.36 [0.311, 0.433]) (All p values < 0.001). Among individuals with obesity, increased total pregnancy weight gain was significantly associated with decreased likelihood of VBAC success for those gaining greater than 20 pounds (21-30lbs: OR 0.76 [0.633, 0.909]; >30lbs: 0.75 [0.626, 0.887], p values < 0.001). However, when stratified by total pregnancy weight gain within each BMI category, no consistent significant differences in VBAC success were observed.

Conclusion: Our data suggest that pre-pregnancy BMI is more closely associated with likelihood of successful VBAC than total pregnancy weight gain within each BMI category.

	VBAC N (%)	RCD N (%)	OR (95% CI)	p
BMI Category				
Normal (BMI 18.5-24.9)	2629 (58.4%)	1869 (41.6%)	REF	
Overweight (BMI 25.0-29.9)	1836 (51.5%)	1729 (48.5%)	**0.75 [0.691, 0.825]**	**<0.001****
Obesity I (BMI 30.0-34.9)	924 (44.2%)	1168 (55.8%)	**0.56 [0.506, 0.624]**	**<0.001****
Obesity II (BMI 35.0-39.9)	464 (44.1%)	586 (55.9%)	**0.56 [0.492, 0.645]**	**<0.001****
Obesity III (BMI ≥40.0)	243 (34.0%)	471 (66.0%)	**0.36 [0.311, 0.433]**	**<0.001****

	VBAC N (%)	RCD N (%)	OR (95% CI)	p
Normal BMI				
Overall	2629 (58.4%)	1869 (41.5%)	REF	
0-10 lbs.	79 (59.8%)	53 (40.2%)	1.06 [0.744, 1.508]	0.37
11-20 lbs.	360 (59.5%)	245 (40.5%)	1.04 [0.879, 1.242]	0.31
21-30 lbs.	875 (60.8%)	564 (39.2%)	1.1 [0.977, 1.245]	0.06
>30 lbs.	1315 (56.6%)	1007 (43.4%)	0.93 [0.839, 1.027]	0.08
Overweight				
Overall	1836 (51.5%)	1729 (48.5%)	REF	
0-10 lbs.	177 (62.3%)	107 (37.7%)	**1.56 [1.215, 1.998]**	**<0.001****
11-20 lbs.	402 (51.4%)	380 (48.6%)	0.996 [0.853, 1.163]	0.48
21-30 lbs.	561 (52.6%)	505 (47.4%)	1.05 [0.912, 1.200]	0.26
>30 lbs.	696 (48.5%)	737 (51.5%)	0.89 [0.787, 1.005]	0.03
Obesity I (BMI 30-34.9)				
Overall	924 (44.2%)	1168 (55.8%)	REF	
0-10 lbs.	147 (48.7%)	155 (51.3%)	1.2 [0.942, 1.526]	0.07
11-20 lbs.	256 (47.8%)	280 (52.2%)	1.16 [0.956, 1.398]	0.07
21-30 lbs.	256 (44.4%)	321 (55.6%)	1.01 [0.837, 1.214]	0.46
>30 lbs.	295 (41.7%)	412 (58.3%)	0.91 [0.762, 1.076]	0.13
Obesity II (BMI 35-39.9)				
Overall	464 (44.2%)	586 (55.8%)	REF	
0-10 lbs.	132 (49.4%)	135 (50.6%)	1.2 [0.944, 1.616]	0.06
11-20 lbs.	122 (47.7%)	134 (52.3%)	1.15 [0.874, 1.512]	0.16
21-30 lbs.	110 (42.3%)	150 (57.7%)	0.93 [0.704, 1.219]	0.29
>30 lbs.	100 (37.3%)	168 (62.7%)	**0.75 [0.570, 0.991]**	**0.02****
Obesity III (BMI ≥40)				
Overall	243 (34.0%)	471 (66.0%)	REF	
0-10 lbs.	89 (34.0%)	173 (66.0%)	1.00 [0.740, 1.345]	0.49
11-20 lbs.	72 (41.6%)	101 (58.4%)	**1.38 [0.984, 1.941]**	**0.03****
21-30 lbs.	43 (29.9%)	101 (70.1%)	0.83 [0.559, 1.218]	0.17
>30 lbs.	45 (31.9%)	96 (68.1%	0.91 [0.617, 1.337]	0.31

336 | Breastfeeding Intention, Initiation, and Continuation in Pregnant Patients with Sickle Cell Disease

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[1]University of Connecticut, Rocky Hill, CT; [2]University of Connecticut, Farmington, CT; [3]University of Connecticut Health, Avon, CT

10:30 AM - 12:30 PM

Objective: Mothers with sickle cell disease have more barriers that may either prevent them from breast feeding or discontinue early. The aim of this study is to compare the rates of breastfeeding intention, initiation, and discontinuation at 6 weeks in patients with sickle cell disease (SCD) versus patients without SCD.

Study Design: A retrospective matched cohort study was performed between January 1, 2018 to July 31, 2023 to examine the risk of SMM with SCD in the first year postpartum. Inclusion criteria were pregnant patients with SCD who received their prenatal and postpartum care at a single tertiary academic center. We randomly selected two non-exposed patients for every SCD patients, matched for age and year of delivery. Baseline characteristics were summarized using frequencies and percentages for categorical variables and mean and standard deviation for continuous variables overall. Chi square analysis and a two-population proportion test was used to compare breastfeeding rates between SCD and non-exposed cohorts.

Results: We identified 25 eligible patients with SCD with singleton pregnancies who received their pregnancy and postpartum care up to one year at our institution. Baseline demographics were similar between both SCD and non-SCD groups including age, parity, and insurance. There were differences however in race and ethnicity. SCD patients were more likely to be non-Hispanic Black. Intention to breastfeed was similar in patients with SCD versus non-SCD (96% (24/25) versus 94% (47/50), P = 0.9523). Similarly, breastfeeding initiation less than 7 days postpartum was 88% (22/25) in patients with SCD compared to 90% (45/50) in non-SCD patients (P = 0.9045). Only 48% (12/25) of SCD patients and 70% (35/50) of non-SCD patients continued to breast feed after 6 weeks postpartum (P = 0.0629).

Conclusion: While we did not find a difference in breastfeeding intention, initiation or discontinuation rates between mothers with sickle cell disease and those without sickle cell disease, there was a trend in discontinuation of breastfeeding at 6 weeks in SCD patients that should be explored with a larger population.

337 | Late Preterm Steroids for those with Pregestational/ Early Gestational Diabetes and Risk of Neonatal Hypoglycemia

Ruby Lin; Cande V. Ananth; Todd J. Rosen; On behalf of the MOMPOD Consortium
Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ

10:30 AM - 12:30 PM

Objective: The ALPS trial showed reduced rate of neonatal respiratory complications with the use of late preterm steroids but excluded those with pregestational diabetes. We hypothesize that late preterm steroids given to those with pregestational and early gestational diabetes are associated with a higher risk of neonatal hypoglycemia (NNH) and lower risk of respiratory complications.

Study Design: This is a secondary analysis of MOMPOD, a multicenter, randomized controlled trial of 831 pregnant patients with preexisting type 2 diabetes or diabetes diagnosed prior to 23 weeks' gestation that were treated with insulin alone or insulin and metformin. Patients who delivered 34-36 6/7 weeks were included. Those who received late preterm steroids were compared to those who did not have any exposure to antenatal steroids in pregnancy. The primary outcome was NNH (blood glucose < 40 mg/dl or need for IV dextrose treatment). Secondary outcomes included respiratory support in the NICU/ intermediate nursery, transient tachypnea of the newborn, and respiratory distress syndrome. Modified Poisson regression was performed to calculate the relative risk, adjusting for confounding variables.

Results: Of the patients that delivered late preterm, 20 received late preterm steroids and 136 did not have any antenatal steroid exposure. NNH was present in 16 (80%) and 73 (54%) of those exposed to steroids vs no steroids. The adjusted relative risk for NNH was 1.63 (95% CI 1.23-2.16). 9 (45%) and 62 (46%) required respiratory support in the NICU during the first 30 days of life in the steroid and no steroid group, respectively. The adjusted relative risk for respiratory support in the NICU was 1.08 (95% CI 0.63-1.86).

Conclusion: Administration of late preterm antenatal steroids in pregnancies complicated by pregestational diabetes and early gestational diabetes is associated with a 1.6 increased risk for neonatal hypoglycemia. However, the secondary analysis was not powered to evaluate for respiratory complications. Further studies are needed to understand the full spectrum of neonatal outcomes associated with this practice.

Table 1
Neonatal Hypoglycemia in Pregnancies Complicated by Diabetes with Late Preterm Deliveries

Adverse Outcomes	Steroids (n=20)	No Steroids (n=136)	Adjusted Relative Risk (95% CI)*
Neonatal Hypoglycemia	16 (80%)	73 (54%)	1.63 (1.23-2.16)
Treated with IV dextrose	13 (65%)	49 (46%)	
BG<40	11 (55%)	60 (44%)	

*Adjusted for age, BMI, treatment with insulin with or without metformin, pregestational vs early gestational diabetes, HgbA1c early in pregnancy, and total daily insulin dose at the end of pregnancy

Table 2
Neonatal Respiratory Complications in Pregnancies Complicated by Diabetes with Late Preterm Deliveries

Adverse Outcomes	Steroids (n=20)	No Steroids (n=136)	Adjusted Relative Risk (95% CI)*
Respiratory Support in first 30 days**	9 (45%)	62 (46%)	1.08 (0.63-1.86)
Transient Tachypnea of newborn	2 (11%)	12 (9%)	1.11 (0.26-4.68)
Respiratory distress syndrome	3 (15%)	32 (23%)	0.71 (0.24-2.13)

*Adjusted for age, BMI, treatment with insulin with or without metformin, pregestational vs early gestational diabetes, HgbA1c early in pregnancy, and total daily insulin dose at the end of pregnancy
**Nasal canula, CPAP, mechanical ventilation, neurally modulated ventilation in the NICU/ Intermediate Nursery

338 | Leptin Alters Myometrial Contractility-Related Gene Expression in a Human Myometrial Cell Line

Ruchira Sharma[1]; Xiangying Xue[2]; Prodyot Chatterjee[2]; Burton Rochelson[3]; Christine Metz[2]
[1]Rutgers Robert Wood Johnson Medical School, New Brunswick, New Jersey, Rutgers Robert Wood Johnson Medical School, NJ; [2]Feinstein Institutes for Medical Research, Manhasset, NY; [3]Northwell, New Hyde Park, NY

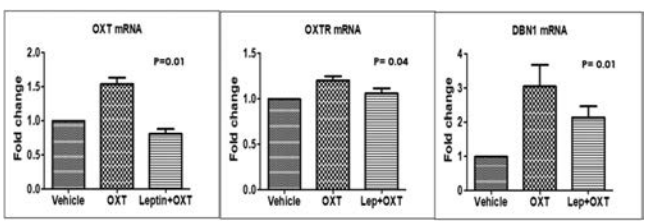
10:30 AM - 12:30 PM

Objective: Obesity is linked with poor labor progression and increased cesarean deliveries. Dysfunctional labor in the setting of obesity is hypothesized to result from reduced myometrial contractility. Leptin levels rise with obesity and are reported to inhibit spontaneous and oxytocin-induced myometrial contractility (Moynihan et al., 2006). However, the underlying biologic mechanisms by which leptin produces this effect is unknown. We investigated the effects of leptin on the expression of genes associated with uterine contractility in a myometrial cell line treated ±oxytocin.

Study Design: Immortalized human myometrial (PHM1-41) cells were treated with vehicle or leptin (1μM) for 24 hours. Cytotoxicity assays confirmed non-cytotoxicity of this dose. The expression of mRNAs encoding oxytocin (OXT), oxytocin receptor (OXTR) and gap junction-related Debrin-1 (DBN1) were analyzed by real time qRT-PCR. Cells pretreated with either vehicle or leptin (1μM) were subsequently exposed to oxytocin for 2 hours, and gene expression was re-assessed. Vehicle vs. leptin data were analyzed using unpaired t tests with Welch's correction and combination treatment data were analyzed using non-parametric Kruskal-Wallis test, followed by Dunn's multiple comparisons. $P< 0.05$ was considered significant.

Results: Leptin treatment alone did not alter OXT mRNA or OXTR mRNA expression but significantly increased DBN1 mRNA expression ($p = 0.04$). Oxytocin treatment increased OXT, OXTR and DBN1 mRNA expression compared to vehicle. Leptin significantly inhibited oxytocin-induced OXT mRNA expression ($p < 0.01$) and showed a non-significant trend towards reducing oxytocin-induced OXTR and DBN1 mRNA expression when compared to vehicle+oxytocin treated cells (Figure 1).

Conclusion: Leptin alone did not affect OXT or OXTR mRNA expression in human myometrial cells but suppressed oxytocin-induced contractility-related gene expression. These novel findings suggest leptin's role in modulating myometrial expression of contractility-related genes, offering insights into possible pathways contributing towards parturition dysfunction in obese individuals.



339 | Association Between Obstetric Care Provider Density and Maternal and Perinatal Outcomes: A Cross-Sectional Analysis

Rula Atwani; Lindsay S. Robbins; George R. Saade; Tetsuya Kawakita

Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA

10:30 AM - 12:30 PM

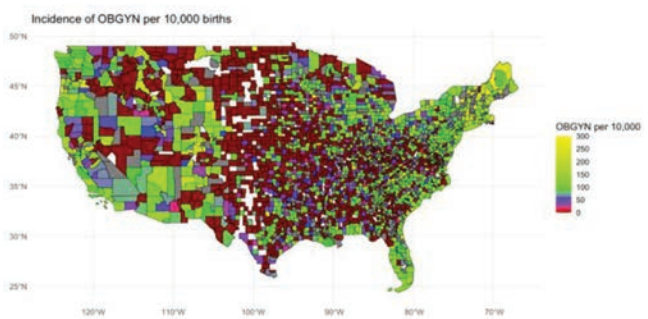
Objective: To examine the association between obstetric care provider density and maternal and perinatal outcomes at the county level.

Study Design: This was a cross-sectional analysis of publicly available Health Resources & Services Administration and limited-use county-level birth certificate data. The primary exposure was the number of obstetric care providers (obstetrician/gynecologist or midwives) per 10,000 births in the county, categorized according to the March of Dimes as full coverage (60 or more providers), moderate coverage (1-59 providers), and desert areas (no providers). Our primary outcome was maternal mortality during pregnancy and up to 42 days postpartum (deaths per 100,000 live births). Our secondary outcomes were maternal mortality up to 365 days post-delivery (deaths per 100,000 live births), stillbirth, preterm birth (PTB), and cesarean delivery (CD) rates. We calculated relative risks (RR) with 95% confidence intervals (95%CI) using Bayesian conditional autoregressive models with Poisson distribution, accounting for spatial autocorrelation and potential confounders.

Results: Of 14,802,676 births included in this analysis, 137,023 (0.9%) births were in desert counties, 1,131,211 (7.6%) births were in counties with moderate coverage and 13,534,442 (91.4%) births were in counties with full coverage (Figure 1). Compared with desert counties, moderate coverage counties had significantly lower maternal mortality up to 42 days postpartum and mortality up to 365 days post-delivery along with higher stillbirth, PTB, and CD rates. Compared with desert counties, full-coverage counties had significantly lower maternal mortality up to 42 days postpartum and mortality up to 365 days postpartum; along with higher stillbirth, PTB, and CD rates (Table 1).

Conclusion: Increased maternal mortality at the county level is associated with decreased obstetrical provider coverage, with counties that have no providers having the highest mortality rates despite having lower stillbirth, preterm birth, and cesarean rates.

Figure 1. Density of obstetrician/gynecologist or midwives per 10,000 live births.



OBGYN includes obstetricians, gynecologists, and midwives.

Colors indicate the density of OBGYN per 10,000 live births.

Table 1. Adjusted relative risks of primary and secondary outcomes per OBGYN category.

Outcome	Desert	Moderate	Full
Births	137,023	1,131,211	13,534,442
MMR[a] n (per 100,000)	170 (124.1)	272 (24.0)	4038 (29.8)
MMR aRR (95%CI)	Reference	0.32 (0.27; 0.41)	0.43 (0.35; 0.56)
MMR 1 yr[b] n (per 100,000)	238 (173.7)	381 (33.7)	5826 (43.0)
MMR 1 yr aRR (95%CI)	Reference	0.32 (0.26; 0.39)	0.42 (0.36; 0.51)
Stillbirth n (per 1,000)	1142 (8.3)	10368 (9.2)	164798 (12.2)
Stillbirth aRR (95%CI)	Reference	1.11 (1.09; 1.13)	1.16 (1.13; 1.19)
PTB n (%)	8616 (6.3)	103370 (9.1)	1,392,509 (10.3)
PTB aRR (95%CI)	Reference	1.41 (1.38; 1.43)	1.43 (1.42; 1.44)
CD n (%)	36327 (26.5)	349750 (30.9)	4,318,303 (31.9)
CD aRR (95%CI)	Reference	1.16 (1.15; 1.17)	1.19 (1.17; 1.20)

[a] Maternal mortality during pregnancy and up to 42 days postpartum

[b] Maternal mortality up to 365 days postpartum

All analyses adjusted for spatial autocorrelation, race, ethnicity, insurance, hypertension, and pregestational diabetes.

340 | Mid-trimester Cervical Length in Patients with a History-Indicated Cerclage and the Risk of Preterm Delivery

Rula Atwani; Rebecca Horgan; Jerri A. Waller; Mackenzi Mchugh; Tetsuya Kawakita; George R. Saade; Alfred Z. Abuhamad; Marwan Ma'Ayeh
Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA

10:30 AM - 12:30 PM

Objective: To investigate the predictive value of cervical length (CL) in patients with a history-indicated cerclage on preterm delivery (PTB) < 37 weeks.

Study Design: This was a retrospective cohort study of individuals who had history-indicated cerclage during pregnancy and who delivered at a tertiary referral center between 2014 and 2022. Individuals who did not have cervical length measurement post-cerclage were excluded. Post-cerclage CL was categorized into < 2.5 cm and ≥ 2.5 cm. The primary outcome was preterm birth (PTB) < 37 weeks. Secondary outcomes included PTB < 34 weeks, mode of delivery, chorioamnionitis, postpartum hemorrhage, transfusion, and endometritis. Categorical variables were compared using Chi-squared or Fisher's exact test. Continuous variables were tested for normality using the Shapiro-Wilk test and compared using Student's t-test or Mann-Whitney-U test as applicable.

Results: A total of 65 patients were included in the study, with 50 having a post-cerclage CL < 2.5 cm and 15 having a post-cerclage CL ≥ 2.5 cm. There was no significant difference in the rates of PTB < 37 weeks between the two groups (32%vs. 46.7%, p = 0.36). Similarly, there were no significant difference in the rates of PTB < 34 weeks (p = 0.08), mode of delivery (p = 1.00), postpartum hemorrhage (p = 0.71), transfusion (p = 1.00), or endometritis (p = 0.23). Significant differences were noted in rates of chorioamnionitis (94.00% for CL < 2.5 cm vs. 73.33% for CL ≥2.5 cm, p = 0.04) (Table 1).

Conclusion: Post-cerclage CL appears to have limited predictive value for PTB and other pregnancy outcomes in the setting of history indicated cerclage. Further research with larger sample sizes is needed to confirm these findings and explore potential clinical implications.

Table 1. Primary and secondary outcomes based on post- cerclage cervical length.

Outcome	Cervical Length < 2.5 cm (n=50)	Cervical Length ≥ 2.5 cm (n=15)	Total (n=65)	p-value
PTB < 37 weeks				0.361
No	34 (68.00%)	8 (53.33%)	42 (64.62%)	
Yes	16 (32.00%)	7 (46.67%)	23 (35.38%)	
PTB < 34 weeks				0.075
No	46 (92.00%)	11 (73.33%)	57 (87.69%)	
Yes	4 (8.00%)	4 (26.67%)	8 (12.31%)	
Mode of Delivery				1.000
Cesarean Section	24 (48.00%)	7 (46.67%)	31 (47.69%)	
Vaginal Delivery	26 (52.00%)	8 (53.33%)	34 (52.31%)	
Chorioamnionitis				0.044
No	47 (94.00%)	11 (73.33%)	58 (89.23%)	
Yes	3 (6.00%)	4 (26.67%)	7 (10.77%)	
Postpartum Hemorrhage				0.706
No	42 (84.00%)	12 (80.00%)	54 (83.08%)	
Yes	8 (16.00%)	3 (20.00%)	11 (16.92%)	
Transfusion				1.000
No	49 (98.00%)	15 (100.00%)	64 (98.46%)	
Yes	1 (2.00%)	0 (0.00%)	1 (1.54%)	
Endometritis				0.226
No	48 (96.00%)	13 (86.67%)	61 (93.85%)	
Yes	2 (4.00%)	2 (13.33%)	4 (6.15%)	
BMI at First Visit				0.652
Mean (SD)	33.85 (8.73)	33.02 (5.11)		
Maternal Age at Delivery				0.602
Mean (SD)	32.50 (5.74)	31.80 (4.07)		

341 | The Relationship Between In-Hospital Opioid use After Cesarean Delivery and Opioid use After Discharge

Ruth Landau; Uma M. Reddy; On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network
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10:30 AM - 12:30 PM

Objective: To evaluate opioid use after cesarean delivery (CD) and assess our hypothesis that no in-hospital opioid use is associated with no post-discharge opioid use, and to evaluate the association between no opioid use and post-discharge pain.

Study Design: Secondary analysis of a multicenter trial in patients who underwent CD at 31 U.S. hospitals (2020-22) and were randomized to individualized or fixed quantity of opioid tablets at discharge. The exposure was no in-hospital opioid use (morphine milligram equivalents [MME] = 0). Primary outcome was post-discharge MME = 0 up to 90 days. Secondary outcomes were moderate to severe pain (Brief Pain Inventory [BPI] score; BPI worst pain ^{3} 4 at 1-, 2- and 6-weeks post-discharge), opioid prescriptions filled, and refills within 90 days. MMEs included all routes of administration. Univariable modeling estimated the association between in-hospital MME = 0 and outpatient opioid use, as well as pain.

Results: Of 5515 eligible participants, in-hospital MME = 0 rate was 19% (N = 1023) and post-discharge MME = 0 rate was 34% (N = 1752). Overall, 710 of the 1,023 of the participants (76%) who did not use opioids in-hospital used none post-discharge, though 54% filled a prescription for opioids at or after discharge. In-hospital MME = 0 was associated with lower post-discharge opioid use, higher odds of MME = 0 (OR 9.8, CI 8.3, 11.5) and lower median MME dose (0 vs 7) (Table 1). With post-discharge MME = 0, the proportion of participants with moderate to severe pain was significantly lower at 1 week (42% vs. 70%), 2 weeks (20% vs. 38%), and 6 weeks (6% vs. 14%, all p < 0.001).

Conclusion: Consistent with our hypothesis, in-hospital opioid use was associated with post-discharge opioid use. Though one-third of participants did not use any opioids post-discharge, this was not associated with higher pain scores at any time point up to

90 days post-discharge. Further efforts are needed to align opioid prescriptions with actual post-discharge opioid use.

Table 1. In-hospital vs. post-discharge MME and opioid prescription

Outcome	In-hospital MME=0 (N= 1,023)	In-hospital MME > 0 (N= 4,492)	Unadjusted Odds Ratio (95% CI) or p-value
Post-discharge MME=0 – n (%)	710 (76.3)	1042 (24.8)	9.8 (8.3, 11.5)
Median post-discharge MME – median [IQR]	0 [0, 0]	7 [1,16]	<0.001
Filled opioid prescription at or after discharge – n (%)	521 (53.7)	3774 (86.2)	0.18 (0.16, 0.22)
Filled an opioid prescription post-discharge – n (%)	28 (2.9)	338 (7.7)	0.35 (0.24, 0.52)

MME, morphine milliequivalent;
In-hospital MME: any opioids, from surgery until discharge
Post-discharge MME: opioids used from discharge to 90 days post-discharge

342 | Factors Associated with no In-Hospital Opioid use After Cesarean Delivery

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10:30 AM - 12:30 PM

Objective: Improving pain trajectories after cesarean delivery (CD) with minimal to no opioid use is a challenging goal: opioid reduction may result in uncontrolled pain, yet in-hospital opioid use may be associated with persistent opioid use after discharge. Our objective was to evaluate factors associated with opioid use after CD, with 2 aims: characterize patients with no in-hospital opioid use after CD, and identify pre/peri-delivery factors associated with no opioid use.

Study Design: Secondary analysis of a controlled trial in patients who underwent CD at 31 U.S. hospitals (2020-22) and were randomized to individualized or fixed quantity of opioid tablets at discharge. For this analysis, participants were categorized into one of 2 groups based on opioid use (morphine milligram equivalents [MME]), with MME = 0 indicating no in-hospital opioid use. Secondary outcomes were worst pain on the (Brief Pain Inventory [BPI] score) and Pain Catastrophizing Score (PCS) assessed within 24 hours of discharge. Univariable and multivariable logistic regression analyses with backward selection were performed to identify factors associated with no in-hospital opioid use.

Results: Of 5515 eligible participants, 1023 (19%) had MME = 0. On multivariable analysis, Black race, government insurance, anxiety/depression, and preterm birth were associated with decreased odds for MME = 0 (Table 1). In contrast, Hispanic ethnicity, spinal or combined spinal-epidural (CSE) anesthesia, and neuraxial morphine administration were associated with increased odds for MME = 0. Participants with BPI ^{3} 4 or PCS $\geq$ 13 were more likely to use opioids (Table 2).

Conclusion: Patient-specific factors, including anxiety/depression and preterm birth were associated with increased in-hospital opioid use after CD, while anesthesia technique (spinal and CSE) and neuraxial morphine administration were associated with reduced opioid use. No opioid use was not associated with higher in-hospital pain scores or pain catastrophizing.

Table 1. Patient, obstetric, and anesthesia-related factors associated with no in-hospital opioid use (MME=0) after cesarean delivery

	MME=0 N (%)	p-value*	Adjusted OR (95% CI) (MME=0) **
Patient/demographic factors			
Treatment Group		0.86	
IOPP group	512/2746 (18.7)		
Fixed	511/2769 (18.5)		
Race/Ethnicity		<0.001	
Hispanic	300/1162 (25.8)		**0.53 (0.44, 0.64)**
Non-Hispanic Black	141/1504 (9.4)		**1.37 (1.11, 1.70)**
Non-Hispanic White	470/2351 (20.0)		
Other/not reported	112/498 (22.5)		
Insurance		<0.001	
Government	380/2475 (15.4)		**0.61 (0.51, 0.73)**
Self-pay/uninsured	18/78 (23.1)		
Private insurance	622/2957 (21.0)		
Depression or Anxiety		<0.001	
Yes	297/2176 (13.7)		**0.58 (0.50, 0.68)**
No	726/3336 (21.8)		
Obstetric factors			
Preterm birth		<0.001	
Yes	132/1054 (12.5)		**0.55 (0.44, 0.69)**
No	891/4461 (20.0)		
Anesthesia factors #			
Spinal		<0.001	
Yes	556/2702 (20.6)		**1.49 (1.23,1.79)**
No	467/2813 (16.6)		
Combined spinal-epidural (CSE)		0.004	
Yes	220/1013 (21.7)		**1.71 (1.36, 2.15)**
No	803/4502 (17.8)		
Neuraxial preservative-free morphine		<0.001	
Yes	726/3628 (20.0)		**1.35 (1.14, 1.61)**
No	297/1887 (15.7)		

*p-value from chi-square test comparing factors to no in-hospital opioid use (MME=0)
**Adjusted OR from a multivariate logistic regression model including all of the factors in this column and with the outcome of no in-hospital opioid use (MME=0).
Sum of anesthetic is higher than total of participants, because some patients received more than one anesthetic (e.g., general anesthesia might occur in addition to spinal/epidural/CSE).
General anesthesia, epidural anesthesia and opioids given intraoperatively were not associated with a reduction in aOR for MME=0

Table 2. Relationship between baseline pain and inpatient MME use

	MME > 0 Inpatient (N=4488)	MME=0 Inpatient (N=1023)	Unadjusted OR (95% CI)	Adjusted* OR (95% CI)
Worst BPI				
≥ 4	4217 (85.3)	728 (14.7)	6.3 (5.3, 7.6)	6.7 (5.4, 8.3)
< 4	271 (47.9)	295 (52.1)		
Pain catastrophizing score				
Median (IQR)	8 [4,13]	5 [2,9]		
≥ 13	1172 (89.3)	140 (10.7)	2.2 (1.8, 2.7)	2.1 (1.7, 2.7)
< 13	3314 (79.0)	883 (21.0)		

*Adjusted models included black race, Hispanic ethnicity, government insurance, anxiety or depression, spinal or combined spinal anesthesia, and neuraxial morphine administration, and preterm birth.
BPI and PCS were assessed within 24 hours of discharge from the hospital

343 | Cost Effectiveness of Zuranolone for Treatment of Postpartum Depression

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10:30 AM - 12:30 PM

Objective: Zuranolone is a novel GABA-A agonist approved to treat postpartum depression (PPD), however its cost effectiveness (CE) is unknown. We sought to estimate the CE of Zuranolone for PPD treatment when compared to selective serotonin receptor inhibitors (SSRIs).

Study Design: We constructed a decision-analytic model to estimate the CE of treating postpartum depression with Zuranolone as compared to SSRIs and placebo over one year among a cohort of 10,000 postpartum individuals with depression from a perspective of a third-party payer. The direct medical costs of PPD and medication-related costs over one year were gathered from existing literature and incorporated into the model. We defined effectiveness in two ways: treatment response defined

as >50% decrease in symptoms from baseline and remission of PPD. Using first order Monte Carlo simulations, we calculated the incremental cost-effectiveness ratio (ICER). We also explored parameter uncertainty with probabilistic sensitivity analyses.

Results: Across the hypothetical cohort, SSRIs returned the lowest average cost for both effectiveness outcomes (response: $18880; remission: $18876) across the three strategies. The proportion of the cohort experiencing treatment response and remission in the SSRI group were 0.33 and 0.15, respectively. Zuranolone showed the highest average cost across both outcomes (response: $33986; remission: $15085) but also yielded the highest effectiveness (response: 0.72; remission: 0.37). The ICER of Zuranolone compared to SSRIs was $105635 for treatment response and $271799 for remission. The probabilistic sensitivity analysis showed that Zuranolone was the preferred strategy at willingness-to-pay thresholds at or above approximately $105000 for treatment response whereas SSRIs were the preferred strategy across all explored thresholds.

Conclusion: Zuranolone is cost effective for treatment response of PPD when compared to SSRIs, however it is not cost effective at the given thresholds for full remission

344 | Impact of Comorbid Chronic Hypertension on Perinatal Outcomes among Pregnant Persons with Pregestational Diabetes

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10:30 AM - 12:30 PM

Objective: Pregnant persons with either pregestational diabetes (DM) or chronic hypertension (cHTN) are at increased risk for adverse outcomes; however, the additive effect of comorbid cHTN among patients with DM is not well studied in contemporary cohorts. Our objective was to quantify the association between DM+cHTN and adverse outcomes, compared to DM only.

Study Design: Retrospective cohort study of pregnant persons with pregestational DM who delivered a non-anomalous singleton or twin gestation ≥22 weeks' at a tertiary care center (2012-2023). The primary outcome was a composite of neonatal morbidity and mortality (Table). Secondary outcomes included composite components and other pregnancy outcomes. Baseline characteristics and outcomes were compared between persons with DM+cHTN vs DM only. Multivariable logistic regression estimated the association between DM+cHTN and outcomes, adjusting for covariates that differed between groups. Results were stratified by DM type when there was evidence of interaction.

Results: Of 1,656 neonates, 498 (30.1%) were born to persons with DM+cHTN and 1158 (69.9%) with DM only. DM+cHTN was associated with higher odds of composite neonatal morbidity and mortality (65.3% vs 58.5%; aOR 1.88, 95% CI 1.33-2.67) compared with DM only. Among the composite components, DM+cHTN was associated with higher odds of hyperbilirubinemia, IVH, and perinatal death (Table). DM+cHTN was also associated with higher odds of preterm birth (PTB), NICU admission, and preeclampsia (PreE). The association between DM+cHTN and PTB and PreE was only significant for those with T2D (Figure).

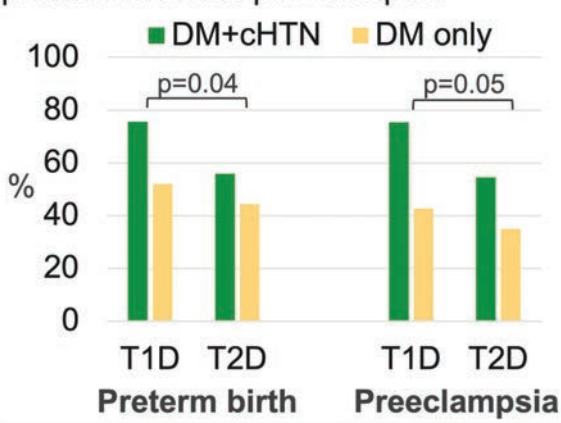
Conclusion: Preconception and early pregnancy counseling for pregnant persons with DM and comorbid cHTN should emphasize the nearly two- to three-fold higher risk of adverse outcomes including composite neonatal morbidity/mortality, hyperbilirubinemia, IVH, perinatal death, PTB, NICU admission, and PreE, compared to DM alone. Future studies should focus on interventions that improve outcomes for this particularly high-risk population as 2 out of 3 persons with DM+cHTN experienced neonatal morbidity and mortality.

Table. Association between diabetes with comorbid chronic hypertension and perinatal outcomes, compared to diabetes only

	DM & cHTN (n=498)	DM only (n=1158)	aOR (95% CI)
Neonatal morbidity composite	325 (65.3)	677 (58.5)	1.88 (1.33-2.67)
Hypoglycemia	167 (35.9)	375 (34.2)	1.17 (0.83-1.67)
Hyperbilirubinemia	189 (40.0)	386 (34.0)	1.80 (1.24-2.62)
Mechanical ventilation	42 (8.5)	91 (7.9)	1.82 (0.90-3.69)
NEC	7 (1.4)	19 (1.6)	1.07 (0.20-5.78)
IVH	34 (6.8)	55 (4.8)	4.68 (1.93-11.35)
Sepsis	12 (2.4)	25 (2.2)	1.38 (0.39-4.88)
Fetal/neonatal death	32 (6.5)	38 (3.5)	2.93 (1.33-6.48)
NICU admission	335 (70.8)	668 (58.8)	2.02 (1.43-2.87)
SGA	70 (14.3)	99 (8.7)	1.71 (0.97-3.00)
LGA	90 (18.4)	319 (28.1)	1.07 (0.71-1.63)
Preeclampsia	287 (57.6)	437 (37.7)	1.89 (1.34-2.66)
Cesarean section	317 (63.4)	572 (51.3)	1.14 (0.81-1.58)
Preterm birth	281 (57.9)	421 (37.6)	2.00 (1.42-2.83)

*Adjusted for maternal age, race/ethnicity, marital status, nulliparity, pre-pregnancy BMI, cardiac disease, chronic kidney disease, tobacco use, aspirin use, diabetes type, insulin use, metformin use, gestational age at 1st clinical visit, gestational weight gain, last HbA1C prior to delivery, and year of delivery

Figure. Interaction between comorbid cHTN and DM type with relation to preterm birth and preeclampsia



	DM+cHTN aOR (95% CI)
Preterm birth	
Type 1 diabetes	2.20 (0.99-4.89)
Type 2 diabetes	**1.93 (1.32-2.82)**
Preeclampsia	
Type 1 diabetes	2.32 (0.99-5.43)
Type 2 diabetes	**1.84 (1.25-2.69)**

345 | Small for Gestational Age Neonates and Neonatal Adverse Outcomes Among Pregnant Persons with Pregestational Diabetes

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10:30 AM - 12:30 PM

Objective: Pregnant persons with pregestational diabetes are at increased risk for having SGA infants; however, this is often overlooked compared to the risk of LGA. Additionally, the risk of adverse outcomes is typically generalized for all pregestational diabetes. We aimed to evaluate the risk of SGA and other adverse outcomes among persons with type 2 diabetes (T2D) versus type 1 diabetes (T1D). Additionally, we aimed to identify risk factors for SGA.

Study Design: Retrospective cohort study of pregnant persons with T2D or T1D who delivered at a tertiary care center (2012-2023). Persons with fetal anomalies, delivery < 22 weeks' gestation, multiple gestation, and missing birthweight or diabetes type were excluded. The primary outcome was SGA, defined as birthweight < 10th percentile for gestational age. Secondary outcomes included composite neonatal morbidity/mortality and other adverse outcomes (Table). Baseline characteristics and outcomes were compared between T2D and T1D. Multivariable logistic regression estimated the association between T2D and outcomes, adjusting for covariates that differed between groups. Multivariable regression with step-wise backward selection was used to identify factors associated with SGA.

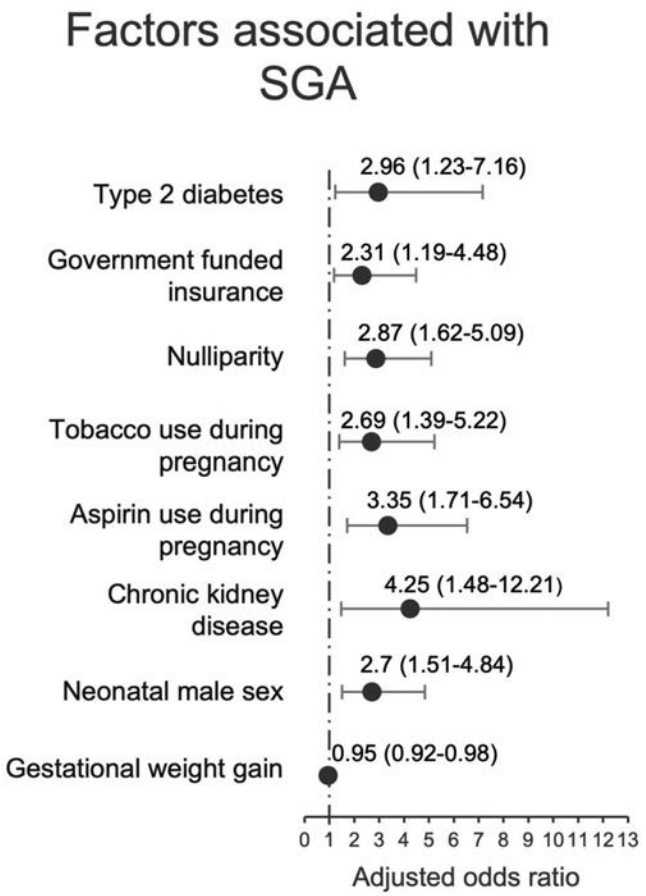
Results: Of 1,255 persons included, 872 (69.5%) had T2D and 383 (30.5%) had T1D. Pregnant persons with T2D differed from those with T1D by multiple sociodemographic and medical factors. SGA was more common with T2D (12.2%, vs 4.7%; aOR 3.48, 95% CI 1.48-8.34) compared with T1D. Secondary neonatal outcomes were similar between groups, but preeclampsia was more common with T1D (Table). Factors associated with higher odds of SGA were T2D, government insurance, nulliparity, tobacco use, aspirin use, chronic kidney disease, neonatal male sex, and less gestational weight gain (Figure).

Conclusion: In this cohort, pregnant persons with T2D were 3.5 times more likely to have an SGA infant than those with T1D. Pregnant persons with T2D and other risk factors such as tobacco use and chronic kidney disease among others, should be specifically counseled about the risk of SGA and monitored closely.

Table. Association of diabetes type with adverse outcomes

	Type 2 Diabetes (n=872)	Type 1 Diabetes (n=383)	aOR (95% CI)*
SGA	106 (12.2)	18 (4.7)	3.48 (1.45-8.34)
LGA	178 (20.4)	139 (36.3)	0.61 (0.36-1.05)
Composite neonatal morbidity and mortality	502 (57.6)	279 (72.9)	0.73 (0.45-1.17)
Hypoglycemia	280 (33.0)	165 (44.0)	0.64 (0.40-1.02)
Hyperbilirubinemia	294 (34.7)	166 (44.3)	0.94 (0.57-1.54)
Mechanical ventilation	55 (6.3)	33 (8.6)	0.67 (0.26-1.77)
NEC	9 (1.0)	5 (1.3)	3.68 (0.22-61.9)
IVH	47 (5.4)	28 (7.3)	0.37 (0.13-1.04)
Sepsis	10 (1.2)	7 (1.8)	0.58 (0.10-3.35)
Perinatal death	33 (3.8)	11 (2.9)	3.45 (0.96-12.4)
NICU admission	519 (61.2)	249 (66.4)	0.91 (0.54-1.55)
Preeclampsia	432 (49.5)	207 (54.1)	0.60 (0.38-0.96)
Cesarean delivery	535 (61.4)	231 (60.5)	0.88 (0.53-1.46)
Preterm birth	408 (46.8)	203 (53.0)	0.72 (0.44-1.17)

*Adjusted for maternal age, race/ethnicity, government funded insurance, marital status, nulliparity, pre-pregnancy BMI and HbA1c, cHTN, chronic kidney disease, insulin and metformin use, gestational weight gain and HbA1c before delivery



346 | Effects of Antiretroviral Therapy on Fetal Biometric Measurements and Neonatal Weight

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10:30 AM - 12:30 PM

Objective: Several types of antiretroviral therapy used in the treatment of HIV, such as integrase inhibitors, have been linked to increased risk of metabolic syndrome in adults. This study assessed if these antiretroviral medications that cause metabolic syndrome in adults have similar effects on fetal weight and abdominal circumference when taken by HIV patients during pregnancy.

Study Design: Retrospective cohort study of HIV-positive pregnant patients at a single academic institution in New York City who delivered from 2014-2023. Patients were included if they had at least one ultrasound assessing fetal growth. Demographics, medical co-morbidities, antiretroviral medications, intrapartum complications, and birthweight were extracted from the electronic medical record. We extracted estimated fetal weight and abdominal circumference from the last ultrasound for each pregnancy. Bivariate analysis was performed to assess the difference between neonatal birthweight and estimated fetal abdominal circumference between those on antiretroviral therapy associated with metabolic syndrome (integrase inhibitors) and those on other antiretrovirals.

Results: Among 155 patients meeting inclusion criteria, 106 (68%) were taking integrase inhibitors and 49 (32%) were on other antiretrovirals. There was no significant difference in neonatal birthweight (p = 0.3), birthweight percentile (p = 0.4), or sonographic estimate of fetal abdominal circumference percentile (p = 0.57, Table 1) despite increased rates of gestational diabetes and obesity. Additionally, there were no significant differences in obstetric outcomes associated with macrosomia, including postpartum hemorrhage or cesarean delivery for labor abnormalities.

Conclusion: Although specific antiretroviral medications are associated with metabolic syndrome in adults, these regimens do not appear to be associated with increased birthweight or abnormal fetal biometric measurements, such as elevated abdominal circumference, when taken in pregnancy. Further examination among larger datasets is needed, as well as comparison with HIV negative patients.

Table 1	Integrase Inhibitor	Other Antiretroviral Medication	
	106	49	
Characteristic	Mean (SD)	Mean (SD)	*p*
Maternal Age, years	30.9 (5.6)	31.8 (6.5)	0.38
Gestational Weight Gain, pounds	20.7 (15.3)	21.7 (11.4)	0.71
	N (%)	N (%)	*p*
Maternal BMI			0.04
< 25.0	31 (29.2)	25 (51.0)	
25 - 30	28 (26.4)	9 (18.4)	
30 - 35	25 (23.6)	6 (12.2)	
> 35	20 (18.9)	8 (16.3)	
Pre-gestational Diabetes	2 (1.9)	0 (0.0)	0.84
Gestational Diabetes	9 (8.5)	1 (2.0)	0.02
Hypertensive Disorders of Pregnancy	18 (17.0)	5 (10.2)	0.39

Table 2	Integrase Inhibitor	Other Antiretroviral Medication	
	106	49	
Characteristic	Mean (S)	Mean (SD)	*p*
Gestational Age at Delivery, weeks	38.2 (4.0)	38.6 (2.3)	0.52
Birthweight, grams	2928.6 (622.2)	3040.7 (628.6)	0.3
Birthweight, percentile	36.9 (25.6)	40.6 (25.5)	0.4
Fetal Abdominal Circumference, percentile	49.4 (3.0)	52.4 (3.9)	0.57
	N (%)	N (%)	*p*
Postpartum Hemorrhage	8 (7.5)	7 (14.3)	0.29
Mode of Delivery			< 0.01
Spontaneous Vaginal Delivery	64 (60.3)	17 (34.7)	
Operative Vaginal Delivery	1 (1.0)	1 (2.0)	
Cesarean Delivery	41 (38.7)	31 (63.2)	
Indication: Labor Abnormalities	3 (7.3)	4 (12.9)	0.7
Indication: Reduced Viral Transmission	8 (19.5)	5 (16.1)	0.95
Indication: NRFHT	5 (12.2)	6 (19.4)	0.61
Indication: Malpresentation	5 (12.2)	2 (6.5)	0.68
Indication: Elective or Repeat	14 (34.1)	12 (38.7)	0.88

347 | Probiotics Perinatal Vertical Transmission from Mother to Neonate

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10:30 AM - 12:30 PM

Objective: Probiotics given to preterm babies can reduce the risk of perinatal complications such as necrotising enterocolitis. The primary objective was to determine if *in utero* vertical probiotics transmission is possible.

Study Design: A randomized double-blinded crossover pilot study was proposed to women aged 18-42 years, with a single pregnancy, considered at low risk. Probiotics (powder for dilution) containing 5 bacterial strains (FlorababyÒ) vs Placebo were offered. At 32-33 weeks of gestation (WG), women were randomized in: Group A: probiotics from the 34 WG until delivery and placebo from delivery to 10 days post-partum (D PP) or group B: placebo from the 34 WG until delivery then probiotics from delivery to 10D PP. All women completed questionnaires and a logbook to assess compliance and side effects. Samples were collected at baseline and at 37 WG (stools, vaginal secretions), at birth (meconium, colostrum) and at 10D PP (maternal stools, breastmilk, neonate stools). Detection of the probiotic strains was performed using single nucleotide variants method to confirm engraftment.

Results: 52 women were recruited and 45 of them were analysed. There were no statistical differences between groups' characteristics at baseline. All mothers (100%) were breastfeeding from delivery to 10D PP. Probiotic strains in mother's stools were detected in 91% of cases at 37 WG (group A) and 87% of cases at 10D PP (group B)). Strains were only marginally detected in the vaginal samples. No probiotic strains were detected in meconium or colostrum (group A). Only one strain was found in 2 samples of breastmilk at 10D PP (group B). In the babies' stools at 10D PP, probiotics were detected in 17% (group A) and 61% (group B) respectively. The *B. Infantis* strain HA116 was the most detected

strain in babies' stools. No severe adverse events were reported during the study.
Conclusion: Vertical transmission was evidenced by the presence of probiotic strains in babies' stools to a greater extent in the neonatal period than in the ante-natal period. However, probiotic strains were not detected in meconium or breastmilk.

348 | Comparing Perinatal Outcomes in Gestational and Cystic Fibrosis Related Diabetes

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10:30 AM - 12:30 PM
Objective: Gestational Diabetes (GDM) and pre-existing cystic fibrosis-related diabetes (CFRD) impact 18-62% of pregnancies in individuals with cystic fibrosis (CF). While GDM and CFRD can alter maternal metabolism and contribute to hyperglycemia, it is unknown if there are specific differences in clinical outcomes related to GDM compared to CFRD.
Study Design: This is a retrospective cohort study from 2011-2023 of all singleton, non-anomalous pregnancies affected by cystic fibrosis within a multi-institution health system obstetric outcome database. Individuals with CFRD were diagnosed prior to pregnancy, and GDM was diagnosed by glucose tolerance testing during the second or third trimester in those without evidence of CFRD before pregnancy. Metabolic, pregnancy, and neonatal outcomes between individuals with CFRD and GDM were statistically compared using Wilcoxon rank-sum tests or Fisher's exact test as indicated.
Results: 31 individuals with CF were identified: 16 with CFRD, 6 with GDM, and 9 without diabetes. While no one with GDM required insulin, those with CFRD used 15 units (range 5.9, 31.9) of insulin daily in the third trimester, with an average increase of 0.5 units from pre-pregnancy dosing. As expected, those with CFRD had higher median hemoglobin A1c (HbA1c) compared to those with GDM during preconception (6.3 vs. 5.3, $p = 0.005$), 3rd trimester (6.0 vs. 5.1, $p = 0.033$), as well as postpartum (6.2 vs. 5.7, $p = 0.047$). HbA1c decreased 0.4% for GDM and 0.7% for CFRD throughout gestation. No differences in pregnancy-induced hypertensive disorders or gestational age at birth were observed. Additionally, there were no significant differences in median birth weights, rates of large for gestational-age neonates, or neonatal hypoglycemia.
Conclusion: We find that individuals with CFRD have higher insulin needs and HbA1c than those with GDM though both groups have similar maternal and neonatal outcomes.

349 | Impact of CFTR Modulators for Cystic Fibrosis on Perinatal Outcomes

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10:30 AM - 12:30 PM
Objective: Pregnancy in individuals with cystic fibrosis (CF) has been associated with acute deterioration of pulmonary function, leading to higher perinatal morbidity and mortality. Combination cystic fibrosis transmembrane conductance regulator (CFTR) modulators have been shown to improve outcomes in non-pregnant patients, but data on their use in pregnancy are limited. Here, we examine the CFTR modulator, Trikafta (Elexacaftor/Tezacaftor/Ivacaftor), and its impact on perinatal outcomes.
Study Design: In a retrospective cohort study, we identified individuals with CF and singleton, non-anomalous pregnancies within a multi-institution health system obstetric outcomes database between 2011-2023. We compared maternal and neonatal outcomes by perinatal Trikafta exposure using the Wilcoxon rank-sum test and Fisher's exact test as indicated.
Results: 31 individuals with CF were identified, including 10 with Trikafta exposure in pregnancy. Baseline characteristics were similar between the two groups. There was no difference in the development of pregnancy complications such as diabetes or hypertensive disorders of pregnancy. Although there was no identified difference in acute pulmonary exacerbations, there was a trend toward improved FEV (Forced Expiratory Volume) during the third trimester in the Trikafta-exposed group. The Trikafta-exposed had a 5% improvement in FEV from their pre-pregnancy baseline to the third trimester, while the non-exposed had a 2% *decline* in FEV during the same time interval ($p = 0.10$). Trikafta-exposed had a higher third trimester weight (75 kg vs. 64 kg, $p = 0.03$) and experienced increased weight gain from pre-pregnancy to the third trimester than the non-exposed (13 kg vs. 9 kg, $p = 0.06$). These results suggest that Trikafta may improve pulmonary function and nutritional status in pregnancy. There was no significant difference in gestational age at birth, birth weight, or NICU admission between groups.
Conclusion: The use of Trikafta in pregnancy tends to improve respiratory function and maternal weight gain without clearly increasing maternal or neonatal complications.

350 | Methamphetamine use and Mental Health Disorders: What are the Effects on Maternal and Neonatal Outcomes?

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10:30 AM - 12:30 PM
Objective: The objective of this study is to examine the association of methamphetamine use and mental health disorders with perinatal outcomes.
Study Design: This is a retrospective cohort study using California linked vital statistics and hospital discharge data from 2008 to 2020. We included singleton, non-anomalous gestations delivered between 23 and 42 weeks and excluded polysubstance use. Methamphetamine use and mental health disorders (depression, anxiety, bipolar disorder, schizophrenia) were identified using ICD-9 and ICD-10 codes. Chi-square tests and multivariable Poisson regression models were used.
Results: 4,602,896 individuals were included, 0.34% had methamphetamine use, 2.79% had mental health disorders,

and 0.04% had both methamphetamine use and mental health disorders. Compared to individuals without methamphetamine use or a mental health disorder, individuals with both methamphetamine use and a mental health disorder had significantly higher risk of all maternal outcomes, including non-severe hypertensive disorders (8.4% vs 4.7%; aRR = 1.93; 95% CI 1.67, 2.22) and cardiovascular morbidity (1.8% vs 0.3%; aRR = 4.09; 95% CI 2.82, 5.93). The increased risk of these outcomes however, was similar to individuals with methamphetamine use alone. Likewise, individuals with both methamphetamine use and a mental health disorder had a higher risk of all neonatal outcomes, including preterm birth < 37 weeks (17.8% vs 6.1%; aRR = 2.29; 95% CI 2.08, 2.54) and infant death (0.8% vs 0.2%; aRR = 3.43; 95% CI 2.03, 5.81). While this risk was increased compared to individuals with mental health disorders alone, the risk of adverse neonatal outcomes was similar or decreased compared to individuals with methamphetamine use alone.

Conclusion: Individuals with methamphetamine use and mental health disorders have increased risk of maternal and neonatal morbidity. The occurrence of both of these risk factors for adverse outcomes however did not appear to be synergistic.

Table 1: Comparison of maternal and neonatal outcomes among pregnant individuals with and without methamphetamine use and/or mental health disorders (2008-2020)

	No methamphetamine use or mental health disorders	Methamphetamine use	Mental health disorders	Methamphetamine use and mental health disorders	p-value*
	n=4,457,231 (96.84%)	n=15,483 (0.34%)	n=128,238 (2.79%)	n=1,984 (0.04%)	
Maternal outcomes					
Non-severe hypertensive disorder	207,907 (4.7%)	1,175 (7.6%)	10,423 (8.1%)	166 (8.4%)	<0.001
Preeclampsia with severe features	49,814 (1.1%)	587 (3.8%)	2,853 (2.2%)	65 (3.3%)	<0.001
Placental abruption	41,662 (0.9%)	622 (4.0%)	1,496 (1.2%)	49 (2.5%)	<0.001
Cardiovascular morbidity**	12,249 (0.3%)	183 (1.2%)	1,482 (1.2%)	36 (1.8%)	<0.001
Severe maternal morbidity	49,394 (1.1%)	688 (4.5%)	2,551 (2.0%)	82 (4.1%)	<0.001
Neonatal outcomes					
Preterm birth (<37 weeks)	273,739 (6.1%)	3,345 (21.7%)	10,968 (8.6%)	354 (17.8%)	<0.001
Preterm birth (<32 weeks)	25,788 (0.6%)	485 (3.1%)	1,202 (0.9%)	47 (2.4%)	<0.001
NICU admission	409,871 (9.2%)	4,184 (27.1%)	13,087 (10.2%)	481 (24.2%)	<0.001
Hypoglycemia	64,530 (1.4%)	423 (2.7%)	3,658 (2.9%)	74 (3.7%)	<0.001
Respiratory distress syndrome	91,499 (2.1%)	861 (5.6%)	5,797 (4.5%)	128 (6.5%)	<0.001
Small for gestational age	378,089 (8.5%)	1,790 (11.6%)	10,086 (7.9%)	232 (11.7%)	<0.001
Infant death	7,623 (0.2%)	115 (0.7%)	333 (0.3%)	16 (0.8%)	0.785

* Chi-square test
** Cardiovascular morbidity is a composite outcome of stroke, myocardial infarction, pulmonary edema, peripartum cardiomyopathy, and venous thromboembolism

Table 2: Multivariable Poisson regression analyses showing adjusted risk ratios (aRR) of perinatal outcomes among individuals with methamphetamine use and/or mental health disorders in California (2008-2020)

	No methamphetamine use or mental health disorders	Methamphetamine use	Mental health disorders	Methamphetamine use and mental health disorders
Maternal outcomes				
Non-severe hypertensive disorder	Reference*	1.94 (1.83-2.05)	1.48 (1.45-1.51)	1.93 (1.67-2.22)
Preeclampsia with severe features	Reference*	3.97 (3.56-4.22)	1.84 (1.77-1.92)	3.09 (2.42-3.97)
Placental abruption	Reference*	3.97 (3.65-4.32)	1.25 (1.19-1.32)	2.40 (1.79-3.22)
Cardiovascular morbidity**	Reference*	4.13 (3.54-4.83)	3.19 (3.01-3.38)	4.09 (2.82-5.93)
Severe maternal morbidity	Reference*	3.70 (3.42-4.01)	1.75 (1.68-1.82)	2.99 (2.37-3.78)
Neonatal outcomes				
Preterm birth <37 weeks	Reference*	3.05 (2.95-3.15)	1.31 (1.29-1.34)	2.29 (2.08-2.54)
Preterm birth <32 weeks	Reference*	4.32 (3.91-4.77)	1.48 (1.39-1.57)	2.74 (2.31-3.24)
NICU admission	Reference*	2.59 (2.52-2.66)	1.12 (1.10-1.14)	2.21 (2.04-2.40)
Hypoglycemia	Reference*	1.99 (1.79-2.20)	1.63 (1.59-1.71)	2.29 (1.81-2.90)
Respiratory distress syndrome	Reference*	2.60 (2.42-2.79)	1.96 (1.91-1.91)	2.51 (2.10-2.99)
Small for gestational age	Reference*	1.41 (1.34-1.47)	1.01 (0.99-1.03)	1.36 (1.19-1.54)
Infant death	Reference*	3.42 (2.79-4.17)	1.50 (1.34-1.68)	3.43 (2.03-5.81)

*Adjusted for race/ethnicity, age, education, BMI, insurance, parity, alcohol use, nicotine use, mental health disorder, chronic hypertension, and preexisting diabetes
** Cardiovascular morbidity is a composite outcome of stroke, myocardial infarction, pulmonary edema, peripartum cardiomyopathy, and venous thromboembolism

351 | Association of Cord Serum Insulin-like Growth Factor-1 and Fetal Fractional Limb Volume

Satoru Ikenoue[1]; Junko Tamai[1]; Keisuke Akita[1]; Naotsugu Ishikawa[1]; Yasuhiko Ogata[1]; Kaoru Kajikawa[1]; Yuka Fukuma[1]; Yuya Tanaka[1]; Toshimitsu Otani[2]; Yoshifumi Kasuga[1]; Mamoru Tanaka[1]
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10:30 AM - 12:30 PM

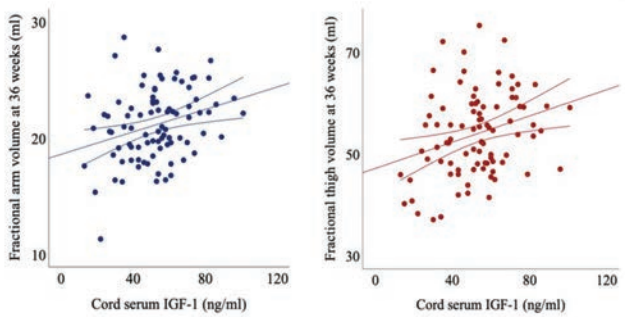
Objective: Insulin-like growth factor-1 (IGF-1) is one of the growth factors that promote protein and carbohydrate metabolism, and consequently affects birth weight. Fetal fractional limb volume has been proposed as a useful parameter for predicting birth weight and quantifying fetal soft tissue development. However, the association between umbilical cord serum IGF-1 level and fetal fractional limb volume remains unclear. This study aimed to investigate the association between cord serum IGF-1 level with longitudinal change of fetal fractional limb volume in uncomplicated pregnancies.

Study Design: A prospective study was conducted in a cohort of 91 singleton pregnancies. Fetal ultrasonography was performed at 24, 30, and 36 weeks' gestation. Fractional arm volume and thigh volume were assessed as cylindrical limb volumes based on 50% of the fetal total diaphysis length using 3D ultrasonography. Cord serum IGF-1 level was measured using Electrochemiluminescence immunoassay.

The association between cord blood IGF-1 level and fetal fractional limb volume was determined by multiple linear regression adjusted for potential confounding factors including maternal age, parity, pre-pregnancy body mass index, gestational weight gain, fetal sex, and gestational age at assessments.

Results: Cord serum IGF-1 was 52.8 ± 18.4 ng/ml (mean ± S.D.). IGF-1 was not associated with fetal fractional limb volume at 24 and 30 weeks. IGF-1 significantly correlated with fractional arm volume ($r = 0.290$, $p = 0.006$) and fractional thigh volume ($r = 0.289$, $p = 0.006$) at 36 weeks. After accounting for the effects of covariates, cord serum IGF-1 explained 8.0% and 10.0% of the variation in fractional arm volume and fractional thigh volume at 36 weeks, respectively.

Conclusion: Cord serum IGF-1 level significantly correlated with fetal fractional limb volume in late gestation. IGF-1 could be one of the serum markers for predicting fetal growth and soft tissue development in late gestation.



352 | Disparities in Non-Invasive Prenatal Testing (NIPT) in the Medicaid and Private Insurance Populations

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10:30 AM - 12:30 PM

Objective: Effective screening involves not only the test's availability but also its timing and the coordination of follow-up care. We evaluated the use of NIPT in patients with Medicaid versus private insurance to identify disparities in screening practices.

Study Design: This is a retrospective cohort study of those with abnormal NIPT who underwent diagnostic testing from 2015-2022. We recorded demographic information, NIPT abnormality, type of invasive testing (CVS vs amniocentesis) and pregnancy outcomes. We excluded low fetal fraction results on NIPT. We compared gestational ages at first prenatal visit, NIPT, genetic counseling, invasive testing and abortion between the Medicaid and private insurance populations. Wilcoxon rank sum test was used to compare continuous data. Fisher's exact test and Pearson's Chi-squared test were used for categorical comparisons.

Results: We identified 206 patients with abnormal NIPT, including 179 with private insurance and 27 with Medicaid. Results are in Table 1. Medicaid patients initiated prenatal care and underwent NIPT at later gestational ages and were less likely to have CVS than private insurance patients. Invasive testing had similar normal result rates and distribution of abnormalities. Abortion rates were comparable; however, Medicaid patients underwent abortion at later gestational ages. Intervals between NIPT, disclosure of results, invasive testing, and abortion are in Table 2. While Medicaid patients underwent NIPT at a later gestational age, there were no significant differences in the intervals for post-NIPT care between the groups.

Conclusion: In patients with abnormal NIPT, those with Medicaid underwent screening, prenatal diagnosis, and abortion at later gestational ages. These disparities appear to arise from the later gestational age at first prenatal visit. The availability of early genetic screening, which can greatly affect the timing of prenatal diagnosis and abortion, identifies a clear benefit of earlier prenatal care. Redoubling efforts to initiate prenatal care earlier can alleviate disparities in pregnancies affected by genetic conditions.

Table 1: Demographics and Characteristics

Characteristic	Private Insurance N = 179	Public Insurance N = 27	p-value
Age (years)	37.0 (34.0, 40.0)	37.0 (31.0, 39.0)	0.6
EGA at initial prenatal visit	9 (8 1/7, 10 2/7)	10 3/7 (9 4/7, 12 3/7)	<0.001
EGA at NIPT	10 3/7 (10, 11 2/7)	11 6/7 (10 4/7, 13 6/7)	<0.001
EGA at NIPT disclosure	11 6/7 (11 3/7, 12 6/7)	13 3/7 (12 3/7, 15 3/7)	<0.001
Offered genetic counseling?	166 (97%)	24 (100%)	>0.9
EGA at genetics consult	12 3/7 (11 5/7, 13 3/7)	14 4/7 (12 5/7, 16 2/7)	<0.001
Type of Invasive testing			<0.001
CVS	105 (59%)	3 (11%)	
Amniocentesis	68 (38%)	24 (89%)	
Both	6 (3.4%)	0 (0%)	
Timing of invasive testing (weeks)	13 1/7 (12 1/7, 16 1/7)	16 6/7 (16, 17 4/7)	<0.001
Invasive testing results			0.4
Normal	69 (39%)	12 (44%)	
Autosomal Trisomy	64 (36%)	12 (44%)	
Sex Chromosome Aneuploidy	31 (17%)	3 (11%)	
Other	12 (6.7%)	0 (0%)	
No Result	3 (1.7%)	0 (0%)	
Termination of pregnancy	79 (46%)[1]	11 (48%)[2]	>0.9
EGA at termination (weeks)	14 1/7 (13, 15 6/7)	17 (14 6/7, 19 5/7)	0.006

Gestational ages are given in Median Weeks (IQR)
[1]Data missing for 9 patients
[2]Data missing for 4 patients
Abbreviations: CVS: chorionic villus sampling; EGA: estimated gestational age

Table 2: Time To Events

Characteristic	Private insurance N = 243	Public insurance N = 29	p-value
NIPT to NIPT disclosure	1 3/7 (1 1/7, 1 6/7)	1 3/7 (1 1/7, 1 5/7)	0.6
NIPT disclosure to invasive testing	1 1/7 (0 3/7, 3 5/7)	1 6/7 (0 6/7, 3 3/7)	0.3
Invasive testing to termination	1 3/7 (0 6/7, 2 2/7)	2 1/7 (1 2/7, 2 3/7)	0.2
NIPT to termination	3 5/7 (2 5/7, 5 1/7)	4 4/7 (3 6/7, 5 2/7)	0.2

Gestational ages are given in Median Weeks (IQR)

353 | Pregnancy Outcomes in the Setting of Overt Hypothyroidism

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10:30 AM - 12:30 PM

Objective: This study aimed to evaluate whether patients with uncontrolled overt hypothyroidism at initial presentation in pregnancy (thyroid stimulating hormone(TSH) >10) had differences in pregnancy outcomes in comparison to those with controlled hypothyroidism (TSH < 2.5μU/mL), and whether degree of control by gestational week(GW) 28 affected results.

Study Design: This was a retrospective cohort study of patients with hypothyroidism in pregnancy comparing patients with a TSH less than 2.5 to patients with TSH levels greater than 10 at the initiation of prenatal care. Patients with a TSH > 10 were separated based on whether control was obtained by GW 28 weeks (TSH < 2.5), to evaluate potential effects of controlling overt hypothyroidism during pregnancy.

Results: There was a significant difference in rates of gestational hypertension and preeclampsia. For patients with controlled hypothyroidism, overt hypothyroidism that became controlled, and overt hypothyroidism that remained uncontrolled the rates of gestational hypertension were 2.7%, 5.56%, and 21.4%(p 0.03), respectively. The rates of preeclampsia followed a similar pattern with the rates of preeclampsia increasing as the control of hypothyroidism worsened, 6.85%, 22.2%, and 35.7%(p 0.01). There were no significant differences in miscarriage, preterm delivery, NICU admission, gestational diabetes, stillbirth or postpartum hemorrhage. When considering the past medical history, there was a significant difference in the rates of a history of gestational hypertension/preeclampsia across the groups; no differences in the rates of chronic hypertension. There were no significant differences between a history of gestational hypertension/preeclampsia and preeclampsia or gestational hypertension in the current pregnancy.

Conclusion: We observed a dose response with the degree of hypothyroidism control by GW 28 and rates of preeclampsia and gestational hypertension, suggesting that controlling overt hypothyroidism may reduce risk of complication of preeclampsia and gestational hypertension, but risks remain elevated compared to those who are euthyroid initially.

	TSH <2.5 µIU/mL at presentation and 28wks	TSH >10 µIU/mL at presentation and <2.5 µU/mL at 28wks	TSH >10 µIU/mL at presentation and 28wks	P value
Total n=105				
n(%)	73 (69.5)	18 (17.1)	14 (13.3)	
Demographics and Medical History				
Age (y), mean (SD)	34.2 (4.8)	30.1 (4.9)	27.9 (7.3)	**<0.001**
BMI, mean(SD)	31.2 (6.9)	28.9 (5.8)	30.6 (7.3)	0.45
Ethnicity				
Hispanic, n(%)	62 (93.9)	16 (94.1)	12 (85.7)	0.24
Race				
Asian, n(%)	5 (6.8)	1 (5.6)	0 (0.0)	0.92
Non-Hispanic Black, n(%)	0 (0.0)	0 (0.0)	0 (0.0)	--
Non-Hispanic White, n(%)	2 (2.74)	0 (0.0)	0 (0.0)	--
Other, n(%)	66 (90.4)	17 (94.4)	14 (100)	--
Chronic hypertension, n(%)	5 (6.8)	2 (11.1)	3 (21.4)	0.17
History of gestational hypertension or preeclampsia, n(%)	3 (4.1)	1 (5.6)	4 (28.6)	**0.02**
Pregestational diabetes, n(%)	9 (12.3)	1 (5.6)	2 (14.3)	0.80
History of gestational diabetes, n(%)	9 (12.3)	0 (0.0)	0 (0.0)	0.17
TSH values				
TSH at presentation (µIU/mL), range	0.01-2.43	10.5-244.1	11.7-154	
TSH at presentation (µIU/mL), median	1.41	24.9	33.02	
TSH at 28wks (µIU/mL), range	0.01-2.42	0.01-2.16	11.23-177.4	
TSH at 28wks (µIU/mL), median	1.02	0.62	17.6	
Pregnancy outcomes				
Preterm delivery, n(%)	15 (20.5)	2 (11.1)	3 (21.4)	0.80
Fetal growth restriction, n(%)	2 (2.74)	0 (0.0)	0 (0.0)	1.00
Gestational hypertension, n(%)	2(2.7)	1 (5.6)	3 (21.4)	**0.03**
Preeclampsia, n(%)	5 (6.8)	4 (22.2)	5 (35.7)	**0.01**
Eclampsia, n(%)	0 (0.0)	0 (0.0)	0 (0.0)	
Abruption, n(%)	0 (0.0)	0 (0.0)	0 (0.0)	
Miscarriage, n(%)	3 (4.1)	0 (0.0)	0 (0.0)	1.00
Gestational diabetes, n(%)	14 (19.2)	1 (5.6)	0 (0.0)	0.11
Postpartum hemorrhage, n(%)	5 (6.8)	2 (11.1)	3 (21.4)	0.18
Stillbirth, n(%)	0 (0.0)	0 (0.0)	0 (0.0)	
NICU admission, n(%)	11 (15.1)	4 (22.2)	0 (0.0)	0.17

354 | Implementation and Outcomes of an Intrauterine, Vacuum-Induced Hemorrhage-Control Device at a Community Hospital

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10:30 AM - 12:30 PM

Objective: Our study examined the real-world implementation and outcomes of an intrauterine vacuum-induced postpartum hemorrhage (PPH) control device (Jada) versus a balloon tamponade device (Bakri) in a community hospital setting. We aimed to determine the frequency of Jada use over Bakri and its impact on quantitative blood loss, need for blood transfusion, and further surgical intervention.

Study Design: This single-institution, retrospective, observational study analyzed PPH cases from January 2019 to July 2023. We identified cases using the electronic medical record with keywords "Jada" and "Bakri" to track mechanical device use. Primary outcomes included device failure, estimated or quantitative blood loss (EBL, QBL), need for blood transfusion, and further surgical intervention. Device failure was defined as a device that was placed but expelled or needed removal due to malfunction or inefficacy. Additional data included subject characteristics, number of uterotonics used, and type of surgical intervention.

Results: Over 4.5 years, 741 PPH cases were identified, with 88 managed using mechanical devices: 29 (32.9%) with Bakri and 57 (64.7%) with Jada. Within 18 months of the Jada device introduction, it was more frequently chosen over Bakri (p = 0.0001). Subject characteristics between the Jada and Bakri groups were not significantly different. Bakri device was more likely to fail than Jada when adjusting for gestational age, BMI, and ethnicity (RR 4.11, 95% CI 1.53-11.02). The Jada group experienced lower blood loss, fewer blood transfusions, and fewer surgical interventions and uterotonics (Table 2).

Conclusion: Our study showed that within 18 months of introducing the intrauterine vacuum device, it was preferred over balloon tamponade for PPH management, resulting in fewer device failures and better outcomes in terms of blood loss, uterotonic use, blood transfusions, and further surgical intervention.

Table 1: Subject Characteristics Across Device Type

Characteristic	Device JADA (n=57)	Bakri (n=29)	p- value
Gestational age, mean (SD)	38.3 (2.1)	37.4 (1.1)	0.190
BMI, mean (SD)	35.72 (7.01)	33.06 (5.58)	0.081
Race			
White	40 (70.18%)	18 (62.07%)	
African American	7 (12.28%)	2 (6.90%)	
Asian or Pacific Islander	3 (5.26%)	1 (3.45%)	
Other/Unknown	7 (12.28%)	8 (27.59%)	0.330
Ethnicity			
Non-Hispanic	40 (74.07%)	16 (57.14%)	
Hispanic	14 (25.93%)	12 (42.86%)	0.140
Parity			
0	0 (0.00%)	1 (3.45%)	
1	31 (54.39%)	11 (37.93%)	
2	10 (17.54%)	10 (34.48%)	
≥ 3	16 (28.07%)	7 (24.14%)	0.140
Delivery Type			
C/S	28 (50.00%)	12 (41.38%)	
SVD	28 (50.00%)	17 (58.62%)	0.450
Gestational age			
≤ 34 weeks	4 (7.02%)	1 (3.57%)	
> 34 weeks	53 (92.98%)	27 (96.43%)	1.000
Fetal birth weight (grams)			
< 4000	50 (89.29%)	23 (92.00%)	
≥ 4000	6 (10.71%)	2 (8.00%)	1.000

Table 2: Primary and Secondary Outcomes

Outcome	Device JADA (n=57)	Device Bakri (n=29)	p-value
Device failure	7 (12.28%)	15 (51.72%)	**<0.001**
Blood Loss, ml median (IQR)	1406 (1050, 2400)	1888 (1500, 2700)	**0.021**
No. Uterotonics Used			
0	7 (12.28%)	0 (0.00%)	
1	17 (29.82%)	3 (10.34%)	
2	24 (42.11%)	16 (55.17%)	
3	9 (15.79%)	10 (34.48%)	**0.015**
Blood Transfusion	25 (43.9%)	23 (79.3%)	**0.016**
Further Surgical Intervention	13 (22.81%)	14 (48.28%)	**0.016**
Surgical Intervention Type			
D&C	7 (12.28%)	5 (17.24%)	0.530
B-Lynch Suture	1 (1.75%)	4 (13.79%)	**0.042**
O'Leary Suture	0 (0.00%)	2 (6.90%)	0.110
Exploratory Laparotomy	4 (7.02%)	4 (13.79%)	0.430
Interventional Radiology	3 (5.26%)	1 (3.45%)	1.000
Hysterectomy	5 (8.77%)	7 (24.14%)	0.096

355 | Impact of Continuous Glucose Monitoring and Insulin Pump use on Type 1 Diabetes in Pregnancy

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10:30 AM - 12:30 PM

Objective: Type 1 diabetes (T1DM) is strongly associated with adverse pregnancy outcomes. Technological advancements, including insulin pumps and continuous glucose monitors (CGM), may improve glycemic control in pregnancy but have not been consistently associated with improved clinical outcomes. We hypothesize that patients utilizing both an insulin pump and CGM will have improved outcomes.

Study Design: This was a retrospective cohort study of patients with T1DM receiving pregnancy care in a large health system from 2016 to 2023. Patients were compared by utilization of insulin pumps versus multi daily insulin injections (MDI). Patients were excluded if missing delivery information, care was established after 20 weeks, or if unable to determine CGM status in pregnancy. Primary outcome was on-target glycemic control, defined as a second trimester Hb A1c < 6.5%. Secondary outcomes included additional glycemic and clinical outcomes. A sub-analysis limited to pump patients compared CGM versus traditional blood glucose monitoring (TBGM). Adjusted odds ratios were calculated using multivariable logistic regression to adjust for potential confounding variables.

Results: Among 288 patients with T1DM, there were 155 deliveries in the insulin pump group and 133 in the MDI group. Patients using insulin pumps were more likely to be of non-Black race, nulliparous, utilize CGM, and have commercial insurance (Table 1). On-target glycemic control was unchanged in the pump group when compared to MDI (36.1% vs 21.1%, aOR 0.97, 95% CI 0.47-1.98). There was no difference in clinical outcomes. In contrast, when examining the pump group by CGM status, glycemic control was improved in those utilizing CGM as compared to TBGM (43.8% vs 16.3%, aOR 3.38, 95% CI 1.24-9.23). There was also improvement in DKA admission and rates of antenatal stillbirth (Table 2). Other non-glycemic outcomes remained unchanged.

Conclusion: When used in conjunction with insulin pump therapy, CGM use in T1DM is predictive of glycemic control in pregnancy and associated with improvement in certain clinical outcomes.

Table 1. Demographics

	Pump (n=155)	MDI (n=133)	P value
Age in years [IQR]	29 [23, 33]	27 [25, 32]	0.719
BMI in kg/m2 [IQR]	27.3 [23.6, 32.8]	26.8 [23.7, 31.3]	0.488
Nulliparity (%)	86 (55.5)	55 (41.4)	0.023
Chronic Hypertension (%)	29 (18.7)	29 (21.8)	0.613
Publicly Funded Insurance (%)	58 (37.4)	86 (64.7)	<0.001
Continuous Glucose Monitoring (%)	112 (72.3)	33 (24.8)	<0.001
Tobacco Use (%)	8 (5.2)	11 (8.3)	0.411
Age at diabetes diagnosis	13.6 (7.2)	15.6 (8.2)	
Black race (%)	30 (19.5)	69 (51.9)	<0.001

Data are presented as n (%), median [interquartile range], mean (standard deviation)
BMI, body mass index, presented in kilograms per meters[2]

Table 2. Glycemic and Clinical Outcomes

	Insulin pump vs MDI			CGM vs TBGM in pump users		
	Pump (n=155)	MDI (n=133)	aOR (95% CI)	CGM (n=112)	TBGM (n=43)	aOR (95% CI)
Glycemic Control						
Baseline HgA1c < 6.5%	38 (24.5)	12 (9.0)	2.01 (0.86,4.69)	31 (27.7)	7 (16.3)	1.51 (0.56, 4.03)
2nd trimester HgA1c < 6.5%	56 (36.1)	28 (21.1)	0.97 (0.47,1.98)	**49 (43.8)**	**7 (16.3)**	**3.38 (1.24, 9.23)**
Baseline HgA1c > 10%	**17 (11.0)**	**39 (29.3)**	**0.4 (0.19,0.84)**	**9 (8.0)**	**8 (18.6)**	**0.21 (0.06, 0.71)**
Maternal Outcomes						
DKA Admission	15 (9.7)	18 (13.5)	1.24 (0.53,2.9)	**6 (5.4)**	**9 (20.9)**	**0.23 (0.08, 0.71)**
Hypertensive disorder of pregnancy	73 (47.1)	57 (42.9)	1.39 (0.78,2.47)	51 (45.5)	22 (51.2)	0.7 (0.32, 1.51)
Preterm birth (<37 weeks)	71 (45.8)	72 (54.1)	0.88 (0.5,1.55)	50 (44.6)	21 (48.8)	0.72 (0.33, 1.54)
Indicated PTB <34 weeks	15 (9.7)	18 (13.5)	0.7 (0.28,1.79)	11 (9.8)	4 (9.3)	0.88 (0.24,3.29)
Primary cesarean delivery	59 (38.1)	52 (39.1)	0.81 (0.4,1.65)	47 (42.0)	12 (27.9)	1.09 (0.38, 3.13)
Perinatal Outcomes						
Fetal Anomaly	19 (12.3)	21 (15.8)	0.94 (0.42,2.08)	12 (10.7)	7 (16.3)	0.63 (0.22, 1.78)
Perinatal Death	6 (3.9)	9 (6.8)	1.08 (0.3,3.9)	3 (2.7)	3 (7.0)	0.18 (0.03, 1.25)
Antenatal Stillbirth	4 (2.6)	5 (3.8)	2.08 (0.46,9.38)	**1 (0.9)**	**3 (7.0)**	**0.07 (0.01, 0.88)**
Large for gestational age	62 (40.0)	34 (25.6)	1.91 (1.05,3.49)	41 (36.6)	21 (48.8)	0.57 (0.27, 1.18)
Small for gestational age	4 (2.6)	8 (6.0)	0.51 (0.12,2.08)	3 (2.7)	1 (2.3)	1.26 (0.13, 12.62)
NICU Admission	85 (54.8)	71 (53.4)	1.91 (1.05,3.49)	58 (51.8)	27 (62.8)	0.57 (0.27, 1.18)

Data are n (%)
MDI, multi-daily insulin injection; CGM, continuous glucose monitoring; TBGM, traditional blood glucose monitoring; NICU, neonatal intensive care unit

356 | The Relationship between the Plasminogen Activator Inhibitor-1 (PAI-1) Polymorphism and Adverse Obstetrical Outcomes

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10:30 AM - 12:30 PM

Objective: The purpose of this study is to investigate the characteristic differences in PAI-1 polymorphism status in a population of patients with RPL and/or adverse obstetrical outcomes.

Study Design: An IRB-approved retrospective chart review of patients who sought care at the Hackensack University Medical Center MFM Division and underwent testing for the PAI-1 polymorphism between January 1, 2019 and January 1, 2024 was performed. Included patients were those that had a history of 2 or more pregnancy losses, and/or adverse obstetrical outcomes, such as fetal growth restriction, intrauterine fetal demise,

postpartum hemorrhage, placental abruption, preterm labor / PPROM associated with the thrombin pathway, or preeclampsia with severe features. Patient characteristics and pregnancy outcomes were recorded in REDCap. Chi-square goodness-of-fit test was performed.

Results: 132 patients who met inclusion criteria were identified. 18 patients (13.6%) had the PAI-1 4G/4G polymorphism present, 69 patients (52.3%) had the 4G/5G polymorphism present, and 45 patients (34.1%) had the 5G/5G polymorphism present. There was no significant difference between the observed and expected distribution of PAI-1 polymorphisms in patients with recurrent pregnancy loss, nor was there a significant difference in patients who had second trimester pregnancy losses. In patients with placental abruption, there was a statistically significant difference in the observed distribution of PAI-1 polymorphisms compared to expected (X^2 (2, $N = 13$) = 6.286, $p < 0.0432$), with the PAI-1 5G/5G polymorphism occurring in 61.5% of patients with placental abruption. However, there was no statistically significant difference in PAI-1 polymorphism status in patients with any of the other studied adverse obstetrical outcomes.

Conclusion: In patients with placental abruption, there was a higher distribution of patients with the PAI-1 5G/5G polymorphism than expected. However no significant difference in distribution was noted in patients with recurrent pregnancy loss or other studied adverse obstetrical outcomes.

357 | Self-Assessment of Complexity and Risk for Pregnant Adults with Congenital Heart Disease

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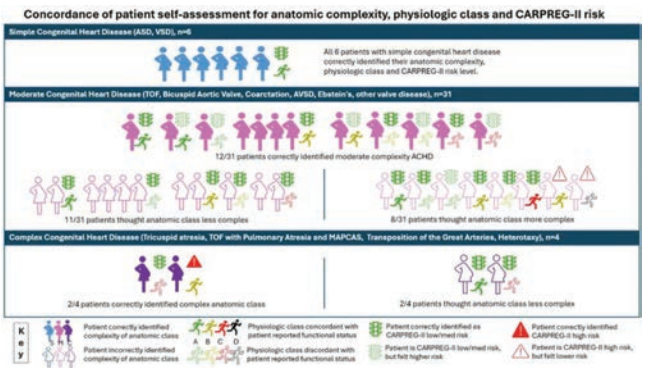
10:30 AM - 12:30 PM

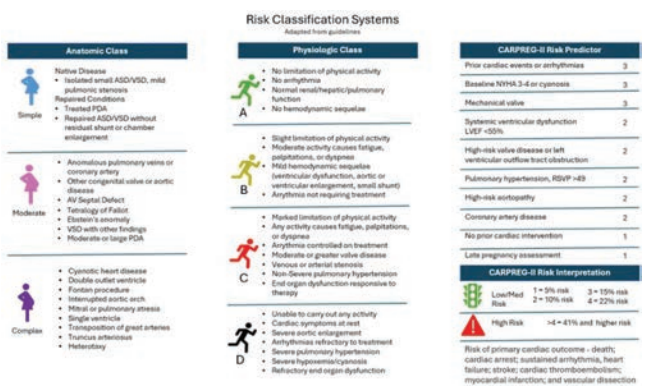
Objective: Elucidate the degree to which patient risk self-assessment correlates with anatomic and physiologic class and CARPREG-II score in the setting of pregnancy and adult congenital heart disease (ACHD).

Study Design: Patients with ACHD with new Cardio-Obstetric consultation were invited to complete a pre-visit self-assessment. The survey queried ACHD complexity, physical activity limitations, rating of overall health, and prior counseling. Patients selected factors that increase pregnancy risk for people with ACHD and identified their level of risk for outcomes like heart failure, arrhythmia, stroke, cardiac arrest, or death. Basic demographic information was collected. Correlation of self-assessed risk was compared to ACHD anatomic and physiologic class and CARPREG-II scores.

Results: 41 patients were reviewed. Only 26% had entirely concordant self-assessment of ACHD complexity, functional status, and ACHD-related pregnancy risk. 31% felt their ACHD was less complex than their anatomic class, 14% more complex. Patient self-assessment of functional status correlated with ACHD physiologic class in only 56%. 84% of patients with a low/medium risk of complications based on CARPREG-II correctly identified this level. Of the 3 patients with a CARPREG-II score >4, only one correctly identified that they were at high risk for cardiac complications.

Conclusion: Only 1 in 4 pregnant patients' pre-visit self-assessment of ACHD complexity, functional status, and risk for complications matched physician assessment. When patients misestimated anatomic class, they tended to think disease was less complex. Physiologic class, which is partially based on imaging findings, was a poor predictor of self-assessed functional status. We anticipate NYHA class would more closely match patient self-assessment. Of the highest risk patients in our cohort, 2/3 were unaware they were at high risk for complication, highlighting the critical nature of preconception counseling for patients with ACHD. Further analysis will identify factors associated with inaccurate patient risk assessment and examine pregnancy outcomes.





358 | Examining Maternal Medication Administration Prior to Urine Drug Screening

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10:30 AM - 12:30 PM

Objective: Urine drug screening (UDS) is prevalent on many labor and delivery (L&D) units. However, several common medications can cause a false positive UDS. We assessed how often pregnant patients received medications associated with false positive results and whether patient characteristics were associated with receipt of these medications.

Study Design: Retrospective cohort study of patients presenting to L&D at a single academic center between June 10, 2021, and May 31, 2022, who had UDS following implementation of a maternal substance use screening protocol. Primary outcomes included the proportion of patients who received medications

associated with false positives prior to UDS and the proportion of patients with a positive UDS after receipt of these medications (Table 1). Additionally, we examined whether patient age, race, ethnicity, or insurance status differed between those who received these medications and those who did not. Kruskal Wallis and Chi square tests were used to compare categorical variables.

Results: 140 patients underwent UDS. Of those, 30 (21.4%) received medications associated with false positives, and 12 (8.6%) subsequently tested positive (Table 2). Among these 12 patients, the most commonly detected substance was THC (n = 7, 58.3%). The majority of patients tested negative and did not receive any associated medications beforehand. We found no significant differences in age, race, ethnicity, or insurance status, or primary language between those who received these medications and those who did not.

Conclusion: Few patients were administered medications associated with false positives prior to UDS. Given the screening nature and potential for false positives in UDS, iatrogenic false positive results should be considered in instances of confounding administration. Patient characteristics were not associated with receiving medications that can cause false positives. Future research should explore the frequency of confirmatory testing in pregnant patients, the steps taken after a potentially confounded positive result, and whether these vary based on patient demographics.

Table 1. Medications that can cause a false positive UDS

Medication	False Positive
Bupropion (Wellbutrin)	Amphetamines, Methamphetamines
Dextromethorphan (Robafen, Robitussin)	PCP, Opioids
Diphenhydramine (Benadryl)	Opioids, PCP
Doxylamine (Unisom)	Barbiturates
Labetalol (Trandate)	Amphetamines, Methamphetamines
NSAIDs (e.g. Ibuprofen (Advil), Naproxen (Aleve), Toradol (Ketorolac))	THC, PCP, Barbiturates, Benzodiazepines
Phentermine	Amphetamines
Promethazine (Phenergan)	Amphetamines, Methamphetamines
PPIs (e.g. Pantoprazole (Protonix))	THC
Pseudoephedrine (Sudafed)	Amphetamines, Methamphetamines
Quetiapine (Seroquel)	Opioids
SSRIs (e.g. Sertraline (Zoloft))	Benzodiazepines, LSD
Trazodone (Desyrel)	Amphetamines, Methamphetamines
Venlafaxine (Effexor)	PCP

Table 2. UDS results stratified by medication intake

Substance tested	(1) Positive and received associated medications (n, %)	(2) Positive and did not receive associated medications (n, %)	(3) Negative and received associated medications (n, %)	(4) Negative and did not receive associated medications (n, %)
Amphetamine	2(1.4%)	4(2.9%)	8(5.7%)	126(90.0%)
Barbiturate	0(0.0%)	0(0.0%)	23(16.4%)	117(83.6%)
Benzodiazepine	2(1.4%)	3(2.1%)	19(13.6%)	116(82.9%)
Opiate (Opioid)	1(0.7%)	9(6.4%)	9(6.4%)	121(86.43%)
Cocaine*	--	--	--	--
Ethanol*	--	--	--	--
THC	7(5%)	28(20%)	9(6.4%)	96(68.6%)
Oxycodone (Opioid)	3(2.1%)	6(4.3%)	7(5%)	124(88.6%)
Methadone (Opioid)	0(%)	4(2.9%)	10(7.1%)	126(90%)
Total	15	54	85	826
Patients (n)**	12	44	30	139

*No information about medications associated with false positive
**Patients may overlap between each category
Row percentages presented

359 | Expanding Obstetric Carrier Screening: Patient Knowledge of Genes Tested and Interest in Adding Cancer-Associated Genes

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10:30 AM - 12:30 PM

Objective: The American College of Obstetricians and Gynecologists recommends that all pregnant women receive information regarding expanded carrier screening (ECS), with up to 40% of patients completing ECS. ECS can include hundreds of genes but has, traditionally, excluded genes implicated in hereditary cancer. Our objective is to assess patient knowledge of ECS and interest in concurrent cancer multigene panel testing (CMPT).

Study Design: In a mixed-methods, quality improvement study, patients were called 2-6 following ECS results. Patients were queried about their understanding of ECS and interest in CMPT. Descriptive statistics were used for quantitative data and grounded theory to perform thematic analysis for qualitative data.

Results: 155 patients were called and 73 reached, among who 67 (43%) agreed to complete the survey (Table 1, demographics). When asked if a provider had explained ECS during a prenatal visit, 63 (94%) said yes, 2 (3%) no, and 2 (3%) unsure. When asked if patients know what ECS evaluates, 34 (50%) said yes, 23 (34%) no, and 10 (15%) unsure. When asked if they believed testing for cancer-related genes was included in ECS, 13 (19%) said yes, 31 (46%) said no, and 23 (34%) were unsure. When asked if they would have opted for testing for cancer-associated genes with ECS if offered, 50 (75%) said yes, 13 (19%) no, and 4 (6%) were unsure. 48 participants provided additional comments, with the themes of increased knowledge, increased anxiety, and cost concerns being the most common (Table 2).

Conclusion: More than half of patients were unsure or believed that cancer-related genes were included on ECS panels, suggesting a potentially dangerous misunderstanding of the scope of this test and meaning of "negative" results. Furthermore, 75% of patients stated that if offered, they would accept CMPT at time of ECS. As the majority of individuals with hereditary cancer syndromes remain unidentified, pregnancy and ECS may offer a unique window of opportunity for women to engage in discussions around genetic testing and complete potentially lifesaving CMPT.

Table 1. Patient Demographics (n = 67)		
	Median	Range
Patient Age (years)	34	18 – 43
Gestational Age (weeks)	20.1	10.0 – 34.7
Gravida	2	0 – 7
Para	0	0 – 3
Race	n	%
White	30	44
Black	11	16
Asian	9	13
Other	6	9
Declined to answer	11	16

Table 2. Themes regarding testing for cancer-related genes with ECS		
Theme	N of participants contributing (n=48)	Example quote
Knowledge - Better to know test results - Option to take preventative measures - Desire for increased medical counseling	11	"I want to know if I will pass [cancer] onto my baby. Knowledge is power and I want to have that information up front… It's important to educate patients so they know what they can do with these test results."
Anxiety and fear - Fear of abnormal results - Guilt of increasing child's risk of cancer - Anxiety of not being able to do anything about results during pregnancy	10	"Cancer is anxiety producing. I'd get tested if it was protocol, but the feelings I got before when doing tests when I know I couldn't fix anything was not a good feeling."
Factors that affect feelings on including cancer-related genes - Cost - Family history - Medical comorbidities - Joint decision making with providers and family members - Using information to plan future pregnancies	24	"It really depends on if insurance covered the test or if you have a family history of cancer."

360 | Cerebroplacental Doppler Ratio for the Prediction of Adverse Perinatal Outcomes in Late-Onset Fetal Growth Restriction

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10:30 AM - 12:30 PM

Objective: Late-onset fetal growth restriction (LO-FGR), defined as onset ³ 32 weeks gestation, is the more common subgroup of FGR. The umbilical artery Doppler is usually unaffected. There are no subgroup-specific guidelines for monitoring pregnancies affected by LO-FGR. We compared the utility of the cerebroplacental Doppler ratio (CPR) to the Biophysical Profile (BPP), a widely endorsed FGR monitoring tool, for the prediction of adverse perinatal outcomes (APO).

Study Design: This is a retrospective cohort study of LO-FGR, defined as estimated fetal weight < 10th%, from 2013-2018. Using logistic regression analysis, we determined whether low CPR < 5th% and BPP score £ 6 significantly independently predicted the composite APO defined as one or more complications: cord pH < 7.20, 5-minute Apgar score of < 5, operative or cesarean delivery secondary to non-reassuring fetal heart tracing, assisted respiration at birth, NICU admission, and/ or perinatal death. Secondarily, we also evaluated prediction of severe neonatal morbidity (SNM) defined in Table 1 (legend).

Results: There were 233 cases of LO-FGR of which 76 (34%) had a low CPR percentile and 28 (13%) had a low BPP score. There were 22 (9.9%) cases with SNM of which 5 (2.1%) had a low CPR percentile and 4 (1.8%) had a low BPP score. A low CPR was associated with a significantly higher rate of individual and composite APO than cases with normal CPR percentile (p < 0.001) [Table 1]. Both a low CPR percentile and a low BPP score significantly predicted APO overall. CPR appeared to be a better predictor of the APO, controlling for gestational age at testing [Table 2]. Only BPP significantly predicted SNM: CPR (OR = 4.64, p = 0.13) and BPP (OR = 4.11, p = 0.038).

Conclusion: A low CPR percentile was a significant independent predictor of perinatal complications in LO-FGR, including abnormal fetal heart rate tracing, smaller birthweight percentile, and NICU admission. CPR appeared superior to BPP overall. CPR should be considered as a fetal surveillance tool in LO-FGR.

Table 1: Characteristics and outcomes in late-onset fetal growth restriction: abnormal CPR <5th% or BPP score ≤ 6.

	Abnormal CPR (n=76)	Normal CPR (n=147)	*P*-value	BPP score ≤ 6 (n=28)	BPP score 8 (n=195)	*P* -value
Maternal Demographics						
Maternal age (mean ± SD)	29.6 ± 5.8	29.7 ± 5.5	0.908[m]	29.2 ± 5.6	29.8 ± 5.6	0.562[m]
Nulliparous (%)	54 (71.1)	86 (58.5)	0.157[f]	14 (50.0)	126 (64.6)	0.132[f]
BMI in kg/m^2 (mean ± SD)	28.8 ± 5.4	28.9 ± 5.4	0.884[m]	31.2 ± 7.6	28.5 ± 4.9	0.094[m]
Preeclampsia (%)	16 (21.1)	11 (7.5)	**0.003**[f]	7 (25.0)	20 (10.3)	0.059[f]
Obstetrical Outcomes						
GA at delivery (mean ± SD)	37.2 ± 1.7	38.3 ± 1.3	**<0.001**[m]	37.1 ± 1.9	38.0 ± 1.4	**0.012**[m]
Preterm birth < 37 weeks (%)	20 (26.3)	17 (11.6)	**0.005**[f]	11 (39.2)	26 (13.3)	**<0.001**[f]
Preterm birth < 34 weeks (%)	6 (7.8)	0 (0.0)	**0.001**[f]	3 (10.7)	3 (1.5)	**0.030**[f]
Induction of labor (%)	58 (76.3)	114 (77.6)	0.835[f]	25 (89.3)	147 (75.3)	0.212[f]
Non-reassuring FHR tracing (%)	27 (35.5)	31 (21.1)	**0.020**[f]	11 (39.3)	47 (24.1)	0.117[f]
CD or OVD for fetal indication (%)	27 (35.5)	30 (20.4)	**0.014**[f]	11 (39.3)	46 (23.5)	0.102[f]
Neonatal Outcomes						
Birthweight percentile (mean ± SD)	5.7 ± 12.7	8.1 ± 11.1	**0.011**[m]	5.8 ± 9.4	7.5 ± 12.0	0.161[m]
5-minute APGAR score < 5 (%)	1 (1.3)	2 (1.4)	1.000[f]	0 (0.0)	3 (1.5)	1.000[f]
Arterial cord blood pH (mean ± SD)	7.3 ± 0.07	7.3 ± 0.05	0.156[m]	7.3 ± 0.07	7.3 ± 0.06	0.553[m]
Arterial cord blood pH < 7.2 (%)	9 (11.8)	11 (7.5)	0.325[f]	2 (7.1)	18 (9.2)	1.000[f]
NICU admission (%)	35 (46.1)	31 (21.1)	**<0.001**[f]	16 (57.1)	50 (25.6)	**0.01**[f]
Severe neonatal morbidity* (%)	5 (6.6)	6 (4.1)	0.516[f]	4 (14.3)	7 (3.6)	**0.04**[f]
Composite APO** (%)	48 (63.2)	55 (37.4)	**<0.001**[f]	18 (67.9)	85 (43.1)	**0.04**[f]

*Severe neonatal morbidity defined as one or more of the following: necrotizing enterocolitis, sepsis, respiratory distress syndrome, or abnormal fetal head ultrasound after delivery
**Compositive APO, composite adverse perinatal outcome defined as one of the following: cord pH < 7.20, 5-minute Apgar score of < 5, operative or cesarean delivery secondary to non-reassuring fetal heart tracing, assisted respiration at birth, NICU admission, or perinatal death.
Abbreviations: CPR, cerebroplacental ratio; BPP, biophysical profile; SD, standard deviation; BMI, body mass index; GA, gestational age; FHR, fetal heart rate; CD, cesarean delivery; OVD, operative vaginal delivery.
Statistical methods: [m] Mann-Whitney U test, [f] Chi-squared test, Fisher's exact test. P-value < 0.05 are statistically significant.

Table 2: Significant predictors of adverse perinatal outcomes in late-onset fetal growth restriction.

Logistic Regression Model: Summary of Predictor Variables						
	Estimate	Std. Error	z value	Pr(>|z|)	Odds Ratio	95% CI
(Intercept)	-1.432	0.36	-3.974	< 0.001	-	-
GA CPR	0.335	0.436	0.77	0.442	1.4	n.s
CPR	1.304	0.374	3.483	<0.001	3.68	2.55-5.08
BPP	1.145	0.551	2.077	0.038	3.14	1.43-4.48
GA BPP	-0.319	0.434	-0.735	0.462	0.73	n.s

Abbreviations: CPR, cerebroplacental ratio; BPP, biophysical profile; GA, gestational age.

361 | Dual Positivity for Down Syndrome and Neural Tube Defects: Indicator of Adverse Pregnancy Outcomes

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10:30 AM - 12:30 PM

Objective: 'Dual positivity' refers to screen-positive for both Down syndrome (DS) and neural tube defect (NTD) in second-trimester screening tests (Fetal Diagn Ther 1998;13:106–110). Given that alpha-fetoprotein (AFP) level is usually low in DS, the concurrence of high risk for both DS and NTD does not match each other. Herein, we aim to check the clinical significance of dual positivity associated with adverse pregnancy outcomes, including preeclampsia and fetal growth restriction (FGR).

Study Design: This retrospective study included 445 pregnant women whose serum marker tests indicated a high risk for DS (N = 315), NTD (N = 81), or both (N = 49), who delivered at our institution between January 2014 and March 2024. Additionally, one hundred consecutive women with low-risk results for both DS and NTD during the study period were selected as a control group. We compared the rate of preeclampsia and FGR among four groups: control, high risk for DS, high risk for NTD, and dual positivity. We also examined the gestational age of delivery and neonatal birth weight. Statistical analyszes were performed using linear-by-linear analysis and ANOVA.

Results: Among the dual positivity group, no fetus was diagnosed as DS by amniocentesis nor NTD by level II ultrasonography. The rate of preeclampsia was highest in dual positivity (57.1%), followed by high risk for NTD (18.5%), high risk for DS (14.9%), and control (4%). Similarly, the rate of FGR was highest in dual positivity (79.6%), followed by high risk for NTD (40.7%), high risk for DS (17.1%), and control (6%). The median gestational age at delivery and neonatal birth weight of dual positivity group were 29+5 (interquartile range, 25+6-35+5) weeks and 0.94 (interquartile range, 0.45-1.96) kg, respectively, which was significantly lower compared with other three groups (Figure 1).
Conclusion: Our data indicate that dual positivity is strongly associated with preeclampsia or FGR. This suggests that women with dual positivity require enhanced prenatal care, including regular monitoring of maternal blood pressure and fetal growth assessments.

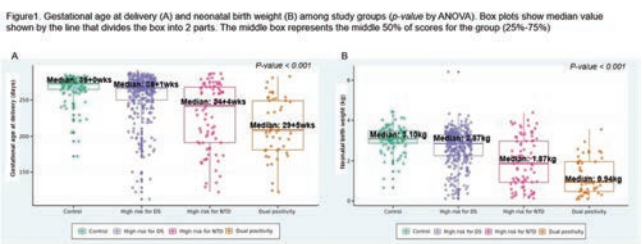

Figure1. Gestational age at delivery (A) and neonatal birth weight (B) among study groups (*p-value* by ANOVA). Box plots show median value shown by the line that divides the box into 2 parts. The middle box represents the middle 50% of scores for the group (25%-75%)

362 | Variable Expression of sFlt-1 Splice Variants in Distinct Placental Cells in Normal and Preeclamptic Pregnancies

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10:30 AM - 12:30 PM
Objective:
Elevated levels of soluble fms-like tyrosine kinase-1 (sFlt-1) have been associated with placental disorders, such as preeclampsia. However, the precise expression patterns and regulation of the main placental sFlt1 splice variants, e15a and i13, within the intricate placental tissue remain poorly understood. The aim of our study is to investigate how these splice variants are differentially expressed and regulated across pregnancy and in preeclampsia, providing insights into their roles in placental pathology.
Study Design: We used 16 placental samples for this study. First-trimester samples were obtained from women undergoing pregnancy terminations, while samples from individuals with preeclampsia and gestational age-matched controls were collected at the time of delivery. Cellular localization of sFlt-1 e15a and sFlt-1 i13 transcripts was analyzed by RNA in situ hybridization using a custom-designed BaseScope probe for e15a and a 35S-labeled probe for i13.
Results: In the first-trimester placentas, e15a and i13 mRNAs were highly expressed in the intermediate trophoblasts and invading cytotrophoblast columns. In term placentas (controls), the signal was primarily detected in the extravillous trophoblasts located in the basal plate/decidua. In preeclamptic placentas, the expression of both e15a and i13 was markedly elevated in the extravillous trophoblasts and also observed in some villi near the basal plate. Notably, the signals for both e15a and i13 were highly focal within the villi but more widespread in the extravillous trophoblasts. Furthermore, the e15a signal was stronger in the villi, while the i13 signal was more intense in the extravillous trophoblasts.
Conclusion: Our findings reveal that sFlt-1 e15a and i13 expression in the placenta is highly localized and confined to specific cell types, challenging the previous notion of their widespread and uniform distribution. This localized expression highlights the importance of understanding the cell-specific regulatory mechanisms of sFlt-1 in unraveling the pathophysiology of pregnancy complications.

363 | Hospital Birth Volume and Rural/Urban Location: Associations with Perinatal Outcomes Among Individuals with Chronic Hypertension

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[1]Stanford University, Palo Alto, CA; [2]Stanford University, Stanford, CA; [3]Children's Hospital of Philadelphia, Philadelphia, PA; [4]Children's Hospital of Pennsylvania, Philadelphia, PA; [5]University of Minnesota, Minneapolis, MN

10:30 AM - 12:30 PM
Objective: Chronic hypertension (cHTN) in pregnancy is increasing, but little is known about perinatal outcomes at birth hospitals with different characteristics. We evaluated the association between hospital birth volume and rural/urban location with risk of adverse perinatal outcomes among individuals with cHTN.
Study Design: We conducted a population-based study using linked vital statistics and birth hospitalization discharge data from Michigan, Oregon, Pennsylvania, and South Carolina (2008-2020). We classified hospitals based on federal rural-urban county classifications and annual birth volume. The primary outcome was a composite of obstetric and fetal/neonatal outcomes, with components as secondary outcomes (Table 1). We used multivariable modified Poisson regression models with hospital fixed effects and robust standard errors to estimate the relative risk (RR) of the outcomes for each hospital group compared with high-volume urban hospitals.
Results: Among 102,787 births to individuals with cHTN, the crude incidence of the primary outcome was highest in high-volume urban hospitals (47.2%) and lowest in low-volume rural hospitals (32.0%Table 2). Additionally, a higher proportion of individuals giving birth at high-volume urban hospitals had a high (≥10) obstetric comorbidity score (44% vs 24-26% at rural and low-volume urban hospitals). After robust adjustment in regression models, however, no differences between hospital groups were evident. Among primary outcome components, only risk of superimposed preeclampsia/eclampsia was higher in low-volume urban (RR: 1.14; 95% CI: 1.02-1.28) and medium-volume rural (RR: 1.33; 95% CI: 1.08-1.62) hospitals, with imprecise results in low-volume rural hospitals.

Conclusion: Lower rates of adverse outcomes among individuals with cHTN giving birth at lower volume and rural hospitals were observed and our results suggest these differences were largely explained by hospital case mix. Higher risk-adjusted rates of superimposed preeclampsia/eclampsia at medium-volume rural and low-volume urban hospitals suggest potential opportunities for prevention.

Table 1. Characteristics and outcomes of study population: individuals with chronic hypertension during pregnancy, 2008-2020, N=102,787.

	N (%)
State	
Michigan	35,763 (34.8)
Oregon	11,074 (10.8)
Pennsylvania	30,641 (29.8)
South Carolina	25,309 (24.6)
Method of payment for birth	
Private insurance	52,116 (50.7)
Public insurance	49,318 (48.0)
Self-pay or other	1,353 (1.3)
Nulliparous	34,213 (33.3)
BMI ≥40 kg/m^2	26,028 (25.3)
Chronic renal disease	1,995 (1.9)
Preexisting diabetes	8,804 (8.6)
Preexisting cardiac disease	4,100 (4.0)
Obstetric comorbidity score 0	27,540 (26.8)
Obstetric comorbidity score 1-4	21,072 (20.5)
Obstetric comorbidity score 5-9	14,412 (14.0)
Obstetric comorbidity score ≥10	39,763 (38.7)
Superimposed Preeclampsia/Eclampsia	26,839 (26.1)
Severe obstetric morbidity composite outcome	3,820 (3.7)
Severe postpartum hemorrhage	835 (0.81)
Placental abruption	1,762 (1.7)
Cerebrovascular event	466 (0.45)
Pulmonary edema	112 (0.11)
Acute renal failure	590 (0.57)
Acute heart failure	373 (0.36)
Fetal/neonatal morbidity composite outcome	32,588 (31.7)
Small-for-gestational age (<10th percentile)	13,652 (13.3)
Preterm birth	22,649 (22.0)
Low birthweight	18,471 (18.0)
Stillbirth	187 (0.18)
Obstetric and fetal/neonatal combined outcome (any of the above outcomes)	44,936 (43.7)

Table 2. Associations between annual birth volume and rural/urban location of hospitals with obstetric and fetal/neonatal outcomes among individuals with chronic hypertension.

	Hospital Birth Volume and Rural/Urban Location				
	High-Volume Urban >2000 births/yr 50 hospitals N = 61,191	Medium-Volume Urban 1001-2000 births/yr 56 hospitals N = 22,814	Low-Volume Urban 10-1000 births/yr 96 hospitals N = 11,091	Medium-Volume Rural >500 births/yr 24 hospitals N = 4,123	Low-Volume Rural 10-500 births/yr 78 hospitals N = 3,568
Superimposed Preeclampsia/Eclampsia					
Incidence, n (%)	17,595 (28.8)	5,537 (24.3)	2,256 (20.3)	881 (21.4)	570 (16.0)
aRR (95% CI) with hospital fixed effects	Reference	0.99 (0.93-1.05)	1.24 (1.11-1.39)	1.18 (0.97-1.45)	1.12 (0.84-1.50)
aRR (95% CI) with hospital fixed effects and covariates*	Reference	0.97 (0.92-1.04)	1.14 (1.02-1.28)	1.33 (1.08-1.62)	1.09 (0.81-1.46)
Severe Obstetric Morbidity Composite Outcome					
Incidence, n (%)	2,587 (4.2)	729 (3.2)	324 (2.9)	96 (2.3)	84 (2.4)
aRR (95% CI) with hospital fixed effects	Reference	1.04 (0.87-1.25)	1.24 (0.85-1.81)	0.45 (0.20-0.99)	0.61 (0.23-1.62)
aRR (95% CI) with hospital fixed effects and covariates*	Reference	1.08 (0.89-1.31)	1.25 (0.87-1.81)	0.49 (0.22-1.07)	0.52 (0.19-1.43)
Fetal/Neonatal Morbidity Composite Outcome					
Incidence, n (%)	21,590 (35.3)	6,615 (29.0)	2,531 (22.8)	1,098 (26.6)	754 (21.1)
aRR (95% CI) with hospital fixed effects	Reference	0.94 (0.89-0.99)	1.01 (0.91-1.12)	1.06 (0.89-1.27)	1.00 (0.76-1.32)
aRR (95% CI) with hospital fixed effects and covariates*	Reference	0.97 (0.92-1.01)	1.04 (0.95-1.14)	1.08 (0.93-1.24)	0.92 (0.71-1.19)
Obstetric and Fetal/Neonatal Combined Outcome (Any of the Above Outcomes)					
Incidence, n (%)	28,904 (47.2)	9,359 (41.0)	3,956 (35.7)	1,575 (38.2)	1,142 (32.0)
aRR (95% CI) with hospital fixed effects	Reference	0.97 (0.93-1.01)	1.07 (0.99-1.16)	1.08 (0.94-1.23)	1.04 (0.85-1.28)
aRR (95% CI) with hospital fixed effects and covariates*	Reference	0.97 (0.94-1.02)	1.06 (0.99-1.14)	1.12 (0.99-1.27)	1.00 (0.82-1.22)

*Covariates in adjusted models: delivery year, state, age, payment method, education level, parity, race-ethnicity, and obstetric comorbidity index. Hospital fixed effects were used to control for unobservable differences between hospitals.

364 | Forward Weight Prediction Among Sga, Aga, and Lga Neonates

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10:30 AM - 12:30 PM

Objective: The Gestation-Adjusted Projection (GAP) forward projection model extrapolates birth weight at delivery from third-trimester growth ultrasounds. This method relies on the observation that the ratio of the weight of the normal fetus to the population median remains constant in the third trimester. This study aims to evaluate weight prediction accuracy using GAP forward projection from 3rd trimester growth assessments from neonates ultimately with LGA, SGA, and AGA birthweights at delivery and examine the effect of elevated maternal body habitus on accuracy of these estimates.

Study Design: We conducted a retrospective analysis of pregnancy records from 2016 to 2023 of patients cared for and delivered in our hospital system. We included singleton, liveborn, and non-anomalous pregnancies delivered after 28 weeks GA. Exclusions were multiple gestation, major fetal anomalies, stillbirth, and absence of third trimester growth assessments or mid-gestational anatomic surveys. We identified 1559 records that resulted in review of 554 records with final growth ultrasounds. Accuracy of GAP prediction was defined as an estimation of birth weight within 10% of actual birth weight. Percent error and absolute value of percent error of estimation were also examined.

Results: We observed an overall median absolute value of accuracy of 8.56 (IQR 3.9, 15.19). Across all pregnancies, 57.2% of fetal weight estimates were accurate. Respective groups showed a 51.4% accuracy in women with appropriate BMI (n = 185), 61.4% accuracy in the overweight category (n = 145), and 58% in the obese category (n = 224). Rates of accuracy, overestimation, and underestimation were significantly different between weight classifications (p = 0.031).

Conclusion: The GAP forward projection method can be used as an alternative method to estimating fetal weight rather than extrapolation by adding stagnant estimates of grams per day or by using Leopold's maneuvers which can be challenging on patients of higher maternal BMI.

365 | Burden of Placental Pathology is Associated with Severity of Clinical Outcomes

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10:30 AM - 12:30 PM

Objective: Hypertensive disorders of pregnancy (HDP) and Small for Gestational Age (SGA) neonates have both been previously associated with placental pathology. Here we evaluate the association of placental disease burden with severity of clinical disease - either HDP or SGA alone compared to the combination of both HDP and SGA.

Study Design: Placentas were prospectively collected and examined by a perinatal pathologist in the Stress, Pregnancy, and Health study. We compared placentas from patients with neither HDP nor SGA, HDP or SGA, and both HDP+SGA by four categories of placental pathology: acute inflammation (AI), chronic

inflammation (CI), maternal vascular malperfusion (MVM), and fetal vascular malperfusion (FVM). Univariate analysis was performed using chi^2 tests, ANOVA, and Kruskal-Wallis as appropriate. Multivariate analysis was conducted with logistic regression adjusted for BMI, mode of conception, diabetes, and socioeconomic status. We additionally examined the number of MVM related lesions.

Results: Of 571 placentas, 421 (74%) served as the control with neither HDP nor SGA, 138 (24%) had either HDP or SGA, and 12 (2%) had both HDP+SGA. Prevalence of MVM was higher with increasing clinical disease (22.1% control, 45.7% HDP or SGA, 75% HDP+SGA, p< .001). After adjustment, odds of MVM increased more than 3-fold from just HDP or SGA (aOR 3.34 [95%CI 2.08,5.34]) to both HDP+SGA (aOR12.3 [95%CI 3.17,47.5]) compared to the control group. There was no significant difference in prevalence of AI (p = 0.09), FVM (p = 0.78), and CI (p = 0.6) between the three groups. In examining placental disease burden, increasing MVM was seen with increasing amount of clinical disease (median [IQR] MVM score 0[0,1] for control, 1[0,3]for HDP or SGA, 3.5[1.5,5] for HDP+SGA, p = .0001).

Conclusion: A combination of both HDP and SGA, compared to either alone, is associated with greater prevalence of placental MVM lesions as well as higher MVM score. Future research should focus on further understanding this relationship and potential opportunities for intervention for patients with HDP and suspected SGA.

	Control N = 421	SGA OR HDP alone N=138	SGA + HDP N=12	p
Acute Inflammation	247 (58.7) *	67 (48.6)	8 (66.7)	0.09
Chronic Inflammation	228 (54.2)	81 (58.7)	6 (50.0)	0.607
Maternal Vascular Malperfusion	**93 (22.1)**	**63 (45.7)**	**9 (75.0)**	**<0.001**
Fetal Vascular Malperfusion	142 (33.7)	44 (31.9)	3 (25.0)	0.778
Maternal Vascular Malperfusion Score	**0 [0,1]**	**1 [0,3]**	**3.5[1.5,5]**	**0.0001**

*Presented as N(%)

366 | Neonatal Inflammatory Profiles Associated with Perinatally Acquired HCV Infection

Stephanie A. Fisher; On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network
Northwestern University Feinberg School of Medicine, Chicago, IL

10:30 AM - 12:30 PM

Objective:

To identify plasma inflammatory cytokine and chemokine profiles associated with hepatitis C virus (HCV) infection among infants with perinatal HCV exposure.

Study Design: Nested case-control study of infants born to pregnant people with HCV viremia enrolled in a prospective, multisite, observational cohort study of perinatal HCV transmission (2012-21). Cases were infants with perinatally acquired HCV infection (positive HCV RNA PCR at 2 months of life). Negative controls were matched on center, term vs. preterm birth, and peak maternal viral load (HCV RNA >10^6 IU/ml vs. HCV RNA ≤10^6 IU/ml) during pregnancy. We assessed pro-inflammatory cytokine and chemokine (TNF-α, IL-1RA, IL-18, FGF-basic, PD-L1, CXCL10/IP-10) concentrations in infant plasma drawn at 2 months of life. Quantile regression was used to compare the distribution of cytokine and chemokine concentrations between cases and controls; box plots depicting their log-transformed concentrations were generated.

Results: Perinatal transmission occurred in 26 infants (8%) born to 314 individuals. Of infants without exposure to HIV (N = 24), 11 had had 2-month samples available for analysis. In 11 cases and 11 controls, the mean gestational age at birth was 38 ± 2 weeks (3 cases and 2 controls were born preterm). Median PD-L1 concentration was higher in cases than controls (79 vs. 58 pg/ml; difference in medians, 95 % CI 22 pg/ml, 3 - 41; p = 0.03). Median CXCL10/IP-10 concentration was higher in cases than controls, but not statistically significantly (100 vs 57, p > 0.05). The distributions of other detectable cytokine concentrations were similar between groups (Table, Figure).

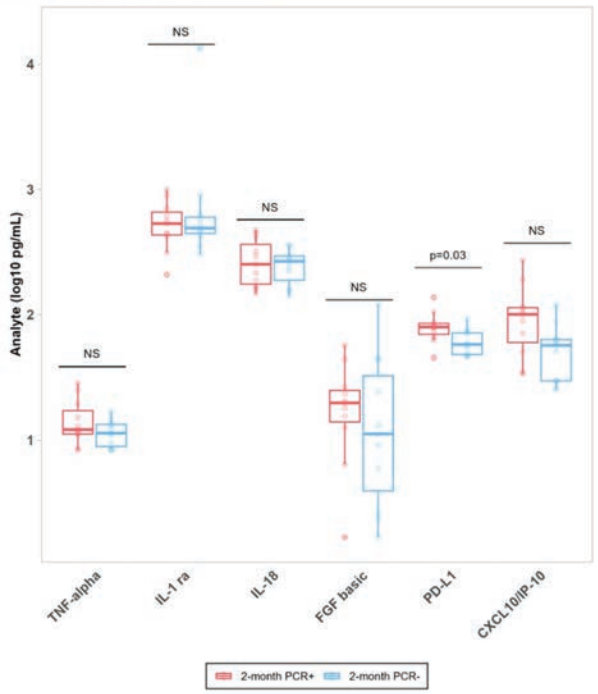
Conclusion: Compared to HCV-exposed uninfected infants at 2 months of life, infants with perinatal HCV infection demonstrate upregulation of PD-L1, a signature of functional CD8 T-cell exhaustion. Understanding the role of the PD-1/PD-L pathway and regulation of cytotoxic T-cell responses requires further investigation in infants exposed to HCV viremia *in utero*.

Table. Distribution of cytokine and chemokine concentrations in infants with versus without perinatal HCV infection at 2 months of life

Analyte	2 month HCV PCR+ *Median (IQR)* N=11	2 month HCV PCR- *Median (IQR)* N=11	Difference in medians (95% CI)
TNF-α	12 (11, 20)	11 (8, 14)	1 (-4, 5)
IL-1RA	533 (422, 706)	491 (422, 629)	42 (-164, 248)
IL-18	252 (164, 414)	267 (159, 295)	-14 (-153, 125)
FGF-basic	20 (13, 27)	11 (3, 44)	9 (-10, 27)
PD-L1	79 (66, 86)	58 (47,73)	22 (3, 41)
CXCL10/IP-10	100 (50, 115)	57 (30, 63)	44 (-1, 88)

All analyte concentrations, assessed at 2 months of life, are reported as pg/mL.
HCV: hepatitis C virus, PCR: polymerase chain reaction, IQR: interquartile range, CI: confidence interval, TNF-α: tumor necrosis factor-alpha, IL-1RA: interleukin-1 receptor antagonist, IL-18: interleukin-18, FGF-basic: basic fibroblast growth factor, PD-L1: programmed death-ligand 1, CXCL10/IP-10: C-X-C motif chemokine ligand 10, also known as Interferon gamma-induced protein 10

Figure. Distribution of cytokine and chemokine concentrations in HCV PCR+ vs. PCR- neonates



HCV: hepatitis C virus, PCR: polymerase chain reaction, NS: not statistically significant

367 | Area-Based Socioeconomic Deprivation Indices to Predict Glycemic Control in Pregnant Patients with Type 1 Diabetes

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10:30 AM - 12:30 PM

Objective: Area Deprivation Index (ADI) and Social Vulnerability Index (SVI), indicators of socioeconomic disadvantage, have been associated with adverse outcomes. The inclusion of demographic and economic variables differs between the two indices, potentially affecting the strength of the association with some conditions. We sought to determine if Area Deprivation Index (ADI) or Social Vulnerability Index (SVI) better predicts glycemic control in pregnant patients with type one diabetes mellitus (T1DM).

Study Design: We performed a retrospective cohort study of pregnant patients with singleton gestations and T1DM receiving care at a large regional health system from January 2016 to January 2023. Patients establishing care after 20 weeks and those with missing delivery information were excluded. Primary outcome was optimal baseline glycemic control, defined as HbA1c < 6.5%. Area under the curve (AUC) was calculated to examine the ability of each index to predict optimal glycemic control. Secondary outcomes included midtrimester HbA1c < 6.0%, delivery < 34 weeks and non-transfusion severe maternal morbidity (SMM). Outcomes were compared via regression analyses controlling for individual level deprivation as indicated by public insurance.

Results: Among 288 patients, 144 (50%) had public insurance, with those patients more likely to be younger (median age 26 vs 31, p < 0.001) and Black (52% vs 17%, p < 0.001, Table). Public insurance was associated with lower odds of optimal HbA1c (5.6% vs 29.2%, p < 0.001). Controlling for payor status, ADI was associated with baseline glycemic control (p = 0.006) while SVI was not (p = 0.36). The AUC for prediction of optimal baseline HbA1c was similar for ADI and SVI when paired with payor status (Figure). ADI, but not SVI, was predictive of midtrimester glycemic control (ADI p = 0.013, SVI p = 0.098). Neither ADI nor SVI was associated with SMM or delivery < 34 weeks after controlling for payor.

Conclusion: Neighborhood deprivation defined by ADI, but not SVI, was associated with glycemic control after controlling for individual-level income status in pregnant patients with T1DM.

Table 1. Baseline characteristics of pregnant patients with type I diabetes mellitus by insurance payor status.

	Commercial N = 144 N (%) -or- median [IQR]	Public N = 144 N (%) -or- median [IQR]	P
Median Age, years	31.0 [27.0, 34.0]	26.0 [22.0, 29.0]	<0.001
Black, n	24 (16.8%)	75 (52.1%)	<0.001
Hispanic, n	1 (0.7%)	2 (1.4%)	>0.999
Multiparous, n	64 (44.4%)	83 (57.6%)	0.034
Median baseline BMI, kg/cm^2	26.6 [23.5, 31.7]	27.5 [23.7, 33.3]	0.237
Chronic Hypertension, n	21 (14.6%)	37 (25.7%)	0.028
Tobacco use, n	3 (2.1%)	16 (11.1%)	0.004
Median Duration of Diabetes	13.0 [9.0, 19.0]	13.0 [8.0, 18.8]	0.363
Median ADI centile	49.0 [34.0, 63.0]	72.0 [60.0, 89.0]	<0.001
Most deprived ADI quartile, n	11 (7.6%)	65 (45.1%)	<0.001
Median SVI Centile	43.8 [21.6, 61.4]	66.0 [42.1, 83.1]	<0.001
Most deprived SVI quartile , n	20 (13.9%)	58 (40.3%)	<0.001
Urban residence*, n	140 (97.2%)	118 (81.9%)	<0.001

ADI, Area Deprivation Index; BMI, body mass index; cm, centimeters; IQR, interquartile range; SVI, Social Vulnerability Index

**Defined as Rural Urban Commuting Code < 4*

Figure 1

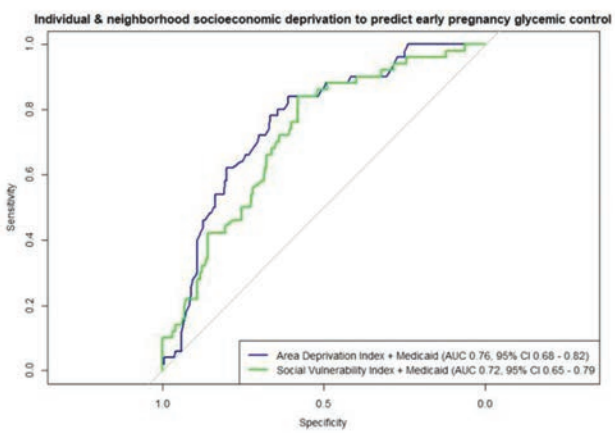

Figure 1: Receiver operator characteristic (ROC) produced comparable area under the curve (AUC) for ADI and SVI in prediction of optimal glycemic control. ADI shows AUC 0.76 (95% CI 0.68-0.82) while SVI shows AUC 0.72 (95% CI 0.65-0.79).

368 | The Intersectionality of Social Determinants on Preterm Birth Risk

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10:30 AM - 12:30 PM

Objective: There is a significant gap in the understanding of what causes women with rheumatic disorders to be at increased risk for preterm birth (PTB). This study aimed to identify social determinants that influence the relationship between immune-mediated inflammatory arthritis (IMIA), including rheumatoid arthritis, psoriatic arthritis, and axial spondyloarthritis, and PTB in a large multi-racial/ethnic cohort of women. In line with the intersectionality framework, we quantified the relationship between IMIA and PTB and how it is impacted by race, insurance type, and mother's age.

Study Design: We utilized data from electronic medical records from Indiana University Health curated by the Regenstrief Institute, Inc. on births from 2018 to 2022 to create a retrospective cohort of 72,264 unique deliveries. A stratified logistic regression analysis was conducted to assess the associations between maternal age, race, and insurance type with preterm birth, separately for women with and without IMIA. Interaction terms were included to explore the multiplicative effects of these variables.

Results: Among women with IMIA (n = 294), Non-Hispanic (NH) Black women were at significantly increased risk of PTB (OR = 1.50, p = 0.006), and advanced maternal age (35-49yrs) was also associated with higher risk (OR = 0.94, p = 0.031). However, the interaction between age and NH Black women, though suggestive, did not reach statistical significance. For non-IMIA women (n = 71,970), similar patterns were observed with significant associations for maternal age (OR = 0.23, p < 0.001) and NH Black women (OR = 0.19, p < 0.001). Importantly, the interaction between age and NH Black women was statistically significant (OR = 0.32, p < 0.001), indicating that the combined effect of these factors may amplify PTB risk.

Conclusion: These findings suggest intersectional factors, particularly race and maternal age, interact complexly to influence PTB irrespective of IMIA. Future exploration of intersectional identities and their impact on perinatal health is warranted.

369 | Assessing Racial Disparities in the Initiation of Prenatal Care in Women after Emergency Department Visits

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10:30 AM - 12:30 PM

Objective: Colloquially, we have seen emergency departments (ED) become the first line of prenatal care for persons early in their pregnancy. Still, there is insufficient data on how this prenatal care is performed, who utilizes the ED prior to initiation of prenatal care, and how quickly and often this leads to long-term follow-up by an obstetrician for initiation of prenatal care. This study aimed to assess the demographics of women who presented with pregnancy for the first time in the emergency department before initiating prenatal care to identify demographics and risk factors associated with this presentation.

Study Design: A retrospective cohort analysis was conducted on women who presented at Fairview Hospital Emergency Department (ED) with a positive hCG test between January 2, 2019, and December 31, 2019, without prior established obstetric care in their current pregnancy.

Results: The analysis included 347 patients who presented to the ED before establishing obstetric care in their pregnancy, with 87% of patients seeking care for obstetric-related complaints during their ED visit. Our study found notable differences between non-Hispanic white (140 patients) and minority patients (Black, Hispanic, and Multiracial ~ 197 patients) populations, with minority patients being more likely to be on public insurance or uninsured (p = 0.0148) and to establish care after 12 weeks gestational age (23.5% vs 11.6%, p = 0.0141). Minority patients were less likely to have an established OB/GYN (44.4% vs 62.2%, p = 0.0013) or to have an OB/GYN for their current pregnancy than Non-Hispanic White patients (p = 0.0193).

Conclusion: Although there are racial disparities evident in the time taken to establish prenatal care between minority to non-Hispanic white patients who present to the ED prior to establishing care, this study revealed how differences in insurance status between racial and ethnic groups may also be contributing to this disparity in the initiation of prenatal care.

Characteristic	Total Population	White (N = 140)	Minority (N = 199)	P value
BMI median, kg/m2	27.3 (7.84)	26.61 (8.01)	27.98 (7.72)	0.0826
Established OB-GYN				0.0013
Yes	172 (52.1)	89 (62.2)	83 (44.4)	
No	158 (47.8)	54 (37.8)	104 (55.6)	
OB-GYN for pregnancy	86 (25.1)	42 (29.6)	40 (20.4)	0.0193
Established PCP				0.2334
Yes	115 (34.8)	55 (38.2)	60 (31.9)	
No	217 (65.4)	89 (61.8)	128 (68.1)	
Insurance n (%)				0.0148
Public	246 (71.1)	98 (66.2)	148 (74.8)	
Private	65 (18.8)	38 (25.7)	27 (13.6)	
Uninsured	35 (10.1)	12 (8.11)	23 (11.6)	
Patient Aware	273 (79.4)	124 (84.4)	149 (75.6)	0.1125
Follow Up	285 (82.6)	121 (85.1)	159 (80.7)	0.2832
Gest age when Prenatal care				0.0141
<12 weeks	196 (82.0)	91 (88.4)	101 (76.5)	
>12 weeks	43 (18.0)	12 (11.6)	31 (23.5)	
Days between + b-hCG and IPC (med days)	23 (29.2)	19 (37.53)	23 (27.5)	0.5301
Reason for ED Visit,				0.5957
OB-related	298 (86.7)	129 (87.8)	169 (85.8)	
Non-OB related	46 (13.3)	18 (12.2)	28 (14.2)	
Pre-existing Condition				
HTN	18 (5.2)	11 (7.4)	7 (3.7)	0.1072
DM	5 (1.4)	3 (1.5)	2 (1.3)	0.8980
Autoimmune	5 (1.4)	3 (2.1)	2 (1.0)	0.4341
Asthma/COPD	45 (12.9)	12 (8.1)	33 (16.6)	0.0190
Obesity	67 (19.3)	32 (21.5)	35 (17.6)	0.3626
Smoker	55 (15.8)	29 (19.5)	26 (13.1)	0.1055
Substance Use	34 (9.8)	15 (10.1)	19 (9.6)	0.8717
Previous Pregnancy Complication				
Hypertensive Disorder	25 (7.2)	12 (8.3)	13 (6.8)	0.5866
Gestational Diabetes	9 (2.6)	4 (2.8)	5 (2.6)	0.9203
Pre-term Delivery	21 (6.0)	9 (6.0)	12 (6.0)	0.9969
Miscarriage	73 (21.0)	33 (22.2)	40 (20.1)	0.6426
Intrauterine fetal demise	4 (1.1)	0	4 (2.1)	0.0338
Intrauterine Growth Restriction	4 (1.1)	2 (1.4)	2 (1.0)	0.7702
Macrosomia	2 (0.6)	1 (0.7)	1 (0.5)	0.8369
Oligo or Polyhydramnios	2 (0.6)	2 (1.4)	0	0.1012
Anemia	17 (4.9)	4 (2.7)	13 (6.5)	0.0994
Post-partum hemorrhage	6 (1.7)	3 (2.1)	3 (1.5)	0.1290
Psychiatric Illness	16 (4.6)	10 (6.7)	6 (3.0)	0.1033
Current Pregnancy Complication				
Hypertensive Disorder	14 (4.2)	6 (4.2)	8 (4.2)	0.9975
Gestational Diabetes	16 (4.7)	6 (4.2)	9 (4.7)	0.9984
Pre-term Delivery	22 (6.3)	10 (6.9)	10 (5.2)	0.2507
Miscarriage	83 (23.9)	42 (29.2)	37 (19.4)	0.1004
Intrauterine fetal demise	2 (0.6)	0	2 (1.5)	0.2197
Intrauterine Growth Restriction	9 (2.6)	4 (2.8)	5 (2.6)	0.9203
Macrosomia	5 (1.4)	4 (2.8)	1 (0.5)	0.0905
Oligo or Polyhydramnios	4 (1.2)	2 (1.4)	2 (1.5)	0.7702
Anemia	29 (8.3)	9 (6.3)	19 (9.9)	0.3435
Post-partum hemorrhage	3 (0.86)	1 (0.7)	2 (1.5)	0.7389
Cesarean Section	31 (8.9)	13 (9.0)	16 (8.4)	0.9173
Psychiatric Illness	14 (4.0)	7 (4.9)	7 (3.7)	0.0075
Months since last delivery (med, SD)	28 (32.6)	29 (34.23)	26 (30.6)	0.2722
Gravidity > 3	80 (24.2)	34 (24.5)	44 (24.4)	0.4881
Term > 2	39 (12.8)	16 (12.2)	22 (13.4)	0.7947

Table 1: Baseline Characteristics of who presented to the ED prior to establishing obstetric care.

370 | Application of a Multiscale Model of Heart Growth in Pregnancy to Patient-Specific Echocardiographic Data

Tiffany Corlin; Molly S. Kaissar; Kyoko Yoshida

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10:30 AM - 12:30 PM

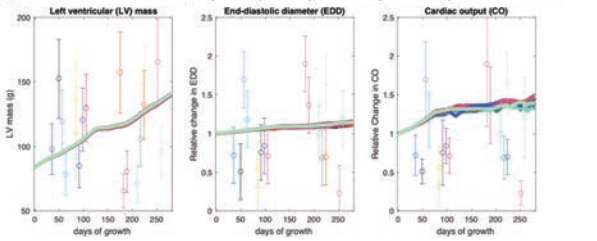
Objective: Computational models are a useful tool in predicting changes during pregnancy, as real-time monitoring can be invasive or not practically feasible. Here, we apply a multiscale model

of left ventricular (LV) growth throughout pregnancy. The model was scaled to patient masses and mean arterial pressures (MAP) to assess how the model represents individual pregnant patients.
Study Design: The MATLAB code for the previously developed model in the rat is publicly available and allometric scaling was used to adapt the rat model's hemodynamics to human physiology. Hormone levels (estrogen, progesterone, and angiotensin II) were adapted to human concentrations reported by the literature. Then, using an obstetric outcomes database, we identified 663 pregnant patients without comorbidities and at least one normal echocardiogram during pregnancy. The model was executed for 18 patients, which was scaled to the patient's pre-pregnancy mass and matched to MAP. Hormones were considered the same for all patients.
Results: The model demonstrates an increase in LV mass by approximately 60-70% through pregnancy. The allometric scaling between patients did not significantly affect the model's growth, as each patient's LV mass growth curve was nearly the same (Figure 1). The model overpredicted LV mass in patients with a pre-pregnancy mass of < 60 kg, but was nearly all within a 20% error range of the patient's LV mass in patients > 60 kg (Table 1). The model's predictions for end-diastolic diameter (EDD) and cardiac output
(CO) were overestimated in the patients weighing > 60 kg prior to pregnancy (Table 1).
Conclusion: A multiscale model demonstrating heart growth during pregnancy has been scaled from rats to humans. It is a novel use of this model to compare to human echocardiographic data that makes reasonable predictions, especially in normal-weight patients. Future directions include comparison of the model's accuracy to longitudinal data for specific patients to determine which factors are most instrumental in predictions and how to make determinations about those at risk for pregnancy-associated cardiac morbidity.

Table 1. Comparison of model prediction to echocardiographic data by patient's pre-pregnancy mass.

Pre-pregnancy Mass (kg)	LV Mass	EDD	CO
37.19	over	under	in range
48.53	over	in range	over
48.53	over	in range	in range
52.15	under	under	under
53.97	over	in range	in range
57.14	in range	under	in range
58.96	under	under	under
58.96	over	in range	in range
58.96	over	in range	in range
67.12	in range	in range	over
73.47	in range	over	over
86.62	in range	over	over
88.44	in range	in range	over
93.43	under	over	over
93.43	in range	in range	over
104.76	in range	over	over
117.46	under	over	over
117.92	in range	over	over
over	33.3	33.3	**55.6**
under	22.2	22.2	11.1
in range	**44.4**	**44.4**	33.3

Figure 1. Modeled LV mass, EDD, and CO with patient-specific echocardiogram LV mass, EDD and CO with 20%, 0.3cm, and 20mL error bars, respectively. Each patient is represented by a different color.



371 | One Key Question Ascertainment of Pregnancy Intention and Participation in Genetic Testing/Research Among Puerto Ricans

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10:30 AM - 12:30 PM
Objective: Peri-pregnancy is a unique opportunity for genetic testing (GT) in clinical care and for inclusion of pregnant people in genetic research (GR). Equitable inclusion of people self-identifying as Puerto Rican (PR) in GT/GR is complicated by historical scientific abuses, mistrust, and minoritization, placing PR at risk of distributional injustice in being excluded from GT/GR from which they could benefit. We aimed to ascertain likelihood of participation in GT/GR among non-pregnant PR women of reproductive age who hope to become pregnant in the next year.
Study Design: We conducted a nested analytical cross-sectional study of social determinants of GR/GT participation among people who self-identified as non-pregnant PR women age 21-49. We used *One Key Question* to ascertain pregnancy intention in the next year. We used two beliefs scores (GT and GR), and participation in GT/GR using 5-point Likert scales.
Results: Among 321 eligible people, 13.9% (n = 49) hoped to become pregnant in the next year, 79.0% (256) did not want to become pregnant, and 6.2% (20) were ambiguous. Those living in Puerto Rico were 50% more likely than those in the USA to participate in GR ($p < 0.001$). In the USA, those intending pregnancy were significantly more likely to participate in GR than those not intending pregnancy. In Puerto Rico, GT/GR participation rates for both intent groups were high and not significantly different. In Puerto Rico, women intending pregnancy within the next year had similarly high levels of positive GR beliefs and GT beliefs as others, while in the USA, only women intending pregnancy within the next year had significantly more positive levels of both.
Conclusion: PR hoping to become pregnant in the next year have high rates of intending to participate in GT/GR, with GR interest higher in Puerto Rico. This interest provides a unique opportunity to engage people intending pregnancy in efforts toward participating in GT/GR, aiming to improve PR inclusion in GT clinical benefits while contributing to GR involving unique tissues of pregnancy (e.g., placenta, cord blood), and reducing distributional injustice.

Table 1: Likelihood of participating in genetic research and genetic testing, among self-identified Puerto Rican women of reproductive age (21-49), by pregnancy intention status and country of residence

One Key Question* Would you like to become pregnant or have a child in the next year?	We would like you to now answer some questions about genetic research. Genetic research is when researchers collect your DNA (through saliva, blood, or other tissues) to explore a link between people's genetic makeup and their risk for certain health outcomes. Please use the options provided to share how likely or unlikely you are to participate in genetic research. I would participate in research that used my DNA.		Genetic testing, also known as DNA testing, allows individuals and medical professionals to determine how vulnerable a person is to certain diseases. For example, individuals with a certain gene in their DNA may be more likely to get certain types of cancer. DNA testing could be used for other many reasons, such as determining a child's biological mother or father or identifying where your biological ancestors are from. If a genetic test was available to you at a minimum cost, how likely are you to have it done?		Belief Scales (Higher score = more positive beliefs)	
	Likely or Very Likely % (n)	Odds Ratio (95% CI)	Likely or Very Likely % (n)	Odds Ratio (95% CI)	Genetic Testing Beliefs Mean (SD)	Genetic Research Beliefs Mean (SD)
OKQ Yes/ Unsure	70.3 (45)	1.8 (1.0, 3.3)	60.3 (38)	1.0 (0.6, 1.8)	46.7 (7.2)	34.9 (6.5)
OKQ No	56.2 (140)	Referent	60.1 (152)	Referent	45.3 (7.2)	33.3 (6.5)
All	59.1 (185)		60.1 (190)		45.6 (7.2)	33.6 (6.5)
	X^2: 4.180		X^2: 0.001		F: 2.831	F: 1.741
	(p=0.041)		(p=0.972)		(p=0.094)	(p=0.188)
Live in USA						
OKQ Yes/ Unsure	65.1 (28)	2.1 (1.1, 4.3)	61.9 (26)	1.2 (0.6, 2.3)	47.5 (6.6)	35.0 (6.3)
OKQ No	46.6 (76)	Referent	58.1 (97)	Referent	44.8 (7.4)	32.3 (6.0)
All	50.5 (104)		58.9 (123)		45.3 (7.4)	32.9 (6.2)
	X^2: 4.654		X^2: 0.202		F: 3.966	F: 6.120
	(p=0.031)		(p=0.653)		(p=0.048)	(p=0.014)
Live in Puerto Rico						
OKQ Yes/ Unsure	81.0 (17)	1.5 (0.4, 4.8)	57.1 (12)	0.8 (0.3, 2.0)	45.3 (8.5)	34.8 (7.5)
OKQ No	74.4 (64)	Referent	64.0 (55)	Referent	46.2 (6.7)	35.0 (7.0)
All	75.7 (81)		62.6 (67)		46.0 (7.0)	35.0 (7.0)
	X^2: 0.392		X^2: 0.001		F: 0.179	F: 0.011
	(p=0.531)		(p=0.972)		(p=0.673)	(p=0.917)

372 | Implementation of a Novel Blood Distribution System in an Obstetrics Service

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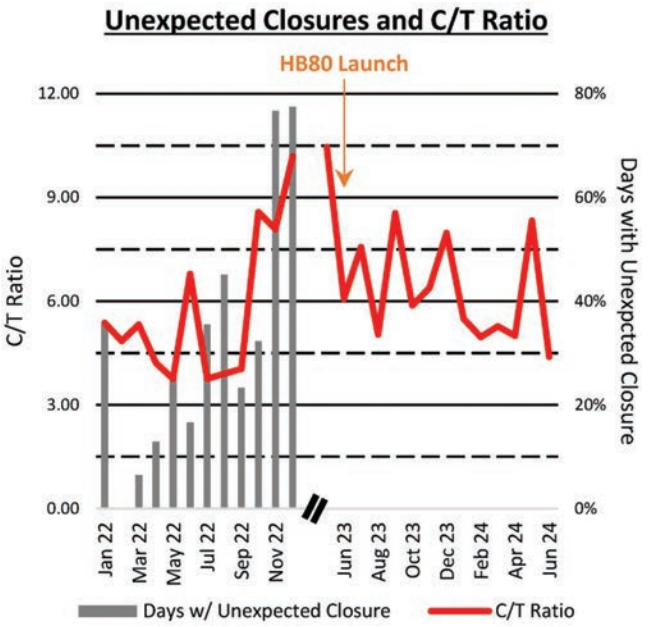
10:30 AM - 12:30 PM

Objective: Obstetric hemorrhage, a leading cause of maternal morbidity and mortality, complicates up to 10% of births. Our institution opened an obstetric hospital with a satellite blood bank (SBB), 0.25 miles from the main hospital. Due to national licensed blood bank technologist shortages, the SBB could not remain open consistently, requiring blood to be obtained from the main blood bank (MBB). This presented a significant patient safety issue and increased unnecessary blood orders indicated by crossmatch-to-transfusion (C/T) ratio. Our objective was to assess the impact of implementing a novel blood distribution system using non-licensed personnel on blood product availability, ordering, and utilization.

Study Design: The BloodTrack Haemobank 80 (HB80) is an FDA-cleared smart refrigerator with 80 compartments that can perform electronic crossmatches and issue blood products (RBCs, plasma, fibrinogen concentrate, RhIG) for specific patients in a rapid and controlled manner. We developed workflows to provide 24/7 blood product dispensing and massive hemorrhage support from the HB80 using lab assistants in the SBB starting in June 2023. The SBB closure rates and C/T ratio were assessed before and after installation of the HB80.

Results: Prior to HB80 rollout, SBB experienced a high closure rate and an increasing C/T ratio (Figure 1). Post HB80, there were no unplanned SBB closures and the C/T ratio decreased from a peak 10.5 before the HB80 to a recent nadir of 4.4 after implementation (Figure 1).

Conclusion: Implementation of a novel blood distribution system utilizing an HB80 within an obstetric unit eliminated SBB closures and improved blood product utilization. The HB80, which can be embedded within an obstetric unit, is a valuable resource to provide safe and effective blood product support for an obstetric service.



373 | Allostatic Load Score is Associated with Gestational Age at Delivery in a Dose Dependent Manner

Sarah Heerboth[1]; Maura Jones Pullins[1]; Emily Gascoigne[2]; Rebecca Fry[1]; Tracy A. Manuck[1]
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10:30 AM - 12:30 PM

Objective: Allostatic load (AL) is a multidimensional construct that encompasses cumulative stressors, and is associated with a multitude of adverse health outcomes outside of pregnancy. Despite this, there is no 'standard' definition of AL, and the relationship between AL and preterm birth (PTB) remains poorly defined.

Study Design: Secondary analysis of a prospective cohort enriched for those at high *a priori* risk of PTB. Participants identifying as Black, White, and/or Hispanic, with singleton, non-anomalous gestations were recruited < 22 weeks, 2017-2022. At enrollment, baseline health data and blood samples collected. We considered 6 markers previously considered in other AL indices: CV domain factors (initial prenatal systolic BP, initial prenatal diastolic BP), a metabolic factor (pre-pregnancy BMI), and inflammation (plasma IL-6, IL-10, and IL-1β levels). Each marker was classified as 'high' ($\geq 75^{th}$ centile; 1 point) or 'low' ($< 75^{th}$ centile; 0 points). The total AL score was calculated by summing these 6 factors for a max AL score = 6. The primary outcome was GA at delivery (continuous). Secondary outcomes were PTB < 37, < 35, and < 28 wks. Data were analyzed by t-test, chi-square, Cox regression, and Kaplan-Meier survival.

Results: 493 participants were included, delivering at a median 38.3 (IQR 36.9, 39.3) weeks'. The median AL was 1 (IQR 0, 2).

Clinical characteristics are shown in Table 1. In Cox regression models, an AL score of 0 was associated with pregnancy prolongation [adjusted Hazard Ratio (aHR) 0.81, 95% CI 0.67, 0.99]; in contrast, AL scores ≥1 were associated with an increased aHR of delivery in a dose dependent manner (Figure 1A). In survival analyses, those with a high AL scores [≥75th centile (≥2)] delivered earlier (Figure 1B, log-rank p = 0.0014).

Conclusion: A multidimensional AL score calculated early pregnancy is associated with delivery gestational age in a dose-dependent manner. Several of these AL components are potentially modifiable; future studies should evaluate whether optimization of health / improvement in these metrics is associated with improved perinatal outcomes.

		High Allostatic Load (score ≥2, ≥ 75thcentile) N=220	Lower Allostatic Load (score 0-1, <75th centile) N=273	p-value
Demographics and Medical Comorbidities	Age	31.8 (5)	31.6 (5)	0.76
	Black Race	108 (49)	96 (35)	0.002
	Hispanic Ethnicity	49 (22)	59 (21)	0.86
	Public Insurance	116 (53)	116 (42)	0.02
	Tobacco Use in Pregnancy	26 (12)	27 (10)	0.49
	Chronic Hypertension	65 (29)	17 (6)	<0.001
	Pre-Pregnancy BMI	34.8 (10)	27.1 (6)	<0.001
	Pre-Gestational DM	19 (9)	5 (2)	<0.001
Obstetric History	History of Spontaneous PTB <35wks	162 (74)	161 (59)	<0.001
	Earliest GA of Prior PTB	27.1 (9)	31.5 (8)	<0.001
	Cerclage in Prior Pregnancy	49 (22)	31 (11)	0.001
	Prior Term Delivery >37wks	135 (61)	191 (70)	0.04
Pregnancy Outcomes	Short Cervix	49 (22)	36 (13)	0.008
	Vaginal Progesterone	27 (12)	34 (12)	0.95
	Cerclage Placed	91 (41)	63 (23)	<0.001
	Pre-Eclampsia or Gestational Hypertension	58 (26)	23 (8)	<0.001

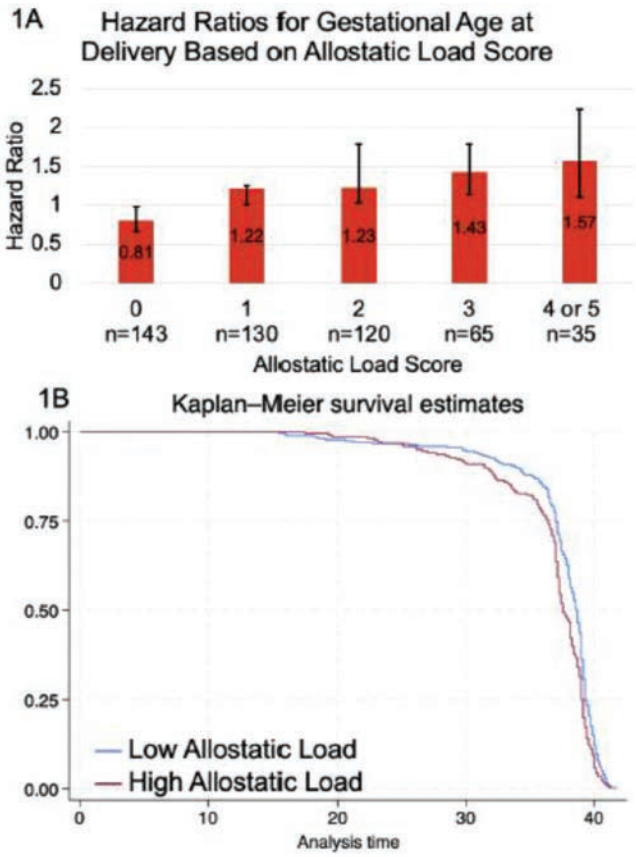

Figure 1A: Cox Regression model results. Shown are adjusted Hazard Ratios for gestational age at delivery based on Allostatic Load Score. Other factors considered in regression models included short sonographic mid-trimester cervical length (<25mm), public insurance, and cigarette smoking during pregnancy.
Figure 1B: Kaplan-Meier survival curve, adjusted for short trimester cervical length (<25mm), public insurance, and cigarette smoking during pregnancy. Those with a high allostatic load score (≥ 75th centile, ≥ 2) were compared to those with lower scores.

374 | Community Features Incorporating Multiple Domains Outperforms Composite Indices in Predicting NC County-Level Perinatal Outcomes

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10:30 AM - 12:30 PM

Objective: Community features influence health outcomes; these data are increasingly available and commonly incorporated into research and clinical care. However, it is unknown if multiple individual community domains or composite community indices better predict perinatal outcomes.

Study Design: NC county-level data were obtained online. Primary perinatal outcomes = county-level PTB < 37 wks, LBW, infant mortality, breastfeeding (BF) initiation, and short IPI (< 6 mo). We adapted an established community framework to create models with 6 community domains (health behaviors, clinical care & quality, SES factors, physical environment, length of life, quality of life), Figure 1A. For each outcome, we selected the most predictive factor from each domain using linear regression;

the relative contribution of each domain to each outcome was calculated using general dominance analysis. Next, we selected the most predictive composite index (evaluating the social vulnerability index, childhood opportunity index, and reproductive maternal vulnerability index) for each outcome. Logistic regression was used to evaluate which model best predicted the highest (e.g., worst) quartile for each outcome.

Results: The median rates of PTB (11.5%, IQR 10.1-12.8%), LBW (9.2%, IQR 8.4-10.2%), infant mortality (6.0%, IQR 0.0-8.0%), BF initiation (78.5%, IQR 68.7, 83.5), and short IPI (13.7%, IQR 11.8-15.2%) varied widely across the 100 NC counties. The optimal county-level domain predictor and the relative contribution of each domain to each outcome differed by perinatal outcome (Figure 1B). For all outcomes, the multiple domain models outperformed composite index models (higher AUCs), and the AUC was statistically significantly higher for infant mortality ($p < 0.001$) and BF-initiation models ($p < 0.001$), Table 2.

Conclusion: A range of non-conventional community features in multiple domains are associated with perinatal outcomes; these vary by perinatal outcome. These data underscore the importance of considering individual community factors in multiple domains (vs. composite community indices) when quantifying neighborhood exposures.

Figure 1A. Community Health Framework used to construct the multiple exposure models, adapted from the UWPHI County Health Rankings model. For each perinatal outcome, the most predictive health behavior, clinical care & quality, SES factor, physical environment, length of life, and quality of life factor was selected for model inclusion.

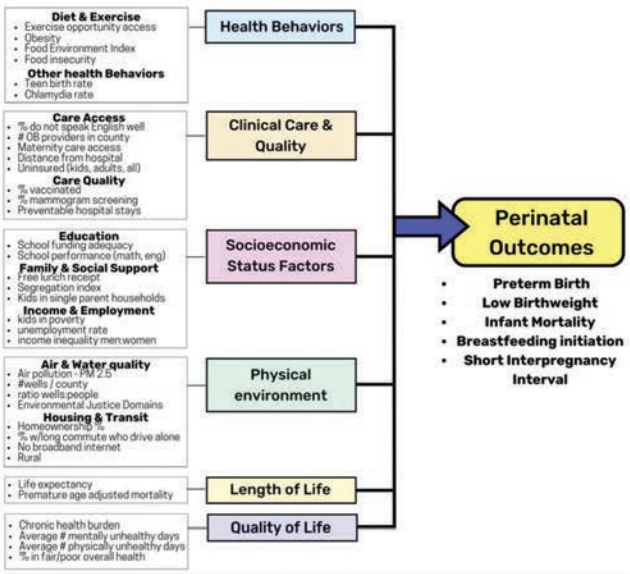

Figure 1B. Factors included in multiple domains models. The factors most predictive of each outcome and included in regression models are listed. The relative dominance (importance) of each domain for each perinatal outcome is shown in the bar graph.

	Health behaviors	Clinical Care & Quality	SES	Physical environment	Length of life	Quality of life
PTB	obesity	Uninsured kids	School funding	#wells/ county	Life expectancy	# in fair/poor health
LBW	Teen birth rate	Uninsured kids	Free lunch receipt	Home-ownership %	Adjusted death rate	Avg. # phys. unhealthy days
Infant mortality	Chlamydia rate	Maternity care access	Segregation index	Ratio wells:people	Life expectancy	Avg. # phys. unhealthy days
Breast feeding	Food environ. index	% vaccinated	Single parent hh	Long commute, drive alone	Life expectancy	Avg. # mental unhealthy days
Short IPI	Food insecurity	Preventable hospital stays	% Kids in poverty	Envir. Justice Domain #3	Life expectancy	Chronic health burden

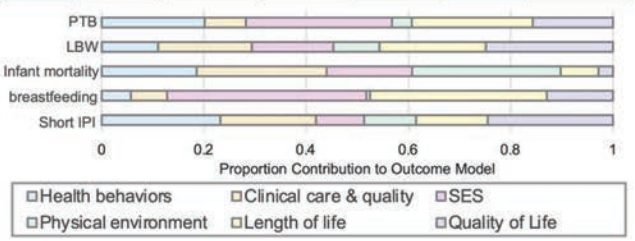

Table. Logistic regression results. Shown are the Multiple Predictors Models (included 6 independent variables: the best county-level predictor in each of the 6 main domains as described in the methods) and the Composite Predictors Model (included the single best composite predictor, as listed in the table, as the independent variable). The AUC (95% CI) for the highest quartile of each outcome are shown. The p-value reflects the comparison of the AUCs of the Multiple Predictor and Composite Predictor models.

Outcome	Multiple Domains Model	Composite Index Model		p-value
	AUC (95% CI)	Best composite index	AUC (95% CI)	
Preterm birth <37 weeks	0.8336 (0.744, 0.923)	Childhood Opportunity Index	0.784 (0.69, 0.877)	0.273
Low birth weight	0.937 (0.887, 0.987)	Childhood Opportunity Index	0.874 (0.793, 0.954)	0.097
Infant mortality	0.9371 (0.886, 0.987)	Social vulnerability index	0.785 (0.695, 0.874)	<0.001
Breast-feeding initiation	0.962 (0.929, 0.994)	Social vulnerability index	0.694 (0.564, 0.824)	<0.001
Short inter pregnancy interval	0.688 (0.571, 0.806)	Childhood Opportunity Index	0.595 (0.471, 0.718)	0.092

375 | Opioid Use Disorder and Severe Maternal Morbidity

Valeria Mantilla[1]; Alexis Cates[2]; Mariella Gastanaduy[2]; Elizabeth Howard[2]; Frank B. Williams[3]
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10:30 AM - 12:30 PM

Objective: Opioid use disorder (OUD) in pregnancy increased nationally more than four-fold from 1999-2014. OUD has been associated with adverse perinatal outcomes, including preterm labor, growth restriction, and low birth weight. We hypothesize that OUD is likewise associated with severe maternal morbidity (SMM).

Study Design: We performed a retrospective cohort study of delivery admissions at a large regional health system from May 2018 to April 2023. Patients with multiple delivery admissions were limited to only the first pregnancy. Those without delivery outcome information and prenatal care in the system were excluded. OUD was defined by ICD-10 code documentation in the electronic medical record. The primary outcome was the Centers for Disease Control-defined SMM. Baseline characteristics were compared via chi-square test or t-test. Outcomes were compared with regression analysis controlling for age, obesity, nulliparity, pre-gestational diabetes, chronic hypertension and public insurance. Secondary outcomes included cesarean delivery, preterm delivery, and low birth weight.

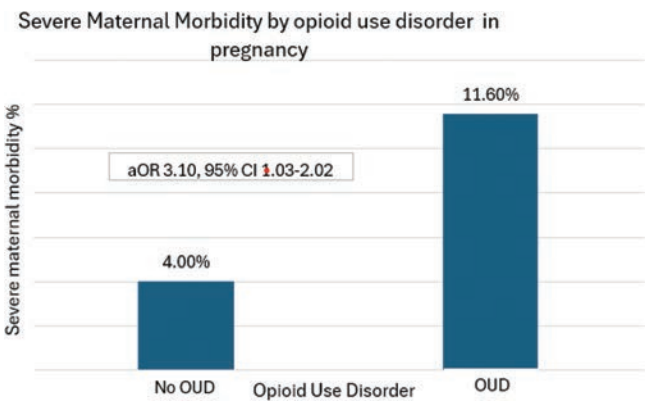
Results: Among 57,023 deliveries, OUD was diagnosed in 534 (0.9%) patients. OUD was more prevalent among patients with age > 35 years, multiparity, chronic hypertension, and public insurance (Table 1). Obesity was less common among patients with OUD (Table 1). SMM was more common in OUD patients compared to those without the diagnosis (11.6% vs 4.0%); difference persisted when controlling for age, obesity, nulliparity, pre-gestational diabetes, chronic hypertension and public insurance (aOR 3.10, 95% CI 1.84–5.21, Figure). OUD was also associated with an increase in cesarean (aOR 1.44, 95% CI 1.03–2.02) and low birth weight (aOR 1.61, 1.02–2.54). Preterm delivery outcomes did not differ.

Conclusion: OUD is associated with three-fold increased odds of SMM, as well as increased in cesarean and low birth weight.

Table 1. Baseline characteristics of pregnant patients by opiod use disorder status

	No OUD n = 56,489	OUD n = 534	P
Maternal Age > 35 years	7,643 (13.5%)	110 (20.6%)	<0.001
Obese	5,908 (36.9%)	39 (26.4%)	0.010
Nulliparous	24,713 (43.7%)	131 (24.5)	<0.001
Rural home address	3,269 (5.8%)	27 (5.1%)	0.545
Pre-Pregnancy Diabetes Mellitus	1,510 (2.7)	8 (1.5)	0.123
Chronic Hypertension	5,415 (9.6)	73 (13.7)	0.002
Public Insurance	20,312 (62.9)	333 (91.7)	<0.001

OUD, opioid use disorder



376 | Late Preterm Corticosteroid Treatment in Twin Pregnancies and Neonatal Outcomes

Victor A. Olafusi[1]; Elizabeth Roy[1]; Enaja Sambatur[2]; Faezeh Aghajani[3]; Moti Gulersen[4]; Asma Khalil[5]; Vincenzo Berghella[4]; Hiba J. Mustafa[6]
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10:30 AM - 12:30 PM

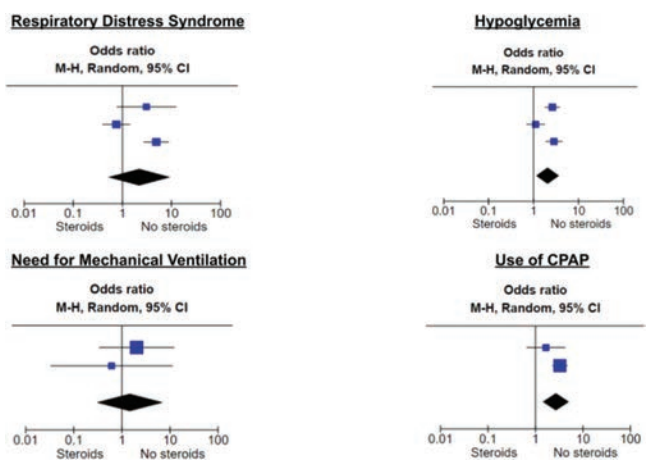
Objective: To examine the impact of administering late preterm corticosteroids on neonatal outcomes in twin pregnancies.

Study Design: A systematic review of the literature was conducted in four electronic databases between 2000 and 2024. Studies reporting on neonatal outcomes in twin pregnancies exposed to corticosteroid (ACS) treatment vs no treatment for fetal lung maturity at the gestational age (GA) of 34 0/7-36 6/7 weeks were included. Studies involving participants with specific conditions (twin-to-twin transfusion syndrome and

intrauterine fetal demise of one fetus) were excluded. The primary outcome was the incidence of respiratory distress syndrome (RDS). Secondary outcomes included the need for mechanical ventilation, continuous positive airway pressure (CPAP), and neonatal hypoglycemia. The random effect model was used to generate weighted mean differences (MD) and odds ratio (OR) along with their 95% confidence intervals (CI). Heterogeneity was assessed using the I^2 value.

Results: 267 abstracts were screened, of which 15 full-texts were fully reviewed. Three studies were included in the final analysis which comprised 489 twin pregnancies receiving steroids and 2807 not receiving steroids. There were no significant differences in baseline characteristics compared between groups including maternal age, body mass index, rate of preeclampsia or diabetes, and type of twin chorionicity. GA at delivery was significantly earlier in the steroids group (MD -0.91, 95% CI -1.50 to -0.32). For neonatal outcomes, no significant differences in RDS and the need for mechanical ventilation between groups. There were higher chances for CPAP use (OR 2.69, 95% CI, 1.47 to 4.92) and neonatal hypoglycemia (OR 2.05, 95% CI, 1.18 to 3.56) in the steroids group.

Conclusion: This study found that antenatal corticosteroid treatment during the late-preterm period in twin pregnancies was not associated with a reduced risk of neonatal respiratory complications.



377 | Cesarean Delivery Rate Among Pregnancies with Fetal Growth Restriction

Virali Patel[1]; Madeline V. Smith[2]; Mariella F. Toro[1]; Brooke E. Ciampaglio[2]; Zarin Mohsenin[3]; Rodney A. McLaren, Jr., Jr.[4]; Huda B. Al-Kouatly[4]; Amanda Roman[5]

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10:30 AM - 12:30 PM

Objective: To determine the incidence of cesarean section (CS) in patients diagnosed with fetal growth restriction (FGR)

Study Design: This is a retrospective cohort study conducted at a single, urban institution of all singleton, nonanomalous pregnancies with no known genetic disorder that had a diagnosis of FGR (defined as estimated fetal weight (EFW) < 10th% or abdominal circumference (AC) < 10th%). All included patients were candidates for vaginal delivery. The severity of FGR was classified into 2 groups: < 3rd% and/or abnormal umbilical artery (UA) Doppler and EFW 4-9th% or AC < 10th% and normal UA Doppler. Maternal demographics, gestational age at delivery, and indication for delivery were collected. Outcomes were analyzed using t-test and Chi-square.

Results: Of the 179 patients meeting inclusion criteria, a total of 24 patients (13.4%) underwent CS. Overall, 36/179 (20.1%) patients had EFW < 3rd% and/or abnormal UA Doppler and 143/179 (79.9%) had EFW 4-9th% and normal UA Doppler, with no significant difference between delivery modes (Table 1). Non reassuring fetal status was the indication for cesarean in 14/24 (58%) of patients. Successful vaginal delivery after CS was noted in 8/13 (61.5%). Compared to patients who delivered vaginally, patients who delivered via CS were more likely to have pre-eclampsia (25% vs. 5.2%, p = 0.001), a prior CS (20.8% vs. 5.2%, p = 0.006) or be induced before 37 weeks (20.8% vs.7.8%, p = 0.042) (Table 1). The nulliparous, term, singleton, vertex CS rate was 11/56 (19.6%) and the preterm rate was 22/179 (12.3%), which are comparable to the national general population rate of 25%.

Conclusion: Patients with an antenatal diagnosis of FGR have similar CS rates when compared to the general population. This information will assist in counseling patients with FGR when discussing mode of delivery.

Table 1: Characterization of patients with fetal growth restriction resulting in vaginal versus cesarean delivery

	Successful vaginal delivery n= 155	Cesarean section n= 24	P-value
Maternal age	28.4 (5.9)	30.25 (5.5)	0.143
Race			
Black	80 (51.6)	16 (66.7)	0.169
White	41 (26.5)	4 (16.7)	0.304
Asian	29 (18.7)	3 (12.5)	0.460
Other	2 (1.3)	0	
Hispanic/Latino	3 (1.9)	1 (4.2)	0.441
Maternal comorbidities			
CHTN	9 (5.8)	4 (16.7)	0.056
PEC or SIP	8 (5.2)	6 (25)	**0.001**
GDM	6 (3.9)	2 (8.3)	0.325
Lupus	0	0	
Nulliparous	52 (33.6)	13 (54.2)	0.051
Prior c-section	8 (5.2)	5 (20.8)	**0.006**
FGR <3rd%	28 (18.1)	6 (25)	0.420
FGR 4-9th% or AC< 10th%	127 (81.9)	18 (75%)	0.420
Elevated PI UA Doppler	4/33 (12.1)	0/5 (0)	0.411
AEDV	0	0	1
REDV	0	0	1
Oligohydramnios	4 (2.6)	0 (0)	0.426
Gestational age at IOL	38.2 (2.1)	36.9 (3.2)	**0.019**
<37 weeks	12 (7.8)	5 (20.8)	**0.042**
≥37 weeks	106 (68.4)	15 (62.5)	0.566
No induction	37 (23.9)	4 (16.7)	0.434
GA at delivery	38.3 (2.1)	36.8 (3.5)	**0.003**
Birthweight	2625.1 (498.5)	2463.2 (876.4)	0.191
Indications of the cesarean section			
Labor complications*	N/A	10 (41.7)	
NRFHT	N/A	14 (58.3)	
Abruption	N/A	1 (4.2)	

Data are mean (SD) or n (%)
Abbreviations: AEDV: Absent end diastolic velocity; CHTN: Chronic hypertension; FGR: Fetal growth restriction; GDM: Gestational diabetes mellitus; PEC: Preeclampsia; PI: Pulsatility index; REDV: Reverse end diastolic velocity; SD: Standard deviation; SIP: Superimposed preeclampsia; TOLAC: Trial of labor after cesarean section; UA: Umbilical artery Doppler
*Labor complications: arrest of dilation or descent

378 | Episiotomy in the US: Have We Got it Right?

Vivienne Souter[1]; Ian Painter[1]; Kristin Sitcov[1]; Asma Khalil[2]; Aaron B. Caughey[3]
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10:30 AM - 12:30 PM

Objective: A recent randomized controlled trial (Bergendahl et al., BMJ June 2024) reported a 50% reduction in obstetric anal sphincter injury (OASI) in nulliparous patients undergoing vacuum delivery who were assigned to lateral episiotomy versus no episiotomy. Our objective was to evaluate OASI in a similar US population.

Study Design: This retrospective study included births at 17 US hospitals (2022-2023). The analysis was restricted to singleton nulliparous, pregnancies undergoing vacuum delivery at > = 34 weeks' gestation. The outcome was 3rd or 4th degree laceration (OASI). The comparator groups were mediolateral episiotomy (ML) and midline episiotomy (M) and the reference group was no episiotomy (N). The incidence of OASI was compared among the ML, M, and N groups. Unadjusted odds ratios (OR) for OASI were calculated for each of ML and M groups compared to the N group. Adjusted ORs controlled for maternal age, BMI, and birthweight.

Results: Of 926 vacuum deliveries that met eligibility criteria, 775 (83.7%) were in the N, 80 (8.6%) in the M, and 71 (7.7%) in the ML episiotomy group. OASI was reported in 8.4% of the ML, 14.6% of the N, and 26.2% of the M episiotomy group (Table 1). Compared to the N group, the adjusted odds of OASI were significantly higher in the M group (2.25; 95% CI 1.28, 3.93) and lower in the ML group but the latter did not meet statistical significance (0.54; 95% CI 0.23, 1.30). Compared to ML, M episiotomy was associated with a significantly increased risk for OASI: adjusted OR 4.41 (95% CI; 1.55, 12.49).

Conclusion: Our study showed increased risk for OASI with midline episiotomy and a trend towards decreased OASI with mediolateral episiotomy, compared to no episiotomy in nulliparous patients undergoing vacuum delivery. Additionally, midline episiotomy was associated with a significantly increased risk for OASI compared to a mediolateral approach. Given this and the recent RCT results, reflection on episiotomy technique and more research into operative vaginal delivery are needed in the US.

Table 1 Episiotomy and 3rd or 4th degree laceration (OASI).

	3rd or 4th degree laceration n (%)	Unadjusted odds for 3rd or 4th degree laceration OR (95% CI)	Adjusted odds* for 3rd or 4th degree laceration aOR (95% CI)
No episiotomy (N=775)	113 (14.6)	Ref	Ref
Right mediolateral (N=71)	6 (8.4)	0.54 (0.23, 1.28)	0.54 (0.23, 1.30)
Midline (N=80)	21 (26.2)	2.09 (1.22, 3.57)	2.25 (1.28, 3.93)

*Adjusted for maternal age, BMI, and birthweight

379 | Placenta Accreta Spectrum Disorder and Vasa Previa: is There a Connection?

Yadira L. Bribiesca Leon[1]; Zaira Chavez Jimenez[1]; Fay Pon[1]; Shinya Matsuzaki[2]; Jennifer Yao[3]; Rachel S. Mandelbaum[1]; Joseph G. Ouzounian[1]; Koji Matsuo[1]
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10:30 AM - 12:30 PM

Objective: This study assessed the association between placental accreta spectrum (PAS) disorder and vasa previa.

Study Design: This serial cross-sectional study queried the Healthcare Cost and Utilization Project's National Inpatient Sample in the United States. The study population was 21,517,317 in-hospital deliveries from 2016 to 2021. The exposure status was a diagnosis of PAS. The outcome measure was a diagnosis of vasa previa. Log-Poisson generalized linear model was created to assess the independent exposure-outcome association, adjusted for prior selected clinico-obstetrics characteristics. Sensitivity analysis included PAS subtype-specific evaluation (accreta, increta, and percreta).

Results: Vasa previa was diagnosed in 11,830 patients, corresponding to an incidence of 5.5 per 10,000 deliveries or one in 1,819 deliveries. The prevalence of vasa previa was 180.0 per 10,000 deliveries in patients with PAS and 5.3 per 10,000 deliveries for patients without PAS ($P < .001$). After controlling for maternal age, race and ethnicity, hypertensive disorder, diabetes mellitus, obesity, prior uterine scar, placenta previa, and multifetal gestation, the diagnosis of PAS was associated with nearly a five-fold increased risk for vasa previa (adjusted-prevalence ratio 4.46, 95% confidence interval 4.02-4.95, $P < .001$). When assessed by PAS subtypes, placenta increta had the highest prevalence rate of vasa previa (5.3, 171.2, 366.1, and 111.1 per 10,000 deliveries, for absence of PAS, accreta, increta, and percreta, respectively, $P < .001$).

Conclusion: The results of this study suggest that PAS is associated with an increased risk of vasa previa. Careful sonographic examination assessing for vasa previa may be necessary when evaluating patients with high suspicion for PAS. This hypothesis-generating observation is clinically compelling and warrants further investigation prospectively. Furthermore, it is possible that maternal neovascularization secondary to PAS may also occur in the fetoplacental unit vasculature.

380 | Glycoprotein Olfactomedin 4 is Preferentially Expressed in Cervical Epithelia of Patients with Preterm Birth

Yevgenia Y. Fomina[1]; ShanmugaPriyaa Madhukaran[2]; Sarah K. England[3]; Mala Mahendroo[2]
[1]*University of Texas Southwestern, Dallas, TX;* [2]*University of Texas Southwestern Medical Center, Dallas, TX;* [3]*Washington University, St. Louis, MO*

10:30 AM - 12:30 PM

Objective: Cervical epithelium is protected by a mucous layer that serves as an essential barrier against genitourinary

pathogens. Despite the central role of mucins in immune defense, we do not understand the regulatory pathways that drive mucus composition. We hypothesize that specialized secretory cells called goblet cells secrete the glycoprotein olfactomedin 4 (OLFM4) which plays an important role in mucosal defense during infection mediated preterm birth.

Study Design: Cervicovaginal fluid (CVF) samples (n = 183) were obtained from patients in the first, second, and third trimester of pregnancy who had term (n = 20) or preterm (n = 30) birth. Of the patients with a preterm delivery, 14 had a genitourinary infection diagnosed during the pregnancy. OLFM4 expression in CVF samples was measured by enzyme-linked immunosorbent assays and normalized to the total protein concentration of each sample. Protein concentration between cohorts were compared using the Wilcoxon rank-sum test. Next, OLFM4 expression was analyzed in mouse cervical epithelium using RNA in situ hybridization. Finally, histologic studies were performed in OLFM4 deficient mice to characterize OLFM4 deficiency on cervical structure in pregnancy.

Results: Expression of OLFM4 is higher in preterm as compared to term CVF samples across all three trimesters, with the highest concentrations in the preterm patients who had a reproductive tract infection in pregnancy ($p < 0.05$) **(Figure 1)**. In mice, OLFM4 is preferentially expressed in the pregnant state. Histologically, OLFM4 deficient mice had fewer goblet cells with secretory vacuoles and reduced mucin in the endocervical canal as compared to wild type controls (**Figure 2).**

Conclusion: In humans, while OLFM4 synthesis and secretion occurs throughout gestation, it is highest in patients with a preterm delivery and a reproductive tract infection. In mice, OLFM4 is preferentially expressed during pregnancy. The cervix of OLFM4 deficient mice has a distinct morphologic signature. Insights into such secretory proteins as OLFM4 can serve as biomarkers for infection-mediated preterm birth.

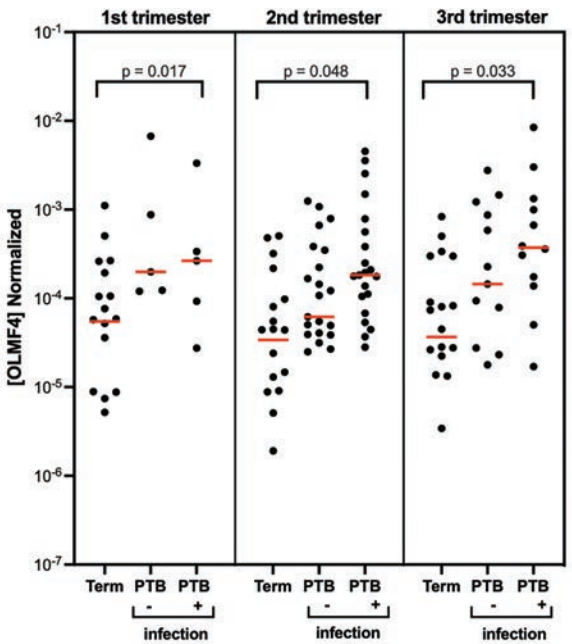

Figure 1: Expression of OLFM4 in cervicovaginal fluid is elevated in patients with an infection-mediated PTB relative to term pregnancies. (n= 20 term, 14 PTB + inf, 16 PTB - inf). Each black dot is a patient sample, red lines are medians. Protein expression between cohorts is compared using the Wilcoxon rank-sum test, with a p-value < 0.05 considered significant. P-values presented are not adjusted for multiple comparisons.

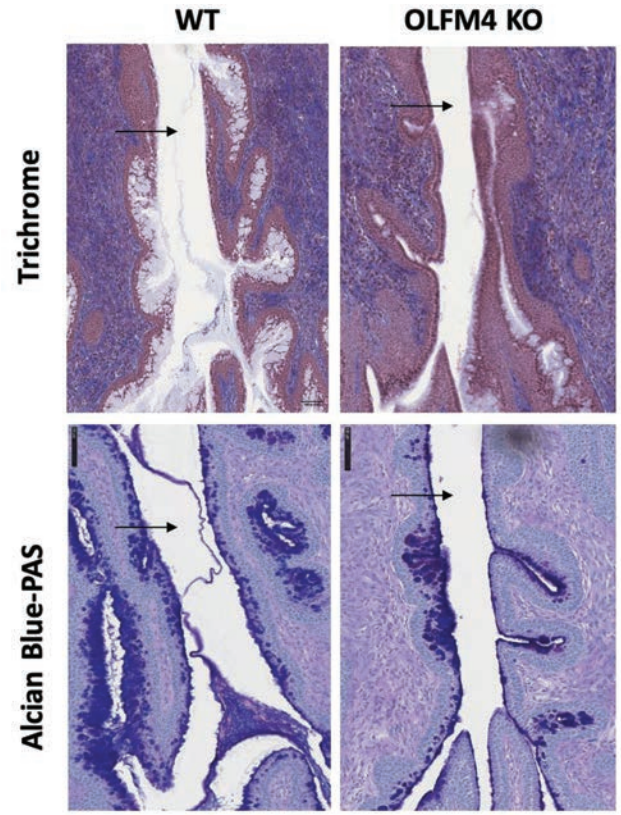

Figure 2: Reduction in goblet cells and mucins in endocervix (arrow) of OLFM4 deficient pregnant mice as seen by trichrome and Alcian Blue-PAS mucin staining respectively.

381 | Beta-Defensin is Preferentially Expressed in Cervical Epithelia of Patients with Preterm Birth

Yevgenia Y. Fomina[1]; Sarah K. England[2]; Mala Mahendroo[3]
[1]University of Texas Southwestern, Dallas, TX; [2]Washington University, St. Louis, MO; [3]University of Texas Southwestern Medical Center, Dallas, TX

10:30 AM - 12:30 PM

Objective: Human beta-defensin 2 is a cysteine-rich antimicrobial peptide that is expressed by cervical epithelial cells. This peptide is a critical mediator of the innate immune system and is an important contributor to maintaining a healthy cervical mucosal barrier. Disruption of this immune barrier allows microorganisms to penetrate fetal membranes and cause preterm labor. We hypothesize that cervical secretory cells increase the expression of beta-defensin 2 after exposure to genitourinary infections in an effort to maintain a sterile intrauterine environment during pregnancy.

Study Design: Cervicovaginal fluid samples (n = 183) were obtained from patients in the first, second, and third trimester of pregnancy who had term (n = 20) or preterm (n = 30) birth outcomes. Of the patients with a preterm delivery, 14 had a genitourinary infection diagnosed during the pregnancy. Cervicovaginal fluid samples were used for measurements of human beta-defensin 2 by enzyme-linked immunosorbent assay (ELISA). Beta-defensin concentration was normalized to the total protein concentration of each sample. Levels of beta-defensin were compared between the term and preterm study groups using

the Wilcoxon rank-sum test, with a p-value < 0.05 considered significant. P-values presented are not adjusted for multiple comparisons.

Results: Beta-defensin 2 is expressed in the cervicovaginal fluid across all three trimesters of gestation in term and preterm birth cohorts. Beta-defensin 2 is expressed at a higher concentration in the preterm as compared to the term cohort during all trimesters. In the third trimester of pregnancy, there is a statistically significant ($p < 0.01$) increase beta-defensin expression between patients with term (median: 1.1×10^{-6}) as compared to preterm (median: 9.6×10^{-6}) delivery outcomes **(Figure 1)**.

Conclusion: Beta-defensin 2 synthesis and secretion occurs throughout gestation and is highest in patients with a preterm delivery in the third trimester. Insights into such secretory proteins as beta-defensin 2 can serve as potential biomarkers for preterm birth outcomes.

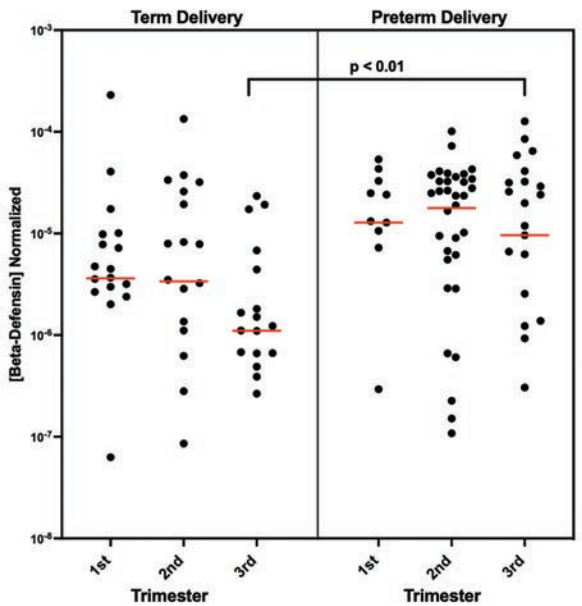

Figure 1: Expression of beta-defensin is elevated in cervicovaginal fluid samples of patients with preterm as compared to term delivery outcomes. Each black dot is a patient sample, red lines are medians. Protein expression between cohorts is compared using the Wilcoxon rank-sum test, with a p-value < 0.05 considered significant. P-values presented are not adjusted for multiple comparisons.

382 | Intrapartum Cesarean Delivery in Different Phases of Labor and Maternal Morbidity

Yossi Bart[1]; Hector M. Mendez-Figueroa[2]; Farah H. Amro[1]; Sean C. Blackwell[1]; Baha M. Sibai[1]

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10:30 AM - 12:30 PM

Objective: Intrapartum cesarean delivery (CD) is associated with maternal morbidity. We aimed to examine if the phase of labor when the decision was made to proceed with intrapartum CD is associated with adverse maternal outcomes.

Study Design: We conducted a secondary analysis of the Assessment of Perinatal Excellence (APEX) database. We included all nulliparous singletons that underwent labor and delivered via CD at term (≥ 37 weeks). Individuals with fetal malformations and absent documentation of vaginal exam prior to delivery were excluded. We divided the cohort into three groups according to their labor stage/phase when the decision to proceed with CD was made: latent phase, 0-5 cm; active phase, 6-9 cm; and 2nd stage, 10 cm. The primary outcome was defined as a composite of maternal outcomes, including estimated blood loss ≥ 1,500 mL, blood transfusion, surgical tamponade, hysterectomy, wound infection or separation, endometritis, sepsis, and venous thromboembolism. Poisson regression was applied to adjust for confounders.

Results: Overall, inclusion criteria were met by 4,738 individuals; of those, 2,090 (44%) underwent CD during the latent phase, 1,811 (38%) during the active phase, and 837 (18%) during the 2nd stage. Intrapartum CD at later phases of labor was associated with higher rates of the composite outcome, driven mainly by higher rates of hemorrhage, transfusion, and surgical tamponade (Table). The adjusted relative risk for composite maternal outcome was 1.54 (95% CI 1.21-1.95) for CD during the active phase and 1.90 (95% CI 1.45-2.51) for CD during the 2nd stage. A subgroup analysis of the active phase demonstrated that individuals with 8-9 cm dilation at the decision to proceed with CD had higher composite outcome rates than 6-7 cm dilation (Figure).

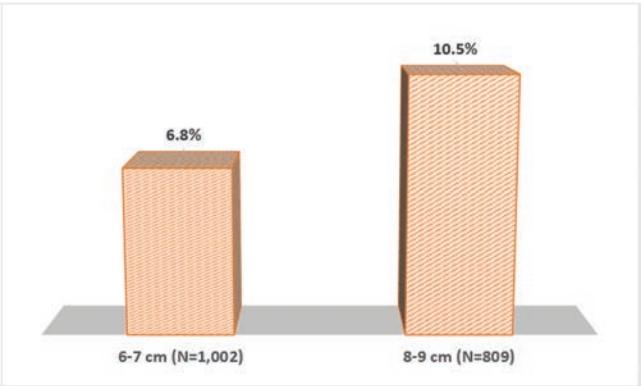
Conclusion: Compared to the latent phase, CD in a more advanced phase of labor was associated with higher rates of maternal morbidity.

Table – Intrapartum cesarean delivery in different phases of labor and the association with maternal adverse outcomes

Outcomes	Group [a]	N (%)	Adjusted RR [b] (95% CI)
Composite maternal outcome [c]	Latent phase	122 (5.8)	1.00
	Active phase	153 (8.4)	**1.54 (1.21-1.95)**
	2nd stage	89 (10.6)	**1.90 (1.45-2.51)**
Estimated blood loss ≥ 1,500 mL	Latent phase	35 (1.7)	1.00
	Active phase	54 (3.0)	**1.85 (1.18-2.90)**
	2nd stage	37 (4.4)	**2.68 (1.63-4.40)**
Blood transfusion ≥ 1 unit	Latent phase	41 (2.0)	1.00
	Active phase	52 (2.9)	**1.66 (1.10-2.53)**
	2nd stage	26 (3.1)	**1.95 (1.19-3.21)**
Surgical tamponade [d]	Latent phase	12 (1.1)	1.00
	Active phase	23 (2.3)	**2.17 (1.07-4.39)**
	2nd stage	12 (2.3)	1.77 (.076-4.11)
Hysterectomy	Latent phase	0	1.00
	Active phase	1 (0.1)	-
	2nd stage	0	-
Wound infection or separation	Latent phase	16 (1.5)	1.00
	Active phase	9 (0.9)	0.56 (0.23-1.34)
	2nd stage	8 (1.6)	0.92 (0.37-2.28)
Endometritis	Latent phase	41 (3.9)	1.00
	Active phase	56 (5.7)	1.45 (0.98-2.16)
	2nd stage	30 (5.8)	1.53 (0.96-2.44)
Sepsis	Latent phase	1 (0.1)	1.00
	Active phase	2 (0.2)	-
	2nd stage	3 (0.6)	-
Venous thromboembolism	Latent phase	1 (0.0)	1.00
	Active phase	0	-
	2nd stage	1 (0.1)	-

Bolded if significant.
[a] The groups were defined by cervical dilation: latent phase, 0-5 cm; active phase, 6-9 cm; and 2nd stage, 10 cm.
[b] Adjusted to obesity (defined as pre-delivery body-mass index ≥ 30 kg/m²), chronic hypertension, diabetes mellitus, and a pre-delivery hematocrit < 30%.
[c] The primary outcome included estimated blood loss ≥ 1,500 mL, blood transfusion, surgical tamponade, hysterectomy, wound infection or separation, endometritis, sepsis, and venous thromboembolism.
[d] Any of the following: B-Lynch suture, uterine artery ligation, hypogastric artery ligation.
* No maternal deaths were reported in this cohort.

Figure – Comparison of pre-cesarean dilation during the active phase of labor and the associated composite maternal outcome rate



p < 0.01.

383 | DNA Methylation Analysis of Imprinting Control Regions and Copy Number Variation Sequencing in Early Miscarriage

ZhongJie Guo[1]; Jingwen Mai[2]; Qing Li[3]; Fang Wang[4]; Xuan Lin[1]; Jianping Zhang[5]

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10:30 AM - 12:30 PM

Objective: To characterize DNA methylation of imprinting control regions (ICR) and copy number variation sequencing (CNV-seq) among early miscarriages in China. CNV-seq detects chromosomal abnormalities in embryos, but the full genetic basis remains unclear. ICR methylation analysis offers insights into gene expression regulation crucial for embryonic development.

Study Design: We conducted a cross-sectional study of 80 patients with early miscarriages (6-8 weeks gestation) in 3 provinces, China from November 2022 to Jun 2024. Chorionic villi of embryonic arrest were collected using hysteroscopy. Specialized in technologies in molecular genetics and reproductive immunology, our centralized lab performed CNV-seq and ICR methylation analysis of 19 loci. These loci include PLAGL1, GRB10, H19/IGF2(IC1), KvDMR1(IC2), SNURF(IC), GNAS-XL, MEST, ZNF331, PEG3, IGF1R, PEG10, DNMT1, DIRAS3, NAP1L5, FAM50B, TRAPPC9 (PEG13), MCTS2P/HM13, and L3MBTL1.

Results: Among these 80 cases (Table 1), chromosomal abnormalities (45%, 36) were detected and ICR methylation abnormalities 28% (22). NESP-AS/GNAS-AS1 was detected in 5 cases (Table 2). PLAGL1 was in 2 cases with transient neonatal diabetes mellitus and KvDMR1(IC2) in 2 with Bechwith-Wiedemann syndrome. Methylation abnormalities were detected in 30% (13/44) of early miscarriages with normal CNV-seq. This ratio varied across maternal age groups [≤ 30 years 18% (2/11), 31-40 years 31% (9/29), and ≥ 41 years 50% (2/4)] and conception methods [PGT-A 20% (2/10), natural 27% (7/26), ICSI 40% (2/5), and IVF 67% (2/3)] (Table 2).

Conclusion: ICR methylation abnormalities among early miscarriages with normal CNV-seq were prevalent across maternal ages and conception methods, indicating epigenetic causes. Study findings inform future cohort studies in our multi-center consortium with 90,000 annual live births in 16 provinces, China.

Table 1-Descriptive Analyses of the Methylation of Imprinting Control Regions and Copy Number Variation in Early Miscarriages in Three Provinces, China, 2022 to 2024

conception method	age	CNV	ICR and MR
PGT-A	35	dup(7)(q11.23)(0.44Mb)chr7:76180001-76620000	null
PGT-A	34	dup(5)(q32)(0.12M) chr5:147670001-147790000	null
PGT-A	23	del(16)(q24.1)(0.14M) chr16:84410001-84550000	null
PGT-A	28	del(15)(q13.1)(0.32M) chr15:28700001-29020000	null
PGT-A	32	/	SNURF 0.8044
PGT-A	52	/	L3MBTL1 0.873
PGT-A	27	+(mosaic)(X)(30%)	Null
PGT-A	46	dup(1)(q25.1)(0.62M)chr1:174260000-174880000	Null
IVF-ET	42	+21	L3MBTL1 0.8384
IVF-ET	28	/	SNURF 0.8807
IVF-ET	38	+(mosaic)(7)(66%)	NESP-AS/GNAS-AS1 0.8214
IVF-ET	32	/	GRB10 0.9455
ICSI	41	-(mosaic)(X)(30%);	Null
ICSI	38	dup(14)(q22.3)(0.13M) chr14:56000001-56130000	Null
ICSI	34	/	GNAS-XL 0.0
ICSI	44	/	NESP-AS/GNAS-AS1 0.8182
ICSI	41	+(mosaic)(Y)(30%)	null
ICSI	38	dup(7)(q36.1)(0.30M) chr7:149550001-149850000 dup(7)(q11.21)(0.22M) chr7:63760001-63980000	null
Natural conception.	28	dup(7)(q11.23)(0.54Mb)chr7:76080001-76620000	null
Natural conception.	29	del(12)(q21.31-q21.32)(1.27M)chr12:86040001-87310000	null
Natural conception.	27	dup(22)(q11.22)(0.27M) chr22:22300001-22570000	MCTS2P/HM13 0.0444
Natural conception.	39	+11	null
Natural conception.	46	+14;+15	IGF1R 0.8194
Natural conception.	30	+16	null
Natural conception.	36	+(mosaic)(2)(62%)	IGF1R 0.9219 DNMT1 0.955
Natural conception.	31	dup(10)(q23.1)(0.12M) chr10:83970001-84090000 dup(7)(q36.1)(0.28M) chr7:149550001-149830000	null
Natural conception.	46	del(X)(q25)(0.64M) chrX:122680001-123320000 dup(12)(p13.1)(0.29M) chr12:13580000-13870000	null
Natural conception.	43	+22	null
Natural conception.	30	+(mosaic)(7)(61%);+(mosaic)(14)(59%);+(mosaic)(X)(38%)	null
Natural conception.	34	+16;+21	null
Natural conception.	31	del(8)(p23.3-p11.21)(43.08M) chr8:1-43080000 dup(8)(p11.21-q24.3)(103.28M)(48%) chr8:43080001-146364022	null
Natural conception.	38	/	FAM50B 0.972
Natural conception.	37	+20	null
Natural conception.	35	+16	null
Natural conception.	40	+16;+21	PLAGL1 0.9402
Natural conception.	29	+(mosaic)(X)(24%)	null
Natural conception.	31	/	PEG10 0.8025
Natural conception.	44	+12;-(mosaic)(19)(33%)	null
Natural conception.	32	+22	null
Natural conception.	33	/	IGF1R 0.8272
Natural conception.	27	-(mosaic)(19)(25%)	null
Natural conception.	28	/	KvDMR1 0.8938
Natural conception.	32	+16	null
Natural conception.	32	/	NAP1L5 0.872
Natural conception.	32	/	NESP-AS/GNAS-AS1 0.8333
Natural conception.	31	/	NESP-AS/GNAS-AS1 0.8227
Natural conception.	33	del(2)(q22.3)(0.12M) chr2:145240000-145360000	PLAGL1 0.0778; KvDMR1 0.0074; ZNF331 0.0036; PEG3 0.0; MCTS2P/HM13 0.0

Natural conception.	30	-(mosaic)(19)(66%);
		dup(mosaic)(10)(q26.2-q26.3)(6.90M)(66%)chr10:127940000-134840000; dup(14)(q32.33)(1.21M)chr14:106140000-107349540;
		dup(2)(p13.2)(0.66M) chr2:71740000-72400000;
		dup(7)(q36.2-q36.3)(1.24M)chr7:154940000-156180000
			FAM50B 0.978

Natural conception.	39	+21	null
Natural conception.	23	+6; dup(5)(q23.3)(0.78M)chr5:128140000-128920000; dup(7)(p21.3)(0.60M)chr7:11480000-12080000	NESP-AS/GNAS-AS1 0.8176

Note: null means the sample showed no abnormalities in the methylation of imprinted control regions. MR means methylation rate.

Table 2-Comprehensive Analysis of Imprinting Control Regions Methylation and Copy Number Variation in Early Miscarriages in Three Provinces, China, December 2022 to June 2024

	n	1.Normal CNV	2.Abnormal CNV	3.Normal methylation ratio	4.Abnormal methylation ratio	1 and 3	1 and 4	2 and 3	2 and 4
Maternal age									
≤ 30 years	23	11	12	18	5	9	2	9	3
31-40 years	46	29	17	33	13	20	9	13	4
≥ 41 years	11	4	7	7	4	2	2	5	2
Conception method									
Natural	52	26	26	38	14	19	7	19	7
IVF	5	3	2	1	4	1	2	0	2
ICSI	7	5	2	5	2	3	2	2	0
PGT-A	16	10	6	14	2	8	2	6	0

ICR	Frequency	Related disease
PLAGL1	2	Transient neonatal diabetes mellitus
GRB10	1	Russell Silver syndrome
H19/IGF2(IC1)	0	Bechwith-Wiedemann syndrome
KvDMR1(IC2)	2	Bechwith-Wiedemann syndrome
SNURF(IC)	2	Prader-Willi syndrome/Angelman syndrome
GNAS-XL	1	Pseudohypoparathyroidism type 1B
MEST	0	Embryo and placental development-related
ZNF331	1	
PEG3	1	
IGF1R	3	
PEG10	1	
DNMT1	1	
DIRAS3	0	May cause other issues in the developmental process
NAP1L5	1	
FAM50B	2	
TRAPPC9 (PEG13)	0	
NESP-AS/GNAS-AS1	5	
MCTS2P/HM13	2	
L3MBTL1	2	

Note: ICR, Imprinting Control Regions; CNV, Copy Number Variation. One sample detected 2 ICRs methylation ratio abnormality; another sample detected 5 ICRs methylation ratio abnormality.

384 | Environmental Endocrine Disrupting Chemicals and Chromosomal Abnormalities in Recurrent Pregnancy Loss in 5 provinces China

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10:30 AM - 12:30 PM

Objective: To examine the association between environmental endocrine disrupting chemicals (EDCs) and abnormal chromosomal karyotypes among cases of recurrent pregnancy loss. EDCs could induce mitochondrial dysfunction in pregnant mice then cell death which could cause miscarriage and developmental toxicity. Strict regulations were set up to ban the application of Bisphenol A in baby bottles in countries including China in 2011.

Study Design: We designed a cross-sectional study of 106 recurrent pregnancy loss patients recruited in 5 provinces, China from December 2022 to June 2024. Our centralized molecular genetic lab has specialized technologies in environmental EDCs and reproductive immunology. We assessed chromosomal karyotype in chorionic villi through copy number variation sequencing (CNV-seq) and urine samples using liquidchromatography-mass spectrometry to detect EDCs such as monomethyl phthalate (MMP), monoethyl phthalate (MEP), monobutyl phthalate (MBP), mono-2-ethylhexyl phthalate (MEHP), bisphenol A, and parabens. We performed McNemar's tests.

Results: We identified and ranked the most commonly detectable EDCs (e.g., Methyl paraben 23.58%, MMP 21.70%, Bisphenol A 16.04%, Propyl Paraben 13.21%) (Table 1). Of 106 recurrent pregnancy loss patients, 50 were detected chromosomal abnormalities whereas 56 were not (Table 2). The association between CNV-seq abnormalities and EDCs was significant ($\chi^2 = 6.12$, $p = 0.01$) (Table 2).

Conclusion: The significant association between EDCs and embryonic chromosomal abnormalities suggests that EDC exposure may contribute to recurrent pregnancy loss. Future research should investigate mechanisms and explore prevention and intervention strategies. Study findings inform the registered prospective cohort studies in our multi-center consortium with 90,000 annual live births in 16 provinces, China.

Table 1. Environmental Endocrine Disrupting Chemicals among 106 patients with Recurrent Pregnancy Loss in 5 Provinces, China, 2022 to 2024

Endocrine Disrupting Chemicals	n	Percentage	Min	Max	Median	Reference Range
Methyl Monoester of Phthalic Acid (MMP)	23	21.70%	37.47	347.3	81.63	below 37.32ug/g-cr
Ethyl Monoester of Phthalic Acid (MEP)	6	5.66%	230.79	1116.31	672.45	below 197.59ug/g-cr
Butyl Monoester of Phthalic Acid (MBP)	2	1.89%	476.06	738.27	607.165	below 408.49ug/g-cr
2-Ethylhexyl Monoester of Phthalic Acid (MEHP)	4	3.77%	35.04	185.21	85.925	below 21.94ug/g-cr
Bisphenol A	17	16.04%	7.42	22.38	10.45	below 7.17ug/g-cr
Methyl Paraben	25	23.58%	38.71	2019.2	61.27	below 37.83ug/g-cr
Ethyl Paraben	10	9.43%	26.13	727.41	57.35	below 26.05ug/g-cr
Propyl Paraben	14	13.21%	14.31	357.66	32.815	below 13.02ug/g-cr
Butyl Paraben	10	9.43%	0.65	3.37	1.12	below 0.64ug/g-cr

Table 2. Cross-Tabulation Analysis between Copy Number Variation Sequencing and Endocrine Disrupting Chemicals among 106 Patients with Recurrent Pregnancy Loss in 5 Provinces, China, December 2022 to Jun 2024

	Normal CNV	Abnormal CNV	Total
EDCs within Range	17	20	37
EDCs beyond Range	39	30	69
Total	56	50	106
	$\chi^2 = 6.12$	p-value = 0.01	

Note: EDCs, Endocrine Disrupting Chemicals; CNV, Copy Number Variation.

Poster Session 2

Abstracts 385–665

THURSDAY
January 30, 2025
4:00 PM – 6:00 PM

PREGNANCY

ABSTRACTS OPEN ACCESS

Poster Session 2

Thursday, January 30, 2025 4:00 PM – 6:00 PM

385 | "Keep Transfusing Until the Bleeding Stops"-Massive Transfusion and Circulatory Overload in Obstetric Hemorrhage

Aaron W. Roberts[1]; Ghamar Bitar[1]; Ahmed Zaki Moustafa[2]; Carly Shahbazian[3]; Kate Drone[3]; Kendra Folh[3]; Sean C. Blackwell[1]

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4:00 PM - 6:00 PM

Objective: Hemodynamic support and blood replacement during massive hemorrhage is critical to survival, but high-volume massive transfusion (MTP) increases risk of transfusion associated circulatory overload (TACO). When faced with cardiac arrest from hemorrhagic shock restriction of fluid resuscitation may not be an option, and management of MTP goes beyond the moment bleeding is finally controlled. We aim to assess the risk and morbidity of TACO due obstetric hemorrhage managed with MTP.

Study Design: This retrospective cohort quality improvement study of parturients who suffered obstetric hemorrhage requiring large volume transfusion of blood products with more than four units of PRBC transfused as part of a MTP from June 2023 to July 2024 at our level IV center. Those cases with TACO were compared to those without.

Results: There were 5690 deliveries, 176 (3.1%) had PPH/MTP activation, of which 51 (28.9%) had > 4U MTP blood products transfused. The rate of TACO with MTP was 40% (N = 20/51). Placenta accreta spectrum alone was not a risk factor for TACO, neither was average estimated blood loss. Those with TACO had significantly more blood component volume/units transfused (Table 2). Patients with TACO had more diffuse intravascular coagulation (DIC) (75% vs 6%; $p < 0.001$), hemolysis (35% vs 3%; $p = 0.002$), ICU admission (75% vs 35%; $p = 0.006$), and acute kidney injury (50% vs 9%; $p = 0.001$). Post-transfusion hemoglobin and nadir fibrinogen were similar between groups, despite more baseline anemia in the TACO group. The only maternal death in this study occurred in the TACO group.

Conclusion: High volume MTP in obstetric patients shows increased rates of TACO and other serious morbidity, mostly related to transfusion volume and development of DIC. There are few reliable predictors of morbidity. Those with TACO were not grossly more medically complicated at baseline, which underscores that TACO can happen to any parturient. Future investigation of techniques to limit hemorrhage, improve resuscitation quality, reduce volume administered, and mitigate sequalae of massive transfusion is warranted.

Table 1 Baseline Characteristics

	No TACO (N=31)	TACO (N=20)	p value
Age			0.55
Mean (SD)	33.9 (5.9)	32.8 (6.7)	
Range	21.0 - 44.0	21.0 - 45.0	
Race			0.363
Black	10 (32.3%)	7 (35%)	
Asian	1 (3.2%)	3 (15%)	
Hispanic	6 (19.4%)	5 (25%)	
White	12 (38.7%)	5 (25%)	
Other	2 (6.5%)	0 (0%)	
Insurance			0.187
Private	15 (51.7%)	6 (30%)	
Government Assisted	14 (48.3%)	14 (65%)	
Obstetric History			
Nulliparous	9 (29.0%)	8 (40%)	0.417
Prior Cesarean	19 (61.3%)	7 (35%)	0.067
Prior Cesarean Count			0.756
1	7 (36.8%)	2 (28.6%)	
2	9 (47.4%)	3 (42.9%)	
3	3 (15.8%)	2 (28.6%)	
Medical and Surgical History			
Chronic Hypertension	3 (9.7%)	3 (15.0%)	0.565
Type 1 Diabetes	1 (3.2%)	0 (0.0%)	0.417
Type 2 Diabetes	0	0	-
Asthma	2 (6.5%)	0 (0.0%)	0.247
Obesity	2 (6.5%)	1 (5.0%)	0.830
Fibroids	0 (0.0%)	3 (15.0%)	**0.026**
Thrombophilia or Coagulopathy	0	0	-
Anemia	3 (9.7%)	3 (15.0%)	0.565
Hypothyroidism	2 (6.5%)	2 (10.0%)	0.645
Pre-Eclampsia with Severe Features	2 (6.5%)	5 (25.0%)	0.060
Antenatal Complications			
IVF Pregnancy	3 (9.7%)	1 (5%)	0.544
Placenta Accreta Spectrum	14 (45.2%)	6 (30%)	0.279
Twin Gestation	1 (5.9%)	0 (0%)	0.619
Gestational Diabetes	2 (6.5%)	1 (5%)	0.830
Pregnancy Induced Hypertension	3 (9.7%)	1 (5%)	0.544
Preterm Labor	2 (6.5%)	2 (10%)	0.645
Preterm Prelabor Rupture of Membranes	5 (16.1%)	4 (20%)	0.723
Chorioamnionitis	3 (10%)	1 (5%)	0.523
Abruption	2 (6.5%)	4 (20%)	0.143
Prelabor Rupture of Membranes	6 (19.4%)	3 (15%)	0.690
Labor Management			
Gestational Age			0.149
Mean (SD)	33.4 (5.1)	31.1 (5.9)	
Range	19.0 - 40.0	20.0 - 39.0	
Induction of Labor	6 (19.4%)	5 (25%)	0.632
Mode of Delivery			**0.010**
Vaginal	7 (22.6%)	2 (10%)	
Primary Cesarean	7 (22.6%)	13 (65.0%)	
Repeat Cesarean	17 (54.8%)	5 (25%)	
Cesarean in Labor	6 (25%)	10 (55.6%)	**0.044**

Data presented as N (%)
P value bolded if significantly different
TACO is Transfusion associated circulatory overload, defined as hypoxia due to pulmonary edema after transfusion, clinical suspicion of circulatory overload, laboratory evidence of circulatory overload such as elevated BUN, or hypervolemia responsive to treatment with diuretics

Table 2: Transfusion and Hemorrhage Outcomes

	No TACO (N=31)	TACO (N=20)	p value
Starting Hemoglobin			**0.048**
Mean (SD)	9.5 (2.1)	10.7 (2.1)	
Range	1.0 - 12.6	6.4 - 15.0	
Post Transfusion Hemoglobin			0.350
Mean (SD)	9.4 (0.9)	9.8 (1.8)	
Range	8.0 - 11.2	7.2 - 14.4	
Estimated Blood Loss			0.059
Mean (SD)	3674.1 (2827.1)	6381.2 (6523.2)	
Range	700 - 12000	1000 - 25000	
PRBC Units Given			**< 0.001**
Mean (SD)	6.0 (3.9)	16.1 (14.5)	
Range	2 - 22	4 - 63	
FFP Units Given			**< 0.001**
Mean (SD)	4.4 (4.3)	14.8 (15.3)	
Range	0 - 20	1 - 66	
Platelets Units Given			**< 0.001**
Mean (SD)	2.7 (3.2)	13.6 (14.4)	
Range	0 - 12	0 - 54	
Cryoprecipitate Units Given			0.531
Mean (SD)	1.4 (5.5)	2.2 (2.3)	
Range	0 - 30	0 - 7	
Fibrinogen Level Nadir			0.239
Mean (SD)	371.9 (142.8)	312.4 (145.4)	
Range	60 - 609	60 - 638	
Transfusion Complications			
Hemolysis Reaction Suspected	1 (3.2%)	7 (35%)	**0.002**
Transfusion Related Lung Injury	1 (3.2%)	1 (5%)	0.750
Complications and Morbidity			
Diffuse Intravascular Coagulation	2 (6.7%)	15 (75%)	**< 0.001**
Venous Thromboembolism	1 (3.2%)	3 (15%)	0.127
ICU Admission	11 (35.5%)	15 (75%)	**0.006**
Hysterectomy	13 (41.9%)	13 (65%)	0.108
Acute Kidney Injury	3 (9.7%)	10 (50%)	**0.001**
Sepsis	3 (9.7%)	5 (25%)	0.142
Maternal Death	0 (0%)	1 (5%)	0.209
Hemorrhage Timing			
Antepartum	0 (0%)	1 (5.0%)	0.209
Immediate Peripartum	27 (87.1%)	17 (85.0%)	0.832
Delayed	4 (12.9%)	4 (20.0%)	0.496
Hemorrhage Etiology			
Surgical	17 (54.8%)	15 (75.0%)	0.146
Atony	15 (48.4%)	10 (50.0%)	0.910
Hemorrhage Management			
Methergine	9 (29%)	6 (30%)	0.941
Hemabate	8 (25.8%)	5 (25%)	0.949
Misoprostol	5 (16.1%)	4 (20%)	0.723
Additional Pitocin	6 (19.4%)	6 (30%)	0.382
Tranexamic Acid	11 (35.5%)	8 (40%)	0.745
Bakri Balloon Used	8 (25.8%)	3 (15%)	0.360

Data presented as N (%), unless otherwise indicated.
P value bolded if significantly different
TACO is Transfusion associated circulatory overload, defined as hypoxia due to pulmonary edema after transfusion, clinical suspicion of circulatory overload, laboratory evidence of circulatory overload such as elevated BUN, or hypervolemia responsive to treatment with diuretics

386 | Neighborhood Deprivation Impacted COVID-19 Vaccination and Infection Rates Among Pregnant Patients

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4:00 PM - 6:00 PM

Objective: Area Deprivation Index (ADI) is strongly associated with obstetric outcomes but understudied during the COVID-19 pandemic. We sought to evaluate the relationship between ADI and COVID-19 outcomes among pregnant patients during the early pandemic.

Study Design: We performed a secondary analysis of a prospective longitudinal cohort study investigating the impact of COVID-19 exposure in pregnancy on perinatal outcomes. Patients were recruited if they were pregnant between 12/23/20-7/18/22 and serially evaluated for exposure to SARS-CoV-2 infection using serum antibody testing throughout pregnancy. Address of residence at time of delivery was used to categorize patients into a low ADI group ($\leq 50^{th}$ percentile, indicating low levels of deprivation) and a high ADI group ($\geq 75^{th}$ percentile, indicating high levels of deprivation). Our primary outcome was COVID-19 vaccination and infection during pregnancy.

Results: 306 patients were included. Those with higher ADI were younger (28 vs 32, p< 0.01), were less likely to be nulliparous (18% vs 38%, p = 0.02), had a higher average body mass index (35 vs 28, p = 0.01), and had higher rates of tobacco use (7% vs 2%, p = 0.03), asthma (17% vs 9%, p< 0.01), and depression (21% vs 17%, p = 0.01). There were notable differences in insurance type, race, and household income between groups (Table 1). Importantly, the high ADI group was less likely to receive COVID-19 vaccination (24.2% vs 54%, p< 0.01), more likely to develop SARS-CoV-2 infection (59.3% vs 41.9%, p< 0.01), and more likely to be hospitalized due to COVID-19 (3.9% vs 0%, p = 0.04, Table 2).

Conclusion: ADI differences were associated with vaccine hesitancy and COVID-19 infection and severity. Overall, these findings highlight the complex interplay of factors impacting perinatal outcomes during the COVID-19 pandemic, leading to two disparate perinatal experiences. Modifiable characteristics for both individuals and communities–such as tobacco use, obesity, and lack of vaccination–could serve as targets for interventions to improve perinatal outcomes.

Table 1. Key differences in baseline characteristics, by ADI

	Low ADI (n=124)	High ADI (n=182)	*p* value
Average Age	**32.56 ± 5.3**	**27.57 ± 5.6**	**< 0.01**
Nulliparity	**47 (37.9)**	**32 (17.6)**	**0.02**
Average BMI	**28.43 ± 6.1**	**34.5 ± 2.28**	**0.01**
Current tobacco use	**2 (1.6)**	**13 (7.1)**	**0.03**
Insurance Coverage			
Public	**17 (13.7)**	**126 (69.2)**	**< 0.01**
Private	**104 (83.9)**	**49 (26.9)**	**< 0.01**
Uninsured	3 (2.4)	5 (2.8)	0.86
Race			**< 0.01**
Black	**11 (7.3)**	**132 (72.5)**	
Asian	**15 (12.1)**	**2 (1.1)**	
White	**94 (75.8)**	**40 (22.0)**	
Other race	**4 (3.2)**	**8 (4.4)**	
Total Household Income			**< 0.01**
Less than $15,000	**3 (2.4)**	**37 (20.3)**	
$15,000-24,999	**3 (2.4)**	**13 (7.1)**	
$25,000-49,999	**9 (7.3)**	**18 (9.9)**	
$50,000-74,999	**16 (12.9)**	**9 (4.9)**	
$75,000-99,999	**14 (11.3)**	**4 (2.2)**	
$100,000 and above	**54 (43.4)**	**5 (2.7)**	
Pre-existing conditions			
Asthma	**11 (8.9)**	**30 (16.5)**	**< 0.01**
Depression	**21 (16.9)**	**38 (20.9)**	**0.01**

ADI: Area Deprivation Index

Table 2. COVID-19 differences, by ADI

	Low ADI (n=124)	High ADI (n=182)	*p* value
COVID-19 vaccinated	**67 (54.0)**	**44 (24.2)**	**< 0.01**
SARS-CoV-2 infection	**52 (41.9)**	**108 (59.3)**	**< 0.01**
Hospitalized due to COVID-19	**0 (0.0)**	**7 (3.9)**	**0.04**

ADI: Area Deprivation Index

387 | Evaluating Indicators of Severe Maternal Morbidity based on Maternal OBCMI Score

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4:00 PM - 6:00 PM

Objective: Severe maternal morbidity (SMM) encompasses a diversity of adverse maternal medical outcomes that may be differentially triggered in patients with different risk profiles. This study evaluates incidence of component indicators of SMM by OBCMI level.

Study Design: This is a retrospective study of all deliveries $\geq$ 20 weeks across a multi-hospital academic health system from 1/1/2022-6/30/2024. Patient clinical information was extracted from the electronic health record and OBCMI scores were constructed based on risk factors present at delivery and divided into brackets of low risk (0-2), medium risk (3-5), and high risk ($\geq$6) based on score distribution. Patient characteristics including

OBCMI components and delivery admission SMM indicator variables were compared across brackets in univariable analysis using chi^2.

Results: 28,812 deliveries were included: 67.4% with scores 0-2, 21.0% with scores 3-5, and 11.5% with scores $\geq$ 6. There were significant differences in the incidence of each OBCMI component by score bracket (Table 1). Cardiomyopathy and pulmonary hypertension were the only comorbidities present exclusively in the highest risk bracket. Table 2 demonstrates the overall incidence of SMM by group: 0.5% in the lowest, 2.5% in the medium, and 8.1% in the highest risk bracket. Renal failure was the most common SMM indicator for all brackets, followed by disseminated intravascular coagulation in the 2 highest risk brackets and sepsis in the lowest risk bracket. Eclampsia co-ranked as second most frequent SMM indicator in the highest risk bracket. Incidence of each SMM indicator across brackets was significantly different for all except ruptured aneurysm and vaso-occlusive crisis.

Conclusion: SMM sub-types occur at different relative frequencies across patient groups with different co-morbidity-based risk. Understanding these differences can shape patient counseling as well as target specific interventions to prevent sub-types of SMM.

Table 1. Frequency of OBCMI* Components by OBCMI Score Bracket

N (%)	Low Risk OBCMI 0 – 2 N = 19,431	Medium Risk OBCMI 3 – 5 N = 6,061	High Risk OBCMI ≥ 6 N = 3,320	P-value
Maternal age 35 - 39	2,714 (14.0%)	1,649 (27.2%)	141 (4.2%)	< 0.01
Maternal age 40 - 44	235 (1.2%)	411 (6.8%)	408 (12.3%)	< 0.01
Maternal age > 44	0 (0%)	51 (0.8%)	877 (26.4%)	< 0.01
BMI ≥ 40	136 (0.7%)	456 (7.5%)	286 (8.6%)	< 0.01
BMI ≥ 50	0 (0%)	60 (1.0%)	44 (1.3%)	< 0.01
Severe preeclampsia	0 (0.0%)	289 (4.8%)	2143 (64.5%)	< 0.01
Gestational hypertension	2,654 (13.7%)	2,323 (38.3%)	1,565 (47.1%)	< 0.01
Chronic hypertension	549 (2.8%)	908 (15.0%)	1,238 (37.3%)	< 0.01
Cardiomyopathy	0 (0%)	0 (0%)	11 (0.3%)	< 0.01
Pulmonary hypertension	0 (0%)	0 (0%)	8 (0.2%)	< 0.01
Coronary artery disease	0 (0%)	7 (0.1%)	19 (0.6%)	< 0.01
Cardiac arrhythmia	0 (0%)	177 (2.9%)	147 (4.4%)	< 0.01
Congenital heart disease	0 (0%)	35 (0.6%)	59 (1.8%)	< 0.01
Intrauterine fetal demise	52 (0.3%)	38 (0.6%)	50 (1.5%)	< 0.01
Placenta previa	0 (0%)	63 (1.0%)	97 (2.9%)	< 0.01
Placenta accreta**	0 (0%)	19 (0.3%)	55 (1.7%)	< 0.01
Placental abruption	0 (0%)	192 (3.2%)	268 (8.1%)	< 0.01
Prior cesarean	1,636 (8.4%)	1,271 (21.0%)	720 (21.7%)	< 0.01
Prior myomectomy	38 (0.2%)	35 (0.6%)	11 (0.3%)	< 0.01
Autoimmune disease	21 (0.1%)	52 (0.9%)	59 (1.8%)	< 0.01
HIV/AIDS	1 (<0.01%)	8 (0.1%)	2 (0.1%)	< 0.01
Bleeding disorders	0 (0.0%)	1008 (16.6%)	513 (15.5%)	< 0.01
Neuromuscular disorders	292 (1.5%)	558 (9.2%)	479 (14.4%)	< 0.01
Chronic kidney disease	40 (0.2%)	80 (1.3%)	126 (3.8%)	< 0.01
Asthma	1304 (6.7%)	1364 (22.5%)	821 (24.7%)	< 0.01
Pregestational diabetes	134 (0.7%)	217 (3.6%)	274 (8.3%)	< 0.01
Gestational diabetes	1681 (8.7%)	867 (14.3%)	598 (18.0%)	< 0.01

Highlighted OBCMI components are those only present in patients in the highest OBCMI bracket.

*Easter SR, Bateman BT, Sweeney VH, Manganaro K, Lassey SC, Gagne JJ, Robinson JN. A comorbidity-based screening tool to predict severe maternal morbidity at the time of delivery. Am J Obstet Gynecol. 2019 Sep;221(3):271.e1-271.e10. doi: 10.1016/j.ajog.2019.06.025. Epub 2019 Jun 20. PMID: 31229427.

**Cases individually reviewed given high incidence. Many of them reflect suspicion/rule out accreta rather than true placenta accreta spectrum disorder.

Table 2. SMM Indicators Based on OBCMI Score Bracket

N (%)	Low Risk OBCMI 0 – 2 N = 19,431	Medium Risk OBCMI 3 – 5 N = 6,061	High Risk OBCMI ≥ 6 N = 3,320	P-value
SMM without transfusion*	103 (0.5%)	153 (2.5%)	269 (8.1%)	< 0.01
Myocardial infarction	0 (0%)	0 (0%)	1 (<0.01%)	0.02
Ruptured aneurysm	0 (0%)	1 (<0.01%)	1 (<0.01%)	0.10
Renal failure	45 (0.2%)	59 (1.0%)	133 (4.0%)	< 0.01
Acute Respiratory distress syndrome	4 (<0.01%)	10 (0.2%)	31 (0.9%)	< 0.01
Disseminated intravascular coagulation	14 (0.1%)	38 (0.6%)	46 (1.4%)	< 0.01
Eclampsia	7 (<0.01%)	12 (0.2%)	46 (1.4%)	< 0.01
Stroke	9 (<0.01%)	8 (0.1%)	11 (0.3%)	< 0.01
Acute heart failure	3 (<0.01%)	4 (0.1%)	28 (0.8%)	< 0.01
Sepsis	17 (0.1%)	15 (0.2%)	15 (0.5%)	< 0.01
Shock	5 (<0.01%)	9 (0.1%)	16 (0.5%)	< 0.01
Vaso-occlusive crisis	3 (<0.01%)	3 (<0.01%)	2 (0.1%)	0.19
Acute embolism	9 (<0.01%)	16 (0.3%)	11 (0.3%)	< 0.01

Most frequent SMM indicators for each OBCMI bracket highlighted in GREEN, second most frequent highlighted in BLUE, third most frequent in YELLOW
SMM indicators not listed did not occur in this cohort.
*CDC definition: https://www.cdc.gov/maternal-infant-health/php/severe-maternal-morbidity/icd.html

388 | Characterizing Sub-Types of Severe Maternal Morbidity in Patients with Hypertensive Disorders of Pregnancy

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4:00 PM - 6:00 PM

Objective: Patients with preeclampsia are at increased risk for severe maternal morbidity (SMM). Elucidating risk for specific sub-types of SMM can inform interventions to improve maternal outcomes. This study describes the incidence of SMM indicators in patients with hypertensive disorders of pregnancy (HDP).

Study Design: This retrospective cohort study included all deliveries $\geq$ 20 weeks across a multi-hospital academic health system from 1/1/2022-6/30/2024. Patient clinical information was extracted from the electronic health record and patients were classified as having gestational hypertension/mild preeclampsia (gHTN), severe preeclampsia (SPEC, inclusive of superimposed preeclampsia), or no HDP during the delivery admission. Patient characteristics classified according to OBCMI components and outcomes, including SMM sub-types, were compared in univariable analyses using chi^2 by hypertensive disorder of pregnancy status.

Results: 28,812 patients were included: 5,495 with gHTN (19.1%) and 2,432 with SPEC (8.4%). Patient co-morbidities classified according to OB-CMI components were different across groups for every condition except coronary artery disease, congenital heart disease, and autoimmune disease (Table 1). There were significant differences in incidence of preterm birth, cesarean delivery, ICU admission, extended postpartum length of stay ($\geq$5 days), and readmission, as well as non-transfusion SMM, which ranged from 1.0% in patients without HDP to 1.8% in patients with gHTN and 9.1% in patients with SPEC (Table 2). Renal failure was the most frequent SMM indicator for all groups, occurring in 4.7% of patients with SPEC. Eclampsia was the second most common indicator in patients with SPEC, followed by disseminated intravascular coagulation (Table 2).

Conclusion: SMM sub-types have differential incidence based on HDP status. The high rate of renal failure in patients with SPEC could be an important target for care improvement or may reflect over-coding of mild kidney injury, correction of which is an equally important quality target to accurately capture SMM.

Table 1. Clinical Characteristics of Included Patients with and without Hypertensive Disorders of Pregnancy

N (%)	No hypertensive disorders of pregnancy N = 20,885	Gestational hypertension/Mild Preeclampsia N = 5,495	Severe preeclampsia N = 2,432	P-value
Maternal age 35 – 39	3,823 (18.3%)	897 (16.3%)	520 (21.4%)	< 0.01
Maternal age 40 – 44	616 (2.9%)	178 (3.2%)	138 (5.7%)	< 0.01
Maternal age ≥ 44	60 (0.3%)	20 (0.4%)	15 (0.6%)	0.02
BMI ≥ 40	542 (2.6%)	245 (4.5%)	213 (8.8%)	< 0.01
BMI ≥ 50	98 (0.5%)	39 (0.7%)	64 (2.6%)	< 0.01
Black race	3,287 (15.7%)	918 (16.7%)	559 (23.0%)	< 0.01
Hispanic ethnicity	1,618 (7.7%)	318 (5.8%)	160 (6.6%)	< 0.01
Medicaid insurance	6,933 (33.2%)	1,611 (29.3%)	846 (34.8%)	< 0.01
Nulliparity	7,414 (35.5%)	2,972 (54.1%)	1,370 (56.3%)	< 0.01
Multiple gestation	283 (1.4%)	110 (2.0%)	102 (4.2%)	< 0.01
Chronic hypertension	1,453 (7.0%)	-	631 (25.9%)	< 0.01
Placental abruption	332 (1.6%)	75 (1.4%)	53 (2.2%)	0.03
Coronary artery disease	19 (0.1%)	3 (0.1%)	4 (0.2%)	0.32
Cardiac arrhythmia	223 (1.1%)	61 (1.1%)	40 (1.6%)	0.04
Cardiomyopathy	5 (<0.01%)	2 (<0.01%)	4 (0.2%)	< 0.01
Pulmonary hypertension	4 (<0.01%)	0 (0%)	4 (0.2%)	< 0.01
Congenital heart disease	71 (0.3%)	14 (0.3%)	9 (0.4%)	0.57
Intrauterine fetal demise	107 (0.5%)	12 (0.2%)	21 (0.9%)	< 0.01
Autoimmune disease	92 (0.4%)	23 (0.4%)	17 (0.7%)	0.18
Chronic kidney disease	107 (0.5%)	49 (0.9%)	90 (3.7%)	< 0.01
Asthma	2,291 (11.0%)	746 (13.6%)	452 (18.6%)	< 0.01
Pregestational diabetes	328 (1.6%)	115 (2.1%)	182 (7.5%)	< 0.01
Gestational diabetes	2,002 (9.6%)	727 (13.2%)	417 (17.1%)	< 0.01
History of bariatric surgery	167 (0.8%)	44 (0.8%)	36 (1.5%)	< 0.01
Mental health conditions	4,814 (23.1%)	1,539 (28.0%)	752 (30.9%)	< 0.01
Substance use disorder	1,207 (5.8%)	343 (6.2%)	179 (7.4%)	< 0.01

Table 2. Delivery Outcomes and SMM Indicators among Included Patients with and without Hypertensive Disorders of Pregnancy

N (%)	No hypertensive disorders of pregnancy N = 20,885	Gestational hypertension/Mild Preeclampsia N = 5,495	Severe preeclampsia N = 2,432	P-value
Preterm birth < 28 weeks	186 (0.9%)	16 (0.3%)	39 (1.6%)	< 0.01
Preterm birth < 34 weeks	700 (3.4%)	126 (2.3%)	505 (20.8%)	< 0.01
Late preterm birth 34 – 37 weeks	1,088 (5.2%)	302 (5.5%)	716 (29.4%)	< 0.01
Cesarean delivery	5,556 (26.9%)	1,606 (29.5%)	1,151 (48.0%)	< 0.01
Cesarean urgency				
Unscheduled	2,583 (89.5%)	1,067 (89.9%)	936 (92.3%)	0.03
Emergent	303 (10.5%)	120 (10.1%)	78 (7.7%)	
VBAC	647 (3.1%)	137 (2.5%)	39 (1.6%)	< 0.01
Severe maternal morbidity without transfusion*	206 (1.0%)	98 (1.8%)	221 (9.1%)	< 0.01
Myocardial infarction	1 (< 0.01%)	0 (0%)	0 (0%)	0.83
Ruptured aneurysm	2 (<0.01%)	0 (0%)	0 (0%)	0.68
Renal failure	64 (0.3%)	59 (1.1%)	114 (4.7%)	< 0.01
Acute Respiratory distress syndrome	15 (0.1%)	7 (0.1%)	23 (0.9%)	< 0.01
Disseminated intravascular coagulation	55 (0.3%)	18 (0.3%)	25 (1.0%)	< 0.01
Eclampsia	7 (<0.01%)	5 (0.1%)	53 (2.2%)	< 0.01
Stroke	22 (0.1%)	0 (0%)	6 (0.2%)	< 0.01
Acute heart failure	8 (<0.01%)	6 (0.1%)	21 (0.9%)	< 0.01
Sepsis	28 (0.1%)	11 (0.2%)	8 (0.3%)	0.06
Shock	17 (0.1%)	6 (0.1%)	7 (0.3%)	0.01
Vaso-occlusive crisis	5 (<0.01%)	0 (0%)	3 (0.1%)	0.01
Acute embolism	29 (0.1%)	5 (0.1%)	2 (0.1%)	0.55
Postpartum hemorrhage	2625 (12.6%)	684 (12.4%)	319 (13.1%)	0.70
Extended postpartum length of stay ≥6 days	48 (0.2%)	37 (0.7%)	198 (8.1%)	< 0.01
Maternal ICU admission	42 (0.2%)	12 (0.2%)	33 (1.4%)	< 0.01
Readmission (42 day)	291 (1.4%)	198 (3.6%)	76 (3.1%)	< 0.01

Most frequent SMM indicators for each group highlighted in GREEN, second most frequent highlighted in BLUE, third most frequent in YELLOW.
*CDC definition: https://www.cdc.gov/maternal-infant-health/php/severe-maternal-morbidity/scd.html

389 | Antenatal Risk Stratification Using the Obstetric Co-Morbidity Index (OBCMI) during Prenatal Care

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4:00 PM - 6:00 PM

Objective: The obstetric comorbidity index (OBCMI) predicts risk for severe maternal morbidity (SMM) based on chronic and pregnancy-specific conditions and was devised from comorbidities present at the time of delivery admission. This study assesses the ability of an OBCMI calculated during antenatal care to predict risk of SMM.

Study Design: This is an observational study of all deliveries ≥ 20 weeks at 3 delivery hospitals within a large health system from 1/1/2022-6/30/2024. Patient demographic and clinical information was extracted from the electronic health record (EHR) and OBCMI scores were calculated at 3 time points based on the clinical conditions identified from the EHR during that encounter: (1) initial prenatal visit, (2) 32-week visit, and (3) delivery admission. Patient characteristics were evaluated in univariable analysis based on the presence of an OBCMI ≥3 at any of the 3 time points. Receiver-operator characteristic (ROC) curves were constructed and compared for OBCMIs calculated at the initial and 32-week visits versus the delivery admission OBCMI in terms of SMM prediction.

Results: 28,812 deliveries were included and 9,625 patients (33.4%) had an OBCMI ≥ 3 at any point in pregnancy, with significant differences in all examined patient characteristics based on OBCMI score [Table]. The incidence of SMM was 1.8% (N = 525). The prediction of SMM by OBCMI scores calculated during antenatal care at both time points was significantly inferior, with area-under-the-curve (AUC) of 0.59 (95% CI 0.57–0.61) for initial prenatal visit and 0.58 (95% CI 0.55–0.610) for the 32-week visit, compared to AUC of 0.81 (95% CI 0.79–0.83) for delivery admission OBCMI ($p < 0.01$ for all comparisons) [Figure].

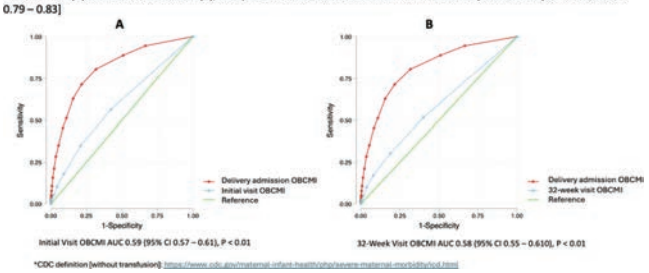
Conclusion: While the OBCMI reliably predicts SMM when calculated based on conditions documented at delivery, it performs poorly as a tool for antenatal risk stratification. This is likely multifactorial due to both EHR under-coding at antenatal visits and the development of clinically significant risk factors late in pregnancy. Better tools for maternal risk prediction prior to delivery are essential.

Table. Patient Characteristics Based on OBCMI* Score Throughout Pregnancy

	OBCMI Always <3 N = 19,187	OBCMI ≥3 at Initial Prenatal Visit N = 2,640	New Cases of OBCMI ≥3 at 32 Week Visit N = 557	New Cases of OBCMI ≥3 at Delivery Admission N = 6,438	P-value
Maternal age (median, IQR)	30 (26, 33)	34 (30, 38)	33 (29, 36)	31 (27, 35)	< 0.01
Pre-gravid BMI (median, IQR)	25.5 (22.5, 29.9)	36.4 (26.9, 43.6)	28.2 (24.2, 35.2)	27.8 (23.8, 33.2)	< 0.01
Black race (N, %)	2,911 (15.2%)	610 (23.1%)	84 (15.1%)	1,159 (18.0%)	< 0.01
Hispanic ethnicity (N, %)	1,481 (7.7%)	159 (6.0%)	39 (7.0%)	417 (6.5%)	< 0.01
Insurance type (N, %)					
Medicaid/Medicare	5,970 (31.1%)	1,026 (38.9%)	154 (27.6%)	2,240 (34.9%)	
Commercial	12,889 (67.2%)	1,588 (60.2%)	398 (71.5%)	4,095 (63.7%)	< 0.01
Self-pay	328 (1.7%)	26 (1.0%)	5 (0.9%)	92 (1.4%)	
Nulliparity (N, %)	8,060 (42.0%)	639 (24.2%)	193 (34.6%)	2,864 (44.6%)	< 0.01
Multiples (N, %)	105 (0.5%)	223 (8.4%)	11 (2.0%)	156 (2.4%)	< 0.01
Preterm delivery < 34 weeks (N, %)	384 (2.0%)	256 (9.7%)	76 (13.6%)	615 (9.6%)	< 0.01
Late preterm delivery [34-37 weeks] (N, %)	764 (4.0%)	398 (15.1%)	105 (18.9%)	839 (13.1%)	< 0.01
Cesarean delivery (N, %)	4,063 (21.3%)	1,512 (58.2%)	285 (52.3%)	2,453 (38.7%)	< 0.01
Quantitative blood loss [mL] (median, IQR)	150 (85, 303)	185 (90, 435)	185 (95, 390)	180 (90, 370)	< 0.01
OBCMI score (median, IQR)	1 (0, 2)	5 (3, 8)	5 (3, 7)	4 (3, 6)	< 0.01

*Easter SR, Bateman BT, Sweeney YH, Mangurano K, Lassey SC, Gagne JJ, Robinson JN. A comorbidity-based screening tool to predict severe maternal morbidity at the time of delivery. Am J Obstet Gynecol. 2019 Sep;221(3):271.e1-271.e10. doi: 10.1016/j.ajog.2019.06.025. Epub 2019 Jun 20. PMID: 31229427.

Figure. Receiver-Operator Characteristic Curves Comparing Prediction of SMM* for OBCMI Scores Generated from the Initial Prenatal Visit **(A)** and the 32-Week Visit **(B)**, Compared to the OBCMI Calculated from the Delivery Admission [AUC 0.81, 95% CI 0.79 – 0.83]



*CDC definition [without transfusion]: https://www.cdc.gov/maternal-infant-health/php/severe-maternal-morbidity/scd.html

390 | Employment Experiences of High-Risk Obstetric Patients: A Post-Pregnant Worker's Fairness and PUMP Act Cohort Study

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4:00 PM - 6:00 PM

Objective: The 2022 Providing Urgent Maternal Protections (PUMP) Act and the 2023 Pregnant Workers Fairness Act have recently changed employment laws in pregnancy. We evaluated employment benefits, knowledge of employment laws, and racial differences among hourly wage and salaried workers receiving high-risk obstetric care.

Study Design: Self-identified non-Hispanic Black (NHB) and White (NHW) patients at a single high-risk OB clinic within a Southeastern tertiary academic medical center were surveyed. We excluded major fetal anomalies, stillbirth or fetal demise. Participants completed surveys on work hours and duties, employment benefits at a single timepoint between 28 weeks' gestation to 12 weeks postpartum. Participants also reported if they received any information about employments laws or employment discrimination resources and the source of that information. Results were analyzed using descriptive statistics with SAS 9.4 (SAS Institute Inc., Cary, NC).

Results: 50/86 participated including 26 NHB and 24 NHW. Of these, 28 (56%) had hourly wage jobs, and 22 (44%) held salaried positions (Table 1). Thirty-seven (74%) had health insurance, and 31 (62%) had paid maternity leave. NHB patients were more often hourly wage earners compared to NHW patients (19/26, 73% vs. 9/24, 37.5%). Although mandated by the PUMP Act, only 13 (26%)

patients in the total cohort and 2 (7.1%) hourly workers reported having private lactation facilities in their workplaces. 33 (66%) received information about Family Medical Leave Act (FMLA), while fewer knew about the Pregnant Worker's Fairness Act (8, 16%) and the PUMP Act (8, 16%). Some participants who did not receive information expressed a desire for more information on these laws (Table 2).

Conclusion: While most participants had health insurance and paid maternity leave, a significant gap existed in workplace lactation support and knowledge of employment laws. These results highlight need for patient education about employment laws in pregnancy.

Table 1. Demographic and employment characteristics of the cohort stratified by race (N=50)

PARTICIPANT CHARACTERISTICS		
Characteristic (n,% unless otherwise noted)	**Black (n=26)**	**White (n=24)**
Age at consent (median, IQR years)	30.4 (29.0, 36.0)	33.0 (28.9, 36.4)
Pay type		
Hourly	19 (73.1%)	7 (26.9%)
Salaried	7 (26.9%)	15 (62.5%)
Body mass index (median, IQR)	39.7 (31.0, 47.4)	30.5 (26.7, 40.2)
Primary insurance		
Private	13 (50.0%)	17 (70.8%)
Medicaid	13 (50.0%)	7 (29.2%)
Enrollment category		
Pregnant (n, %)	14 (53.8%)	14 (58.3%)
Gestational age (median, IQR weeks)	34.5 (33.0, 36.0)	34.5 (33.0, 36.0)
Postpartum (n, %)	12 (46.2%)	10 (41.7%)
Postpartum day (Median, IQR days)	41.5 (39.0-43.0)	36.5 (35.0, 43.0)
Multiple jobs	1 (3.8%)	2 (8.3%)
EMPLOYMENT CHARACTERISTICS of Main Job		
Hours worked per week (mean, SD)	37.6 (12.8)	40.0 (6.8)
More than 1-year at current job	18 (69.2%)	20 (83.3%)
Change in work hours	8 (30.8%)	3 (12.5%)
Unhappy about change in hours	2/8 (25%)	2/3 (66.7%)
Hard to take off work for prenatal appointments	9 (34.6%)	6 (25.0%)
Employment benefits		
Health insurance	17 (65.4%)	20 (83.3%)
Paid maternity leave	15 (57.7%)	16 (66.7%)
Paid vacation days or paid time off (PTO)	19 (73.0%)	20 (83.3%)
On-site private lactation	4 (15.4%)	9 (37.5%)
On-site medical care	4 (15.4%)	4 (16.7%)
On-site childcare	2 (7.7%)	0 (0.0%)

Table 2. Patient employment law knowledge among the cohort (N=50)

	Black (n = 26)	White (n = 24)	Total (n = 50)
Know federal law about pregnancy accommodations or the Pregnant Worker's Fairness Act	4 (15.4%)	4 (16.7%)	8 (16.0%)
Would have been helpful to know about it	18 (69.2%)	11 (45.8%)	29 (58.0%)
Know federal law about lactation accommodations or the PUMP Act	4 (15.4%)	4 (16.7%)	8 (16.0%)
Would have been helpful to know about it	10 (38.5%)	8 (33.3%)	18 (36.0%)
Know federally protected unpaid leave via the Family Medical Leave Act (FMLA)	18 (69.2%)	15 (62.5%)	33 (66.0%)
Would have been helpful to know about it	1 (3.8%)	2 (8.3%)	3 (6.0%)
Where to get help if experiencing work-based discrimination	5 (19.2%)	4 (16.7%)	9 (18.0%)
Would have been helpful to know about it	9 (34.6%)	7 (29.2%)	16 (32.0%)

391 | Maternal and Neonatal Substance Screening Discordance After Implementation of an Obstetric Substance use Screening Protocol

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4:00 PM - 6:00 PM

Objective: To evaluate cases of discordance between maternal and neonatal drug screening before and after implementing an obstetric substance use screening protocol.

Study Design: This was a retrospective cohort study performed at a single tertiary care center using electronic health record data with pre- (July 1, 2020-June 9, 2021) and post-intervention (June 10, 2021-May 31, 2022) design after implementation of an obstetric substance use screening protocol incorporating pre-specified indications for maternal biologic testing and universal maternal consent. Concordances and discordances in neonatal and maternal drug screening were reported as frequency (percentage) in each time period. and compared by time period using test of two proportions. In the cohort of neonates with drug test and no maternal drug test, race, ethnicity, payor status, admission to the NICU, readmission, and neonate UDS results were compared by time period using Fisher's exact tests.

Results: 6552 neonates were born in the study period with 3163 (48.3%) pre and 3389 (51.7%) post implementation. 349/6552 (5.3%) neonates were drug screened (195/3163 [6.2%] pre vs. 154/3389 [4.5%] post, p = 0.004). 172 were ordered in the absence of a maternal test (63/195 [32.3%] pre, 109/154 [70.8%] post; p< 0.001) (Figure). Among 172 drug screens ordered in the absence of maternal tests, 80 were positive (24/63 [38.1%] pre, 56/109 [51.4%] post, p = 0.093). The number of neonates testing positive for specific substances did not significantly differ between the pre- and post-periods (Table).

Conclusion: After implementing the obstetric substance use screening protocol, neonatal substance use screening in the absence of maternal screening occurred more frequently post-intervention than pre-intervention despite similar rates of positive tests and substances for which neonates tested positive. These findings suggest a need for further investigation into the factors driving this increase in discordant testing and the potential implications for both neonatal and maternal care and support strategies in the future.

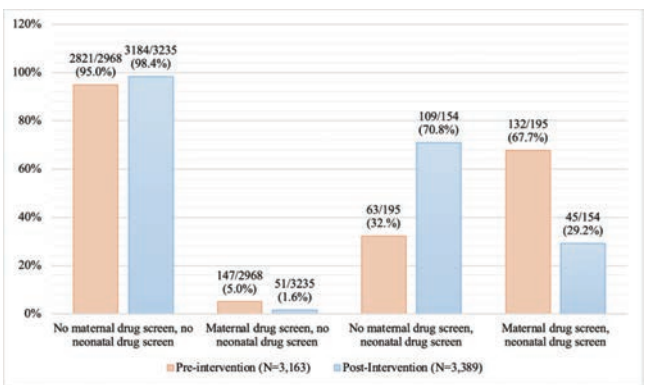

Figure 1. Cross-tabulation of maternal and neonate drug screening by pre- and post-intervention

Table 1. Maternal Characteristics and positive drug test results among drug tested neonates whose mothers were not tested	Pre-Intervention (n=63)	Post-Intervention (n=109)
Maternal Characteristics		
Maternal race (n, %)		
American Indian or Alaskan native	1 (1.6%)	2 (1.8%)
Black or African American	35 (55.6%)	54 (49.5%)
Caucasian/White	21 (33.3%)	47 (43.1%)
Native Hawaiian or other Pacific Islander	0 (0.0%)	2 (1.8%)
Other	1 (1.6%)	3 (2.8%)
2 or more races	2 (3.2%)	0 (0.0%)
Unknown	3 (4.8%)	1 (0.9%)
Maternal ethnicity (n, %)		
Hispanic/Latino	5 (7.9%)	7 (6.4%)
Not Hispanic/Latino	56 (88.9%)	101 (92.7%)
Unknown	2 (3.2%)	1 (0.9%)
Insurance (n, %)		
Government (Medicaid, Medicare, Medicare advantage, NC Medicaid)	46 (73.0%)	80 (73.4%)
Other (Other, other government, special programs, liability)	1 (1.6%)	2 (1.8%)
Private	15 (23.8%)	22 (20.2%)
Unknown	1 (1.6%)	5 (4.6%)
Substance Screening Results[1]		
Positive	24 (38.1%)	56 (51.4%)
Negative	39 (61.9%)	53 (48.6%)
	Pre-Intervention (n=24)	Post-Intervention (n=56)
Positive Substances[1]		
Amphetamine	1 (4.2%)	6 (10.7%)
Barbiturate	0 (0.0%)	1 (1.9%)
Benzodiazepine	0 (0.0%)	3 (5.7%)
Cocaine	4 (16.7%)	3 (5.4%)
Opiate	6 (25.0%)	8 (14.3%)
THC	16 (66.7%)	38 (67.9%)
Oxycodone	1 (5.6%)	0 (0.0%)
Methadone	1 (5.6%)	7 (13.2%)
Phencyclidine	2 (10.0%)	0 (0.0%)

[1]p >.05

392 | Prior Delivery History and Risk of Placenta Accreta Spectrum

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4:00 PM - 6:00 PM

Objective: Previous cesarean delivery, prior uterine procedures, in vitro fertilization and placenta previa are known risk factors for placenta accreta spectrum (PAS). Further studies investigating prior delivery characteristics and risk of PAS are limited. The objective of this study was to describe additional risk factors in prior deliveries associated with the development of PAS.

Study Design: This was a case-control study at a single institution from June 2009 through June 2022 that included patients with prenatal suspicion of PAS based on imaging and confirmed at the time of delivery. Cases were matched to controls based on age, race, number of cesarean deliveries and prior vaginal birth. Prior delivery characteristics included preterm prelabor rupture of membranes, preterm birth, chorioamnionitis, delivery stage, uterine incision, bladder flap closure, peritoneal closure and manual placental extraction. Location of placenta in relation to the internal os on second trimester sonogram in the prior pregnancy was also analyzed. A conditional logistic regression model was used, that accounted for 3:1 matching, to compare cases to controls. A p-value less than 0.05 was significant.

Results: 55 cases were matched to 165 controls. There were no differences in maternal characteristics or comorbidities. Cases were more likely to have experienced preterm birth (OR 3.00 95% CI 1.37-6.57) and have had a manual placenta extraction (OR 5.25 95% CI 1.54-17.93) in a prior delivery. Placental location in a prior pregnancy was not significantly different between cases and controls (Table).

Conclusion: Preterm birth and manual extraction of the placenta in a prior pregnancy appear to be additional risk factors for development of PAS in future pregnancies. Further multicentered studies with a larger population are needed to further understand other risk factors for PAS.

Table. Maternal and delivery characteristics from prior pregnancies of matched patients presenting with (case) and without PAS (control) in subsequent pregnancies.

	Case N = 55	Control N = 165	P-value	Odds Ratio (95% CI)
Age at first delivery	25.9 (6.8)	26.0 (5.6)	0.914	--
Race/ethnicity			0.895	
Black/Non-Hispanic	9 (16)	27 (16)		
White/Non-Hispanic	3 (5)	7 (4)		--
White/Hispanic	41 (75)	125 (76)		
Asian	0 (0)	4 (2)		
Other	0 (0)	2 (1)		
Comorbidities				
Chronic HTN	2 (4)	8 (5)	0.684	0.70 (0.13-3.82)
Gestational HTN	10 (18)	36 (22)	0.571	0.80 (0.37-1.73)
SPE	11 (20)	32 (19)	0.921	1.04 (0.48-2.26)
Gestational DM	6 (11)	25 (15)	0.433	0.68 (0.26-1.77)
Chorioamnionitis	6 (11)	38 (23)	0.066	0.43 (0.17-1.06)
PPROM	1 (2)	2 (1)	0.708	1.73 (0.10-30.76)
Preterm birth	14 (25)	16 (10)	**0.006***	**3.00 (1.37-6.57)**
SAB with D&C	2 (4)	0 (0)	0.062	--
Classical incision	2 (4)	10 (6)	0.485	0.57 (0.12-2.77)
2nd stage CD	3 (6)	26 (16)	0.083	4 (0.10-1.15)
Manual placenta extraction	7 (14)	4 (2)	**0.008***	**5.25 (1.54-17.93)**
Peritoneal closure	10 (20)	51 (32)	0.086	0.52 (0.24-1.10)
Bladder flap closure	17 (31)	79 (48)	0.071	0.55 (0.29-1.05)
Vaginal hand	1 (2)	4 (3)	0.797	0.75 (0.08-6.71)
Low lying placenta	3 (8)	9 (6)	>0.999	--
Previa	1 (3)	3 (2)	>0.999	--

Data reported as n (%) or mean (standard deviation). *indicates significance.
HTN hypertension; *SPE* severe pre-eclampsia; *DM* diabetes mellitus; *PPROM* premature preterm rupture of membranes; *CD* cesarean delivery; *SAB* spontaneous abortion; *D&C* dilation and curettage.

393 | Postpartum EPDS Scores in Prenatally Suspected Placenta Accreta Spectrum

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4:00 PM - 6:00 PM

Objective: Placenta accreta spectrum (PAS) is a life-threatening condition and may impact mental health. Peripartum hysterectomy is also independently associated. This study's objective was to assess the association of prenatally suspected PAS and Edinburgh Postnatal Depression Scale (EPDS) scores.

Study Design: This was a case-control study of singleton pregnancies from 2010 to 2024. Cases with prenatal suspicion of PAS based on imaging were matched to controls by age, parity, cesarean delivery and whether the cesarean was scheduled. Those with fetal anomalies or stillbirth after 24 weeks gestation were excluded. Postpartum EPDS scores were compared with patients with prenatal suspicion of PAS by hysterectomy status using the Kruskal-Wallis test and to matched controls using the Wilcoxon signed rank test.

Results: Of 184 cases matched 101 had available EPDS scores. This was significantly different from matched controls where 150 scores were available (55% vs 82% %, p< 0.001). Sixty-two (61.4%) of cases with EPDS scores underwent hysterectomy. Median EPDS scores were not statistically higher (3 (1-7) vs 3 (1-4), p = 0.114) comparing cases to matched controls. Among cases, patients that underwent hysterectomy had significantly higher median EPDS scores (4 (2-8) vs 2 (0-5), p = 0.049). The percentage of EPDS scores that would require intervention and referral (score of ≥13) were not significantly different between cases and controls

(p = 0.206), however all five cases with EPDS score ≥13 had a hysterectomy compared to none in the controls (p = 0.048).
Conclusion: Patients with prenatal suspicion of PAS were less likely to attend their routine postpartum visit. Compared to matched controls, these patients did not have higher postpartum EPDS scores following delivery but performance of hysterectomy increased EPDS score significantly. Providing counseling services in pregnancy and enhanced postpartum interventions may be of benefit.

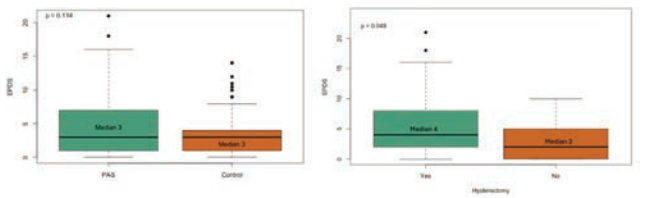

Figure. *Left* Median EPDS scores in patients with prenatal suspicion of placenta accreta spectrum. *Right* Median EPDS scores within the cases of prenatal suspicion of placenta accreta spectrum stratified by outcome of hysterectomy.

394 | Impact of Antenatally Suspected Uterine Window on Maternal and Neonatal Outcomes

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[1]University of Miami Health System, Miami, FL; [2]Montefiore Medical Center, Albert Einstein College of Medicine, New York, NY

4:00 PM - 6:00 PM
Objective: Prenatal sonographic suspicion for uterine window at a prior cesarean scar niche may impact mode and timing of delivery. We aimed to investigate maternal and neonatal outcomes in patients with prenatal suspicion of uterine window.
Study Design: Retrospective cohort study of all patients with a sonographic diagnosis of a uterine window at a tertiary referral academic institution from 2014-2024. Uterine window was defined as lower uterine myometrial segment >10mm in length and thickness < 2mm on 2nd trimester transvaginal ultrasound. Patients were compared to controls with a history of cesarean delivery (CD) without a uterine window, electing a repeat CD. All study patients were planned for repeat CD at early term (37 weeks). Primary outcome was a composite adverse maternal outcome (uterine rupture, blood loss >1.5L, transfusion, intensive care unit (ICU) admission, need for vasopressors and hysterectomy). Secondary outcomes included APGAR < 7, NICU admission and a composite neonatal morbidity outcome (sepsis, respiratory distress, and IVH or NEC). Multivariable logistic regression analysis was performed.
Results: Study included 103 patients with mid-gestation suspicion of uterine window and 103 matched controls. There was no significant difference in age, race/ethnicity, BMI, or parity between groups. Uterine rupture occurred in two (1.94%) study patients and one (0.9%) control. Delivery on the planned date was similar between groups (67.0% vs 69.9%, p = 0.6). Actual delivery occurred earlier for study patients (36.3 ±0.2 weeks vs 38.2 ±0.2 weeks, p< 0.01). Maternal composite adverse outcome was higher in study patients (22.3% vs 11.7%, p = 0.04). Study neonates had similar APGAR scores, but were more likely to be admitted to NICU (20.4% vs 9.7%, p = 0.03) and had higher morbidity (16.5% vs 6.8%, p = 0.02), compared with controls.
Conclusion: Patients with 2nd trimester sonographic suspicion for uterine window are at increased risk for iatrogenic earlier delivery, and higher maternal and neonatal morbidity. Possible benefits of earlier scheduled repeat CD should be weighed against the increased neonatal risks.

395 | Isolated Large Fetal Abdominal Circumference is Associated with Adverse Perinatal Outcomes in Non-Diabetic Pregnancies

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4:00 PM - 6:00 PM
Objective: The Society of Maternal Fetal Medicine currently recognizes an association between large for gestational age (LGA), defined as estimated fetal weight (EFW) >90%, and adverse perinatal outcomes. Our study aimed to assess the impact of isolated large fetal abdominal circumference (AC) on maternal and neonatal outcomes in non-diabetic pregnancies.
Study Design: Retrospective cohort analysis of patients at an urban academic institution who had ultrasonography between 35-36 weeks to estimate fetal weight. Those with multiple gestation, pregestational or gestational diabetes, prior cesarean delivery (CD) and contraindication to vaginal delivery were excluded. Outcomes were compared between three groups: a) appropriate for gestational age (AGA): AC and EFW between 10-90%, b) Isolated large AC: AC >90% and c) LGA: EFW >90%. Groups were matched by parity and gestational age by ultrasound. Primary outcome was primary CD. Secondary outcomes included shoulder dystocia, hemorrhage >1.5L, composite adverse maternal outcome (transfusion, infection, ICU admission, intubation, and mortality) and composite adverse neonatal outcome (APGAR < 7 at 5 min, NICU admission, neonatal morbidity and mortality). Analysis was performed using multivariate logistic regression.
Results: 765 patients were included: 255 in each group. There was no difference in age, parity, body mass index and hypertension among groups. Macrosomia (>4000 grams) at birth was confirmed in 2.4% of AGA, 12.5% of large AC and 38.0% of LGA group (p< 0.01). Patients with isolated large AC were more likely to have primary CD (aOR 2.41, 95%CI 1.56-3.71, p< 0.01), hemorrhage (aOR 2.76, 95%CI 1.19-6.45, p = 0.01) and composite adverse neonatal outcome (aOR 2.98, 95%CI 1.71-5.21, p< 0.01), when compared to AGA group. Outcomes were similar between large AC and LGA groups.
Conclusion: Isolated large AC with normal EFW is associated with an increased risk of primary CD and adverse perinatal outcomes in non-diabetic pregnancies. Including isolated large AC in the definition of LGA may improve counseling, delivery planning, and perinatal management.

396 | Accuracy of Point of Care Urine Drug Screen Testing in Pregnancies Complicated by Opioid Use

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4:00 PM - 6:00 PM

Objective: To evaluate the accuracy of point of care (POC) versus the gold standard quantitative urine drug screen in a comprehensive perinatal substance treatment program.

Study Design: This study was from a longitudinal cohort of women receiving prenatal care through a comprehensive perinatal substance use treatment program between 2014 and 2024. We assessed participants who had both a POC and a quantitative urine drug screen (UDS) result during the same prenatal visit. Postpartum visits were excluded.

Results: Data was available for 2079 samples collected for a POC analysis and a quantitative drug screen, and the results were compared. We looked specifically at the accuracy of identifying opioids as most of our patients are on medication for opioid use disorder (MOUD). A true positive was defined as the POC matching the gold standard urine quantitative result. 78.2% (76.3, 79.9%) of the time the POC test yielded results matching the quantitative assessment. 21.8% of the time the POC was positive for an opiate when the quantitative was negative either for an opiate or for that specific opiate. The test yielded a positive predictive value of 79.5% (78.7, 80.2%) and a negative predictive value of 64.9% (58.2, 71.0%).

Conclusion: POC is not an accurate tool for use in pregnancy when evaluating compliance with MOUD. False positive and false negative results can adversely affect decisions that impact the patient and fetus. This can result in loss of trust in the medical system, decreased likelihood to engage in care, and poorer outcomes. More accurate quantitative tests should be utilized for evaluating compliance with treatment.

397 | Increased Buprenorphine Dosing Frequency Was Not Associated With An Increase In Neonatal Opioid Withdrawal Syndrome

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4:00 PM - 6:00 PM

Objective: Pregnancy alters the pharmacokinetics of buprenorphine with the need for increased dosing frequency to stay in the therapeutic range. We sought to evaluate whether increased dosing frequency is associated with an increased risk of Neonatal Opioid Withdrawal Syndrome (NOWS).

Study Design: This study was from a longitudinal cohort of pregnant persons receiving prenatal care through a multidisciplinary program for substance use disorder (SUD) between 2015 and 2024. We compared outcomes between patients prescribed once-a-day (QD) dosing verses twice a day (BID) or greater dosing of buprenorphine. Women not taking buprenorphine at delivery were excluded as well as those with less than 6 visits. Fisher's exact and two-sample t-tests were used for our statistical analysis.

Results: 367 patients were included, with 266 (72.5%) receiving QD dosing versus 101 (27.5%) dosed BID or more. Demographics were similar between groups including tobacco use. There was no significant difference in gestational age at delivery (38.4 +/- 2.2, 38.1 +/- 1.9;, p = 0.25), rate of preterm birth (9.4%, 12.9%, p = 0.34), birthweight percentile (37.6 +/- 25.5, 32.5 +/- 22.7, p = 0.08), rate of NOWS (48.9%, 45.5%, p = 0.68), length of hospital days (11 [6 to 20.2], 13 [6 to 20.0], p = 0.37) or NOWS treatment days (15 [10 to 20], 14 [11 to 24], p = 0.28).

Conclusion: An increase in dosing frequency was not associated with an increased risk of NOWS. Our data suggests that providers may be able to dose buprenorphine based on patient's needs (cravings and withdrawal symptoms) without concern of increasing the risk of NOWS.

398 | Unplanned Cesarean Delivery is Associated with Higher Risk of Postpartum Depression and Engagement in Care

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4:00 PM - 6:00 PM

Objective: Postpartum depression (PPD) is a serious pregnancy complication, affecting 10-15% of postpartum people. Studies suggest an association between method of delivery (MOD) and PPD. Intrapartum experiences may contribute to PPD development and affect patient engagement in healthcare after birth through attendance at the six week postpartum visit (PPV). This study aims to interrogate the associations between MOD and PPD as well as PPV attendance in a large national pregnancy dataset.

Study Design: This was a retrospective study using the Pregnancy Assistance Monitoring Systems (PRAMS) national dataset by the United States Centers for Disease Control and Prevention (CDC). The cohort includes patients for whom MOD, demographic, and outcome data was available. The outcome of interest was PPD (via survey-administered PHQ-2 and patient-reported via survey), and attendance at the 6-week PPV (patient-reported via survey). The predictor variable was MOD: vaginal delivery (VD), planned cesarean delivery (CD), or unplanned CD. Chi-squared tests examined differences between groups and logistic regression models adjusting for maternal factors estimated adjusted odds ratios (aOR) of outcomes given MOD.

Results: This study included 6078 pregnancies: 3481 VDs (57.3%), and 2597 CDs (42.7%). Of the CDs, 1066 were planned CDs while 1531 were unplanned CDs. These groups differed significantly by maternal age, years of education, and household income. While those who delivered by planned CD did not have increased odds of PPD compared to VD, those who delivered by unplanned CD had increased odds of PPD as compared to VD (aOR 1.19 (1.04, 1.44)), and were significantly more likely to attend a postpartum visit (aOR 1.22 (1.05, 1.56)).

Conclusion: This study found that participants who delivered by unplanned CD but not planned CD are at increased odds of developing PPD and attending PPV compared to VD. Future work should focus on the physical and psychosocial stressors of an unplanned CD that may contribute to PPD development and postpartum care engagement.

N = 6078	VD		Unplanned CD		Planned CD		
	3481		1531		1066		
Characteristic	N	%	N	%	N	%	p
PPD Dx	424	12.18	208	13.59	120	11.26	0.18
Postpartum Visit	3146	90.38	1404	91.70	989	92.78	0.04
Age at Delivery							< 0.001
≤ 25	1115	32.03	378	24.69	164	15.38	
25 - 30	998	28.67	451	29.46	259	24.30	
30 - 35	889	25.54	430	28.09	362	33.96	
35 - 40	401	11.52	216	14.11	223	20.92	
> 40	78	2.24	56	3.66	58	5.44	
Years of Maternal Education							< 0.001
< 12	441	12.67	113	7.38	84	7.88	
12	894	25.68	382	24.95	247	23.17	
13-15	876	25.17	356	23.25	293	27.49	
≥ 16	1256	36.08	571	37.30	417	39.12	
Maternal Household Income							< 0.001
≤ $20,000	1035	29.73	428	27.96	246	23.08	
$20,000 - $32,000	394	11.32	187	12.21	106	9.94	
$32,000 - $48,000	384	11.03	186	12.15	127	11.91	
$48,000 - $60,000	225	6.46	126	8.23	93	8.72	
$60,000 - $85,000	382	10.97	158	10.32	103	9.66	
≥ $85,000	836	24.02	376	24.56	332	31.14	
Maternal History of Depression	541	15.54	236	15.41	171	16.04	0.9

Logistic regression models	Unplanned Cesarean (Ref=Vaginal Delivery)	Planned Cesarean (Ref=Vaginal Delivery)
Characteristic	aOR (95% CI)	aOR (95% CI)
Postpartum Depression	**1.19 (1.04, 1.44)**	1.03 (0.81, 1.30)
Postpartum Visit	**1.22 (1.05, 1.56)**	1.20 (0.91, 1.60)

*** controlling for maternal age, maternal education, maternal income, maternal history of depression, and gestational age at delivery

399 | Risks Factors of Perinatal Morbidity After Instrumental Delivery Among Nulliparous Women

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4:00 PM - 6:00 PM

Objective: Instrumental vaginal delivery is a common practice, especially among nulliparous women, and may increase the risk of neonatal morbidity. However, there is a paucity of recent data regarding the risk factors for neonatal morbidity in this context. The goal is to identify risk factors of neonatal morbidity during instrumental vaginal deliveries among nulliparous women.
Study Design: This is an ancillary study of the prospective cohort study INSTRUMODA, the aim of which was to evaluate the protective effect of episiotomy on anal sphincter injury among nulliparous women during instrumental vaginal delivery. This study was conducted in 111 maternity units in France between April 2021 and March 2022. Instrumental deliveries were included from 34 weeks of gestation. Our primary outcome was a composite criterion of neonatal morbidity, including: Apgar score < 7 at 5 minutes, pH < 7.10, neonatal intensive care unit admission, hypothermia therapy, peripartum death, and cephalic or upper-limb trauma. The association between potential risk factors and perinatal morbidity was assessed using logistic regression, accounting for a center effect. Imputation was performed for missing data.
Results: A total of 11,938 instrumental deliveries were included. The primary outcome was observed in 16.9% of deliveries (table 1). Increased perinatal morbidity was associated with sequential instrument use (aOR = 1.50, 95% CI = 1.26–1.76), occiput posterior position (a OR = 1.30, 95% CI = 1.07–1.58), and delivery between 8 PM and 8 AM (aOR = 1.16, 95% CI = 1.05–1.29) (table 2). There was no significant difference in neonatal morbidity related to the type of instrument used (vacuum or forceps) or associated obstetric pathology (macrosomia, preeclampsia, IUGR).
Conclusion: Sequential use of instruments, occiput posterior fetal position, and deliveries occurring during night shifts are risk factors of neonatal morbidity in case of instrumental vaginal births among nulliparous women. However, neither the type of instrument nor associated obstetric pathology influence neonatal morbidity.

Multivariate analysis conducted with mixed effects logistic regression of risks factors for neonatal morbidity

	Neonatal Morbidity No (%)		aOR[1]	95% IC[2]	p-value
	No	Yes			
Maternal geographic origin					
Caucasian	8 245 (83.2)	1 696 (84.0)	—	—	
African	1 349 (13.6)	258 (12.8)	0.95	0.81 – 1.11	0.52
Asian	191 (1.9)	33 (1.6)	0.87	0.58 – 1.29	0.48
Other	133 (1.3)	33 (1.6)	1.34	0.90 – 2.00	0.15
Missing data	0	0			
Term of delivery (weeks)					
Term (37 - 41)	7 151 (72.2)	1 402 (70.1)	—	—	
Prematurity (< 37)	179 (1.8)	70 (3.5)	1.97	1.45 – 2.67	**<0.001**
Prolonged pregnancy (> 41)	2 573 (26.0)	528 (26.4)	1.04	0.92 – 1.17	0.55
Missing data	*< 1 %*	*< 1 %*			
Onset of labour					
Spontaneous	6 991 (70.6)	1 380 (68.5)	—	—	
Induction	2 916 (29.4)	635 (31.5)	1.09	0.97 – 1.22	0.11
Missing data	*< 1 %*	*< 1 %*			
Stage 2 of labour (duration per 10 minutes)	15.6	14.2	0.99	0.983 – 0.997	**0.01**
Missing data	*2.9%*	*2.9%*			
Intra-Uterin Growth Restriction					
No	9 672 (98.4)	1 952 (97.6)	—	—	
Yes	155 (1.6)	49 (2.4)	1.32	0.93 – 1.87	0.12
Missing data	*< 1%*	*< 1%*			
Instrument that led to birth					
Vacuum	6 193 (63.2)	1 225 (62.3)	—	—	
Forceps	3 601 (36.8)	740 (37.7)	0.99	0.88 – 1.12	0.88
Missing data	*< 1%*	*< 1%*			
Sequential use of instrument					
No	9 118 (92.0)	1 775 (88.0)	—	—	
Yes	789 (8.0)	243 (12.0)	1.5	1.26 – 1.76	**<0.001**
Missing data	*< 1%*	*< 1%*			
Indication of extraction					
Prolonged second stage	5 433 (54.9)	833 (41.2)	—	—	
Fetal distress	4 466 (45.1)	1 184 (58.8)	1.69	1.50 – 1.90	**<0.001**
Missing data	*< 1%*	*< 1%*			
Variety of presentation at birth					
Anterior	9 077 (92.4)	1 796 (90)	—	—	
Posterior	655 (6.7)	171 (8.6)	1.3	1.07 – 1.58	**0.01**
Transverse	87 (0.9)	27 (1.4)	1.32	0.81 – 2.14	0.27
Missing data	*1%*	*< 1%*			
Birth weight > 4000g					
No	9 398 (94.9)	1 895 (94.0)	—	—	
Yes	504 (5.1)	120 (6.0)	1.24	0.99 – 2.67	0.06
Missing data	*< 1%*	*< 1%*			
Shoulder dystocia					
No	9 517 (96.1)	1 878 (93.2)			
Yes	387 (3.9)	137 (6.8)	1.91	1.53 – 2.37	**<0.001**
Missing data	*< 1%*	*< 1%*			
Night Shift (8PM - 8AM)					
No	5 123 (51.7)	956 (47.3)	—	—	
Yes	4 795 (48.3)	1 064 (52.7)	1.16	1.05 – 1.29	**0.004**
Missing data	0	0			

[1] Ajusted Odds Ratio ; [2] Confidance Interval

400 | Maternal and Neonatal Outcomes Following Maternal Cardiac Arrest

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4:00 PM - 6:00 PM

Objective: Maternal cardiac arrest is an uncommon but catastrophic event. We sought to define the maternal and neonatal outcomes associated with maternal code at our public tertiary care center.

Study Design: This is a single-institution retrospective cohort study of cases of maternal cardiac arrest from 2010 through 2024 at a large county hospital. Demographics and data regarding maternal code events, delivery, and neonatal outcomes were obtained from the medical record. All cases of maternal codes in the setting of pregnancy or within six months postpartum were included. A descriptive statistical analysis was completed.

Results: Thirty-eight maternal codes were identified during the study timeframe, with 169,848 deliveries, this is consistent with 2 per 10,000 births. Of the 38 cases, 6 occurred at a gestational age of less than 20 weeks. Thirty-five codes occurred in the hospital with 25 (71%) resulting in return of spontaneous circulation (ROSC). Of the 3 cases of cardiac arrest outside of the hospital, only one patient survived. Overall, 23 individuals (61%) survived until discharge with an average length of stay of 18.2 days. For survivors, ROSC was achieved within 5 minutes in 74%. Eleven of the 38 individuals had a live fetus at 24 weeks or greater at the time of code. A resuscitative hysterotomy occurred in 9 out of 11 (82%) with a median time from code to delivery of 4 minutes. All of the neonates who underwent resuscitative hysterotomy survived until discharge. NICU admission occurred in the majority (78%), with 44% requiring mechanical ventilation and 33% complicated by hypoxic-ischemic encephalopathy. An additional 13 patients experienced a code in the immediate peripartum period with a median time from delivery to maternal code of 22 minutes.

Conclusion: Despite the infrequent and high acuity nature of maternal codes, achievement of ROSC and survival remains high, especially in the event of in-hospital cardiac arrest. Rapid delivery of the neonate, within four minutes of maternal code, was associated with a high likelihood of neonatal survival in the setting of viability.

TABLE 1
Maternal Demographics and Outcomes

Characteristic	*(n = 38)*
Age	31.2 (7.6)
Race	
White	25 (66)
Black	12 (32)
Asian	1 (3)
Ethnicity	
Hispanic	24 (63)
Non-Hispanic	14 (37)
Gravidity	2 (1-4)
Parity	2 (1-3)
BMI	31.3 (9.0)
Gestational age at delivery (weeks)	35.9 (31.5-39.0)
Delivery Method	
Cesarean Section	25 (66)
Vaginal	6 (16)
Abortion <20 weeks	5 (13)
Undelivered	2 (5)
Survival to discharge	23 (61)
In-hospital Code	22 (96)
Time to ROSC	
0-1 min	9 (39)
2-5 min	8 (35)
6-10 min	2 (9)
11-15 min	1 (4)
ECMO	3 (13)
Neurologic Impairment	1 (4)
Days to extubation	1 (1-2.75)
Death prior to discharge	14 (37)
In-hospital code	13 (93)
Initial ROSC achieved	3 (21)

Data reported at N (%), median (interquartile range), and mean (SD). *SVD*, spontaneous vaginal delivery; *ROSC*, return of spontaneous circulation

TABLE 2
Neonatal Outcomes

Characteristic	*Maternal Code Prior to Delivery (n = 9)*	*Maternal Code After Delivery (n=13)*
Time between code and delivery (mins)	4 (2-5)	22 (14-71)
Survival to Discharge	9 (100)	12 (92)
NICU admission	7 (78)	6 (46)
Birth Weight (grams)	3195 (3015-3325)	2830 (2350-3155)
APGAR 1 minute	2 (2-5)	7 (2-8)
APGAR 5 minute	7 (4-9)	9 (7-9)
Cord Gas pH	6.98 (0.2)	7.2 (0.1)
Mechanical Ventilation	4 (44)	1 (8)
Intraventricular Hemorrhage	1 (11)	1 (8)
HIE	3 (33)	0 (0)

Data reported at N (%), median (interquartile range), and mean (SD). NICU, neonatal intensive care unit; HIE, hypoxic-ischemic encephalopathy

401 | Increasing Antimicrobial Resistance Among Post-Cesarean Surgical Site Infections at a Large Public Hospital from 2009-2019

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4:00 PM - 6:00 PM

Objective: To evaluate trends of bacterial composition and antimicrobial resistance among post cesarean surgical site infections (SSIs) in a cohort exposed to contemporary antibiotic prophylaxis.

Study Design: This is a single-institution retrospective cohort study of post-cesarean SSIs for whom culture data was available between 2009-2019 at a large county hospital. Medical records were reviewed to examine microbes isolated, and antimicrobial susceptibility data over time and by wound class. Wounds were clinically classified as superficial, deep, or organ space SSIs according to National Healthcare Safety Network guidelines. Logistic regression was completed to look at trends over time for antimicrobial resistance and bacterial composition.

Results: Of 41,338 cesarean sections, 484 cultured wounds were identified. 104 individuals (21.5%) had chorioamnionitis preceding delivery. SSI incidence remained below 2% consistently; however, positive cultures increased during the study ($p = 0.005$). For all organisms isolated, resistance to any antibiotic increased at a rate of 0.65 per year ($p = 0.13$ for trend). Escherichia coli (E.coli) was the most prevalent microbe identified in 67(13.8%), including 55(11.4%) superficial and 12(2.5%) deep or organ space infections. Significant increases in both the frequency of E. coli isolates among superficial SSIs (0.75 per year, $p = 0.005$) and antibiotic resistance of E.coli (0.49 per year, $p = 0.014$) were seen. Of E. coli isolates with susceptibility testing, 9/23 (37.5%) were resistant to ampicillin, 25/58 (49.1%) to ampicillin-sulbactam, 13/63 (23%) to gentamicin, and 23/66 (34.8%) to Bactrim.

Conclusion: While post-operative cesarean SSI rates have remained relatively constant at a single center over the past decade, antibiotic resistance is increasing, particularly among E. coli isolates. The impact of increasing antimicrobial resistance on maternal and neonatal morbidity and infection-associated healthcare costs warrants further study, and safety data for newer antimicrobial agents in pregnancy and lactation are urgently needed.

Post-Cesarean Surgical Site Infections with Positive Cultures by Year at Parkland Health

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Cultured wounds, *N (%)*	13 (0.3)	49 (1.2)	44 (1.2)	45 (1.3)	38 (1.2)	49 (1.5)	48 (1.4)	41 (1.1)	55 (1.4)	60 (1.5)	42 (1.1)	484
Total CD, *N*	4333	4204	3771	3471	3243	3239	3422	3873	3942	4093	3747	41,338

Figure I. Resistance Patterns by Wound Depth

402 | Polyhydramnios is Associated with Worse Perinatal Outcomes Among Non-Anomalous Births Complicated by Diabetes

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4:00 PM - 6:00 PM

Objective: Pre-existing diabetes mellitus (DM) is associated with adverse perinatal outcomes. Polyhydramnios is more common among pregnant persons with DM, particularly those with suboptimal glycemic control. Our study examined perinatal outcomes in patients with DM in pregnancy with co-occurring polyhydramnios.

Study Design: This was a retrospective cohort study of births in California complicated by pre-existing DM between 2008-2020. We included singleton, non-anomalous births between 32 and 42 weeks of gestation. We assessed numerous maternal and neonatal outcomes among births complicated by polyhydramnios compared to those without polyhydramnios. We performed bivariate and multivariable logistic regression analyses adjusting for significant confounders with a p-value of 0.05.

Results: There were 56,106 people with DM included in this study, of which 1,767 (3.1%) had polyhydramnios. Polyhydramnios was associated with worse outcomes for both pregnant persons and their neonates. There were strong associations observed between polyhydramnios and cesarean delivery despite stratification by history of cesarean delivery, and there were also strong associations with concurrent macrosomia (46.3% vs 19.4%, $p< 0.001$; aOR 3.41, 95% CI 3.07-3.78) and infant death (0.7% vs 0.2%, $p< 0.001$; aOR 2.48, 95% CI 1.28-4.81). Additionally, hypertensive disorders, severe maternal morbidity, lower APGAR at 5 minutes, neonatal ICU admission, and respiratory distress syndrome were more common among people with DM and polyhydramnios.

Conclusion: Polyhydramnios was associated with significantly worse outcomes among pregnant people with pre-pregnancy DM. These results highlight the importance of strategies to mitigate the risk of development of polyhydramnios and optimize glycemic control in patients with DM to improve perinatal outcomes.

Table 1. Outcomes of pregnant people with pre-existing diabetes mellitus with polyhydramnios versus no polyhydramnios

	Polyhydramnios	No polyhydramnios	p	aOR (95% CI)*
Hypertensive disorder of pregnancy	25.8%	20.3%	<0.001	1.17 (1.04-1.32)
Cesarean delivery				
Nulliparous	81.7%	58.2%	<0.001	3.06 (2.34-4.00)
Multiparous without prior CD	57.1%	23.1%	<0.001	3.92 (3.28-4.67)
Multiparous with prior CD	98.5%	94.9%	<0.001	3.16 (1.78-5.62)
Severe maternal morbidity	4.3%	2.4%	<0.001	1.33 (1.03-1.72)
Macrosomia	46.3%	19.4%	<0.001	3.41 (3.07-3.78)
APGAR <7 at 5 minutes	4.0%	1.7%	<0.001	1.91 (1.47-2.49)
Neonatal ICU admission	29.4%	18.0%	<0.001	1.50 (1.33-1.69)
Respiratory distress syndrome	5.0%	2.2%	<0.001	1.46 (1.15-1.85)
Infant death	0.7%	0.2%	<0.001	2.48 (1.28-4.81)

aOR, adjusted odds ratio; CI, confidence interval; CD, cesarean delivery; ICU, intensive care unit
**Multivariable analyses adjusted for race/ethnicity, age, educational attainment, body mass index, insurance type, parity, prenatal care attendance, chronic hypertension, preterm delivery, mode of delivery, prior cesarean delivery*

403 | Perinatal Outcomes Pre- and Post-Arrive Trial Publication Among Low-Risk Term Nulliparous Births in California

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4:00 PM - 6:00 PM

Objective: Following publication of the ARRIVE trial in 2018, there were notable changes to pregnancy management of low-risk nulliparous patients at term, particularly in rates of induction of labor. Therefore, we sought to assess the differences in management and outcomes pre- and post-ARRIVE trial publication.

Study Design: This was a retrospective cohort study of singleton, non-anomalous, nulliparas between 39-42 weeks of gestation in California. To assess only low-risk pregnant persons, we excluded births complicated by chronic hypertension, diabetes, breech presentation, advanced maternal age, oligohydramnios, polyhydramnios, and placental conditions requiring cesarean delivery. We assessed births in the two years before and after publication of the ARRIVE trial, 2016-2017 and 2019-2020, respectively. We assessed overall outcomes among the entire cohort, then stratified by week of gestation. Chi squared and multivariable logistic regression were used for statistical analyses.

Results: There were 151,779 births in 2016-2017 and 126,829 births in 2019-2020 that met our inclusion criteria. Compared with pre-ARRIVE trial publication, induction of labor increased (31.8% vs. 39.1%, p< 0.001) and the rate of cesarean delivery decreased (22.7% vs. 21.3%, p< 0.001). There was a lower rate of adverse neonatal outcomes post-ARRIVE trial publication, including NICU admission (7.4% vs. 6.4%, p< 0.001), respiratory distress syndrome (0.49% vs. 0.44%, p = 0.041), and stillbirth (0.09% vs. 0.06%, p = 0.002). Outcomes remained similar upon stratification by week of gestation.

Conclusion: In this study, we found that maternal and neonatal outcomes were improved on a state level after publication of the ARRIVE trial in 2019-2020 when compared to 2016-2017. As management of low-risk nulliparas at term continues to evolve, it is critical to continue to assess outcomes on a population level.

Table 1. Perinatal outcomes pre- and post-ARRIVE trial publication among low-risk, nulliparous patients.

	2016-2017 (N=151,779)	2019-2020 (N=126,829)	p	aOR (95% CI)
Overall cohort				
Induction of labor	31.8%	39.1%	<0.001	1.35 (1.33-1.37)
Cesarean delivery	22.7%	21.3%	<0.001	0.87 (0.86-0.89)
NICU admission	7.4%	6.4%	<0.001	0.85 (0.82-0.88)
RDS	0.49%	0.44%	0.041	0.90 (0.80-1.00)
Stillbirth	0.09%	0.06%	0.002	0.66 (0.50-0.88)
39 weeks				
Induction of labor	22.7%	31.1%	<0.001	1.51 (1.48-1.56)
Cesarean delivery	19.5%	18.0%	<0.001	0.87 (0.85-0.90)
NICU admission	7.5%	6.5%	<0.001	0.86 (0.83-0.91)
RDS	0.45%	0.42%	0.496	0.97 (0.81-1.17)
Stillbirth	0.11%	0.06%	0.002	0.51 (0.33-0.79)
40 weeks				
Induction of labor	30.3%	37.9%	<0.001	1.39 (1.36-1.43)
Cesarean delivery	22.6%	20.8%	<0.001	0.86 (0.84-0.89)
NICU admission	7.7%	6.5%	<0.001	0.82 (0.79-0.86)
RDS	0.51%	0.44%	0.071	0.86 (0.72-1.02)
Stillbirth	0.09%	0.06%	0.160	0.79 (0.51-1.22)
41 weeks				
Induction of labor	57.5%	63.3%	<0.001	1.25 (1.20-1.30)
Cesarean delivery	30.1%	29.5%	0.164	0.93 (0.89-0.97)
NICU admission	6.6%	5.9%	0.003	0.87 (0.81-0.95)
RDS	0.53%	0.46%	0.270	0.82 (0.62-1.08)
Stillbirth	0.07%	0.07%	0.940	0.92 (0.45-1.91)

Adjusted odds ratio, aOR; confidence interval, CI; neonatal intensive care unit, NICU; respiratory distress syndrome, RDS
**Analyses adjusted for race/ethnicity, age, body mass index, insurance type, prenatal care attendance*

404 | Circadian Variations of Glucose Challenge Test Results In Pregnancy: Examining Non-Linear Trends

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4:00 PM - 6:00 PM

Objective: Research has documented circadian variations in glucose challenge test (GCT) results by comparing morning to afternoon collection. Variations by collection time have implications for the performance of potentially unnecessary glucose tolerance tests (GTTs). However, more detailed examination of the complex non-linear trends in GCT results across collection times has yet to be conducted. Therefore, we aim to examine non-linear relations between collection time and GCT values using polynomial regression.

Study Design: This is a retrospective cohort study of all pregnancies 2017-2023 for which GCT was collected after 24 weeks in a community hospital in New York. Patients with pregestational diabetes mellitus (DM), or early diagnosis of DM in the 1st or 2nd trimester were excluded. To examine non-linear trends in GCT values, we used polynomial regression with a stepwise approach to adding polynomial terms to the initial linear model, assessing model fit with each inclusion.

Results: Our sample included 5341 pregnancies for which GCT was collected. The sample was highly racially/ethnically diverse (Asian: 23.62%, Hispanic/Latino: 66.39%, Other: 10.99%). In the final model, we found significant linear (B = .47, p = .034), quadratic (B = -.18, p< .001), and cubic terms (B = -.02, p< .001), indicating a non-linear relationship of GCT values with collection time. Evaluation of inflection points showed that GCT values reached a local maximum at approximately 1:30pm.

Conclusion: GCT values vary with diurnal rhythms, such that observed values appear to increase throughout the AM, peak in the early afternoon, and then trend downwards. These findings have clinical implications, as GCTs collected in the afternoon may lead to more false positives and potentially unnecessary further testing by GTT. Overall, these data suggest that GDM screening

protocols that include the GCT should be refined to account for the effect of time of day on test performance.

405 | Adherence to Antiseizure Medications in Pregnancy

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4:00 PM - 6:00 PM

Objective: To evaluate antiseizure medication (ASM) adherence in pregnancy.

Study Design: We constructed a retrospective cohort of births (2007-2019) among patients ≥ 20 weeks' gestation with continuous Tennessee Medicaid enrollment 90 days before conception through delivery, using linked healthcare claims, prescription fills, hospital discharge, and birth certificate data. We included births to patients aged 15-44 with evidence of ASM use before and during pregnancy, defined by ≥ 2 prescription fills in the 90 days before conception and ≥ 1 prescription fill between conception and delivery, for a single ASM (monotherapy for newer (levetiracetam, lamotrigine, oxcarbazepine, zonisamide) or older (carbamazepine, phenytoin, and valproate) ASM). We excluded births where patients switched to an alternative ASM or used > 1 ASM (polytherapy). We categorized timing of ASM discontinuation and calculated adherence as the percentage of days covered by filled ASM prescriptions from conception through delivery, accounting for hospitalizations. We evaluated ASM use and adherence by medication, class, and associated epilepsy diagnosis.

Results: Among 2,135 eligible births with ASM monotherapy, 30% had an epilepsy diagnosis and 41% had no diagnosis traditionally associated with ASMs (Table 1). Overall median adherence was low (23%, IQR 12-67%) with 58% discontinuing ASMs before the third trimester (Table 2). Adherence did not significantly differ by ASM class, but was higher among levetiracetam and phenytoin users and significantly higher among births with an epilepsy diagnosis compared to those without (Table 2). Most common ASMs used, by class, were lamotrigine and carbamazepine in all users compared to levetiracetam and phenytoin in those with epilepsy.

Conclusion: The American Academy of Neurology recommends continued use of most ASMs in pregnancy when clinically indicated. In our cohort of births with regular ASM use preceding pregnancy, ASM adherence in pregnancy was poor. These findings emphasize the need for improved patient counseling on ASM use in pregnancy.

Table 1: Demographic and clinical factors of antiseizure medication (ASM) monotherapy users in pregnancy (N=2,135)

Variable	Median (IQR) or N(%)
Age at delivery, years	25 (21-30)
Race or ethnicity	
Non-Hispanic White	1692 (79%)
Non-Hispanic Black	351 (16%)
Hispanic	49 (2%)
Other/Unknown	43 (2%)
BMI at delivery	26 (22-32)
Missing	69 (3%)
Parity	
Nulliparous	564 (26%)
1 prior birth	701 (33%)
2 prior pregnancies	451 (21%)
≥3 or more prior pregnancies	419 (20%)
Missing	40 (2%)
Non-English speaking	42 (2%)
Rural[1] residence	1225 (57%)
Missing	19 (1%)
ASM-associated diagnosis	
Epilepsy alone	426 (20%)
Psychiatric[2] alone	544 (25%)
Other[3] alone	19 (1%)
Multiple[4]	221 (10%)
None	884 (41%)
Diabetes or chronic hypertension	758 (36%)
Duration of pregnancy (days)	259 (249-264)
Gestational age at delivery (weeks)	39 (38-40)
Total days actual use of ASM	60 (30-165)
Timing of ASM discontinuation[5]	
First trimester	996 (47%)
Second trimester or delivery	243 (11%)
Third trimester or delivery	896 (42%)

Abbreviations: ASM: antiseizure medication
[1]Rurality defined by the 2013 NCHS Urban-Rural Classification Scheme for Counties
[2]Psychiatric diagnosis: Mood disorder, depression, anxiety, or schizophrenia
[3]Other diagnoses: Trigeminal neuralgia and migraines
[4]Multiple: epilepsy with a psychiatric and/or other diagnosis present
[5]Timing of ASM discontinuation: defined as the last day covered by an ASM based on the last filled prescription's days supply (First trimester: conception day – 13 weeks 6 days gestation | Second trimester: 14 weeks 0 days – 27 weeks 6 days gestation | Third trimester: 28 weeks 0 days – 42 weeks and 0 days gestation)

Table 2: Antiseizure medication adherence by medication factors and stratified by epilepsy diagnosis

Variable	Adherence[1] %				
	All users (N=2,135)	p-value	With epilepsy (N=647)	No epilepsy (N=1,488)	p-value
Overall	23 (12-67)		63 (25-88)	17 (11-40)	<0.01
ASM		<0.01			
Lamotrigine (N=1,094)	21 (11-55)		65 (22-90)	18 (11-42)	<0.01
Levetiracetam (N=377)	61 (24-86)		63 (31-86)	44 (18-87)	0.06
Oxcarbamazepine (N=366)	15 (10-35)		50 (22-88)	13 (10-26)	<0.01
Zonisamide (N=49)	23 (12-56)		70 (46-86)	13 (8-27)	<0.01
Carbamazepine (N=136)	15 (10-47)		45 (14-82)	13 (8-26)	<0.01
Phenytoin (N=100)	67 (31-90)		72 (34-90)	57 (23-89)	0.34
Valproate (N=13)	11 (9-13)		-	11 (9-13)	-
ASM class[2]		0.13			
Older generation (N=249)	28 (12-77)		62 (23-87)	15 (10-38)	<0.01
Newer generation (N=1,886)	23 (12-65)		63 (27-88)	17 (11-41)	<0.01

All data are presented as median (interquartile range)
Abbreviations: ASM: antiseizure medication
[1]Adherence calculated as a percentage of days covered (0-100%)
[2]ASM class: Newer ASM (levetiracetam, lamotrigine, oxcarbazepine, zonisamide) | Older ASM (carbamazepine, phenytoin, and valproate)

407 | is Timing of Onset of Early Fetal Growth Restriction Associated with Worse Outcomes?

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4:00 PM - 6:00 PM

Objective: Fetal growth restriction (FGR) is associated with significant neonatal morbidity and mortality, which can especially be impacted by timing of onset. Limited data are available to assess whether timing of diagnosis among the high-risk cohort of

early-onset FGR (i.e., diagnosis at < 32 weeks) is associated with adverse outcomes.

Study Design: We conducted a single-site retrospective study of singleton gestations with early-onset FGR, diagnosed between 2020-2023. The exposure was gestational age (GA) at time of diagnosis, dichotomized into 20-27 weeks (group 1) and 28-31 weeks (group 2). The primary outcome was a composite of adverse neonatal outcomes (i.e., neonatal intensive care unit admission, respiratory distress syndrome, need for intubation, sepsis, necrotizing enterocolitis, intraventricular hemorrhage, periventricular leukomalacia, retinopathy of prematurity, death). Secondary outcomes were GA at delivery, route of delivery, diagnosis of small-for-gestational age, neonatal length of stay, and all components of the primary outcome. Bi- and multivariate analyses were performed.

Results: 94 participants were eligible; 52% (n = 49) were in group 1 and 48% (n = 45) were in group 2. Individuals with earlier onset of FGR were more likely to have public payor insurance, be nulliparous and have hypertensive disorders (Table 1). The frequency of the composite outcome was not significantly different between the two groups (45 v. 29%, RR 1.55, 95% CI 0.89-2.70), even after controlling for receipt of antenatal steroids (aRR 1.29, 95% CI 0.82-2.04). Furthermore, there were no differences in any of the secondary outcomes (Table 2).

Conclusion: GA at diagnosis of early-onset FGR is not associated with worse maternal or perinatal outcomes, though the directionality of the findings warrants further investigation with a larger sample size.

TABLE 1. MATERNAL SOCIODEMOGRAPHIC AND BIOMEDICAL CHARACTERISTICS

Characteristic	Group 1(n = 49)	Group 2(n = 45)	P-value
Age, in years	29.8 +/- 6.2	27.6 +/- 5.3	0.067
Race			
Asian	1[2]	3[7]	
African American	37[76]	39[87]	
Caucasian	7[14]	2[4]	
Multiracial	2[4]	0[0]	
Unknown	2[4]	1[2]	0.208
Ethnicity			
Hispanic	3[6]	0[0]	
Not Hispanic	42[86]	42[93]	
Other Hispanic	0[0]	1[2]	
Unknown	4[8]	2[5]	0.257
Insurance status			
Medicaid	32[65]	20[44]	
Medicare	1[2]	0[0]	
Private	15[31]	25[56]	
Self-Pay	1[2]	0[0]	**0.028**
Cigarette use	12[24]	7[16]	0.306
Nulliparity	18[37]	27[60]	**0.024**
Pre-pregnancy BMI, in kg/m2	28[18-42]	26[16-74]	0.684
Chronic hypertension	19[39]	9[20]	**0.047**
Pre-existing diabetes mellitus	2[4]	3[7]	0.668
History of FGR or SGA infant	5[14]	2[8]	0.688
Number of ultrasounds	11[2-27]	7[1-16]	**0.001**
Severe FGR	30[61]	26[58]	0.734
UAD abnormalities	17[35]	10[22]	0.161
Elevated	14[29]	9[20]	0.306
Absent	8[17]	3[7]	0.200
Reversed	5[10]	3[7]	0.715
Cell-free DNA results			
Low risk	39[98]	33[97]	0.907
Amniocentesis	3[6]	1[2]	0.618
Gestational hypertension	6[12]	8[18]	0.452
Pre-eclampsia	19[39]	7[16]	**0.012**
Severe	18[95]	7[100]	0.536
Receipt of magnesium sulfate	24[49]	10[22]	**0.007**
Receipt of corticosteroids	21[43]	14[31]	0.239
Placental abruption	3[6]	0[0]	0.243
Stillbirth	0[0]	0[0]	N/A
Peripartum LOS, in days	3[1-29]	3[1-14]	0.714

Data are given as n[%], mean +/- SD or median[range].
BMI: body mass index, UAD: umbilical artery doppler.

TABLE 2. MATERNAL AND PERINATAL OUTCOMES

Variable	Group 1(n = 49)	Group 2(n = 45)	P-value/RR[95% CI]	
GA at delivery, in weeks	37.1[24.4-41.3]	37.2[29.3-40.6]		0.414
Mode of delivery				
C-section	22[45]	17[38]		
Vaginal, assisted	0[0]	1[2]		
Vaginal, spontaneous	27[55]	27[60]		0.599
APGAR <3 at 5 minutes	1[2]	0[0]		1.000
Birth weight, in g	2370[435-4270]	2380[845-3000]		0.626
SGA	25[51]	29[64]		0.189
Composite outcome	22[45]	13[29]	0.109	1.554[0.894-2.703]
NICU admission	21[43]	13[29]	0.159	1.484[0.847-2.600]
RDS	12[24]	6[13]	0.170	1.837[0.752-4.484]
Need for intubation	10[20]	3[7]	0.074	3.061[0.899-10.422]
Sepsis	4[8]	1[2]	0.364	3.673[0.426-31.650]
NEC	0[0]	1[2]	0.479	N/A
IVH (grade III-IV)	0[0]	0[0]	N/A	N/A
PVL	0[0]	0[0]	N/A	N/A
ROP	6[13]	2[4]	0.269	2.813[0.598-13.221]
Death	3[6]	1[2]	0.618	2.755[0.297-25.538]
Hospital LOS, in days	2[1-194]	2[1-78]		0.126
NICU LOS, in days	22[4-194]	22[2-78]		0.242

Data are given as n[%], mean +/- SD or median[range].
SGA: small for gestational age, NICU: neonatal intensive care unit, RDS: respiratory distress syndrome, NEC: necrotizing enterocolitis, IVH: intraventricular hemorrhage, PVL: periventricular leukomalacia, ROP: retinopathy of prematurity, LOS: length of stay.

408 | Impact of Health-Related Social Needs on Postpartum Anxiety in an Underserved Urban Community

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4:00 PM - 6:00 PM

Objective: The aim of this study was to determine the association of health-related social needs (HRSNs) with postpartum anxiety for individuals living in underserved communities. We hypothesized that individuals with greater social needs would have increased rates of anxiety after birth.

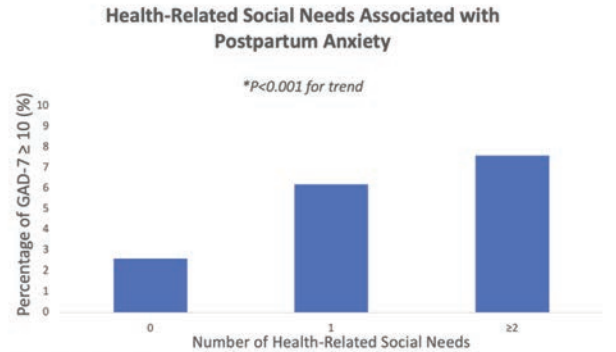
Study Design: This was a prospective observational study of patients delivered from 1 Oct 2020 through 31 Dec 2022 with subsequent 1-year follow-up postpartum. Participants living in underserved areas identified through a community-health needs assessment were enrolled in a dedicated, multidisciplinary postpartum care program. HRSNs were assessed upon enrollment using a standardized assessment modeled from the HealthyPeople2030 framework, and medical services were provided for 12 months. Patients were screened for anxiety using Generalized Anxiety Disorder-7 (GAD-7), at 1, 3, 6, and 9 months with positive scores ≥ 10 prompting mental health referral. Cochran-Armitage trend test was used to examine the association between number of HRSN and GAD-7 and the number of visits completed in relation to the type of HRSN.

Results: Of 1647 enrolled, 64.5% (N = 1063) reported at least one HRSN with 28% (N = 468), 16% (N = 257), and 21% (N = 338) of individuals reporting one, two, or more than two HRSN, respectively. The most prevalent HRSNs were poor WiFi (23.6%), access to childcare (21%), and missed electric or gas bill (15.3%). There was a significant association between increasing number of reported HRSN and screening positive for anxiety using GAD-7 instrument (P < 0.001, Figure). Individually, a reported need for transportation to medical appointments (N = 158) and access

to childcare (N = 364) were significantly associated with fewer number of follow-up visits (both P < 0.01).

Conclusion: Among patients living in an underserved urban community, increasing number of HRSN was significantly associated with higher GAD scores, and specific HRSNs were associated with lower rates of postpartum follow-up. Addressing HRSN provides the opportunity to impact maternal wellbeing and postpartum follow-up.

Figure. Trend of GAD-7 positive screening tests (≥ 10) by number of reported health-related social needs (P < 0.001 for trend).



Health-related social needs include mental health disorder, homelessness, housing instability, incarceration, missed electric or gas bill, missed water bill, poor phone plan, poor WiFi, need for clothes, lack of access to childcare, need for transportation for medical and non-medical reasons, alcohol use, drug use, domestic violence.

409 | Development of Common Data Elements for Maternal Health Research: Results from a Delphi Consensus Process

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Objective: Common data elements (CDEs, i.e., standardized questions paired with allowable responses) are critical for providing consistency in data collection and promoting research collaborations. This study aims to determine a *minimum reporting set of CDEs* by NICHD grantees conducting maternal health (MH) research.

Study Design: NICHD convened a 64-expert panel including representatives from large research networks, ACOG, SMFM, CDC, HRSA, and NIH. Experts formed 2 working groups supporting development of biomedical and psychosocial CDEs. Two modified Delphi processes, each with 2 voting rounds, were undertaken. In Delphi 1 (03/24-05/24; 84% response rate), experts voted on MH constructs for standardized data collection categorized as: Tier 1 (all MH research), Tier 2 (thematic MH research areas), or neither. Constructs for which >80% of experts affirmed the importance of standardization were retained for categorization to Tier 1 or 2 based on majority vote. The Tier 1 list was restricted to constructs with >75% of experts identifying the construct as Tier 1, forming the *minimum set of constructs* for all MH research. For measuring these constructs, in Delphi 2 (07/24-08/24; 70% response rate), experts used 5-point Likert scales to rate the feasibility and validity of specific CDEs identified via landscape analysis and literature searches.

Results: Experts voted on 267 biomedical and 194 psychosocial constructs; 202 biomedical (146 Tier 1; 56 Tier 2) and 144 psychosocial (90 Tier 1; 54 Tier 2) constructs were retained. Restriction to constructs with >75% Tier 1 votes yielded 35 biomedical and 22 psychosocial constructs in the *minimum set of constructs* for all MH researchers (Table). A total of 89 biomedical and 115 psychosocial CDEs were rated by experts during Delphi 2. Of these, depending on available data source (EHR, survey, other), the *minimum reporting set* includes 50-60 CDEs/CDE bundles.

Conclusion: Reporting of CDEs across MH research is expected to improve data quality, study consistency, data interoperability, and our understanding of how to improve MH.

Table. Minimum set of Tier 1 maternal health constructs

Biomedical Constructs (n=35)	Psychosocial Constructs (n=22)
Pregnancy Episode • Pregnancy / postpartum status • Gestational age and estimated due date • Plurality (singleton, twins, triplets, etc.) • Days postpartum at time of event (e.g. diagnosis, hospital encounter) • Pregnancy outcome (e.g., live birth, stillbirth) Delivery Episode • Date of delivery/end of pregnancy • Mode of delivery Maternal Health Conditions and Outcomes • Death of pregnant / postpartum person • Causes of death of pregnant / postpartum person • Date of death of pregnant / postpartum person • Severe maternal morbidity • Gestational diabetes • Hypertensive disorders of pregnancy • Sepsis • Placental complications • Obstetric hemorrhage Neonatal Characteristics and Outcomes • Date of birth • Neonatal birthweight • Neonatal sex assigned at birth • Neonatal death • Causes of neonatal death • Date of neonatal death • Fetal death • Causes of fetal death • Timing of fetal death Health History • Pregnancy history (gravida, para, abortus - GPA) • Prior cesarean • Chronic (pre-gestational) diabetes • Comorbidities Health Status Assessments • Height • Pre-pregnancy weight • Weight (current) • Gestational weight gain Medical Care Encounters • ICU admission	Maternal Mental Health • Depressive disorders Substance Use • Alcohol use • Smoking / tobacco use • Substance / drug use Interpersonal Violence • Intimate partner violence Access to Medical Care and Patient Experience • Health insurance coverage • Health insurance coverage changes • Access to health care Economic, Food, and Housing Stability • Food security • Transportation Bias and Discrimination • Experiences of discrimination Infant Care and Feeding Practices • Human milk or breastfeeding initiation / duration Demographics • Age / date of birth • Race and ethnicity • Sex assigned at birth • Gender identity • Disability status • Partnership / marital status • Primary language • Educational attainment • Current place of residence • Birthplace

410 | Does Fetal Growth Restriction Actually Resolve? Maternal and Neonatal Risks with Resolved Fetal Growth Restriction

Angela Nakahara[1]; Olivia Feltner[1]; William Fesmire[2]; Victoria Schlesinger[1]; Grace Anne Holladay[1]; Anna Belk[3]; Patricia Goedecke[1]; Jim Wan[2]; Kerri Brackney[1]
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4:00 PM - 6:00 PM

Objective: Little guidance exists on the management of FGR that resolves, and potential neonatal outcomes including birth weight and NICU admission are unknown. We compared the likelihood of identifying small for gestational age (SGA) infants in fetuses with resolved FGR (based on estimated fetal weight (EFW) and abdominal circumference (AC) >10th percentile) compared to those without history of FGR.

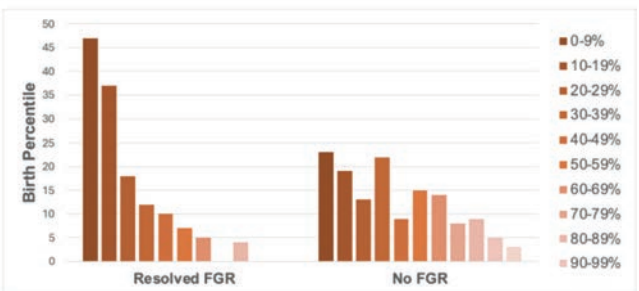
Study Design: A retrospective case control study of fetal growth ultrasounds (US) performed at our institution from 01/2019-04/2024 was conducted. US evaluating biometric parameters for singleton pregnancies originally meeting criteria for FGR

based on EFW or AC < 10th percentile, with resolution of both EFW and AC parameters, were included. Controls were matched based on year of birth, gestational age (GA) and maternal age at delivery. Primary outcome was prevalence of SGA neonate at birth; secondary outcomes were need for NICU admission, GA at birth and mode of delivery. We applied a mixed effects logistic regression model comparing cases and controls.

Results: A total of 140 infants were evaluated. Cases with resolved FGR had a 2.26 RR (95% CI 1.44-3.24) for SGA. When controlling for hypertensive disorders of pregnancy, the RR was 2.31 (95% CI 1.46-3.32). The mean GA of delivery was 37 weeks for both groups (p >0.9) and NICU admission rates were similar (24% vs 24%, p >0.9). Cesarean section (CS) was more likely in pregnancies with resolved FGR (37% vs 26%, p = 0.039) and more likely to be performed for non reassuring fetal heart tones (NRFHT) than those without history of FGR (10% vs 2.9%, p = 0.025).

Conclusion: Neonates with history of FGR are more likely to be SGA compared to those with normal growth profile in antenatal period and are more likely to need CS for NRFHT.

Figure 1: Histogram comparing birth percentiles in cases vs controls



411 | Time is Money: Comparing Costs in 12 Vs 24 Hours of Postpartum Magnesium

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4:00 PM - 6:00 PM

Objective: This study evaluates the implementation of a protocol for shortened magnesium sulfate (MAG) duration in postpartum seizure prophylaxis for preeclampsia (preE). We compared MAG administration of 12 vs 24 hours, assessing cost-effectiveness, patient safety, and postpartum length of stay (LOS), utilizing clinical parameters to identify suitable candidates.

Study Design: This interrupted time series and retrospective cohort study evaluated all patients with preE who received MAG and delivered at a tertiary academic center from 04/2022-04/2024. Patients meeting clinical criteria were considered for shortened 12 (G1) vs traditional 24 hour (G2) MAG administration. Primary outcome was difference in mean total hospital cost (MTHC) after delivery pre vs post protocol; secondary outcomes were number of patients with G1 course, rates of postpartum preE readmissions (PPRA), severe maternal morbidity (SMM) and LOS between groups. Wilcoxon rank sum test was applied to compare variables between G1 vs G2, with alpha = 0.05 as statistically significant.

Results: A total of 656 patients were evaluated; 53% (n = 349) were post protocol, of which 23% (n = 80) met criteria for G1. There were no statistically significant differences in gestational age at delivery, delivery for preE, or mode of delivery between pre vs post protocol groups. The MTHC was not significantly different after protocol initiation ($9158 vs $9514, p = 0.4) however LOS was shorter post protocol (2.72 vs 3.02 days, p = 0.004). Post protocol, G1 had less MTHC ($6840 vs $9850, p = 0.001) and shorter LOS (2.23 vs 2.87 days, p < 0.001). PPRA rates were not significantly different pre protocol (10 vs 6.9%) with RR 0.7 (95% CI 0.4-1.1). Overall SMM was decreased post protocol (7.2% vs 14%, p = 0.004) with G1 having lower SMM vs G2 (0% vs 9.3%, p = 0.005).

Conclusion: Shortened MAG course is a cost effective consideration with shortened LOS and decreased PPRA, but likely requires a larger study group to detect overall differences in MTHC. SMM may be decreased with shortened MAG however, direct causation cannot be established.

412 | Previable Premature Rupture of the Membranes and Neonatal Mortality/Morbidity in a National Retrospective Cohort

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4:00 PM - 6:00 PM

Objective: Counselling after previable preterm premature rupture of the membranes (PPROM) is challenging due to older previable PPROM cutoffs and small studies. Our objective was to assess neonatal mortality/morbidity after previable PPROM < 22 weeks versus no PPROM to assist in counselling at viability and decision making.

Study Design: We conducted a retrospective cohort study of liveborn singletons born < 32 wk' gestation from 2018-2022, who received active resuscitation (including delivery room deaths), or did not need it, and were admitted to a neonatal intensive care unit within the Canadian Neonatal/Preterm Birth Network database. Among previable PPROM infants, gestational age at birth and latency period were determined. Our primary outcome was a composite of neonatal mortality or severe morbidity consisting of any one or more of severe respiratory distress syndrome, severe intraventricular hemorrhage, severe necrotizing enterocolitis, severe retinopathy of prematurity, moderate/severe bronchopulmonary dysplasia, cystic periventricular leukomalacia or sepsis. Outcomes were compared between infants with and without previable PPROM < 22 wk, using generalized estimating equations to account for hospital effect and adjusting for confounders and covariates.

Results: As onset of previable PPROM (n = 225) increased from ≤16 to 21 wk' gestation, median gestational age at birth decreased from 27.5 wk (IQR 24.5, 29.0) to 25.0 (IQR 23.0, 28.0) and latency period decreased from 86.5 days (IQR 63.5, 98.0) to 30.0 (IQR 15.0, 49.0, Table 1). Infants with previable PPROM had increased odds of neonatal mortality/severe morbidity (90%), compared to those without (66%, n = 7846, adj OR 1.71, 95% CI 1.14 to 2.56, Table 2).

There was a trend toward more sepsis with previable PPROM at 21 wk than earlier.

Conclusion: In a large, contemporary cohort of previable PPROM (< 22 wk) reaching viability, an inverse relationship was seen between timing of rupture and gestational age at birth, decreasing from a median of 27.5 to 25 wk. Almost all previable PPROM infants experienced mortality/morbidity, almost double the odds without PPROM.

Table 1: Decreasing gestational age at birth and latency period with later onset of previable PPROM in a national retrospective cohort of infants reaching viability

GA at rupture of membranes	GA at birth Median (IQR)	Latency period Median (IQR)
≤16 weeks (n = 28)	**27.5** (24.5, 29.0)	**86.5** (63.5, 98.0)
17 weeks (n = 21)	27.0 (24.0, 30.0)	69.0 (51.0, 89.0)
18 weeks (n = 26)	27.0 (25.0, 28.0)	60.5 (48.0, 72.0)
19 weeks (n = 36)	26.0 (24.0, 28.0)	53.5 (34.5, 60.0)
20 weeks (n = 40)	26.5 (24.5, 29.0)	43.5 (31.0, 60.0)
21 weeks (n = 74)	**25.0** (23.0, 28.0)	**30.0** (15.0, 49.0)
P-value for trend	**0.007**	**<0.0001**

Legend:
GA – gestational age; IQR – interquartile range

Table 2: Association of previable PPROM before 22 weeks with neonatal mortality or severe morbidity in a national retrospective cohort of infants reaching viability

Key outcomes	Previable PPROM	No Previable PPROM	Crude OR (95% CI)[a]	Adjusted OR (95% CI)[b]
Neonatal mortality or severe morbidity	**90%** (202/225)	**66%** (5168/7846)	**3.93** (2.87 to 5.39)	**1.71** (1.14 to 2.56)
Neonatal mortality	**23%** (52/225)	**8%** (623/7846)	**3.38** (2.30 to 4.95)	1.25 (0.81 to 1.94)

Legend:
PPROM - preterm premature rupture of membranes; OR - odds ratio; CI - confidence interval
[a] Crude logistic regression with generalized estimating equations applied to account for the hospital effect.
[b] Multivariable logistic regression with generalized estimating equations applied to account for the hospital effect. Adjusted for the following confounders and covariates: age of pregnant person, nulliparity, assisted reproductive technology, diabetes, hypertension, infant sex, small for gestational age < 10th percentile for gestational age at birth and infant sex, deferred cord clamping ≥ 60 seconds, admission temperature and SNAP-II score.

413 | Induction Compared with Expectant Management at Term for Individuals with a Prior Cesarean

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4:00 PM - 6:00 PM

Objective: It is common to await spontaneous labor in individuals undertaking a trial of labor after cesarean (TOLAC) over concern of uterine rupture and its associated harms. We evaluated whether this concern is warranted.

Study Design: Secondary analysis of a multicenter cohort of patients delivering on randomly selected days at 17 U.S. hospitals (2019-20). Data were manually abstracted from the medical record by trained staff. Term individuals with a prior cesarean delivery (CD) were included while those with a contraindication to TOLAC, planned repeat CD, multifetal gestation, stillbirth, or fetal anomaly were excluded. The primary outcome was vaginal birth after cesarean (VBAC). Secondary outcomes included uterine rupture, maternal morbidity, neonatal morbidity, and NICU admission. Multivariable modeling estimated the association between induction compared with expectant management and outcomes by gestational week. Adjusted Desirability Of Outcome Ranking (DOOR) analyses calculated the probability that induction leads to more desirable dyadic (paired maternal-neonatal) outcomes. The ordinal DOOR outcome ranged from VBAC without uterine rupture or morbidity (most desirable) to CD with uterine rupture and maternal and neonatal morbidity (least desirable).

Results: Of the 935 individuals included, mean maternal age was 31 years (± 5), median body mass index 31.8 kg/m^2 (interquartile range 27.7-36.7), and 89% had one prior CD. In adjusted multivariable models, there was no association between induction and odds of VBAC in week 37, 38 or 40; in week 39, induction was associated with increased odds of VBAC (Table). Induction and expectant management had similar odds of maternal morbidity at all weeks, while induction was associated with neonatal morbidity and NICU admission only at week 37. In DOOR analyses, induction in week 39 resulted in a higher probability of a desirable outcome for the dyad (adjusted DOOR probability 55%, 95% CI 51-59%; Figure).

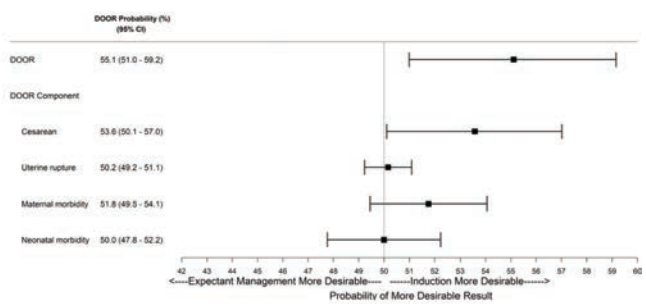
Conclusion: For those undertaking TOLAC, induction compared with expectant management in gestational week 39 optimized outcomes for the maternal-neonatal dyad.

Table. Vaginal birth after cesarean (VBAC) success and perinatal outcomes following induction of labor compared with expectant management among those with prior cesarean delivery (CD) by gestational age week

Outcome	37 weeks' gestation			
	*Induction (N=36)	Expectant management (N=899)	OR (95% CI)	†aOR (95% CI)
VBAC	27 (75.0)	694 (77.2)	0.89 (0.41–1.91)	1.62 (0.68–3.88)
Uterine rupture	0	9 (1.0)	¶	¶
Maternal morbidity composite‡	2 (5.6)	75 (8.3)	0.65 (0.15 - 2.74)	0.53 (0.12 - 2.41)
Neonatal morbidity composite§	8 (22.2)	62 (6.9)	3.86 (1.69 - 8.82)	4.57 (1.72 - 12.16)
NICU	9 (25.0)	78 (8.7)	3.51 (1.59 - 7.73)	3.59 (1.43 - 9.00)
	38 weeks' gestation			
	Induction (N=37)	**Expectant management (N=773)**	**OR (95% CI)**	**aOR (95% CI)**
VBAC	24 (64.9)	605 (78.3)	0.51 (0.26 - 1.03)	0.85 (0.37 - 1.91)
Uterine rupture	1 (2.7)	8 (1.0)	¶	¶
Maternal morbidity composite‡	5 (13.5)	63 (8.2)	1.76 (0.66 - 4.68)	1.60 (0.54 - 4.74)
Neonatal morbidity composite§	3 (8.1)	46 (6.0)	1.39 (0.41 - 4.71)	1.34 (0.36 - 5.01)
NICU	6 (16.2)	52 (6.7)	2.68 (1.07 - 6.72)	2.44 (0.85 - 7.03)
	39 weeks' gestation			
	Induction (N=144)	**Expectant management (N=474)**	**OR (95% CI)**	**aOR (95% CI)**
VBAC	120 (83.3)	365 (77.0)	1.49 (0.92 - 2.43)	2.07 (1.18 - 3.64)
Uterine rupture	1 (0.7)	6 (1.3)	¶	¶
Maternal morbidity composite‡	8 (5.6)	46 (9.7)	0.55 (0.25 - 1.19)	0.56 (0.24 - 1.28)
Neonatal morbidity composite§	8 (5.6)	29 (6.1)	0.90 (0.40 - 2.02)	¶
NICU	12 (8.3)	28 (5.9)	1.45 (0.72 - 2.93)	1.09 (0.49 - 2.43)

Data are n (%). Odds ratio, OR; confidence interval, CI; Adjusted odds ratio, aOR; vaginal birth after cesarean delivery, VBAC; Neonatal intensive care unit, NICU. *Induction group included individuals with an induction of labor from 37w0d to 37w3d (or subsequent gestational age week, e.g., 38w0d to 38w3d). †Adjusted for body mass index, maternal co-morbidity (any: cancer, autoimmune disease, pre-gestational diabetes, cardiovascular disease, pulmonary disease, chronic hypertension, renal disease, liver disease, personal history of thromboembolism), gestational diabetes mellitus, and hypertensive disorders of pregnancy. ‡Maternal morbidity composite including: blood transfusion, peripartum infection, hysterectomy, intensive care unit (ICU) admission during delivery hospitalization. §Neonatal morbidity composite including: perinatal death, need for respiratory support within 72 hours of birth, Apgar score ≤3 at 5 minutes, hypoxic ischemic encephalopathy (HIE), seizure, infection (confirmed sepsis or pneumonia), meconium aspiration syndrome, intracranial hemorrhage, hypotension requiring vasopressor support. ¶Not applicable for multivariable modeling secondary to small cell size. Data for gestational age week 40 and 41 weeks not shown secondary to small numbers.

Figure. Desirability Of Outcome Ranking (DOOR) analyses estimating the probability of having a more desirable outcome with induction of labor compared with expectant management at 39 weeks' gestation



The DOOR probability is the estimated probability with accompanying 95% confidence interval (CI) that a dyad undergoing induction of labor has a more desirable dyadic (paired maternal-neonatal) outcome than a dyad undergoing expectant management. A DOOR probability of 50% equates to chance. A DOOR probability >50% (with the lower bound of the CI >50%) demonstrates an advantage or higher likelihood of a desirable outcome, while a DOOR probability <50% (with the upper bound of the CI <50%) demonstrates a disadvantage or a higher likelihood of an undesirable outcome. DOOR probabilities were adjusted using inverse probability weighting accounting for body mass index, maternal co-morbidity (any: cancer, autoimmune disease, pre-gestational diabetes, cardiovascular disease, pulmonary disease, chronic hypertension, renal disease, liver disease, personal history of thromboembolism), gestational diabetes mellitus, and hypertensive disorders of pregnancy.

414 | Maternal and Obstetric Factors Associated with Successful Cerclage Treatment: A Prediction Model

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4:00 PM - 6:00 PM

Objective: Cervical cerclage treatment effectively reduces the risk of recurrent preterm birth (PTB) in specific subgroups. This study aimed to identify maternal and obstetric factors influencing success of cerclage treatment (i.e. no PTB < 32 weeks) to develop a prediction model.

Study Design: This multicenter prospective cohort study analyzed data of the PC-study (NTR4415) and associated observational cohort. We included patients with prior sPTB < 34 weeks and a singleton pregnancy who received a history-based (HB) or an ultrasound-indicated (UI) cerclage. Primary outcome was PTB < 32 weeks. Maternal and obstetric factors were included in multivariate logistic regression (MLR) and a risk model was composed for the HB- and UI group. Subsequently, outcomes were stratified by risk scores (high, medium and low).

Results: In total, 222 patients received cerclage treatment. PTB < 32 weeks occurred in 43/222 cases (19.4%), of which 13/85 in the HB group (15.3%) and 30/137 (21.9%) in the UI group. In the total group, MLR showed that higher maternal age (p = 0.04), non-Caucasian ethnicity (p = 0.02) and smoking (p = 0.045) were associated with decreased cerclage success (i.e. higher PTB < 32 weeks). In the HB group, event rates were considered too low for proper MLR. In the UI group, higher maternal age (p = 0.008), smoking (p = 0.005), lower gestational age at placement (p< 0.001) and lower CL (p = 0.004) were associated with decreased cerclage success. Individual risk scores in this group were calculated using the composed risk model. Scores < -1.7 were considered low-risk, -1.7 to 0 medium-risk and > 0 high risk. For high-risk patients, the UI-model had a positive predictive value (PV) of 81.3% for occurrence of PTB < 32 weeks. Low-risk patients had a PV of 91.2% for no PTB < 32 weeks. The AUC of the ROC-curve was 0.81 (95% CI 0.72–0.90).

Conclusion: Several maternal and obstetric risk factors significantly influence the success rate of cerclage treatment. The developed risk model effectively stratifies patients with an UI cerclage into high, medium, and low risk categories and can be a valuable tool in counseling patients.

Outcomes	Total cohort (n=222)	Ultrasound-indicated			
		Total (n=130)	High risk (n=16, 12.3%)	Medium risk (n=45, 34.6%)	Low risk (n=69, 53.1%)	p-value
Delivery						
PTB < 32 weeks, n (%)	43 (19.4)	28 (21.5)	13 (81.3)	9 (20.0)	6 (8.7)	<0.001*
PTB < 24 weeks, n(%)	19 (8.6)	12 (9.2)	8 (50.0)	2 (4.4)	2 (2.9)	<0.001*
GA at birth (w[d], median (IQR)	38[+6] (35[+5]-39[+3])	38[+6] (34[+1]-39[+3])	25[+6] (20[+1]-31[+4])	38[+6] (36[+4]-39[+3])	38[+1] (36[+1]-39[+3])	<0.001*
Use of tocolytics, n (%)	23 (10.4)	19 (14.8)	4 (25.0)	7 (15.9)	8 (11.8)	0.396*
Use of corticosteroids, n (%)	27 (12.2)	19 (14.8)	5 (31.3)	7 (15.9)	7 (10.3)	0.102*
Neonatal outcomes						
Birthweight (gram), median (IQR)	3030 (2425-3530)	3025 (2205-3465)	775 (258-1848)	3022 (2665-3526)	3110 (2713-3488)	<0.001*
Adverse neonatal outcomes						
Perinatal death, n (%)	24 (10.8)	16 (12.3)	8 (50.0)	3 (6.7)	5 (7.2)	<0.001*
Chronic lung disease, n (%)	15 (6.8)	7 (5.4)	1 (6.3)	5 (11.1)	1 (1.4)	0.081*
IVH Grade III and IV, n (%)	5 (2.3)	2 (1.5)	0 (0.0)	1 (2.2)	1 (1.4)	0.822*
PVL, n (%)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-
NEC, n (%)	3 (1.4)	2 (1.5)	0 (0.0)	1 (2.2)	1 (1.4)	0.822*
ROP, n (%)	5 (2.3)	3 (2.3)	0 (0.0)	1 (2.2)	2 (2.9)	0.784*
PDA, n (%)	3 (1.4)	1 (0.8)	0 (0.0)	1 (2.2)	0 (0.0)	0.386*
Treated seizures, n (%)	3 (1.4)	2 (1.5)	0 (0.0)	1 (2.2)	1 (1.4)	0.822*
Early neonatal sepsis*, n (%)	8 (3.6)	6 (4.6)	0 (0.0)	5 (8.9)	2 (2.9)	0.212*
Late neonatal sepsis*, n (%)	6 (2.7)	4 (3.1)	0 (0.0)	2 (4.4)	2 (2.9)	0.671*
Neonatal meningitis, n (%)	2 (0.9)	1 (0.8)	0 (0.0)	0 (0.0)	1 (1.4)	0.641*

a = Chi-square test; b = Mann-Whitney U test; c = Fisher's exact test; d = Kruskal Wallis test
PTB = preterm birth; GA = gestational age; IVH = Intraventricular Hemorrhage; PVL = Periventricular Leukomalacia; NEC = Necrotizing Enterocolitis; ROP = Retinopathy of prematurity; PDA = Patent Ductus Arteriosus; * Early = < 72 hours after birth and Late > 72 hours after birth.

Table 1: Outcomes of total cohort and ultrasound- indicated group, stratified by calculated risk score

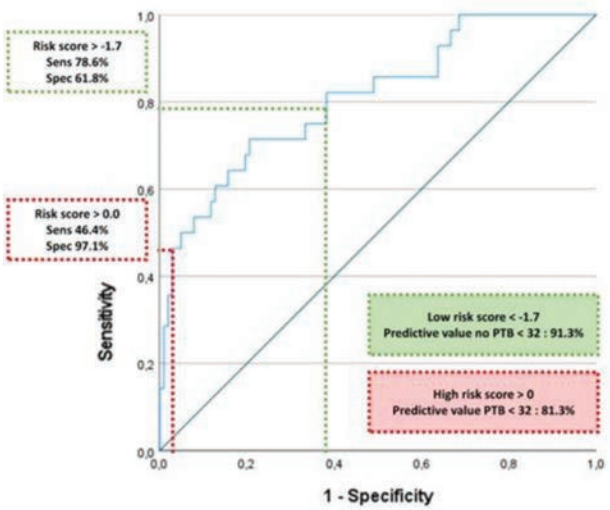

Figure 1 ROC-curve of risk model for the ultrasound-indicated group with sensitivity, specificity and the predictive value for high-risk and low-risk scores, AUC = 0.810 (95% CI 0.717-0.904).

415 | Defining Specific Bile Acid Profiles in Intrahepatic Cholestasis of Pregnancy

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4:00 PM - 6:00 PM

Objective: Although intrahepatic cholestasis of pregnancy (ICP) is often diagnosed using total serum bile acid (BA) measurements, there is a paucity of information on the individual bile acid profiles in this enigmatic condition. Thus, our aim was to define the specific BA profiles among a cohort of pregnant individuals with ICP.

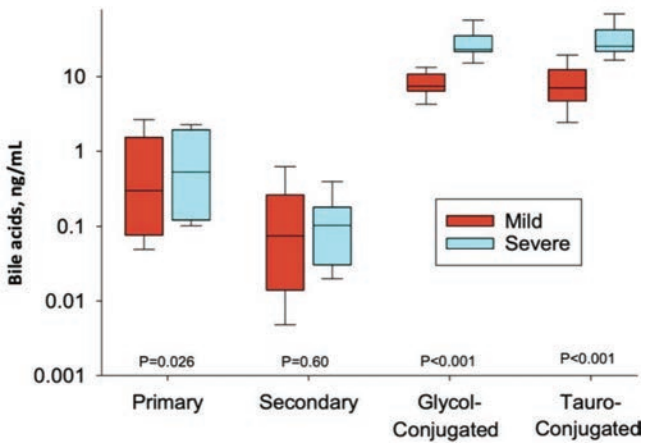
Study Design: This was a prospective, observational cohort study of pregnant individuals evaluated for ICP from February 2022 to July 2023 a single academic center. Patients were characterized into pruritis of pregnancy (total BA < 10 mmol/L, referent), ICP (BA 10-39 mmol/L), and severe ICP (BA >40 mmol/L) using a quantitative enzymatic assay. At the time of initial evaluation for ICP, an additional blood sample was collected to evaluate for a selection of primary (cholic, chenodeoxycholic), secondary (deoxycholic), glycol-conjugated (glycocholic, glycodeoxycholic,

glycolithocholic), and tauro-conjugated (taurocholic, taurochenodeoxycholic, taurodeoxycholic, taurolithocholic) forms of BA. These measurements were conducted using liquid chromatography and mass spectrometry methods.

Results: There were 39 patients evaluated: 5 with pruritis, 24 with ICP, and 10 with severe ICP. Levels of glycocholic, taurocholic, and taurochenodeoxycholic acids were significantly increased in those with ICP. When comparing patients with ICP to severe ICP, there was an increase in both glycol and tauro-conjugated BA (Figure).

Conclusion: Beyond total BA, patients with ICP have significantly elevated levels of specific BA profiles that offer an important opportunity to better understand the pathophysiology and treatment targets for this enigmatic condition.

Figure: Individual bile acids associated with intrahepatic cholestasis



416 | Intrapartum Glycemic Control with IV Insulin Infusion in Pregestational and Gestational Diabetes

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4:00 PM - 6:00 PM

Objective: ACOG recommends maintaining maternal glucose < 110mg/dL in labor, often managed with IV insulin infusion. Our objective was to describe the degree of intrapartum glycemic control achieved with IV insulin infusion and identify factors associated with intrapartum glycemic control.

Study Design: A retrospective cohort study of pregnant persons with pregestational or gestational diabetes who received IV insulin infusion during labor at a tertiary center was conducted (2015-2024). Antepartum fetal demise and deliveries < 22 weeks were excluded. At our center, IV insulin titration is individualized by clinicians based on hourly glucose values and response to prior adjustments. The primary outcome was percentage of intrapartum glucose values within target range of 65-110mg/dL (TIR_{Labor}). We compared TIR_L and other glycemic measures by diabetes type. Multivariable linear regression with backward stepwise selection was used to identify sociodemographic and clinical factors associated with TIR_L.

Results: Of 896 included persons, 49 (5%) had A1GDM, 305 (34%) had A2GDM, 365 (41%) had T2DM, and 177 (20%) had T1DM. Overall, 52% were non-Hispanic Black, 32% non-Hispanic White, 14% Hispanic; 65% had government insurance; mean BMI was 40±9 kg/m2; mean delivery GA was 35.8±3.2 weeks; and 72% had labor induction. The mean TIRL was 51±33% with differences in glycemic control by diabetes type (Table 1). A2GDM (vs T1D), labor induction, use of SMBG (vs CGM) for monitoring, greater number of intrapartum glucose measurements and later delivery year were associated with higher TIR_L, whereas higher HbA1c and corticosteroids < 7 days before delivery were associated with lower TIR_L (Table 2).

Conclusion: Strict intrapartum glycemic control (65-110 mg/dL) is difficult to achieve with clinician-managed IV insulin infusion. Future interventions to improve intrapartum control including alternatives to clinician-managed IV insulin should address potential barriers such as diabetes type, suboptimal glycemic control before admission, recent antenatal corticosteroids, and short labor duration with fewer intrapartum glucose measurements.

Table 1. Intrapartum glycemic control of overall study cohort and compared by maternal diabetes type

	Overall study cohort (N=896)	A1GDM (n=49)	A2GDM (n=305)	T2DM (n=365)	T1DM (n=177)
TIR_{Labor} (% glucose values 65-110mg/dL)	51 ± 33	52 ± 35	57 ± 35	49 ± 34	48 ± 28
% glucose values ≥110 mg/dL	47 ± 34	47 ± 35	43 ± 35	50 ± 35	49 ± 29
% glucose values ≥140 mg/dL	15 ± 23	12 ± 22	10 ± 15	17 ± 25	20 ± 24
% glucose values <65 mg/dL	1 ± 5	0.3 ± 1	0.5 ± 3	1 ± 6	4 ± 8
Mean glucose (mg/dL)	113.2 ± 23.1	112.4 ± 20.1	109.6 ± 18.4	115.4 ± 25.5	115.0 ± 25.1
Max glucose (mg/dL)	150.1 ± 45.4	142.4 ± 36.8	138.5 ± 39.1	150.4 ± 43.6	171.6 ± 53.1
Min glucose (mg/dL)	88.4 ± 21.3	91.6 ± 18.1	90.6 ± 16.4	91.3 ± 22.2	77.8 ± 24.4
Time to euglycemia (min)	266 ± 342	245 ± 365	237 ± 361	264 ± 290	324 ± 395
p<0.05 for all except time to maternal euglycemia (p=0.06)					

Table 2. Sociodemographic and medical factors associated with percentage of intrapartum glucose values in target range (65-110 mg/dL)

	TIR_{Labor} Adjusted mean difference (95% CI)
Diabetes type	
A1GDM	-9.48 (-31.60 to 12.65)
A2GDM	8.81 (0.70 to 16.93)
T2DM	1.29 (-5.14 to 7.72)
T1DM	Ref
Last HbA1c before delivery (per 1%)	-2.23 (-4.17 to -0.28)
Steroids <7 days before delivery	-19.02 (-24.51 to -13.53)
Labor induction	9.87 (3.30 to 16.44)
SMBG for intrapartum monitoring	11.58 (2.90 to 20.26)
Number of intrapartum glucose values (per 1 value)	0.43 (0.12 to 0.74)
Delivery year (per 1 year)	1.39 (0.28 to 2.50)

Factors considered in initial models included maternal age, race/ethnicity, insurance, nulliparous, multiple gestation, delivery BMI, delivery gestational age, last HbA1c before delivery, diabetes type, metformin use, insulin use, chronic hypertension, preeclampsia, creatinine before delivery, antenatal corticosteroids within 7 days before delivery, fetal anomaly, labor induction, used POCT glucose for monitoring, number of intrapartum glucose values, time from insulin infusion to delivery, year of delivery

417 | Time in Range and Barriers to Achieving Continuous Glucose Monitoring Targets in Type 2 Diabetes

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4:00 PM - 6:00 PM

Objective: For pregnant persons with type 1 diabetes (T1D) using CGM, the recommended time in target range (TIR, 63-140 mg/dL) is > 70%. However, TIR recommendations for pregnant persons with type 2 diabetes (T2D) are uncertain. Our objectives were to evaluate TIR achieved before delivery among pregnant persons with T2D and identify barriers to achieving TIR > 70%.

Study Design: Retrospective cohort study of gravidae with T2D who used CGM and received care at a single, tertiary center (2019-2024). Timed CGM data was downloaded, and TIR in 30 days pre-delivery was calculated. Factors were compared between persons with TIR > 70% vs £ 70%. Multivariable logistic regression with backward selection identified the factors independently associated with TIR > 70%. Sensitivity analyses evaluated factors associated with TIR > 70% in 2 weeks and %TIR 30 days pre-delivery.

Results: Of 134 pregnant persons included, the average TIR during 30 days pre-delivery was 59.5±19.2% with 43 (32%) achieving TIR > 70% pre-delivery. Of 22 sociodemographic and clinical factors, only pre-pregnancy HbA1c and baseline insulin dose differed between TIR > 70% vs £ 70% (Table 1) and were independently associated with TIR > 70% in regression models (Table 2). For every 1% increase in pre-pregnancy HbA1c, there was 26% lower odds of TIR > 70% (aOR 0.74, 95% CI 0.60-0.94). For every 10 unit increase in baseline insulin dose, there was 16% lower odds of TIR > 70% (aOR 0.84, 95% CI 0.74-0.94). These findings were unchanged in sensitivity analyses evaluating TIR > 70% in 2 weeks and %TIR in 30 days pre-delivery.

Conclusion: In this cohort of gravidae with T2D, the average TIR in 30 days pre-delivery was 60% with only 1/3 achieving the T1D-recommendation of TIR > 70%. Barriers to achieving TIR > 70% that should be addressed include improving glycemic control before pregnancy and identifying effective interventions for gravidae with high insulin requirements. The lack of association with other factors suggests that patients may be able to achieve TIR > 70% pre-delivery despite unfavorable social determinants or later access to prenatal care and CGM.

Table 1. Sociodemographic and clinical factors compared by TIR>70% versus TIR ≤70% in 30 days before delivery

	TIR >70% (n=43)	TIR ≤70% (n=91)	p-value
Sociodemographic factors			
Maternal age (yr)	33.2 ± 6.2	32.3 ± 5.4	0.39
Race/ethnicity			0.38
Non-Hispanic White	14 (34.2)	18 (20.2)	
Non-Hispanic Black	25 (61.0)	65 (73.0)	
Hispanic	1 (2.4)	2 (2.3)	
Other	1 (2.4)	4 (4.5)	
Married	18 (42.9)	31 (34.4)	0.35
Government-funded or no insurance	21 (48.8)	54 (59.3)	0.25
Diabetes factors			
Duration of diabetes (yr)	6.2 ± 6.0	7.8 ± 6.2	0.16
Diabetes White classification			0.30
Class B	20 (46.5)	38 (41.8)	
Class C	7 (16.3)	19 (20.9)	
Class D	16 (37.2)	28 (30.8)	
Class R or F	0	6 (6.6)	
Pre-pregnancy or 1st trimester HbA1c (%)	7.8 ± 1.8	9.0 ± 2.2	<0.01
Baseline total daily dose of insulin (units)	19.6 ± 29.7	48.4 ± 52.7	<0.01
GA at CGM initiation (wk)	15.9 ± 15.9	17.2 ± 15.4	0.65
CGM type			0.46
Freestyle Libre 2 or 3	5 (11.6)	7 (7.7)	
Dexcom G6 or G7	38 (88.4)	84 (92.3)	
Metformin use during pregnancy	21 (48.8)	41 (45.1)	0.68
Insulin use during pregnancy	41 (95.4)	90 (98.9)	0.19
% time CGM active in 30 days predelivery	76.9 ± 25.3	75.1 ± 23.2	0.69
Medical and obstetric factors			
Pre-pregnancy BMI (kg/m^2)	38.7 ± 9.4	37.8 ± 7.8	0.58
Chronic hypertension	28 (65.1)	52 (57.1)	0.38
Nulliparous	17 (39.5)	26 (28.6)	0.20
Multiple gestation	0	2 (2.2)	>0.99
Major fetal anomaly	1 (2.3)	3 (3.3)	>0.99
GA at initial prenatal care visit (wk)	12.2 ± 5.5	13.0 ± 7.3	0.52
Prenatal care location			0.06
OB/GYN resident clinic	19 (44.2)	56 (61.5)	
MFM clinic	24 (55.8)	35 (38.5)	
Provider type			0.27
Advanced practice provider	14 (32.6)	19 (20.9)	
Second year OB/GYN resident	12 (27.9)	32 (35.2)	
Third year OB/GYN resident	5 (11.6)	22 (24.2)	
MFM fellow	10 (23.3)	15 (16.5)	
MFM attending	2 (4.7)	3 (3.0)	
GA at delivery (wk)	35.1 ± 8.4	36.1 ± 2.7	0.30

Abbreviations: TIR, time in range (63-140mg/dL); GA, gestational age; CGM, continuous glucose monitor; BMI, body mass index; OB/GYN, obstetrics and gynecology; MFM, maternal-fetal medicine

Table 2. Factors associated with Time in Range (TIR) >70% in 30 days before delivery

	TIR >70% Adjusted odds ratio (95% CI)*
Pre-pregnancy or 1st trimester HbA1c (per 1%)	0.74 (0.60-0.91)
Baseline total daily dose of insulin (per 10 units)	0.84 (0.74-0.94)

*Initial model included maternal age, race/ethnicity, marital status, insurance type, diabetes duration, diabetes White classification, pre-pregnancy/1st trimester HbA1c, baseline total daily dose of insulin, gestational age at CGM initiation, CGM type, pre-pregnancy BMI, chronic hypertension, nulliparous, multiple gestation, major anomaly, gestational age at initial prenatal visit, prenatal care location, prenatal care provider, metformin use during pregnancy, insulin use during pregnancy, percentage of time CGM active during 30 days pre-delivery, and delivery gestational age

418 | Postpartum Gastroenterology Referrals and Follow Up in Pregnant Patients with Viral Hepatitis

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4:00 PM - 6:00 PM

Objective: The objective of this study was to determine rates of appropriate postpartum gastroenterology (GI) referral and follow up in pregnant patients with hepatitis B and C.

Study Design: After institutional review board approval, we performed a retrospective cohort study among 19,974 pregnant patients who delivered at a safety net hospital system between 1/2019 and 12/2022. The primary outcomes were referrals to GI and postpartum follow-up with GI. All baseline demographics and obstetrical variables were collected, including viral hepatitis status. Differences in the baseline characteristics and outcomes were examined using chi-square or Fisher's exact test for categorical variables. A P value of < 0.05 was considered significant. Multivariable Poisson regression models with robust error variance were used to examine the association, and an adjusted relative risk (aRR) with 95% CIs was calculated.

Results: Out of the 19,974 pregnant patients in this cohort, 82 (0.4%) had hepatitis B and 49 (0.2%) had hepatitis C. Hepatitis B was more prevalent in Black women, limited prenatal care, and lack of substance abuse, $p = < 0.001$, for each. (Table 1). Patients with hepatitis B were significantly more likely to be referred to GI than hepatitis C patients, with 62 (75.6%) of hepatitis B patients referred and 22 (44.9%) of hepatitis C patients referred ($p < 0.001$). Furthermore, patients with hepatitis B were significantly more likely to attend a follow-up appointment with GI during the postpartum period. 23 (28.1%) of hepatitis B patients attended a GI appointment postpartum, compared to 5 (10.2%) of hepatitis C patients ($p = 0.016$). After adjustment, hepatitis B patients were 2.60 times more likely to be referred or seen by GI (CI: 1.54-4.38), compared to hepatitis C patients.

Conclusion: This study demonstrates low rates of indicated GI referrals for pregnant women with viral hepatitis, despite screening recommendations to test all pregnant women to prevent mother-to-child transmission and to link them to care services for treatment. Further studies are needed to evaluate the reasons for these gaps.

Table 1 - Demographics

	Hepatitis B n=82	%	Hepatitis C n=49	%	Control n=19974	%	p-value
Race and Ethnicity							<0.001
Non-Hispanic White	1	1.2	22	44.9	465	2.3	
Non-Hispanic Black	37	45.1	6	12.2	2,191	11.0	
Hispanic	23	28.0	15	30.6	16,259	81.4	
Non-Hispanic Other	21	25.6	6	12.2	1,059	5.3	
Language							<0.001
English	33	40.2	31	63.3	5,321	29.6	
Spanish	23	28.1	12	24.5	13,414	67.2	
Other	26	31.7	6	12.2	639	3.2	
Marital Status							<0.001
Single	19	23.2	32	65.3	8,521	42.7	
Married/Life Partner	62	75.6	15	30.6	10,725	53.7	
Separated/Divorced/Widowed	1	1.2	2	4.1	667	3.3	
Unknown	0	0.0	0	0.0	61	0.3	
Prenatal Care							<0.001
Complete (3 or more visits)	67	81.7	44	89.8	10,966	54.9	
Limited (< 3 visits)	10	12.2	3	6.1	2,377	11.9	
None	5	6.1	2	4.1	6,631	33.2	
Gestational age at Delivery							0.904
<37 weeks	9	11.0	7	14.3	2,758	13.8	
≥37 weeks	73	89.0	42	85.7	16,948	84.9	
unknown	0	0.0	0	0.0	268	1.3	
Mode of Delivery							0.797
Vaginal	50	61.0	29	59.2	12,980	65.0	
Vacuum/Forceps	3	3.7	1	2.0	619	3.1	
C-section	29	35.4	19	38.8	6,329	31.7	
Unknown	0	0.0	0	0.0	46	0.2	
Tobacco/drug/alcohol Use							<0.001
No	82	100.0	43	87.8	19,798	99.1	
Yes	0	0.0	6	12.2	176	0.9	
Parity							0.459
1	16	19.5	12	24.5	4,910	24.6	
>1	64	78.1	37	75.5	14,867	74.4	
Unknown	2	2.4	0	0.0	197	1.0	

Table 2 - GI Referral and Follow Up

	Hepatitis B n=82	%	Hepatitis C n=49	%	p-value
Referred to Gastroenterology	62	75.6	22	44.9	<0.001
Follow Up Appointment Attended	23	28.1	5	10.2	0.016

419 | Sociodemographic Differences in Perinatal Outcomes Following Publication of the Chap Trial

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4:00 PM - 6:00 PM

Objective: The April 2022 CHAP trial showed that tight chronic hypertension (cHTN) control decreased preterm birth (PTB) and low birthweight (BW) < 2500g. We conducted a difference in differences (DID) analysis to assess population-level sociodemographic disparities in these outcomes before and after publication and dissemination of the CHAP trial.

Study Design: Population level DID analysis from February 2021 to August 2023 using US Natality data including patients with a singleton, non-anomalous gestation, cHTN, and who initiated prenatal care at $\leq$ 6 months gestation. Pre- and post-CHAP periods were defined *a priori* as February 2021-January 2022 and September 2022-August 2023 respectively with a dissemination period from February-August 2022. Primary outcomes were PTB< 35 weeks, PTB< 37 weeks, and BW< 2500g. Differences in outcomes were compared between Black and White race, Hispanic and non-Hispanic ethnicity, and privately and publicly insured patients during pre- and post-CHAP trial periods. The difference in differences was then calculated. Average treatment effect differences were obtained using linear regression with Stata18 SE.

Results: Black, Hispanic, and publicly insured patients had higher rates of PTB and low BW during the study period compared to their White, non-Hispanic, and privately insured counterparts (Table 1). Rate differences between subgroup categories were significant during the pre- and post-CHAP periods for PTB< 35 weeks, PTB< 37 weeks, and BW< 2500g, except for BW< 2500g during the pre-CHAP period in the ethnicity subgroup.

Treatment effect differences in differences were not significant for any primary outcome across subgroups (Table 1).

Conclusion: Sociodemographic disparities in PTB and low BW in patients with cHTN were identified across racial, ethnic, and payor status subgroups both prior to and after the CHAP trial. However, existing disparities were unchanged by dissemination of CHAP trial. Future research should assess in more granular detail if application of CHAP trial interventions can improve these disparities.

Table 1. Outcomes and average treatment effect differences across sociodemographic subgroups

		Pre-CHAP Trial		Post-CHAP Trial		
		Rate	P value	Rate	P value	Difference[a]
PTB <35 weeks	Race[c]					
	White	7.5%		7.2%		-0.3%
	Black	12.1%		11.5%		-0.6%
	Difference[b]	4.6%	*p <0.001*	4.3%	*p <0.001*	
	DID	**(-)0.003, p =0.444**				
	Ethnicity[d]					
	Non-Hispanic	8.7%		8.1%		-0.6%
	Hispanic	9.9%		9.8%		-0.1%
	Difference	1.2%	*p <0.001*	1.6%	*p <0.001*	
	DID	**0.004, p = 0.352**				
	Payor Status[e]					
	Private	7.9%		7.2%		-0.7%
	Public	10.1%		9.6%		-0.5%
	Difference	2.2%	*p <0.001*	2.3%	*p <0.001*	
	DID	**0.001, p = 0.759**				
PTB <37 weeks	**Race**					
	White	17.3%		16.7%		-0.6%
	Black	23.8%		23.2%		-0.6%
	Difference	6.5%	*p <0.001*	6.5%	*p <0.001*	
	DID	**0, p = 0.981**				
	Ethnicity					
	Non-Hispanic	18.9%		18.3%		-0.6%
	Hispanic	20.8%		20.1%		-0.7%
	Difference	1.9%	*p <0.001*	1.8%	*p <0.001*	
	DID	**(-)0.001, p = 0.890**				
	Payor Status					
	Private	17.5%		16.8%		-0.7%
	Public	21.4%		20.9%		-0.5%
	Difference	3.9%	*p <0.001*	4.2%	*p <0.001*	
	DID	**0.003, p = 0.379**				
BW <2500g	**Race**					
	White	12.6%		12.4%		-0.2%
	Black	22.1%		21.8%		-0.3%
	Difference	9.5%	*p <0.001*	9.3%	*p <0.001*	
	DID	**(-)0.002, p= 0.805**				
	Ethnicity					
	Non-Hispanic	15.5%		15.0%		-0.5%
	Hispanic	15.7%		16.1%		0.4%
	Difference	0.2%	p = 0.484	1.1%	*p = 0.003*	
	DID	**0.009, p = 0.093**				
	Payor Status					
	Private	13.5%		13.3%		-0.2%
	Public	18.1%		17.8%		-0.3%
	Difference	4.6%	*p <0.001*	4.4%	*p <0.001*	
	DID	**(-)0.001, p = 0.747**				

[a]Difference within racial, ethnic, and payor status categories
[b]Difference between racial, ethnic, and payor status categories
[c]White Pre-CHAP n = 49,154, Post-CHAP n = 59,878; Black Pre-CHAP n = 21,915, Post-CHAP n = 23,327
[d]Non-Hispanic Pre-CHAP n = 68,663, Post-CHAP n = 75,387; Hispanic Pre-CHAP n = 12,646, Post-CHAP n =15,018
[e]Private Pre-CHAP n = 43,210, Post-CHAP n = 48,298; Public Pre-CHAP n = 34,222, Post-CHAP n = 38,065

420 | Maternal Placental Vascular Pathology Association with Aspirin Response Among High-Risk Singleton Pregnancies

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4:00 PM - 6:00 PM

Objective: Placental vascular pathologies are noted in pregnancies complicated by preeclampsia and preterm birth. Aspirin initiation in high-risk pregnancies reduces the risk of these outcomes. However, it is unclear how aspirin response affects placental histopathology. Our objective is to evaluate the relationship between aspirin response and placental vascular pathology in high-risk pregnancies taking 81mg aspirin daily.

Study Design: This is a secondary analysis of a prospective cohort of high-risk singletons taking aspirin daily. Placental maternal vascular pathology was categorized according to Amsterdam classification system. The primary outcome was maternal vascular malperfusion (MVM). Aspirin response was assessed by Platelet Function Assay-100 epinephrine closure time (PFA-100) at baseline (before aspirin, < 16 weeks), 2-4 weeks after aspirin initiation (follow up-1), and at 28-32 weeks gestation (follow up-2). The exposure was PFA-100 assessed as a continuous and categorical variable (<150 seconds, inadequate response) in those with and without placental MVM. The Mann-Whitney-U test and Chi-squared test were used.

Results: Of the original cohort (n = 130), 91 participants took 81mg aspirin daily, completed requisite follow-up, and had placental histopathology available. 38 (42%) exhibited placental MVM; baseline characteristics were similar in those with and without MVM (Table 1). There was no significant difference in aspirin response in those with and without placental MVM (Table 2), although there was a higher rate of inadequate aspirin response at 28-32 weeks in those who developed MVM. However, this was not statistically significant (p = 0.14).

Conclusion: We found a high rate of placental MVM in high-risk singletons taking aspirin daily, and a strong association between placental MVM and preterm birth. We did not find a significant association between aspirin response and placental MVM, although a larger study should be done to evaluate the relationship between aspirin response and placental vascular pathology especially when assessed in the 3rd trimester.

TABLE 1. Demographic differences between placentas with and without maternal vascular malperfusion

	Placental MVM N = 38	No Placental MVM N = 53	p-value
Age, average (mean +/- SD)	31.2 (+/- 6.48)	32.3 (+/- 6.20)	0.45
BMI, average (mean +/- SD)	35.8 (+/- 8.70)	33.7 (+/- 8.54)	0.24
Black race (n, %)	25 (65.8)	27 (50.9)	0.20
Chronic hypertension (n, %)	15 (39.5)	17 (32.1)	0.51
Pre-gestational diabetes (n, %)	2 (5.3)	7 (13.2)	0.30
Obesity (n, %)	29 (76.3)	34 (64.2)	0.26
Preeclampsia in prior pregnancy (n, %)	9 (23.7)	14 (26.4)	0.81

TABLE 2. Biochemical and clinical outcomes between placentas with and without maternal vascular malperfusion

	Placental MVM N = 38	No Placental MVM N = 53	p-value
PFA-100 f/u 1 (sec)	143.0 [126.0, 210.5]	150.5 [117.8, 196.8]	0.58
PFA-100 f/u 2 (sec)	140.0 [125.0, 222.5]	153.5 [120.3, 188.5]	0.21
PFA-100<150 f/u 1 (n, %)	23 (60.5%)	27 (50.9%)	0.37
PFA-100<150 f/u 2 (n, %)	20/33 (60.6%)	21/48 (43.8%)	0.14
Preterm birth (n, %)	12 (31.6%)	5 (9.4%)	0.008
Preterm birth due to Preeclampsia (n, %)	6 (15.8%)	1 (1.9%)	0.02
Preeclampsia or Gestational hypertension (n, %)	11 (28.9%)	14 (26.4%)	0.79

421 | Reducing Bias in AI Models for Fetal Heart Ultrasound: Assessing Annotation Quality

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4:00 PM - 6:00 PM

Objective: When building machine learning algorithms in a collaborative manner, annotating ultrasound videos of fetal heart "sweeps" is important prerequisite. These annotations are undertaken by experts following standard guidelines and criteria. To

ensure these data for training machine learning algorithms are reliable, we aimed to create a system to quantify inter and intra-annotation variation. The ultimate aim is to create quality assurance systems of video annotations to reduce annotator bias.
Study Design: Two experienced cardiologists (A1 and A2) each annotated 4,539 individual ultrasound frames from ten fetal heart ultrasound videos (transverse sweep). Individual frames received one of five fetal cardiac labels through manual annotation. Pairwise comparisons were made between annotations conducted two weeks apart by A1 (intra-annotator agreement) and between cardiologists A1 and A2 (inter-annotator agreement). Inter- and intra-annotator agreements were quantified on a frame-by-frame basis using Intra-Class Correlation Coefficient [ICC] and Kappa score values.
Results: Successful labelling of all frames were carried out. Intra-annotator reproducibility showed correlation strong agreement (ICC = 74.9 %, Kappa score of 81%). Inter-annotator agreement between A1 and A2 was moderate (ICC = 66.6, Kappa score of 60%).
Conclusion: The results show high reproducibility of annotations of frames of the fetal heart from ultrasound sweeps for a single annotator. However, when comparing annotations between different annotators, the results are less consistent, indicating only moderate agreement. These variations have implications for quality assurance and what constitutes "ground truth" when using fetal heart annotations in ultrasound videos for training machine learning algorithms.

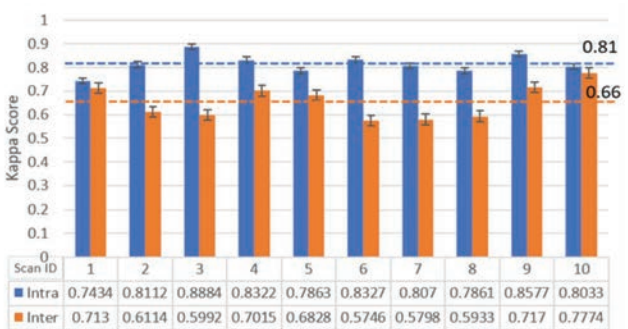

Figure: Visualizing intra and inter-annotator agreement between A1 and A2 by Kappa scores for the 10 (scan ID) fetal heart transverse sweep ultrasound videos.

422 | Impact of Fetal Sex on Adverse Pregnancy and Neonatal Outcomes in Individuals with Pre-Existing Diabetes

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4:00 PM - 6:00 PM
Objective: Pre-existing diabetes mellitus (DM)–diabetes identified prior to pregnancy - is increasing in prevalence among pregnant individuals and is associated with adverse maternal and neonatal outcomes. Prior work suggests that fetal sex impacts underlying placental dysfunction leading to differential pregnancy risks. The objective of this study is to assess the impact of fetal sex on placentally-mediated adverse pregnancy outcomes in individuals with DM.
Study Design: This was a retrospective cohort study of 503 pregnant individuals with pre-existing DM and known fetal sex receiving care at a major urban academic center between 1998-2016. The exposure of interest was fetal/infant sex. The primary outcome was a composite of preterm birth, hypertensive disorder of pregnancy (HDP), small for gestational age (SGA), and stillbirth, and the secondary outcome was NICU admission. A composite of large for gestational age (LGA), hypoglycemia, hyperbilirubinemia, shoulder dystocia, and respiratory distress syndrome (RDS) was assessed. Mixed effects logistic regression models were built to assess the relationship between fetal sex and the pregnancy/neonatal outcomes, accounting for multiple pregnancies and adjusting for 1st Trimester BMI, parity, and race/ethnicity.
Results: Of the 503 pregnant individuals included, 258 pregnancies had a female fetus (51%) and 245 pregnancies had a male fetus (49%)–Table 1; no significant differences in sociodemographic or clinical characteristics were observed between groups. No significant differences in either composite outcome was identified, however there was a significantly higher likelihood of NICU admissions for males (adjusted odds ratio 1.83 [1.14, 2.94], p = 0.012, Table 2).
Conclusion: Although we did not identify differences in composite adverse pregnancy or neonatal outcomes in individuals with DM by offspring sex, the significantly higher rate of NICU admission suggests male neonatal vulnerability to the impact of maternal DM and warrants further investigation.

Table 1: Sociodemographic and clinical characteristics of pregnancy cohort.

	All pregnancies (n=503; N(%)	Pregnancies Carrying Female Fetus (n=258); N(%)	Pregnancies Carrying Male Fetus (n=245; N(%)	P-value
Maternal Demographics				
Maternal Age (mean, SD)	32.86 (5.61)	32.98 (5.73)	32.74 (5.48)	0.63
Insurance Status				0.35
Limited	19 (4%)	8 (3%)	11 (5%)	
Private	279 (56%)	152 (59%)	127 (52%)	
Public	192 (38%)	93 (36%)	99 (40%)	
Chronic Hypertension	83 (16%)	47 (18%)	36 (15%)	0.29
Pregestational Diabetes				0.83
Type 1	166 (33%)	84 (33%)	82 (35%)	
Type 2	337 (67%)	174 (67%)	163 (67%)	

Table 2: Impact of male fetal sex on composite adverse pregnancy and neonatal outcomes

Outcome	*Unadjusted Frequencies*		Adjusted Odds Ratio[a]	P Value
	Pregnancies Carrying Female Fetus (n=258); N (%)	*Pregnancies Carrying Male Fetus (n=245); N (%)*		
Composite of Adverse Pregnancy Outcomes	88 (34%)	87 (36%)	1.14 (0.66, 1.94)	0.64
Preterm Birth	14 (5%)	14 (6%)	0.91 (0.32, 2.61)	0.86
HDP[b]	70 (27%)	64 (26%)	1.06 (0.57, 1.97)	0.85
SGA[b]	9 (3.5%)	10 (4%)	1.63 (0.41, 6.50)	0.49
Stillbirth	5 (2%)	8 (3%)	1.69 (0.47, 6.08)	0.42
NICU admission	53 (21%)	71 (29%)	1.83 (1.14, 2.94)	**0.012**
Composite of Adverse Neonatal Outcomes	149 (61.8%)	156 (65.3%)	1.14 (0.73, 1.80)	0.56
Shoulder dystocia	14 (5.8%)	16 (6.7%)	0.87 (0.34, 2.22)	0.77
LGA[b]	71 (29.5%)	77 (32.2%)	1.75 (0.63, 4.86)	0.29
Hypoglycemia	60 (24.9%)	60 (25.1%)	0.97 (0.58, 1.63)	0.91
Hyperbilirubinemia	61 (25.3%)	60 (25.1%)	0.97 (0.60, 1.56)	0.90
RDS[b]	30 (12%)	40 (16%)	1.24 (0.74, 2.08)	0.42

[a]Mixed effects logistic regression model adjusting for multiple pregnancies per patient, maternal BMI, insurance status, parity, race/ethnicity. Ref: female sex. [b]Table Abbreviations: Hypertensive Disorder of Pregnancy (HDP); Small for Gestational Age (SGA); Large for Gestational Age (LGA), Respiratory distress syndrome (RDS)

423 | Self-Perceptions and Decision-Making Factors regarding CBD Use Among Pregnant People

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4:00 PM - 6:00 PM

Objective: To understand perceptions of risks and benefits, and factors influencing CBD use among pregnant people given limited data regarding CBD use during pregnancy.

Study Design: Participants were drawn from a parent study at UNC-CH on CBD use and reproductive genetics. Eligible participants were pregnant within the last 3 years, had a history of CBD use, or were willing to discuss hypothetical scenarios of CBD use during pregnancy. One on one semi structured interviews were conducted by a single interviewer, recorded, coded, and transcribed. Domains of the interview guide included experience with CBD or other substances, decision making influences, and information seeking behaviors. Interviews were coded using grounded theory methods by three coders (MH, SHB, AT) using Dedoose software. Sampling for interviews was completed once thematic saturation was achieved.

Results: Ten participants were interviewed (Table 1), including one who used CBD during pregnancy and five who used CBD when not pregnant and chose not to continue during pregnancy. Five major themes emerged: (1) Risk and benefit perceptions, (2) identifying trustworthy resources, (3) disclosure, (4) suggestions for practice, and (5) differences between pregnancies (Table 2). Importantly, participants reported frequently receiving discordant opinions when seeking information from various sources, identifying a gap in available data given the prevalence of CBD use. Additionally, participants revealed how relationship with an obstetric provider and perceptions of how a provider will receive information about CBD use, determined revealing use.

Conclusion: This study highlights the myriad of factors influencing pregnant patients' decisions on CBD use. These findings underscore the need for more research on CBD safety during pregnancy given the prevalence of use around gestation and first trimester exposure and can inform the development of educational tools for obstetric providers to better discuss CBD use with reproductive-aged patients.

Table 1. Cohort Demographics

Characteristics	n (%)
Age (years)	Range 31- 41 Median = 36; IQR = 1.75
Marital status	
Married	7 (70)
Single	3 (30)
Occupation	
Unemployed	2 (20)
Server/bartender	1 (10)
Attorney	1 (10)
Federal law enforcement agent	1 (10)
Nonprofit data analyst	1 (10)
Accountant	1 (10)
College music professor	1 (10)
Hospital billing	1 (10)
Oncology nurse	1 (10)
Number of children	
One	1 (10)
Two	9 (90)
Current age of child (years)	Range 3 - 10 Median = 4; IQR = 3
State of residence	NC

Figure 1. Matrix of Themes, Subthemes, and Exemplary Quotations

Theme	Subtheme	Exemplary Quotations
Risk and benefit perception	Unknown risk to fetus Fear of legal repercussions Alternative to traditional medications or to marijuana Use of CBD to address common pregnancy symptoms	*"I would have probably done [CBD] instead of Zoloft, if it was something that's natural."* *"I wouldn't put my baby in danger of being taken by the state or anything like that because some of the restrictions."*
Trust in resources	Based on education level, personal or provider experience Anxiety navigating various sources and conflicting information Difficulty ascertaining which resources are trustworthy Association between trust with provider and honesty Difficulty repairing trust after negative interactions with the healthcare system	*"There's way too much information, and conflicting information."* *"I talked to my husband quite a bit, like, should I be doing this? And he did some research, and I did some research, and I talked to the midwives, and it seems like everybody was kind of just like, it's no big deal. But then if you go to the internet, it's like, this is a big deal."* *"You hear different things from different doctors, and then that's confusing too."*
Disclosure	Importance of trusting relationship with obstetrician Influence of past experiences Safety in group settings Power of suggestion/prompted communication	*"I would have worried a little bit if I spoke to my OB, then they would report me or judge me or treat me differently."* *"Creating the space to bring up those taboo topics grouped with other things can help open the doors."* *"I loved the group aspect of it, the community, and every week was, like, a different topic about taking care of yourself, nutrition, exercise, all the things we have questions about."*
Suggestions for practice	Potentially beneficial resources (pamphlets, apps, hotlines, group classes) Recommendations for providers to increase patient disclosure Empowering patient-driven questions through increased accessibility Desire for more research on CBD use in pregnancy	*"…make sure that they seem like I'm not a burden to their time. That is a really big thing"* *it would be nice if they had like an app, but like more built out thing for pregnant women to go to for different stuff because I was fortunate to have a great doctor, but maybe for women who don't feel like they have that resource."* *"…Zooms, fine emails, fine calls, texts, anything. I would love to call [the clinic] and just be like, hey, I need advice today."*
Differences between pregnancies	Differences in approach to disclosure and research Familiarity with resources Confidence with pregnancy and personal intuition Increased willingness to ask sensitive questions	*"The first time was a little different. Everything was new… The second time, I was way less conservative."* *"I had way more questions with the first, but with the second, I don't know if I was tired or just felt more comfortable because I had been through it before."*

424 | Implementation Challenges for Prenatal Genetic Screening (PGS) at Federally Qualified Health Centers

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[1]University of North Carolina at Chapel Hill, Chapel Hill, NC; [2]University of North Carolina, Chapel Hill, NC

4:00 PM - 6:00 PM

Objective: To identify implementation challenges for prenatal genetic services (PGS) (aneuploidy and carrier) at federally qualified health centers (FQHCs).

Study Design: Qualitative interview study of maternity care providers (MCPs) at FQHCs in NC. Eligible participants were those that see pregnant patients, order and provide counseling for prenatal genetic screening, and follow up results. One-on-one semi-structured interviews were conducted by a single interviewer using an audio-video platform, were recorded, and transcribed. Interviews focused on the following domains based on the Consolidated Framework for Implementation Research (CFIR) constructs: (1) perceived value of genetic screening; (2) perceptions of advancing prenatal genetic technologies; (3) individuals and structural barriers to PGS in public health settings; and (4) recommendations for improved implementation. Interviews were completed after categorical saturation was reached. Interviews were immediately analyzed after interview using a rapid qualitative analytic process.

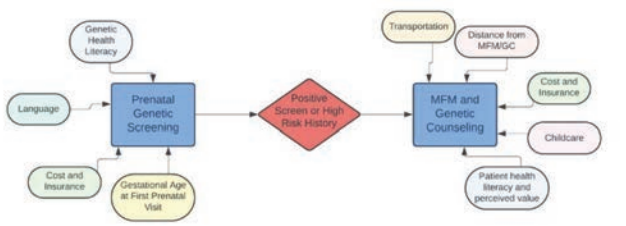
Results: Twelve MCPs were interviewed across FQHCs in 12 counties in NC. 9 providers identified as maternal health program coordinators or managers (RN), and 3 providers identified as advanced practice providers (NP). Mean number of years in practice among the cohort was 6.6 (SD 2.4). In describing their patient populations, all providers reported seeing patients who have Medicaid, presumptive Medicaid, or uninsured. Patient languages in all clinical settings were described as English and Spanish, with one clinic reporting a large Haitian Creole population. Several key themes were identified: (1) MCPs value PGS and describe inequities in access, informed consent, and types of testing between public and private healthcare settings; (2) health literacy and cost are the most cited barriers to PGS implementation; (3) resources for education and expert consultation are needed in rural areas.

Conclusion: Resources to address health literacy, cost, and access to genetics expertise are necessary to improve implementation of PGS at FQHCs.

Matrix 1. Key Findings and Exemplary Quotations

Theme	Exemplary Quotations
Value of PGS	"I think carrier screening is a good tool to have so we can best access where they may need to deliver, what resources we may need to get in place prior to the delivery." *Participant 2* "...especially in North Carolina now, with the abortion limit age...it really comes more into play as far as knowing sooner, having all the information that way you can to make a decision and to make it in time." *Participant 1*
Inequities in PGS in Public versus Private Spaces	"You know for yourself, if you were pregnant, you would go to another private practice clinic and have other test options. It's not right." *Participant 3* "...it doesn't sit very well....I don't think it's fair or equitable that patients receive care or options based on where they go to receive their care." *Participant 7* "I feel like every week I'm seeing emails, but something else is being offered...I don't it's just it's hard to keep up with all of it." *Participant 8*
Barriers to PGS	"I do find that it can be challenging to describe the genetic testing and explain exactly what it is for patients...I think there's limited understanding of the testing. Most of the time, [patients] agree to have it done, but they don't fully understand what they are agreeing to. And so when something comes back abnormal, or we need to do some some follow up testing... I think that's where, things get more complex for our patient population." *Participant 9* "The first question most of the time about genetic testing is, how much does it cost, or will my insurance cover it? And I think that's a huge barrier if, if they're present, if they don't have presumptive or, you know, we explain that you may have to pay out of pocket if there aren't funds through the company that we use. And most of the time, people you know decide not to go through with it because of the potential of the cost." *Participant 7*
Resources Needed for PGS	Participants described resources that they felt would facilitate genetic testing in public settings: • Visual aids or counseling aids in English/Spanish written at a 6th grade reading level • More availability of laboratory genetic counseling services • Genetic counseling or MFM hotline for rural coverage • Webinars, 'lunch and learn' for providers about advances in genetic screening and testing

Figure 1. Model of Multilevel Barriers to PGS at FQHCs



[a]Model demonstrates barriers to initial prenatal genetic screening and additional barriers faced by those with high risk history or positive screens that require MFM/Genetic Counseling Care with transition from public to private healthcare settings.

425 | Duration of High-Dose Postpartum Oxytocin Infusion and Postpartum Bleeding Outcomes in Individuals Undergoing Vaginal Delivery

Ashley E. Shea[1]; Christina T. Blanchard[1]; Alan T. Tita[2]; Ashley N. Battarbee[1]; Akila Subramaniam[1]
[1]Center for Women's Reproductive Health, University of Alabama at Birmingham, Birmingham, AL; [2]University of Alabama at Birmingham, Birmingham, AL

4:00 PM - 6:00 PM

Objective: High-dose prophylactic postpartum (PP) oxytocin (80 IU) has been suggested to reduce postpartum hemorrhage (PPH); however the optimal infusion duration is unknown. We sought to compare rates of PPH and other bleeding outcomes between high-dose (80 IU) oxytocin infused over 1 versus 4 hours.

Study Design: Secondary analysis of a database of all vaginal deliveries >22 weeks at a large academic referral center (1/1/2013-12/31/2018). Our institution's protocol for PP oxytocin infusion was altered on 10/15/2015 for vaginal deliveries only from 80 IU/500 mL over 1 hour to 80 IU/500 mL over 4 hours with initial 100 mL bolus prior to 4 hour infusion. All vaginal deliveries with

available outcomes were included. Patients were categorized as receiving oxytocin over 1 versus 4 hours, individually confirmed in the medication administration record. Primary outcome was a composite of estimated blood loss (EBL) >1000 mL, 2nd line uterotonic use, and any blood transfusion (secondary outcomes in Figure). Generalized estimating equation models were used to estimate adjusted odds ratios (aORs) and 95% confidence intervals (CI) using the 4 hour group as referent.

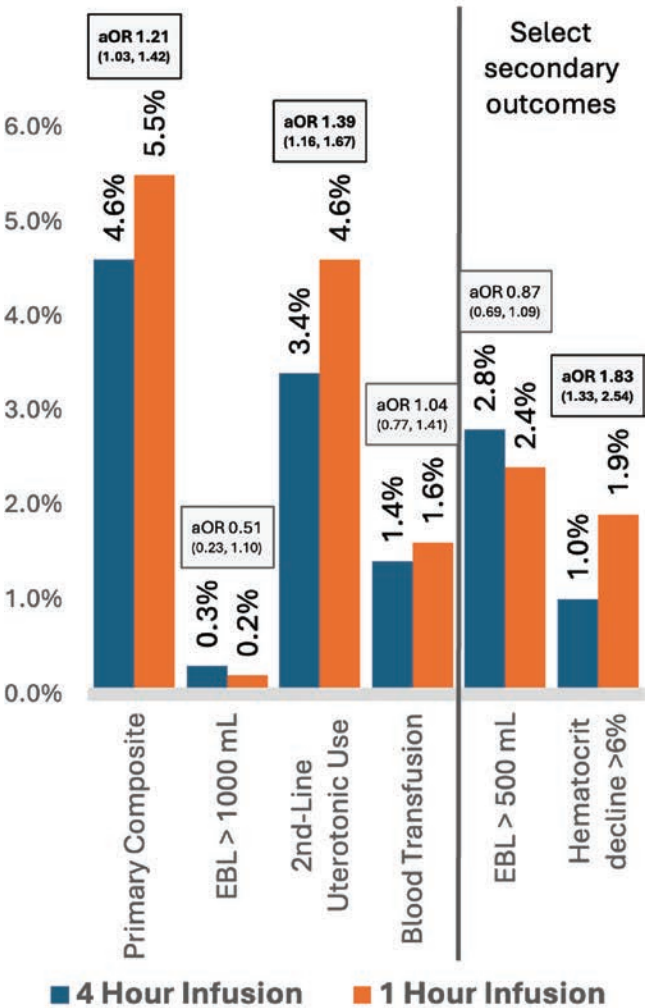
Results: Of 16,793 deliveries, 12,092 met inclusion criteria: 5,675 received 80U oxytocin for 1-hour (47%), 6,417 (53%) for 4-hours. There were multiple differences in baseline characteristics between groups (Table). Compared to the 4-hour group, the 1-hour group had increased odds of the primary composite (aOR 1.21, 95% CI 1.03-1.42), driven by an increase in 2nd line uterotonic use (aOR 1.39,1.16-1.67) (Figure). While there was no difference in EBL >1000 mL or blood transfusion, the 1-hour group had increased odds of HCT decline >6% (aOR 1.83, 1.33-2.54).

Conclusion: Infusion of PP high-dose oxytocin over 1 hour compared to 4 hours is associated with increased odds of postpartum bleeding–mainly 2nd-line uterotonic use and HCT decline > 6%. Given that 2nd line uterotonic use is clinician dependent, further investigation, utilizing less subjective outcomes such as transfusion, is needed to further define optimal high-dose oxytocin duration.

Table. Baseline characteristics of our population (data presented as % or mean± standard deviation)

	4 Hour Infusion Group (n=6417)	1 Hour Infusion Group (n=5675)	P-value
Maternal age	26.9 ± 5.8	26.4 ± 5.7	<0.001
BMI >30	32.8	34.5	0.51
Medicaid/Self pay	69.0	72.8	<0.001
Term delivery	86.6	83.5	<0.001
Diabetes	1.3	1.8	0.004
Chronic hypertension	3.5	3.8	0.82
Admission hematocrit	34.8 ± 4.1	34.6 ± 4.1	0.08
Intrapartum magnesium	3.3	4.5	<0.001
Type of labor			<0.001
Induction	37.2	31.2	
Augmentation	39.5	42.3	
SROM	23.4	26.5	
Neuraxial Anesthesia	78.0	75.7	0.048
Operative Delivery	5.4	4.3	0.006

Figure. Primary composite outcome and its individual components plus select secondary outcomes



*Odds ratios are adjusted for maternal age, insurance, term delivery, diabetes, intrapartum magnesium, labor type, neuraxial anesthesia, and operative vaginal delivery. 4 hour infusion as referent. Significant outcomes are in bold.

‡There was no difference in mean hematocrit change, blood transfusion >4 units, transfusion of products other than blood, hysterectomy, ICU admission, or maternal death.

426 | Impact of Nicu Length of Stay on Outcomes of Birthing People with Opioid use Disorder

Ashley Boerrigter; Cynthia Cockerham; Julie Bowers-Pryor; Ronald Clarkson; Gregory Hawk; Barbara V. Parilla
University of Kentucky, Lexington, KY

4:00 PM - 6:00 PM

Objective: To determine the impact of NICU length of stay on health outcomes of birthing people with opioid use disorder (OUD). Primary outcome was EDPS and GAD-7 scores.

Study Design: Longitudinal prospective cohort of pregnant persons receiving care through a comprehensive perinatal substance use treatment program between 2014 and June 2024. Characteristics of every patient who participated in the program were analyzed regardless of prenatal program participation or complete delivery outcome information; a minimum of postpartum program participation and neonatal outcomes were required for inclusion in the study. Participants were divided into groups based on whether their infant stayed more or fewer than 15 days in the NICU. Fisher's exact and two-sample t-tests were utilized for statistical analysis.

Results: There was no significant difference in postpartum EDPS and GAD-7 scores when groups were analyzed by infant's duration of stay in the NICU (<15 days, n = 183 or 15+ days, n = 106). However, EPDS score >13 at weeks 11–15 postpartum was observed in 33% of patients with infant NICU stays >15 days as compared to 0% with shorter stays, though this was not statistically significant (p = 0.4667). Birthing parents of infants who stayed < 15 days in the NICU were more likely to be exclusively breastfeeding at time of discharge (38.1% vs 32.6%, p = 0.0331) and room in with their infant (70.6% vs 47.1%, p = 0.001). There was no significant difference in attendance at postpartum visits (74% vs 72%, p = 0.6106).

Conclusion: When stratified at the 15-day mark, duration of infant's NICU stay did not appear to be associated with any significant difference in birthing parents' EDPS or GAD-7 scores. However, 33% of parents experienced an EPDS score suggestive of depression as compared to 0% in the shorter stay group. Further studies are needed to evaluate the mental health of parents when their neonate has an extended hospital stay for neonatal opioid withdrawal syndrome (NOWS). Breastfeeding and rooming-in are strategies associated with shorter stays for NOWS, which our study also found.

Table 1. Demographics.

	NICU admission < 15 days (n=183)	NICU admission 15+ days (n=106)	P-value
Age	29.7 +/- 5.1	29.5 +/- 5.1	0.6079
Race			
White	178 (97.8%)	102 (97.1%)	0.7092
Black	5 (2.7%)	2 (1.9%)	1
Asian	1 (0.5%)	1 (00.9%)	1
>1 race	3 (1.6%)	2 (1.9%)	0.8374
Mode of Delivery			0.3343
SVD	97 (52.5%)	47 (44.3%)	
Operative vaginal	12 (6.6%)	9 (8.5%)	
Cesarean	73 (40.1%)	50 (47.2%)	
Insurance			
Private	2 (1.2%)	6 (6.4%)	**0.0248**
Medicaid	167 (97.1%)	83 (88.3%)	**0.0061**
Uninsured	1 (0.6%)	2 (2.1%)	0.2856
Prenatal clinic participation	0.57 +/- 0.46	0.53 +/- 0.48	0.4767
Concurrent psychiatric diagnosis			
Bipolar disorder	21 (12.6%)	12 (13.3%)	0.8475
Anxiety	101 (60.5%)	57 (63.3%)	0.6884
Panic Disorder	4 (2.4%)	3 (3.3%)	0.6984
ADHD	7 (4.2%)	4 (4.4%)	1
PTSD	16 (9.6%)	16 (17.8%)	0.0741
Tobacco use	139 (88.5%)	78 (82.1%)	0.2386
Electronic cigarette use	27 (44.3%)	20 (34.5%)	0.444
MOUD started prior to pregnancy	166 (91.7%)	93 (90.3%)	0.6698
Total buprenorphine dose (mg/d)	11 +/- 4.8	9 (single observation)	0.7044
History of overdose (at enrollment)	38 (48.7%)	24 (44.4%)	0.7233

Table 2. Selected maternal and neonatal outcomes.

	NICU admission < 15 days (n=183)	NICU admission 15+ days (n=106)	P-value
Average length of infant's NICU admission	14.5 +/- 8.8	22.1 +/- 12.8	**< 0.0001**
GA at delivery week.day; [range]	38.2 +/- 1.7; [24.4 - 41]	37.0 +/- 3.3; [25.3 - 41)	**< 0.0001**
Birth weight (gm)	2959 +/- 470	2764 +/- 740	**0.0067**
SGA birth (%ile)	35.1 +/- 23.5	42.3 +/- 27.1	**0.0191**
Highest Finnegan score	12.7 +/- 3.7	15.3 +/- 3.4	**< 0.0001**
Exclusive breastfeeding at discharge			**0.0331**
Breastfeeding only	54 (31.2%)	18 (18.9%)	
Pumped breastmilk	12 (6.9%)	13 (13.7%)	
Rooming in with infant	125 (70.6%)	48 (47.1%)	**0.0001**
Unexpected drug screen			
Delivery (urine)	45 (27.1%)	26 (31%)	0.5542
PP period (6 weeks)	73 (40.6%)	50 (48.1%)	0.2633
Program attendance			
Prenatal	0.68+/- 0.36	0.65 +/- 0.4	0.568
Postpartum	0.74+/- 0.35	0.72+/- 0.35	0.6106
Enrollment mood scores			
EPDS	11.3 +/- 6.7	11.9 +/- 5.8	0.5873
GAD-7	9 [3.0 to 16]	8 [4 to 14]	0.9808
Postpartum avg EDPS scores; score >13			
Weeks 0-4	7.5 [4.0 to 11.6]; 6 (16.7%)	7.0 [4.5 to 12]; 8 (20.5%)	0.6286; 0.771
Weeks 5-10	7 [3.8 to 11.4]; 5 (20.8%)	8 [6.0 to 10/8]; 6 (20%)	0.5029; 1
Weeks 11-15	3.5 [2.2 to 5.2]; 0	7 [7 to 13]; 2 (33.3%)	0.6291; 0.4667
Postpartum avg GAD-7 scores; score >13			
Weeks 0-4	5.8 [4 to 10]; 7 (20.6%)	4 [2 to 8]; 7 (18.9%)	0.1071; 1
Weeks 5-10	3.0 [0 to 13]; 7 (30.4%)	4.5 [2 to 7]; 3 (10%)	0.7639;
Weeks 11-15	3.5 [2.2 to 5.2]; 0	1 [1 to 5]; 0	0.0817 0.6297; N/A

427 | Personalized Infant Birth Weight Percentile Charts for Accurate Assessment of Neonatal Growth using Machine Learning

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4:00 PM - 6:00 PM

Objective: Identifying small for gestational age (SGA) and large for gestational age (LGA) neonates is imperative to manage potential neonatal complications. The Hadlock growth curve, the most widely used standardized growth curve in the United States, overlooks maternal factors such as race, height, BMI, and pregnancy weight gain, which are known to impact fetal weight. This study aims to create a personalized birth weight percentile chart to improve accuracy of diagnosing SGA and LGA neonates.

Study Design: Using the 2022 CDC natality dataset, a least squares quantile regression model was developed using Python to predict the 10th and 90th percentile birth weights based on maternal factors. To improve model accuracy, gestational diabetes, gestational hypertension, plurality, tobacco use, infant sex, and gestational age (GA) were included. Polynomial regressions determined the best-fit degrees. The model focused on pregnancies from 27 to 42 weeks GA, excluding extreme birth weights (< 200 grams or > 5000 grams) and unknown parameters (n = 3,428,570). Validity of the model was confirmed using an 80:20 split for testing and training, respectively.

Results: Among the factors in the model, plurality had the strongest effect on determining the fetal weight, followed by

GA, maternal race, cigarette smoking, fetal gender, and maternal height, even though GA should not alter the percentile. Pre-pregnancy maternal BMI and pregnancy weight gain showed much smaller effects in this model. The quantile loss at the 10th percentile was 66 grams and 90th percentile was 72 grams.

Conclusion: The model was trained using a large, national dataset and shows high accuracy with low quantile losses; therefore, this model can supplement physicians' diagnoses of SGA and LGA and aid in appropriate delivery preparations. However, the model results should be interpreted with caution because medical complications and tobacco smoking status used for the model are known factors that can affect fetal growth. In the next model, we aim to determine the SGA threshold that is associated with adverse fetal outcomes.

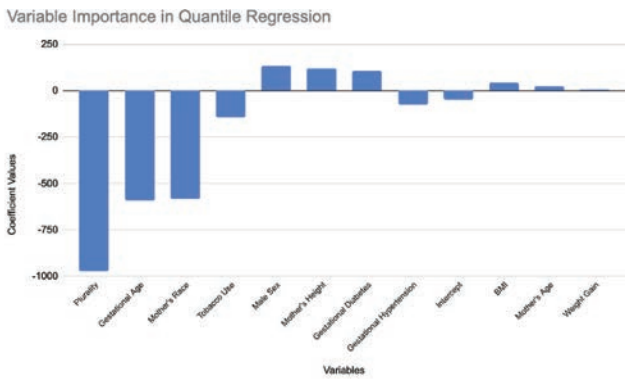

Figure 1: Variables Shown by Coefficient Importance

Input
Mother's BMI: 20 **Mother's Age**: 30 years **Mother's Height**: 65 inches **Mother's Race**: White **Weight Gain During Pregnancy**: 20 lbs **Gestational Diabetes**: No **Gestational Hypertension**: No **Plurality**: 1 **Tobacco Use**: No **Infant Sex**: Female **Gestational Age**: 37 weeks

Predicted 10th Percentile Birth Weight Output	Predicted 90th Percentile Birth Weight Output
2556.02 g	3457.01 g

Table 2: Predicted 10th and 90th Percentile Weights Example

428 | Interactive Lecture Improves Resident Knowledge and Comfort with Periviable Delivery Counseling

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4:00 PM - 6:00 PM

Objective: Counseling patients at risk for periviable delivery (PVD) is a challenging part of obstetrics. Available resources for PVD counseling (PVDC) include previously published best practices and the National Institute for Child Health and Human Development (NICHD) Calculator for Extremely Preterm Birth Outcomes. Given the necessary nuanced provider knowledge, ethical complexity, and emotional environment of a PVD, we assessed ObGyn resident PVD knowledge and comfort with counseling before and after an educational intervention.

Study Design: ObGyn residents at a large urban center were given a pre-survey to assess experience, knowledge, and comfort with PVDC. An interactive lecture was given, with case review and group discussion. Those unable to attend lecture were given a reading for comparison. A post-survey was distributed. Paired t-test was used for statistical analysis.

Results: 39 residents participated, and 32 (82.1%) completed the pre-survey. Collectively, residents reported counseling 100 patients a year on PVD, and receiving 1.6 hours of PVD education a year. A majority (87.5%) felt that patients poorly understood after counseling. 21 residents completed the post-survey: 18/26 post-lecture and 3/13 post-reading. Post-lecture, comfort with PVDC significantly improved for all residents (mean 1.9 vs 3.6 on a 5-point Likert Scale; $p< 0.01$) and PGY1s (mean 1.5 vs 3.2; $p = 0.01$). Knowledge also improved as 50% of residents named all 5 NICHD calculator factors post-lecture, versus 12.5% pre-survey. 100% of residents felt the lecture was very or extremely valuable, and 94.4% plan to implement changes in their practice. Residents post-reading had minimal improvement in PVDC comfort, felt it was slightly or moderately valuable, and none would implement changes.

Conclusion: At centers with a high incidence of PVD, resident education is crucial to counseling and patient care. Interactive lectures with an opportunity to practice counseling significantly improved comfort and knowledge. These findings highlight a need for high-quality resident education and resources to improve care for patients at risk for PVD.

429 | Cost-Effectiveness of Antepartum Versus Postpartum Treatment of Latent Tuberculosis Infection

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4:00 PM - 6:00 PM

Objective: Treatment of latent tuberculosis infection (LTBI) during pregnancy is typically reserved for high-risk cases due to concerns about potential side effects. However, pregnancy provides a unique interaction with the healthcare system, offering an opportunity to treat LTBI and prevent future progression to active tuberculosis (TB). This study aimed to evaluate the health outcomes and cost-effectiveness of antepartum versus postpartum treatment among pregnant individuals with LTBI.

Study Design: A decision-analytic model using TreeAge software was constructed to compare the outcomes and cost-effectiveness of antepartum versus postpartum treatment of LTBI. The theoretical cohort included 20,000 individuals with LTBI based on the number of annual pregnancies and prevalence of LTBI in the United States. Outcomes included the number of complete treatments, drug-induced hepatotoxicity, progression to active TB, fatality from active TB, and cases of untreated latent TB based on data demonstrating lower adherence and follow-up in the postpartum period. Model inputs were derived from the literature. The threshold for cost-effectiveness was $100,000/ quality-adjusted life year (QALY). Sensitivity analyses were performed to assess the robustness of the results.

Results: Compared to postpartum treatment, the antepartum treatment strategy resulted in 4,217 additional treatment completions, 239 fewer cases of progression to active TB, and 17 fewer fatalities from active TB (Table 1). Additionally, the postpartum group had 4,520 cases of untreated LTBI related to the rate of lower follow-up postpartum. Antepartum treatment was the cost-effective and dominant strategy, resulting in cost savings of $8,555,587 and an increase in 4,266 QALYs relative to postpartum treatment.

Conclusion: The antepartum treatment strategy for LTBI was cost-effective and resulted in better health outcomes compared to postpartum treatment. These findings may inform future policies that integrate LTBI treatment into prenatal care to potentially improve outcomes and enhance resource allocation.

Table 1: Outcomes, cost, and effectiveness associated with antepartum versus postpartum treatment of latent tuberculosis infection

	Antepartum Treatment	Postpartum Treatment	Difference
LTBI Treatment Completed	16,326	12,109	↑4,217
Drug-induced Hepatotoxicity	30	17	↑13
Progression to Active TB	243	482	↓239
Fatality from Active TB	17	34	↓17
Untreated LTBI	0	4520	↓4,520
Cost (USD)	$8,708,029	$537,783	↓$8,555,587
Effectiveness (QALYs)	17,263,616	533,517	↑4,266
Strategy	Dominant	Dominated	

LTBI – latent tuberculosis infection, TB – tuberculosis

430 | Management of Placenta Accreta Spectrum with Cesarean Hysterectomy Versus Conservative Management: a Cost-Effectiveness Analysis

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4:00 PM - 6:00 PM

Objective: Cesarean hysterectomy is the standard treatment for placenta accreta spectrum (PAS), but alternative conservative management strategies (e.g., leaving the placenta in situ), have been proposed to preserve fertility. This study aimed to evaluate the cost-effectiveness of conservative management for PAS.

Study Design: A decision-analytic model was built using TreeAge software to compare the outcomes and cost-effectiveness of cesarean hysterectomy versus conservative management. The theoretical cohort included 5,000 individuals in the U.S. with PAS. Maternal outcomes included severe postpartum hemorrhage (>3000 mL estimated blood loss), adjacent organ injury, severe maternal morbidity (including intensive care unit admission, sepsis, and disseminated intravascular coagulation), endometritis, maternal death, and readmission. The number of hysterectomies performed within and after 24 hours of delivery (primary and delayed, respectively) was calculated for the conservative management group. Model inputs were derived from the literature. The threshold for cost-effectiveness was set at $100,000 per quality-adjusted life year (QALY). Sensitivity analyses were performed to assess the robustness of the results.

Results: Cesarean hysterectomy resulted in 2,137 more severe postpartum hemorrhages, 413 more adjacent organ injuries, and 516 more cases of non-hemorrhage SMM, and 8 more maternal deaths compared to conservative management. Conversely, conservative management led to 542 more cases of endometritis and 1,268 more readmissions. Additionally, 347 primary and 202 delayed hysterectomies were performed in the conservative management group. Conservative management resulted in a $64 million cost reduction and an increase of 7,609 QALYs relative to cesarean hysterectomy.

Conclusion: Compared to cesarean hysterectomy, conservative management was cost-effective, with distinct trade-offs in maternal outcomes, such as reduced severe hemorrhage and increased endometritis and readmission. Additional studies are needed to refine the selection of patients undergoing conservative management for fertility preservation.

Table 1: Maternal outcomes, cost, and effectiveness associated with cesarean hysterectomy versus conservative management for PAS

	Cesarean Hysterectomy	Conservative Management	Difference
Severe Postpartum Hemorrhage* (cases)	2,951	814	2,137
Adjacent Organ Injury (cases)	645	233	413
Endometritis (cases)	0	542	-542
Severe Maternal Morbidity** (cases)	806	291	516
Maternal Death (cases)	39	31	8
Readmission within 6 months (cases)	169	1,437	-1,268
Primary Hysterectomy (cases)	0	347	-347
Delayed Hysterectomy (cases)	0	202	-202
Cost ($USD)	178,748,367	115,002,669	63,745,698
Effectiveness (QALYs)	125,587	133,195	-7,609
Strategy	Dominated	Dominant	

*Defined as > 3000mL estimated blood loss
**Defined as intensive care unit admission, sepsis, and disseminated intravascular coagulation

431 | Patient-Similarity Tool Enhancing Decision-Making on Whether to Place Cervical Cerclage

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4:00 PM - 6:00 PM

Objective: Decision-making for cervical cerclage placement is complex and requires consideration of specific patient characteristics. We sought to develop a *patient similarity tool* to augment clinical decision-making and enhance shared decision-making based on the clinical course of similar patients. Patient similarity identifies patients with similar clinical characteristics to predict outcomes and personalize treatment plans.

Study Design: We used a retrospective cohort of all pregnancies at a tertiary center from 2010-24, including all individuals with discussions considering cervical cerclage. The list of patients and their clinical variables served as the analytic DATABASE for the patient similarity tool. We defined 16 variables for similarity assessment that were available in the electronic health record. An additional seven variables will require manual collection: cervical dilation, membranes bulging, cervical length, amniotic fluid sludge, uterine activity, WBC, and CRP. Based on the index patient's similarity parameters, the tool detects similar patients and describes their maternal and neonatal outcomes with and without cerclage.

Results: Among 138,439 deliveries during the study period, 684 clinical scenarios considering cervical cerclage were captured. Cerclage was performed in 343 (50.1%) of these cases. Table 1 compares individuals with and without cerclage based on the

variables selected for similarity assessment. Significant differences were observed in maternal age, gravidity, previous painless dilation, previous cerclage, last pregnancy gestational age (GA) at delivery, spontaneous conception, multifetal pregnancy, and GA at decision time. Figure 1 illustrates an index patient and presents similar patients and their outcomes with and without cerclage.

Conclusion: Developing a patient similarity tool to augment decision-making and decision sharing regarding cervical cerclage placement is feasible. We speculate that our proposed tool may improve data-driven decision-making and empower patient participation in shared decision-making.

Table 1: Similarity Assessment Variables

	Overall (n=684)	No cerclage (n=341)	Cerclage (n=343)	p-value
Medical & Gynecological History				
Age (mean (SD))	**32.83 (6.32)**	**32.08 (6.48)**	**33.58 (6.08)**	**0.002**
Smoking (%)	37 (5.4)	17 (5.0)	20 (5.8)	0.749
History of Cervical Procedure (%)	19 (2.8)	9 (2.6)	10 (2.9)	1
Previous D&E / D&C (%)	55 (8.0)	23 (6.7)	32 (9.3)	0.27
Obstetrical history				
Gravidity (mean (SD))	**3.07 (2.29)**	**2.81 (2.29)**	**3.32 (2.28)**	**0.004**
Parity (mean (SD))	1.15 (2.66)	1.07 (1.45)	1.22 (3.47)	0.441
Previous painless dilatation (%)	**16 (2.3)**	**2 (0.6)**	**14 (4.1)**	**0.006**
Previous Cerclage (%)	**20 (2.9)**	**3 (0.9)**	**17 (5.0)**	**0.003**
Latest Delivery Week Without Cerclage (mean (SD)) *	34.88 (8.36)	36.83 (6.10)	33.84 (9.25)	0.168
Pregnancy Loss < 24 weeks (%)	59 (8.6)	25 (7.3)	34 (9.9)	0.286
Prior PPROM (%)	19 (2.8)	7 (2.1)	12 (3.5)	0.359
Most recent Pregnancy GA at delivery (mean (SD)) *	**32.29 (8.39)**	**34.09 (7.34)**	**30.57 (9.00)**	**0.015**
Current pregnancy				
Spontaneous Conception (%)	**485 (70.9)**	**256 (75.1)**	**229 (66.8)**	**0.021**
Twins or Higher Order Gestation (%)	**134 (19.6)**	**92 (27.0)**	**42 (12.2)**	**<0.001**
Decision parameters				
GA (median [IQR])	**21.29 [18.00, 22.86]**	**22.00 [20.00, 23.43]**	**19.86 [16.29, 22.29]**	**<0.001**
Vaginal Bleeding (%)	30 (4.4)	20 (5.9)	10 (2.9)	0.09

* Pregnancy reaching 2nd trimester
D&E - Dilation and Evacuation; D&C - Dilation and Curettage; PPROM - Preterm premature rupture of membranes; GA – Gestational age;

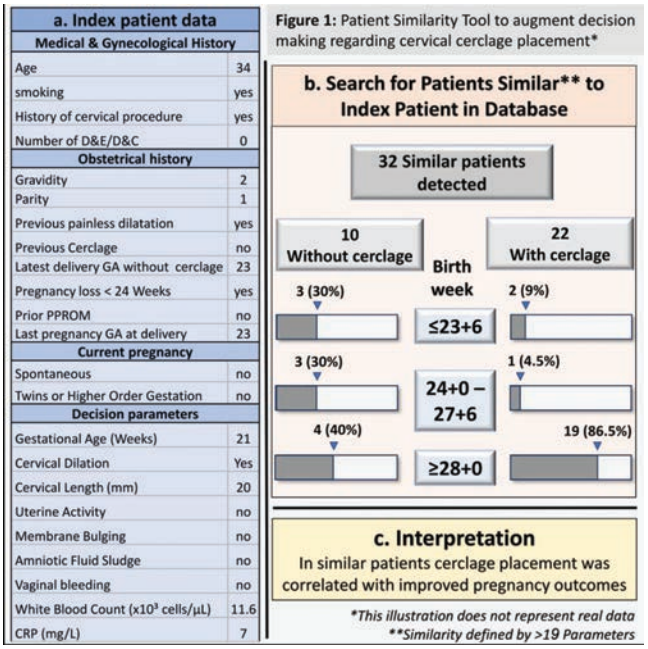

Figure 1: Patient Similarity Tool to augment decision making regarding cervical cerclage placement*

432 | Early Pregnancy Levels of Cholesterol in Maternal Serum and Pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: Elevated maternal serum lipid concentrations during late pregnancy are associated with pregnancy complications. The goal of this study was to investigate the association between early pregnancy maternal serum levels of cholesterol and selected pregnancy outcomes.

Study Design: A prospective cohort study was conducted, including pregnant women with a singleton pregnancy, recruited between 11-13 gestational weeks. The independent variable was maternal serum level of cholesterol (high cholesterol was defined as >200 mg/dL). The incidence of the following pregnancy outcomes was compared between women with high and low cholesterol: abortion, gestational hypertension, gestational diabetes mellitus, gestational length, preterm birth, birth weight, low birthweight, macrosomia, cesarean delivery and low 5 minutes Apgar score.

Results: The study included 201 women. The incidence of high cholesterol was 35% (n = 70). Mean birthweight was higher among women with high cholesterol (Table 2, 3392.71 ± 426 versus 3220.78 ± 448 grams, p-value = 0.01). Similarly, women with high cholesterol were more likely to deliver a macrosomic newborn (10.1% versus 3.2%, p-value = 0.057). Multivariable linear model, adjusted for gender and maternal diseases, found that an increase in one unit of cholesterol was significantly related with an increase of 2.85 grams in birthweight (95% CI = 0.98 - 4.73, p-value = 0.003). Multivariable logistic model which adjusted for gender and maternal BMI, found that every unit increase of cholesterol was significantly related with an increased risk for macrosomia (OR = 1.025, 95% CI = 1.003–1.047, p-value =

0.025). No association was found between cholesterol and others pregnancy outcomes.

Conclusion: Higher birthweight and a risk for macrosomia were found among women with high early pregnancy cholesterol levels, even after controlling for maternal BMI. Lowering maternal cholesterol levels may aid in prevention of pregnancy complications associated with high birthweight.

Table 2 – The association between cholesterol and pregnancy outcomes

	Cholesterol ≤ 200 mg/dL n= 128, 65%	Cholesterol > 200 mg/dL n= 70, 35%	p-value
Abortion (n, %)	6, 4.8%	1, 1.4%	0.219
Gestational Hypertension (n, %)	2, 1.5%	0, -	0.299
GDM (n, %)	8, 5.9%	6, 8.3%	0.511
Gestational length (days, mean ± SD)	267.01 ± 31.64	270.69 ± 24.60	0.397
PTB (n, %)	7, 5.7%	4, 5.7%	0.995
Birth weight (grams, mean ± SD)	3220.782 ± 448	3392.710 ± 426	**0.01**
Low birth weight (<2500) (n, %)	7, 5.9%	1, 1.4%	0.262
Macrosomia (>4000) (n, %)	4, 3.2%	7, 10.1%	**0.057**
Cesarean (n, %)	25, 19.8%	14, 19.7%	0.983
Low Apgar 5 (<7) (n, %)	3, 2.6%	0, -	0.180

433 | Early Pregnancy Levels of Acute Phase Reactants in Maternal Serum and Pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: Inflammation and infection within the fetoplacental unit have been suggested as a mechanism involved in pregnancy complications. The goal of this study was to investigate the association between early pregnancy maternal serum levels of the following acute phase reactants (ARPs): CRP (C- reactive protein), albumin, triglyceride, HDL and selected pregnancy outcomes.

Study Design: A prospective cohort study was conducted, including pregnant women with a singleton pregnancy, recruited between 11-13 gestational weeks. The independents variables were serum levels of the following ARPs: CRP, Albumin, Triglyceride, and HDL. The incidence of the following pregnancy outcomes was compared between women with high and low levels of the measures APRs: abortion, hypertensive disorders, gestational diabetes mellitus, gestational length, preterm birth (PTB), birth weight, low birthweight, macrosomia, cesarean delivery and low 5 minutes Apgar score.

Results: The study included 201 women. No association was found between the ARPs and pregnancy outcomes (Table 2), for instance, the incidence of PTB were 5.8% (n = 8) versus 5.5% (n = 3), among women with high and low HDL, respectively (p = 0.917), and 5.3% (n = 6) versus 6.6% (n = 5) among women with high and low Albumin, respectively (p = 0.704). Birth weight was 3220.75 ± 403 versus 3317.51 ± 467 grams among women with low and high CRP, respectively (p = 0.160), and 3296.39 ± 433.26 versus 2676.05 ± 464.76 grams among women with high and low Albumin, respectively (p = 0.758). These findings were supported by multivariable logistic and linear models, which adjusted for maternal BMI and maternal age.

Conclusion: Based on the current study, early pregnancy levels of ARPs are not associated with an increased risk for adverse pregnancy outcomes.

Table 2- The association between pregnancy outcomes and independent variables

	CRP ≤ 0.5 mg/dL n=66, 34%	CRP > 0.5 mg/dL n=130, 66%	p-value	Triglycerides ≤ 150 mg/dL n= 127, 68%	Triglycerides > 150 mg/dL n= 64, 32%	p-value	HDL ≥ 60 mg/dL n= 146, 73%	HDL < 60 mg/dL n= 54, 27%	p-value	Albumin ≥ 4 gr/dL n= 121, 61%	Albumin < 4 gr/dL n= 77, 39%	p-value
Abortion (n, %)	3, 4.7%	4, 3.1%	0.579	4, 3.1%	3, 4.4%	0.644	5, 3.6%	2, 3.6%	0.983	5, 4.3%	2, 2.6%	0.553
Gestational Hypertension (n, %)	0, -	2, 1.5%	0.330	1, 0.7%	1, 1.5%	0.604	0, -	2, 3.4%	0.078	0, -	2, 2.5%	0.153
GDM (n, %)	2, 2.9%	12, 8.9%	0.109	8, 5.8%	6, 8.8%	0.409	8, 5.4%	6, 10.3%	0.205	7, 5.6%	7, 8.8%	0.392
Gestational length (days, mean ± SD)	267.28 ± 35.9	268.83 ± 25.7	0.725	268.242 ± 29.34	268.479 ± 29.48	0.958	268.72 ± 28.67	267.39 ± 31.32	0.774	267.25 ± 32.77	269.96 ± 23.90	0.531
PTB (n, %)	2, 3.1%	9, 7.1%	0.262	8, 6.3%	3, 4.6%	0.643	8, 5.8%	3, 5.5%	0.917	6, 5.3%	5, 6.6%	0.704
Birth weight (grams, mean ± SD)	3220.75 ± 403	3317.51 ± 467	0.16	3277.398 ± 437.5	3291.800 ± 428.7	0.833	3305.83 ± 430.46	3231.82 ± 485.39	0.301	3296.39 ± 433.26	2676.05 ± 464.76	0.758
Low birth weight (<2500) (n, %)	2, 3.3%	5, 4%	0.801	6, 4.9%	2, 3.1%	0.561	4, 3.0%	4, 7.5%	0.165	3, 2.7%	4, 5.4%	0.343
Macrosomia (>4000) (n, %)	3, 4.7%	8, 6.3%	0.753	6, 4.7%	5, 7.7%	0.512	9, 6.6%	2, 3.6%	0.732	6, 5.3%	5, 6.6%	0.757
Cesarean (n, %)	12, 18.2%	24, 18.8%	0.923	27, 20.6%	12, 18.2%	0.686	29, 20.7%	10, 17.9%	0.651	24, 20.5%	13, 16.9%	0.529
Low Apgar 5 (<7) (n, %)	1, 1.6%	2, 1.6%	0.984	1, 0.8%	2, 3.1%	0.245	2, 1.5%	1, 2.0%	0.822	2, 1.8%	1, 1.4%	0.833

434 | Amyloid-β (Aβ) Proteoforms Impair Trophoblast Survival and Function - Relevance to Defective Placentation in Preeclampsia

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4:00 PM - 6:00 PM

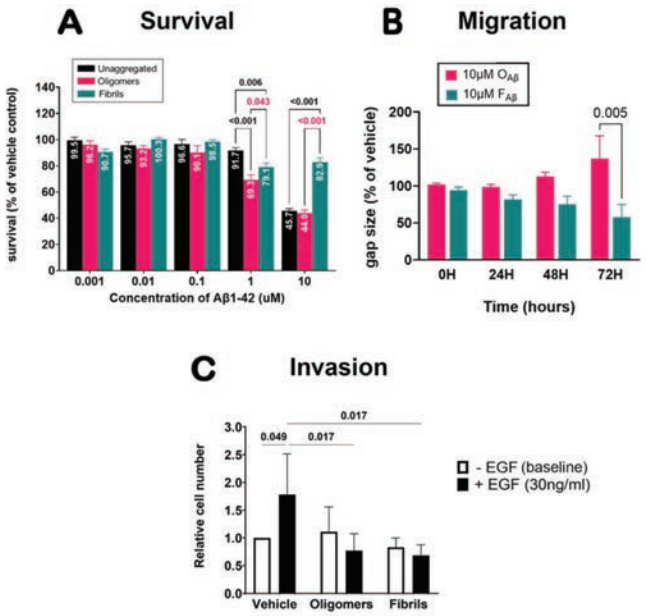
Objective: Misfolding of proteins and their subsequent assembly into supramolecular aggregates are key mechanisms involved in neurodegenerative diseases such as Alzheimer's disease (AD). These aggregates range from small prefibrillar cytotoxic oligomers to large β-sheet rich fibrils that accumulate in tissues and disrupt normal function. In AD, the accumulation of amyloid-β (Aβ) oligomers ($O_{A\beta}$) and fibrils ($F_{A\beta}$) in the brain is a disease hallmark. Excess Aβ aggregates were recently detected in the serum, urine, and placenta of patients with preeclampsia, which is now considered a protein misfolding disease of pregnancy. Whether Aβ aggregates directly impact placental function thereby contributing to pathogenesis of preeclampsia has yet to be elucidated. We aimed to characterize the effect of different Aβ proteoforms on trophoblast cell survival and function.

Study Design: We exposed an immortalized human extravillous trophoblast (EVT) cell line (HTR8/SVNeo) to exogenous unaggregated ($U_{A\beta}$), $O_{A\beta}$, or $F_{A\beta}$ preparations (0.001-10μM) and assessed their effect on cell survival by measuring cytotoxicity (MTT assay), migration (scratch assay) and invasion (Transwell assay ± epidermal growth factor [EGF], an essential regulator of placental development). Data from n = 3-5 independent experiments was analyzed. A dual apoptosis/necrosis assay was used to determine the mechanism of cell death.

Results: **1)** Both $O_{A\beta}$ and $F_{A\beta}$ decreased EVT survival with $O_{A\beta}$ having a more profound effect (p< 0.001); at higher concentrations, $U_{A\beta}$ also decreased cell viability likely due to spontaneous oligomerization (Fig. **A**). **2)** EVT death occurred primarily via apoptosis (not shown). **3)** While $O_{A\beta}$ decreased EVT migration (increased gap size), $F_{A\beta}$ increased cell migration compared to vehicle control (Fig. **B**). **4)** Both $O_{A\beta}$ and $F_{A\beta}$ inhibited EGF-

mediated invasion (p = 0.017) without affecting baseline invasion (Fig. **C**).

Conclusion: Presence of excess Aβ aggregates during placental development has the potential to contribute to preeclampsia pathogenesis by disrupting key cellular processes such as EVT survival, migration and invasion.



435 | APOE4 Genotype Increases Susceptibility to Fetal Growth Restriction in the Context of Preeclampsia

Bani Medegan Fagla[1]; Cielo Dela Rosa[1]; Savita Sundar[1]; Erykah Walton[1]; Jason York[1]; Guomao Zhao[1]; Aswathi Jayaram[1]; Leon M. Tai[1]; Mert Ozan Bahtiyar[2]; Catalin S. Buhimschi[1]; Irina A. Buhimschi[1]

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4:00 PM - 6:00 PM

Objective: *APOE4,* one of three alleles of the lipid regulating gene *APOE,* is the greatest genetic risk factor for sporadic Alzheimer's disease (AD) particularly in females. Preeclampsia (PE), a pregnancy-specific disorder, is characterized by abnormal deposition of misfolded proteins in the placenta, analogous to the hallmark protein aggregates in AD brain. We sought to investigate in a human cohort the association between *APOE* genotype and risk of PE with or without fetal growth restriction (FGR; EFW < 10%). Additionally, the effect of *APOE4* was investigated mechanistically in a transgenic mouse model where the mouse *ApoE* gene was substituted by either human *APOE4* or *APOE3* (the common allele).

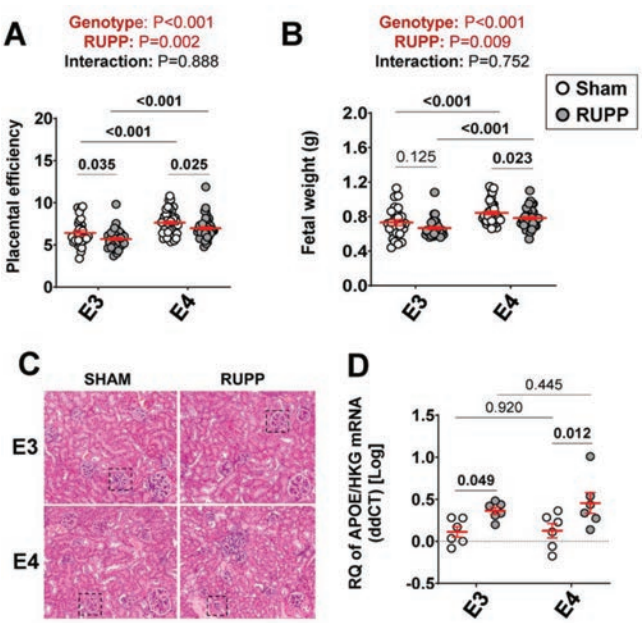
Study Design: We genotyped 181 consecutively enrolled maternal-fetal dyads divided by pregnancy phenotype in three clinical groups: **1)** PE without FGR (n = 56), **2)** PE with FGR (n = 21), and **3)** non-PE pregnancies (n = 104). DNA was extracted from maternal or cord blood and subjected to PCR. Risk association was determined by logistic regression. For mechanistic studies, we induced a PE-like syndrome in pregnant $APOE4^{+/+}$ and $APOE3^{+/+}$ mice using the reduced uteroplacental perfusion pressure (RUPP) procedure. Control mice underwent sham surgeries (n = 6-7/group/genotype). Endpoints consisted of kidney morphology (glomerular size), fetal weights, placental efficiency, and placental ApoE mRNA expression by RT-qPCR.

Results: **1)** In the human cohort, fetal carriage of at least one *APOE4* allele was associated with increased odds of PE with FGR (p = 0.043, Fig. 1); **2)** An interaction of *APOE4* with female fetal sex was further identified (p = 0.024); **3)** In mice, placental efficiency was reduced post-RUPP in both genotypes (Fig. 2A) but only $APOE4^{+/+}$ had decreased fetal weights (Fig. 2B) and kidney injury (p = 0.014, Fig. 2C); **4)** RT-qPCR of mouse placenta indicated significantly upregulated ApoE mRNA in response to RUPP in both genotypes.

Conclusion: ApoE participates to placental homeostasis during pregnancy. *APOE4* may have a reduced capacity to maintain optimal fetal growth in the context of PE-associated placental dysfunction compared to *APOE3*.

	PE (n=77)			PE without FGR (n=56)			PE with FGR (n=21)		
	OR	*95% CI*	*p value*	*OR*	*95% CI*	*p value*	*OR*	*95% CI*	*p value*
Model 1									
Fetal *APOE2*		X			X			X	
Fetal *APOE3*		X			X			X	
Fetal *APOE4*		X			X		3.1	1.0-9.1	***0.043***
Model 2									
Fetal *APOE2*		X			X			X	
Fetal *APOE3*		X			X			X	
Fetal *APOE4*		X			X		4.0	1.2-13.5	***0.024***
Female Fetus	2.4	1.3-4.6	***0.008***		X		6.0	1.2-30.1	***0.030***

X: No significant association (p>0.05)



436 | Changes in Uterine, Placental Metrics, and Vascularization in Placenta Left In Situ for PAS Management

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4:00 PM - 6:00 PM

Objective: In our center, one of our placenta accreta spectrum (PAS) management approaches is leaving the placenta left in situ (LIS) for either delayed hysterectomy (6-7 weeks later), or uterine preservation. We aim to describe changes in uterine and placental metrics and vascularization in individuals with placenta LIS after delivery. We compared those with planned delayed hysterectomy or uterine preservation, to those with unscheduled hysterectomy (UH).

Study Design: In this retrospective cohort, 32 individuals with placenta LIS were evaluated. Our management approach includes postpartum ultrasound biweekly until hysterectomy or passage of placental tissue. The individuals were divided into two groups, group I: successful planned procedure (scheduled hysterectomy or uterine preservation), group II: UH (defined as that occurring prior the scheduled date mainly due to vaginal bleeding). Measurements included: uterus length and height, and placental thickness. Directional color Doppler ultrasound was applied to evaluate the lower uterine segment using the following settings PRF = 22-25 cm/sec, medium filter, and 1.4 dB gain. Images were analyzed using Image J software. Quantitative vascularization (QV) was defined as the percentage of pixels containing color information over the total number of pixels in the studied area. Average change per week of the mentioned parameters were calculated. Differences in metrics and QV between UH and successful conservative management were calculated.

Results: Of 32 patients, 17 (53%) had a successful planned procedure (10 scheduled hysterectomy and 7 retained their uterus) and 15 (47%) had an UH. Differences between the two groups are presented in table 1. The reduction in uterine metrics and QV in those with successful conservative management was more pronounced, but not statistically significant.

Conclusion: This is the first report showing longitudinal change in uterine, placental metrics and QV in those with the placenta LIS. More studies are needed to identify clinical variables which may predict successful conservative management of PAS.

Table 1. Change (Δ) in Uterine, Placental Metrics and Vascularization in Women with Placenta in Situ after Delivery

	Successful Planned Procedure (n=17)	Unscheduled Hysterectomy (n=15)	p
Δ Uterus length *	-5.12 (8.28)	-3.98 (16.91)	0.8
Δ Uterus Height *	-3.98 (8.57)	0.28 (13.8)	0.2
Δ Placenta thickness *	0.74 (8.74)	-1.17 (8.34)	0.4
Δ Quantitative Vascularization §	-1.94 (6.47)	-0.32 (7.56)	0.3

* expressed in mm or § % per week (mean (standard deviation))

437 | The Impact of Weight Gain on Pregnancy Outcomes in Patients with Low BMI

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4:00 PM - 6:00 PM

Objective: The association between adverse pregnancy outcomes and obesity is established, however the impact of low maternal weight upon outcomes is much less studied. We sought to evaluate the odds of adverse pregnancy outcomes in the setting of low pre-pregnancy BMI as well as if these risks are mitigated with adequate weight gain in pregnancy.

Study Design: Retrospective cohort study of all United States births in 2021 using National Vital Statistics US birth certificate data. Pregnancy demographics, as well as maternal and neonatal outcomes were compared between a referent group of normal pre-pregnancy BMI with adequate pregnancy weight gain and 3 investigational cohorts: low pre-pregnancy BMI with either adequate, inadequate, or greater than recommended pregnancy weight gain. Multivariate logistical regression models were used to calculate the odds of adverse maternal and neonatal outcomes.

Results: During study period, 520,552 patients had normal pre-pregnancy BMI and adequate weight gain, compared to 40,144 patients 36,650 patients, and 26,155 patients with low pre-pregnancy BMI and adequate, inadequate, or greater than recommended weight gain, respectively. Demographical data was significantly different amongst groups (Table 1). Interestingly, after adjustment for differences in demographics, low pre-pregnancy BMI was associated with adverse neonatal outcomes only when weight gain was inadequate (aOR of composite adverse neonatal outcomes 1.6, 95% CI 1.6-1.7, Figure 1), whereas low pre-pregnancy BMI with either adequate or greater than recommended weight gain has similar neonatal outcomes (aOR 1.0, 1.0-1.0, aOR 1.0, 0.9-1.0, respectively). Of equal interest, low pre-pregnancy BMI was associated with adverse maternal outcomes regardless of weight gain in the pregnancy (Figure 1).

Conclusion: Low pre-pregnancy BMI is associated with adverse neonatal outcomes only in the setting of inadequate pregnancy weight gain, whereas low pre-pregnancy BMI is associated with adverse maternal outcomes regardless of weight gain in the pregnancy.

	Low pre-pregnancy BMI			Normal pre-pregnancy BMI	
Maternal Factors	**Adequate (n=40,144)**	**Inadequate (n=36,650)**	**More than recommended (n=26,155)**	**Adequate (n=520,552)**	**P**
Age (years)					<.001
<18	1,109 (2.8%)	1,273 (3.5%)	893 (3.4%)	5,550 (1.1%)	
18-34	33,727 (84.0%)	29,033 (79.2%)	21,796 (83.3%)	398,949 (76.7%)	
>34	5,308 (13.2%)	5259 (14.4%)	2,529 (9.7%)	110,597 (21.3%)	
Parity					<.001
0	19,062 (47.5%)	16,163 (44.1%)	14,409 (55.1%)	216,655 (41.6%)	
1	12,220 (30.4%)	11,473 (31.3%)	6,525 (25.0%)	174,030 (33.4%)	
2	5,400 (13.5%)	5,192 (14.2%)	3,028 (11.6%)	79,246 (15.2%)	
3+	3,462 (8.6%)	3,755 (10.3%)	2,091 (8.0%)	49,542 (9.5%)	
Maternal race					<.001
Non-Hispanic White	22,132 (55.1%)	17,489 (47.7%)	14,677 (56.1%)	307,755 (59.1%)	
Non-Hispanic Black	5,264 (13.1%)	5,527 (15.1%)	3,935 (15.0%)	45,727 (8.8%)	
Asian	7,337 (18.3%)	7,265 (19.8%)	4,610 (17.6%)	99,204 (19.1%)	
Hispanic	4,778 (11.9%)	4,843 (13.2%)	1,578 (6.0%)	49,370 (9.5%)	
Other	1,376 (3.4%)	1,075 (2.9%)	1,112 (4.3%)	13,373 (2.6%)	
Not listed	403 (1.0%)	451 (1.2%)	243 (0.9%)	5,123 (1.0%)	
Maternal education					<.001
Less than HS	5,457 (13.6%)	6,220 (17.0%)	4,351 (16.6%)	42,393 (8.2%)	
HS grad or GED	12,369 (30.8%)	11,122 (30.4%)	9,536 (36.5%)	100,172 (19.2$)	
Higher than HS	22,932 (57.1%)	18,639 (50.9%)	11,888 (45.5%)	370,832 (71.3%)	
Pre-pregnancy BMI	17.54 ± .01	17.52 ± .01	17.44 ± .01	22.10 ± .01	<.001
Chronic medical condition					<.001
Chronic HTN	163 (.04%)	213 (0.6%)	161 (0.6%)	4,373 (0.8%)	
Pregestational DM	80 (0.2%)	79 (0.2%)	70 (0.3%)	2,068 (0.4%)	
Gestational HTN	1,567 (3.9%)	1,189 (3.2%)	1,631 (6.2%)	23,763 (4.6%)	
Gestational Diabetes	1,374 (3.4%)	1,719 (4.7%)	816 (3.1%)	24,313 (4.7%)	
Prenatal factors					<.001
ART	506 (1.3%)	447 (1.2%)	204 (0.8%)	10,099 (1.9%)	
Cigarette use	2,781 (6.9%)	2,531 (6.9%)	2,465 (9.4%)	15,540 (3.0%)	
No prenatal care	915 (2.3%)	1,632 (4.4%)	638 (2.4%)	7,645 (1.5%)	
Medicaid	18,959 (47.2%)	17,824 (48.6%)	14,336 (54.8%)	156,963 (30.2%)	

Table 1. Demographics of Low pre-pregnancy BMI with either adequate, inadequate, or more than recommended weight gain compared to pregnancies with normal pre-pregnancy BMI and adequate weight gain. Data is presented as mean and standard deviation or N (%).

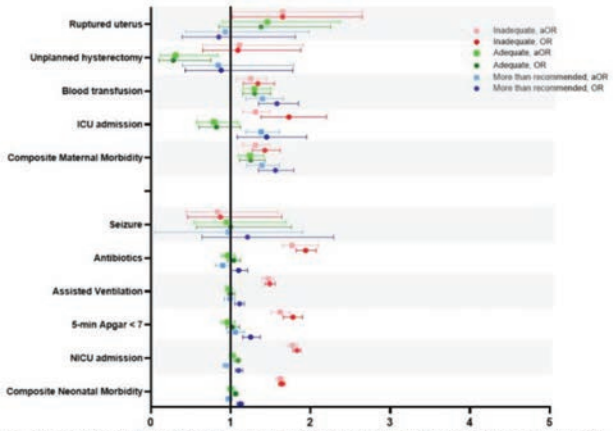

Figure 1. Association of low BMI, stratified by pregnancy weight gain, and adverse maternal and neonatal outcomes. Data presented as odds ratio (OR) with 95% CI. Only inadequate weight gain was associated adverse neonatal outcomes, indicating that appropriate weight gain is protective from a neonatal perspective. Interestingly, weight gain did not affect the risk of adverse maternal outcomes. Composite maternal morbidity is considered positive by the presence of any maternal morbidity in a pregnancy. Composite neonatal morbidity is considered positive by the presence of any neonatal morbidity in a pregnancy.

438 | The Importance of the Number of Prenatal Visits on Pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: Most guidelines recommend roughly 11-15 prenatal visits in each pregnancy, with possibly more for high-risk pregnancies. While no prenatal care is associated with adverse outcomes, the true risk of limited prenatal care is unknown. Thus, we sought to evaluate the association of the number of prenatal visits with pregnancy outcomes.

Study Design: Retrospective cohort of all United States births in 2022 using National Vital Statistics US birth certificate data. Pregnancy demographics, as well as maternal and neonatal outcomes were compared between a referent group of patients that attended 11-15 prenatal visits with 3 investigational cohorts: patients with < 5 prenatal visits, 5-10 prenatal visits, and > 15 prenatal visits. Linear regression models were used to calculate the attributable effect of prenatal visit number upon delivery gestational age, and multivariate logistic regression was used to calculate the odds of adverse maternal and neonatal outcomes.

Results: During study period, 232,616 patients had < 5 prenatal visits, while 1,341,990 had 5-10, 1,702,481 had 11-15, and 320,008 had > 15 visits. Demographics were significantly different amongst groups (Table 1). While all study groups had increased rates of adverse outcomes, the findings were strongest with < 5 visits, which was attributable to a 1.5 week (95% CI 1.44-1.54) decrease in gestational age at delivery, even after adjustment for known risk factors of preterm birth. Conversely, attending 5-10 visits attributed to only 0.66 week (95% CI 0.64-0.68) decrease, and attending > 15 visits attributed to a clinically irrelevant 0.19 week decrease in delivery gestational age. Similar trends were identified when evaluating maternal and neonatal outcomes, in which < 5 prenatal visits significantly increased the odds of adverse maternal and neonatal outcomes (Figure 1).

Conclusion: Attending < 5 prenatal visits is strongly associated with adverse pregnancy outcomes. As patients attend more visits, the odds of adverse outcomes decrease. This highlights the extremely important role of routine prenatal care upon maternal and child health.

	< 5 Prenatal visits (n= 232,616)	5-10 Prenatal visits (n= 1,341,990)	11-15 Prenatal visits (n= 1,702,481)	>15 Prenatal visits (n=320,008)	p-value
Age (years)					p<0.001
<18	5,843 (2.5%)	16,579 (1.2%)	12,066 (0.7%)	1,796 (0.6%)	
18-34	186,438 (80.1%)	1,054,292 (78.6%)	1,345,016 (79.0%)	237,678 (74.3%)	
>34	40,335 (17.3%)	271,119 (20.2%)	345,399 (20.3%)	80,534 (25.2%)	
Multiparity status					p<0.001
1	61,541 (26.5%)	423,553 (31.6%)	555,849 (32.6%)	101,677 (31.8%)	
2	40,918 (17.6%)	236,402 (17.6%)	272,854 (16.0%)	50,496 (15.8%)	
3	24,308 (10.4%)	111,027 (8.3%)	109,537 (6.4%)	21,053 (6.6%)	
4+	28,814 (12.4%)	87,599 (6.5%)	67,089 (3.9%)	13,464 (4.2%)	
Maternal race					p<0.001
Non-Hispanic white	80,443 (34.6%)	595,069 (44.4%)	959,141 (56.4%)	175,189 (54.8%)	
Non-Hispanic black	53,629 (23.1%)	210,663 (15.7%)	191,153 (11.2%)	43,341 (13.5%)	
Asian	8,127 (3.5%)	84,952 (6.3%)	101,643 (6.0%)	19,786 (6.2%)	
Hispanic	75,260 (32.4%)	390,109 (29.1%)	386,389 (22.7%)	69,013 (21.6%)	
Other	12,221 (5.3%)	48,533 (3.6%)	50,404 (3.0%)	9,750 (3.0%)	
Not listed	2,936 (1.3%)	12,664 (0.9%)	13,751 (0.8%)	2,929 (0.9%)	
Maternal education					p<0.001
Less than high school	59,615 (25.6%)	177,956 (13.3%)	132,739 (7.8%)	23,388 (7.3%)	
High school graduate or GED	79,855 (34.3%)	374,954 (27.9%)	406,565 (23.9%)	75,784 (23.7%)	
Higher than high school	87,030 (37.4%)	765,462 (57.0%)	1,140,262 (67.0%)	216,689 (67.7%)	
Pre-pregnancy BMI (kg/m^2)					p<0.001
Underweight (<18.5)	8,309 (3.6%)	38,182 (2.8%)	41,381 (2.4%)	6,983 (2.2%)	
Normal (18.5-24.9)	82,947 (35.7%)	505,066 (37.6%)	654,420 (38.4%)	106,285 (33.2%)	
Overweight (25.0-29.9)	59,161 (25.4%)	369,096 (27.5%)	465,319 (27.3%)	81,612 (25.5%)	
Obese (>30.0)	64,147 (27.6%)	406,593 (30.3%)	523,590 (30.8%)	121,853 (38.1%)	
Chronic medical condition					p<0.001
Chronic HTN	6,128 (2.6%)	35,132 (2.6%)	45,303 (2.7%)	18,405 (5.8%)	
Pregestational Diabetes	2,411 (1.0%)	13,436 (1.0%)	16,682 (1.0%)	9,439 (2.9%)	
Gestational hypertension	20,387 (8.8%)	131,433 (9.8%)	152,045 (8.9%)	37,756 (11.8%)	
Gestational Diabetes	10,740 (4.6%)	97,884 (7.3%)	136,403 (8.0%)	46,086 (14.4%)	
Prenatal factors					p<0.001
ART	1,429 (0.6%)	20,042 (1.5%)	32,281 (1.9%)	9,468 (3.0%)	
Cigarette use	22,613 (9.7%)	50,820 (3.8%)	134,199 (7.9%)	10,184 (3.2%)	
No prenatal care	77,878 (33.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Medicaid	139,423 (59.9%)	600,880 (44.8%)	608,641 (35.8%)	117,503 (36.7%)	
Gestational age and Birthweight					
Birthweight at Delivery (grams)	2970.6 (95 % CI 2967.41-2973.76)	3169.03 (95 % CI 3167.99-3170.07)	3336.83 (95 % CI 3336.07-3337.59)	3266.22 (95 % CI 3264.27-3268.18)	p<0.001
Gestational Age at Delivery (weeks)	37.21 (95 % CI 37.19-37.22)	38.04 (95% CI 38.03-38.04)	38.72 (95% CI 38.72-38.73)	38.43 (95% CI 38.43-38.44)	p<0.001
Gestational Age at Delivery after adjustment for PTB risk factors*	37.93 (95 % CI 37.91-37.99)	38.77 (95% CI 38.74-38.78)	39.43 (95% CI 39.41-39.44)	39.24 (95% CI 39.22-39.26)	p<0.001

Table 1. Demographics, gestational age, and birthweight across various groups of prenatal care visits. Data is presented as N(%) or mean (95% CI) unless noted elsewhere.
*Adjusted for maternal race, chronic hypertension, gestational hypertension, gestational diabetes, pre-existing diabetes, maternal age, BMI, medical usage, smoking, and parity.

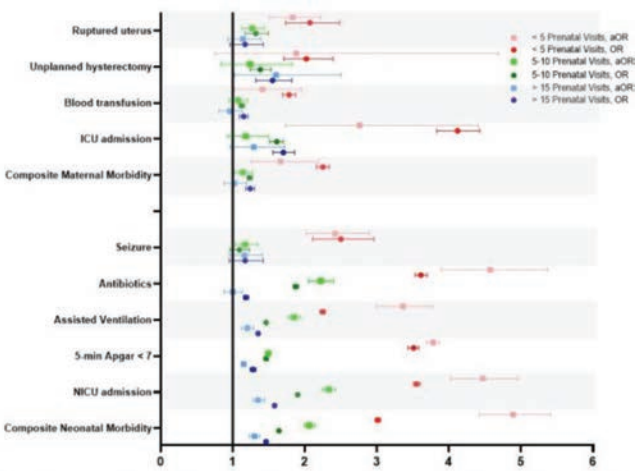

Figure 1. Association of number of prenatal visits and adverse maternal and neonatal outcomes. Data presented as odds ratio (OR) with 95% CI. The highest odds of adverse outcomes in all categories was in the setting of < 5 prenatal visits. OR adjusted for age, race, education, parity, chronic hypertension, gestational hypertension, pregestational diabetes, gestational diabetes, cigarette use, and Medicaid status.

439 | Birth Experiences of Discrimination on Labor and Delivery

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4:00 PM - 6:00 PM

Objective: Discrimination and racism impact obstetric care and approximately 1 in 5 birthing people will report mistreatment during maternity care. We sought to assess perceived discrimination experienced by birthing persons at the time of their delivery admission.

Study Design: This is a prospective survey of 129 birth people presenting for delivery from 03/2024 to 05/2024 using the Discrimination in Medical Settings Scale (DMSS) administered prior to discharge. Birthing people admitted for an indication not related to delivery, who delivered off L&D or precipitously, or unable to speak English were excluded. DMSS scores were compared between people of color (BIPOC) and White and assessed by reports of any discrimination, and DMSS scores >75th percentile (score 8) and ≥90th percentile (score 11). Survey responses were compared between groups using the Mann Whitney U test and multivariable logistic regression was used to estimate adjusted odds ratios(aOR) and 95% confidence intervals (CI) after adjusting for relevant confounders.

Results: Prior to discharge, 176 birthing people were approached to complete the survey and 47 declined to participate. Over 60% of the cohort identified as a person of color. Comparing by race, BIPOC and White birthing people differed by highest educational level achieved and insurance and employment status. In bivariate analysis, there was a statistically significant difference in reported DMSS scores ≥90th percentile between BIPOC and White birthing people with 5 times higher likelihood of reporting discrimination (14 (17%) vs. 2 (4%), p = 0.03, OR 5.42 [95% CI 1.18, 25.00])(Table 1). There was a statistically significant difference in security calls while in medical care between Black and White birthing people, respectively (13 (20%) vs. 5 (7%), p = 0.04)(Table 2).

Conclusion: Discrimination is experienced more by people of color on labor and delivery. Calls made to security calls by staff were more commonly experienced by Black birthing people. Future work is needed to explore how experiences of discrimination contribute to obstetric outcomes and care seeking.

Table 1: Discrimination in medical settings scores during labor and delivery admission

	BIPOC (n=79)	White (n=50)	p-value		
Less courtesy	1.24 ± 0.56	1.14 ± 0.46	0.24		
Any discrimination n (%)	14 (17.7)	5 (10.0)	0.23		
Less respect	1.23 ± 0.66	1.12 ± 0.60	0.12		
Any discrimination n (%)	12 (15.2)	3 (6.0)	0.16		
Poorer service	1.22 ± 0.55	1.08 ± 0.34	0.11		
Any discrimination n (%)	12 (15.2)	3 (6.0)	0.16		
Treated as not as smart	1.14 ± 0.39	1.10 ± 0.47	0.24		
Any discrimination n (%)	10 (12.7)	3 (6.0)	0.37		
Afraid of you	1.15 ± 0.46	1.06 ± 0.43	0.06		
Any discrimination n (%)	9 (11.4)	1 (2.0)	0.09		
Acts as better than you	1.15 ± 0.46	1.08 ± 0.34	0.31		
Any discrimination n (%)	9 (11.4)	3 (6.0)	0.37		
Not listening to you	1.33 ± 0.82	1.14 ± 0.41	0.26		
Any discrimination n (%)	15 (19.0)	6 (12.0)	0.29		
Total	8.47 ± 2.89	7.73 ± 1.59	0.27	OR (95% CI)	aOR* (95%CI)
Any discrimination n (%)	25 (31.7)	12 (24.0)	0.35		
≥75th percentile (score 8)	25 (31.7)	12 (24.0)	0.35	1.55 (0.69, 3.48)	1.36 (0.55, 3.36)
≥90th percentile (score 11)	**14 (17.7)**	**2 (4.0)**	**0.03**	**5.42 (1.18, 25.00)**	**3.87 (0.69, 21.86)**
*Adjusted for insurance status					

Table 2: Differences in hospital experience

	Black (n=64)	Non-Black (n=65)	p-value
Security call in hospital	9 (14.1)	5 (7.7)	0.27
Security call in prenatal care clinic	7 (10.9)	4 (6.2)	0.36
Security call (any)	**13 (20.3)**	**5 (7.7)**	**0.04**
Left prior to recommended discharge	8 (12.5)	2 (3.1)	0.05

Open Responses:

Participant #1: "*Nurses racial profiling me I feel like getting pain management a nurse told me not to go sell my pain meds on [street] another one would not even give me my pain meds after my c section.*"

Participant #2: "*There was initially a concern of being sent home again with a 45-minute drive. 2 prior pregnancies both went from barely progressing to immediately needing to push. I feel like it's hard to get this concern across successfully without feeling like I'm pushing to stay unnecessarily.*"

Participant #3: "*Lactation consultant on made me feel like trash. Less than human.*"

440 | Association of Transversus Abdominus Plane Block and Postoperative Opioid Consumption Following Planned Cesarean Hysterectomy

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4:00 PM - 6:00 PM

Objective: The rate of placenta accreta spectrum is 1 in 272. To combat the opioid epidemic, alternative pain management strategies including multimodal analgesia have been investigated. We hypothesized that patients who underwent planned cesarean hysterectomy (C-HYST) who received a transversus abdominus plane (TAP) block would have lower 24-hour postoperative opioid consumption compared to patients who did not.

Study Design: Our IRB approved the study and waived informed consent. Patients with C-HYST who did not require postoperative mechanical ventilation at our hospital from July 1, 2014 to December 31, 2022 were eligible for inclusion. Our primary outcome was 24-hour postoperative opioid consumption. We converted opioid use to morphine milligram equivalents (MME). For patients with patient-controlled analgesia (PCA), the closest documented entry to 24 hours was used to calculate opioid consumption. Demographic, physical, and clinical data were recorded.

Results: Demographic and physical characteristics of patients with TAP block following C-HYST with (n = 23) and without TAP block (n = 26) were no different. Patients with TAP block following C-HYST had a 24-hour opioid consumption of 30.8 + 29.8 mg compared to 80.4 + 59.4 mg for patients without a TAP block (p< 0.001). Patients with PCA (n = 12) had an average deviation in documentation from the 24-hour period of 41 minutes. For patients with TAP block, the average time from wound closure to TAP block was 69 minutes.

Conclusion: Patients with TAP block following C-HYST had statistically significant reductions in 24-hour opioid consumption compared to patients without TAP block. A limitation of this study was that patients without TAP block had statistically significant lower acetaminophen consumption compared to patients with TAP block. Increased acetaminophen administration may explain a modest decrease in opioid consumption but is unlikely to fully explain the magnitude of reduction observed in our study. Another limitation was imprecise data for patients with intravenous PCA. TAP blocks should be considered for patients who undergo C-HYST procedures.

Table 1. Demographic, physical, and clinical characteristics

Variable	Received postoperative TAP block (N=23)	Did not receive postoperative TAP block (N=26)	P value
Age (years) (mean (SD))	34 ± 3	34 ± 5	0.819
Gravidity (median (IQR))	5 (3-7)	5 (4-6)	0.726
Parity (median (IQR))	3 (1-4)	3 (2-3)	0.936
Gestational age at time of delivery (weeks) (mean (SD))	34.5 ± 2.0	34.1 ± 2.3	0.505
Prior cesarean delivery (yes)	21 (91%)	22 (85%)	0.671
Postoperative diagnosis			0.095
No evidence of abnormal placentation	*1 (4%)*	*8 (31%)*	
Accreta	*8 (35%)*	*9 (35%)*	
Increta	*8 (35%)*	*2 (8%)*	
Percreta	*6 (26%)*	*7 (27%)*	
Time from skin incision to wound closure (minutes) (mean (SD))	185 ± 62	153 ± 61	0.074
Estimated blood loss or quantitative blood loss (ml) (mean (SD))	1568 ± 1357	1434 ± 761	0.666
Intraoperative morphine milligram equivalent (mg) (mean (SD))	28.3 ± 16.9	30.3 ± 18.2	0.698
24 hour postoperative acetaminophen (mg) (median (IQR))	4000 (3000-4000)	325 (0-3250)	**<0.001***
24 hour postoperative ketorolac (mg) (mean (SD))	89 ± 37	61 ± 47	**0.026***
24 hour postoperative morphine milligram equivalent consumption (mg) (mean (SD))	30.8 ± 29.8	80.4 ± 59.4	**<0.001***

441 | Pregnancy Under Fire: Disparities in Firearm-Related Injuries During Pregnancy in the United States, 2017-2021

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4:00 PM - 6:00 PM

Objective: Firearm violence is a preventable public health crisis in the US, and pregnant patients are not immune from this epidemic. Studies have shown that pregnant individuals are more likely to die due to homicide than the three leading obstetric causes of maternal mortality. Our objective was to evaluate disparities in firearm-related injuries (FRI) during pregnancy.

Study Design: A cross-sectional analysis of delivery hospitalizations with FRI was conducted using the Nationwide Inpatient Sample from 2017-2021. We analyzed trends of FRI stratified by self-reported race, payor, hospital region, and location/teaching status. Trend significance was determined using the Cochran-Armitage test. Multivariate logistic regression analyses, adjusting for patient and hospital factors, were performed to evaluate the effects of payor, self-reported maternal race, hospital region, and hospital teaching status on the incidence of FRI.

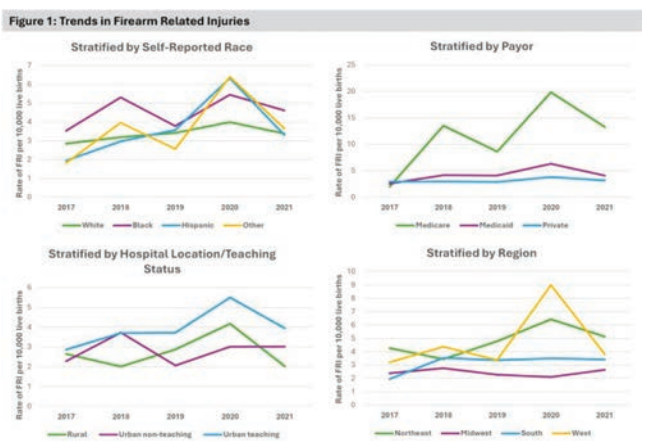
Results: Of 17.5 million deliveries, 6,365 were complicated by FRI (3.6 per 10,000 delivery hospitalizations). In unadjusted analysis, Black patients (OR 1.35, 95% CI 1.15-1.58) and patients delivering at urban teaching hospitals (OR 1.44, 95% CI 1.1-1.88) experienced higher rates of FRI; this finding did not hold after adjustment for patient and hospital factors. In both univariable and adjusted analyses, patients with public insurance were at increased risk of FRI (Medicare aOR: 3.10, 95% CI 2.07-4.66; Medicaid aOR 1.33, 95% CI 1.12-1.59 vs. private insurance). Rates of FRI were lower in the Midwest (aOR 0.53, 95% CI 0.43-0.65) and South (aOR 0.68, 95% CI 0.58-0.81) compared to the Northeast [Table 1]. Rates of FRI increased over time for non-Hispanic Black, non-Hispanic White, and Hispanic patients, as well as for those with public insurance. Rates of FRI also increased over time at urban teaching hospitals, and in all regions except the Midwest ($p < 0.01$) [Figure 1].

Conclusion: There are disparities in firearm related injuries by geographic location and payor status in the United States. Knowledge of such disparities can help to guide public policy aimed at preventing gun violence.

Table 1: Demographic and hospital-level factors and unadjusted and adjusted risk for firearm related injury

	Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
Risk factors		
Self-reported race		
Non-Hispanic White	REF	REF
Non-Hispanic Black	1.35 (1.15, 1.58)	1.17 (0.99, 1.39)
Hispanic	1.07 (0.83, 1.39)	0.87 (0.74, 1.04)
Payor		
Medicare	3.50 (2.34, 5.25)	3.1 (2.07, 4.66)
Medicaid	1.33 (1.13, 1.58)	1.33 (1.12, 1.59)
Private Insurance	REF	REF
Hospital region		
Northeast	REF	REF
Midwest	0.51 (0.41, 0.63)	0.53 (0.43, 0.65)
South	0.66 (0.56, 0.77)	0.68 (0.58, 0.81)
West	0.98 (0.65, 1.49)	1.07 (0.71, 1.63)
Hospital location and teaching status		
Rural	REF	REF
Urban, teaching	1.44 (1.10, 1.88)	1.25 (0.97, 1.61)
Urban, non-teaching	1.03 (0.79, 1.34)	0.84 (0.74, 1.28)

*Adjusted models include maternal age, race, payor, income quartile, hospital location, teaching status and region



442 | Pregnancy Outcomes in Gestational Diabetes Based on Method of Diagnosis: GCT ≥ 200 Versus OGTT

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4:00 PM - 6:00 PM

Objective: Gestational diabetes mellitus (GDM) can be diagnosed based on 1-hour glucose challenge test (GCT) ≥ 200 mg/dL or ≥ 2 abnormal values on 3-hour oral glucose tolerance testing (OGTT). We sought to investigate medication needs and pregnancy outcomes among patients with GDM by method of diagnosis.

Study Design: This is a retrospective cohort study of patients with GDM who delivered at a single institution from 2020-2023.

Comparisons were made between two groups based on abnormal diagnostic test: 1-hour GCT result ≥ 200 mg/dL versus 1-hour GCT < 200 mg/dL and abnormal OGTT. Data were obtained by chart abstraction. The primary outcome was need for insulin initiation. Secondary adverse pregnancy outcomes were also described. Comparisons were performed using χ^2 and t-test, with multivariable logistic regression to adjust for confounders.

Results: We identified 587 patients with GDM during the study period, of whom 111 (19%) were diagnosed by 1-hour GCT ≥ 200 mg/dL and 476 (81%) had a glucose of 140-199 mg/dL and subsequently met Carpenter-Coustan criteria on 3-hour OGTT. Background characteristics were similar between cohorts, though the ≥ 200 mg/dL group was more likely to be Black and was diagnosed at an earlier gestational age (Table 1). Patients with a 1-hour GCT ≥ 200 mg/dL were more likely to require insulin during their pregnancy (53% vs 30%, $P < 0.01$) and to develop poor glycemic control (28% vs 15%, $P < 0.01$), defined as failure to meet recommended glycemic targets > 50% of the time despite medical therapy. A 1-hour GCT ≥ 200 mg/dL was associated with higher likelihood of a large for gestational age (LGA) neonate (17% vs 8%, $P < 0.01$) and neonatal intensive care unit (NICU) admission (28% vs 18%, $P = 0.02$). After adjustment for potential confounders, these associations remained significant (Table 2).

Conclusion: Patients diagnosed with GDM based on 1-hour GCT ≥ 200 mg/dL were more likely to require insulin and have poor glycemic control. LGA and NICU admission were more frequent in this population compared to those diagnosed with abnormal 3-hour OGTT.

Table 1. Characteristics and pregnancy outcomes in patients with GDM stratified by 1-hour GCT result

	1-hour GCT ≥ 200 mg/dL (n=111)	1-hour GCT < 200 mg/dL (n=476)	P
Maternal age (years)	35.3 ± 4.2	35.8 ± 4.7	0.28
Body mass index ≥ 30 kg/m²	37 (33)	117 (25)	0.06
Race/Ethnicity			
White, non-Hispanic	30 (27)	147 (31)	0.03
Black, non-Hispanic	14 (13)	36 (8)	
Hispanic	26 (23)	116 (24)	
Asian	39 (35)	175 (37)	
Other	2 (2)	2 (0.4)	
Parity	0.8 ± 1	0.6 ± 0.8	0.07
In vitro fertilization	12 (11)	58 (12)	0.69
Chronic hypertension	9 (8)	24 (5)	0.21
Thyroid disease	5 (5)	37 (8)	0.23
Prior GDM	18 (16)	67 (14)	0.56
Family history of DM	55 (50)	243 (51)	0.78
GA at GDM diagnosis (weeks)	25.0 ± 4.7	26.9 ± 4.1	< 0.01
Insulin requirement	59 (53)	145 (30)	< 0.01
GA at insulin initiation (weeks)	29.1 ± 4.7	30.7 ± 7.2	0.13
Insulin type			
Rapid-acting	2/59 (3)	6/145 (4)	0.80
Intermediate-acting	41/59 (70)	120/145 (83)	0.04
Both rapid and intermediate	16/59 (27)	19/145 (13)	0.02
Poor glycemic control [a]	31 (28)	70 (15)	< 0.01
GA at delivery (weeks)	38.1 ± 1.9	38.4 ± 1.6	0.13
Mode of delivery			
Spontaneous vaginal	66 (59)	264 (55)	0.60
Operative vaginal	5 (5)	17 (4)	
Cesarean	40 (36)	195 (41)	
Hypertensive disorder of pregnancy	27 (24)	99 (21)	0.42
Polyhydramnios	7 (6)	20 (4)	0.34
Shoulder dystocia	4 (4)	7 (2)	0.14
Estimated blood loss > 1 L	10 (9)	43 (9)	0.99
Neonatal outcomes			
Composite adverse neonatal outcome [b]	67 (60)	237 (50)	0.04
LGA	19 (17)	38 (8)	< 0.01
NICU admission	31 (28)	86 (18)	0.02

Data are n (%) or mean ± SD

[a] Poor glycemic control defined as failure to meet recommended glycemic targets > 50% of the time despite medical therapy

[b] Composite adverse neonatal outcome consists of 5-minute APGAR < 7, hypoglycemia, hypocalcemia, respiratory distress syndrome, hyperbilirubinemia, polycythemia, or death

GDM, gestational diabetes mellitus; *GCT*, glucose challenge test; *DM*, diabetes mellitus; *GA*, gestational age; *LGA*, large for gestational age; *NICU*, neonatal intensive care unit

Table 2. Logistic regression for pregnancy outcomes in GDM patients diagnosed with 1-hour GCT ≥ 200 mg/dL

Outcome	Unadjusted Odds Ratio	Unadjusted 95% CI	P	Adjusted [a] Odds Ratio	Adjusted 95% CI	P
Insulin requirement	2.6	1.7 – 3.9	< 0.01	2.3	1.5 – 3.5	< 0.01
Poor glycemic control [b]	2.2	1.4 – 3.7	< 0.01	2.1	1.3 – 3.5	< 0.01
LGA neonate	2.4	1.3 – 4.3	< 0.01	2.7	1.4 – 5.0	< 0.01
NICU admission	1.8	1.1 – 2.8	0.02	1.8	1.1 – 3.1	0.04

[a] Adjusted for maternal age, obesity, race/ethnicity, GA at GDM diagnosis, and GA at delivery

[b] Poor glycemic control defined as failure to meet recommended glycemic targets > 50% of the time despite medical therapy

GDM, gestational diabetes mellitus; *GCT*, glucose challenge test; *LGA*, large for gestational age; *NICU*, neonatal intensive care unit

443 | Pregnancy Outcomes in Gestational Diabetes Mellitus: Ethnic-Specific Differences Among a Diverse Asian-American Population

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4:00 PM - 6:00 PM

Objective: The prevalence of gestational diabetes mellitus (GDM) is higher in Asian populations. Comparative data on pregnancy outcomes among specific ethnic groups within Asian cohorts is lacking. Our objective was to study Asian patients with GDM and describe perinatal outcomes by country of origin.

Study Design: Retrospective cohort study of Asian patients with GDM stratified by region of origin (East: China, Korea, Japan, Taiwan; Southeast: Philippines, Thailand, Vietnam; South: India) who delivered at a single institution from 2020-2023. Classification of race/ethnicity was self-reported. Data were obtained through chart abstraction. Comparisons were performed using χ^2 and t-test. Multivariable logistic regression was then performed to adjust for potential confounders.

Results: We identified 667 patients with GDM during the study period, of whom 274 (41%) identified as Asian (36% East, 32% Southeast, 32% South). Specific ethnic groups within each region are shown in the Figure. Southeast and South Asian patients were more likely to be obese compared to those from Eastern regions (27% and 26% vs 11%, $P = 0.01$) (Table). South Asian patients were more likely to require insulin for blood glucose management and to develop poor glycemic control, defined as failure to meet recommended glycemic targets > 50% of the time despite medical therapy. Southeast Asian patients were more likely to require rapid-acting insulin and to develop a hypertensive disorder of pregnancy. Other maternal and neonatal outcomes were similar between groups. After adjustment for obesity, Southeast and South Asian patients remained more likely to require insulin compared to East Asian patients (aOR 3.0, CI 1.5-5.8 and aOR 2.0, CI 1.1-4). Poor glycemic control remained associated with South Asian descent compared to East Asian after adjustment for obesity (aOR 2.5, CI 1.1-5.9).

Conclusion: There are differences in glycemic management between Asian ethnic groups. Though Asian race is a known risk factor for GDM, patients who identify as Asian represent a heterogeneous group with diverse backgrounds and different clinical outcomes.

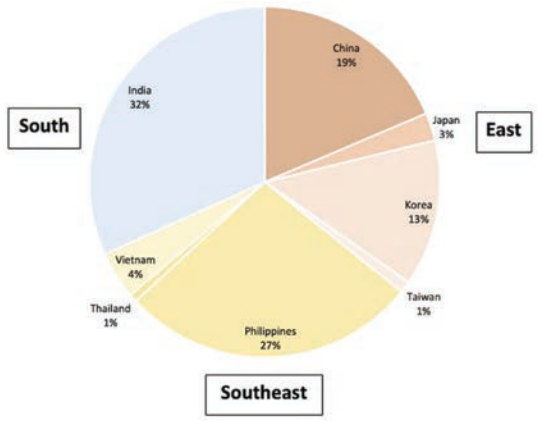

Figure. Ethnic groups by Asian region among patients with GDM at a single institution

Table. Characteristics and pregnancy outcomes among Asian patients with GDM by region

	East (n=98)	Southeast (n=89)	South (n=87)	P
Maternal age ≥ 35 years	73 (74)	62 (70)	56 (64)	0.33
Body mass index ≥ 30 kg/m²	11 (11)	24 (27)	23 (26)	0.01
Nulliparous	58 (59)	47 (53)	52 (60)	0.58
In vitro fertilization	20 (20)	12 (13)	10 (11)	0.21
Chronic hypertension	3 (3)	7 (8)	5 (6)	0.35
Thyroid disease	11 (11)	6 (7)	8 (9)	0.57
Prior GDM	17 (17)	13 (15)	15 (17)	0.85
Family history of DM	47 (48)	55 (62)	43 (49)	0.12
Insulin requirement	20 (20)	33 (37)	40 (46)	< 0.01
Insulin type				
Rapid-acting	1/20 (5)	6/33 (18)	0/40 (0)	0.01
Intermediate-acting	19/20 (95)	20/33 (61)	33/40 (82)	< 0.01
Both rapid and intermediate-acting	0/20 (0)	7/33 (21)	7/40 (18)	0.09
Poor glycemic control [a]	9 (9)	14 (16)	20 (23)	0.04
Gestational age < 37 weeks	7 (7)	14 (16)	15 (17)	0.09
Mode of delivery				
Spontaneous vaginal	60 (61)	54 (61)	46 (53)	0.38
Operative vaginal	7 (7)	2 (2)	5 (6)	
Cesarean	31 (32)	33 (37)	36 (41)	
Hypertensive disorder of pregnancy	19 (19)	27 (30)	13 (15)	0.04
Polyhydramnios	1 (1)	2 (2)	5 (6)	0.15
Shoulder dystocia	2 (2)	0 (0)	1 (1)	0.41
Estimated blood loss > 1 L	9 (9)	4 (5)	5 (6)	0.40
Neonatal outcomes				
Composite adverse neonatal outcome [b]	44 (45)	43 (48)	45 (52)	0.65
LGA	3 (3)	4 (5)	6 (7)	0.47
NICU admission	11 (11)	16 (18)	20 (23)	0.10

Data are n (%)
[a] Poor glycemic control defined as failure to meet recommended glycemic targets > 50% of the time despite medical therapy
[b] Composite adverse neonatal outcome consists of 5-minute APGAR < 7, hypoglycemia, hypocalcemia, respiratory distress syndrome, hyperbilirubinemia, polycythemia, or death
GDM, gestational diabetes mellitus; *DM*, diabetes mellitus; *LGA*, large for gestational age; *NICU*, neonatal intensive care unit

444 | The Impact of Senate Bill 8 on LARC and Permanent Contraception Trends in Texas

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4:00 PM - 6:00 PM

Objective: The goal of this study was to determine the impact of Senate Bill 8 (SB8) on trends in long-acting reversible contraception (LARC) and permanent sterilization (PS) procedures in the state of Texas.

Study Design: We conducted a retrospective cohort study utilizing the Texas Outpatient Public Use Data to characterize the relationship between the Texas "Heartbeat Act" (SB8) and trends in LARC/PS procedures before (1/2021-6/2021) and after (10/2021-3/2022) its passage in 9/2021. We excluded data from 7/2021-9/2021 which included the passage of SB8 and treated it as a washout period. Inclusion criteria were patients aged 15 to 54 who underwent LARC placement or female PS for contraceptive purposes. We excluded patients who underwent procedures for presumably non-contraceptive purposes (ie. ectopic pregnancy requiring salpingectomy). ICD-10 diagnostic and procedure codes were used. We used patients' home zip codes and the Rural and Urban commuting area codes to categorize geographic area.

Results: Of the 26,576 patients who met inclusion criteria during the study period, 14,006 (52.7%) and 12,570 (47.3%) received LARC/PS in the 6 months prior to and after passage of SB8, respectively. A decrease was observed in LARC use after SB8 (12.9 v 11.8%, p = 0.0048), while there was a significant increase in PS procedures (87.1 v 88.2%, p = 0.0027). A significant increase was noted in LARC/PS after SB8 in Hispanic patients compared to other racial/ethnic groups (31.9 v 33.2%, p< 0.0001). There were increases in patients ages < 20 (3.2 v 3.7%, p = 0.021), 30-39 (33.9 v 36.7%, p< 0.0001), and a decrease in those ≥50 (14.4 v 10.0%, p< 0.0001) post-SB8. More patients with Medicaid (20.7 v 21.8%, p = 0.03) and commercial insurance (40.6 v 42.4%, p = 0.003) received LARC/PS after SB8. The rate of rural LARC/PS users increased after SB8 (15.2 v 17.9%, p≤ 0.0001) compared to urban dwellers (84.6 v 82.1%, p≤ 0.0001).

Conclusion: The significant increase in PS use compared to LARC after SB8 may indicate the desire for more reliable forms of contraception in areas where access to reproductive healthcare is at risk.

Table. LARC and Permanent Contraception Utilization before and after passage of SB8

		Before SB8	After SB8	P-value
	Overall (n=26,576)	January 2021-June 2021 (n=14,006)	October 2021-March 2022 (n=12,570)	
Type of Contraception				
LARC	3,278	1,803 (12.9)	1,475 (11.8)	**0.0048**
Permanent	23,251	12,173 (87.1)	11,078 (88.2)	**0.0027**
Race/Ethnicity				
Hispanic	8,644	4,467 (31.9)	4,177 (33.2)	**<0.0001**
Non-Hispanic				
- White	9,928	5,223 (37.3)	4,705 (37.4)	0.81
- Black	6,390	3,394 (24.2)	2,996 (23.8)	0.45
- Asian or Pacific Islander	226	120 (0.9)	106 (0.8)	0.9
- American Indian/Eskimo/Aleut	31	16 (0.1)	15 (0.1)	0.9
- Other	1349	778 (5.6)	571 (4.5)	**0.0002**
Age				
<20	921	451 (3.2)	470 (3.7)	**0.021**
20-29	3,158	1,628 (11.9)	1,530 (12.2)	0.17
30-39	9,363	4,750 (33.9)	4,613 (36.7)	**<0.0001**
40-49	9,851	5,156 (36.8)	4,695 (37.4)	0.36
>/=50	3,283	2,021 (14.4)	1,262 (10.0)	**<0.0001**
Insurance				
Medicaid	5,642	2,901 (20.7)	2,741 (21.8)	**0.03**
Commercial Insurance	11,007	5,682 (40.6)	5,325 (42.4)	**0.003**
Medicare	1467	756 (5.4)	711 (5.7)	0.36
Self-Pay and Charity	8,470	4,677 (33.4)	3,793 (30.2)	**<0.0001**
Specialty Programs and Insurance	651	404 (2.9)	247 (2.0)	**<0.0001**
Unknown	8	4 (0.0)	4 (0.0)	>0.99
Urban or Rural Setting				
Urban	22,173	11,856 (84.6)	10,317 (82.1)	**<0.0001**
Rural	4,381	2,135 (15.2)	2,246 (17.9)	**<0.0001**
Unknown	22	15 (0.1)	7 (0.1)	0.15

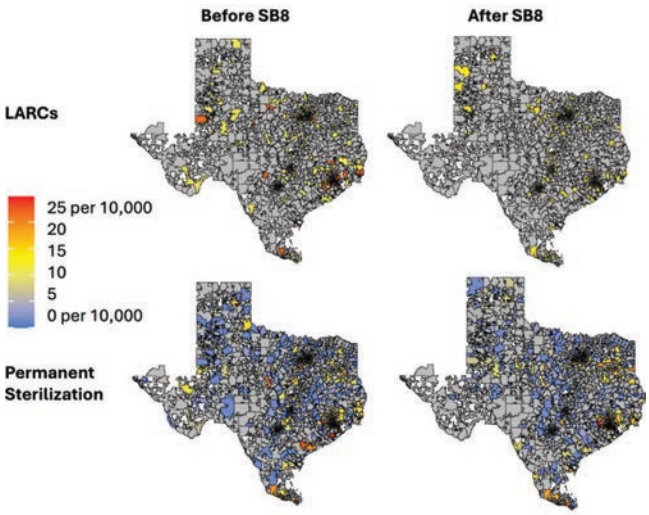

Figure. Prevalence of contraceptive use in Texas before and after SB8 decision. LARC, long acting reversible contraception; SB8, Senate Bill 8.

445 | Regional Differences in LARC and Permanent Contraception procedures in Texas after the Dobbs Decision

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4:00 PM - 6:00 PM

Objective: The aim of this study is to determine if there are differences in long-acting reversible contraception (LARC) and permanent contraception (PS) procedures in Texas before and after the Dobbs v Jackson Women's Health Organization (Dobbs) decision.

Study Design: We conducted a retrospective cohort study utilizing the Texas Outpatient Public Use Data to determine rates of LARC/PS procedure before (1/2022 to 6/2022) and after (7/2022 to 12/2022) the Dobbs decision in June of 2021. Inclusion criteria were patients aged 15 to 54 who underwent LARC placement or female PS for contraceptive purposes. We excluded patients who underwent procedures for presumably non-contraceptive purposes(ie. ectopic pregnancy requiring salpingectomy). ICD-10 diagnostic and procedure codes were used. We used patients' home zip codes and the Rural and Urban commuting area codes to categorize geographic setting.

Results: Of the 13,544 patients who met inclusion criteria during the study period, 6675 (49.3%) and 6869 (50.7%) received LARC/PS in the 6 months prior to and after passage of the Dobbs decision, respectively. Although there were no differences in overall rates of LARC/PS placement after passage of Dobbs, we noted a significant increase in LARC/PS procedures in patients from rural areas (17.9 v 20%, p = 0.0017) and a significant decrease in patients from urban areas (82 v 79.9%, p = 0.0013). Apart from a decrease in LARC/PS utilization after passage of Dobbs in the Hispanic population (32.7 v 31%, p = 0.03), there were no significant racial/ethnic differences in LARC/PS utilization after the passage of Dobbs. Similarly, there were no changes in LARC/PS rates across different age groups except for a decrease in the ≥50 age group (14.3 v 11.8%, p< 0.0001). There were no differences in LARC/PS rates based on insurance type.

Conclusion: The slight decline in LARC/PS procedures for patients living in urban areas and of Hispanic ethnicity in Texas following the Dobbs decision may indicate emerging healthcare disparities related to changes in reproductive health policy.

Table. LARC and Permanent Contraception Utilization before and after the Dobbs decision

		Before Dobbs	After Dobbs	P-value
	Overall (n=13,544)	January 2022-June 2022 (n=6675)	July 2022-December 2022 (n=6869)	
Type of Contraception				
LARC	1,510	748 (11.2)	762 (11.1)	0.84
Permanent	12,011	5,914 (88.8)	6,097 (88.9)	0.77
Race/Ethnicity				
Hispanic	4,308	2,181 (32.7)	2,127 (31.0)	**0.03**
Non-Hispanic				
- White	5,194	2,506 (37.5)	2,688 (39.1)	0.06
- Black	3,145	1,543 (23.1)	1,602 (23.3)	0.78
- Asian or Pacific Islander	137	69 (1.0)	68 (1.0)	0.8
- American Indian/Eskimo/Aleut	36	18 (0.3)	18 (0.3)	0.93
- Other	724	358 (5.4)	366 (5.3)	0.93
Age				
<20	187	90 (1.3)	97 (1.4)	0.55
20-29	1,684	811 (12.1)	873 (12.7)	0.32
30-39	4,862	2359 (35.3)	2,503 (36.4)	0.18
40-49	5,047	2461 (36.9)	2,586 (37.6)	0.35
>/=50	1,764	954 (14.3)	810 (11.8)	**<0.0001**
Insurance				
Medicaid	3,184	1,600 (24.0)	1,584 (23.1)	0.21
Commercial Insurance	5,458	2,681 (40.2)	2,777 (40.4)	0.75
Medicare	660	304 (4.6)	356 (5.2)	0.09
Self-Pay and Charity	3,941	1,936 (29.0)	2,005 (29.2)	0.81
Specialty Programs and Insurance	283	142 (2.1)	141 (2.1)	0.76
Unknown	18	12 (0.2)	6 (0.1)	0.14
Urban or Rural Setting				
Urban	10,960	5,475 (82.0)	5,485 (79.9)	**0.0013**
Rural	2,570	1,195 (17.9)	1,375 (20.0)	**0.0017**
Unknown	14	5 (0.1)	9 (0.1)	0.42

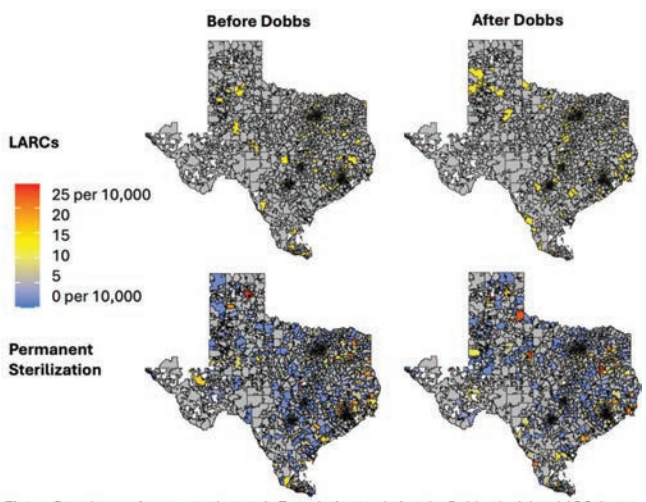

Figure. Prevalence of contraceptive use in Texas before and after the Dobbs decision. LARC, long acting reversible contraception.

446 | Strict Blood Pressure Control and Risk of Postpartum Readmission

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4:00 PM - 6:00 PM

Objective: Hypertensive disorders of pregnancy (HDP) comprise approximately 10% of postpartum readmissions. Strict discharge criteria for the delivery encounter are a suggested practice for reduction in HDP-related readmission. We evaluated whether implementation of discharge criteria requiring BP < 150/100 for at least 24 hours reduced the likelihood of postpartum readmission for HDP.

Study Design: Analysis included live- and stillbirths >/ = 20 weeks' at a single site from 2019-2022. Readmissions included inpatient stays with any hypertension-related primary diagnosis code 1-42 days after discharge. Patients discharged pre-implementation of strict BP discharge criteria, (1/1/19-1/31/22) were compared to those discharged post-implementation (2/1/22-12/31/22). Race and ethnicity were excluded from regression models to avoid conflating the social construct of race with biological contributors to a clinical outcome.

Results: We reviewed 23,734 deliveries and 358 readmissions. HDP-related readmission rates were 1.4% (N = 259) pre-implementation of strict BP discharge criteria, and 2.1% (N = 99) post-implementation, p< .0003. Our delivery cohort was racially and ethnically more diverse than the United States' population, though EMR-reported Black patients were readmitted disproportionately more than others (Tables). The most common readmission diagnosis was severe preeclampsia. Post-implementation of strict BP discharge criteria, a higher proportion of patients (N = 307, 6.4%) also presented to triage for HDP issues than pre-implementation (N = 1068, 5.7%), p = .0003. The odds ratio (OR) for HDP readmission post-2/1/22 was 1.53 (CI 1.2-1.9, p = .0004). After adjusting for confounders, the OR was 1.48 (CI 1.13-1.92, p = .004).

Conclusion: HDP readmission risk was higher after implementing strict BP discharge criteria. This may represent more severe disease exacerbations, and strict BP discharge criteria may mitigate risk of unnecessary readmissions. Close outpatient follow-up, remote BP monitoring, and patient education on HDP exacerbation may encourage appropriate presentations to care and prevent out-of-hospital mortality.

Table 1: Characteristics of Patients Pre- and Post-Implementation of Strict BP Discharge Criteria

Characteristic	Pre-Implementation, N=18918	Post-Implementation, N=4816	p-value
Age, years			.30
Mean (SD)	30.3 (5.7)	30.2 (5.8)	
Delivery Gestational Age, weeks			<.0001
Median (IQR)	39.0 (37.6-39.7)	38.9 (37.4-39.7)	
Parity , N (%)			<.0001
Nulliparous	7622 (40.3)	2209 (45.9)	
Multiparous	11292 (59.7)	2607 (54.1)	
Mode of Delivery, N (%)			0.165
Vaginal	11477 (60.7)	2869 (59.6)	
Cesarean	7441 (39.3)	1947 (40.4)	
BMI			<.0001
Mean (SD)	32.6 (6.7)	33.2 (6.9)	
Multifetal Gestation, N (%)	488 (2.6)	120 (2.5)	0.73
Prenatal Preeclampsia, N (%)	1985 (10.5)	763 (15.8)	<.0001
Gestational Hypertension, N (%)	2024 (10.7)	529 (11.0)	0.57
Chronic Hypertension, N (%)	30 (0.2)	5 (0.1)	0.38
Gestational Diabetes, N (%)	1497 (7.9)	364 (7.5)	0.41
Preexisting Diabetes, N (%)	495 (2.6)	145 (3.0)	0.13
Substance Use Disorder, N (%)	132 (0.7)	28 (0.6)	0.38
Mood Disorder, N (%)	1966 (10.4)	549 (11.4)	.04
Smoking History, N (%)	217 (1.2)	46 (0.96)	0.27
Highest Delivery Admission Systolic BP, mmHg			.04
Mean (SD)	138.3 (16.7)	138.9 (17.1)	
Highest Delivery Admission Diastolic BP, mmHg			.0001
Mean (SD)	81.4 (11.0)	82.1 (11.0)	
Birthweight, grams			<.0001
Median (IQR)	3255 (2892-3595)	3200 (2815-3530)	
Fetal Demise, N (%)	170 (0.9)	54 (1.1)	0.15
Payor, N (%)			<.0001
Commercial	10,800 (57.1)	2464 (51.2)	

Table 2. Characteristics of HDP-Related Inpatient Readmissions

Characteristic	Not Readmitted, N=21,916	Readmitted, N= 358	p-value
Age, years			<.0001
Mean (SD)	30.18 (5.7)	32.48 (5.7)	
Delivery Gestational Age, weeks			<.0001
Median (IQR)	39.0 (37.7-39.7)	38.1 (37.1-39.3)	
Parity, N (%)			0.15
Nulliparous	9020 (41.2)	161 (45.0)	
Multiparous	12896 (58.8)	197 (55.0)	
Mode of Delivery, N (%)			<.0001
Vaginal	13471 (61.5)	178 (49.7)	
Cesarean	8445 (38.5)	180 (50.3)	
BMI			<.0001
Mean (SD)	32.6 (6.7)	34.3 (6.5)	
Multifetal Gestation, N (%)	529 (2.4)	10 (2.7)	0.64
Prenatal Preeclampsia, N (%)	2412 (11.0)	116 (32.4)	<.0001
Gestational Hypertension, N (%)	2276 (10.4)	75 (21.0)	<.0001
Chronic Hypertension, N (%)	30 (0.1)	1 (0.3)	0.40
Gestational Diabetes, N (%)	1698 (7.8)	34 (9.5)	0.22
Preexisting Diabetes, N (%)	584 (2.7)	10 (2.8)	0.88
Substance Use Disorder, N (%)	140 (0.6)	4 (1.1)	0.27
Mood Disorder, N (%)	2232 (10.2)	55 (15.4)	0.001
Smoking History, N (%)	239 (1.1)	5 (1.4)	0.58
Highest Delivery Admission Systolic BP, mmHg			<.0001
Mean (SD)	138.1 (16.7)	151.0 (16.3)	
Highest Delivery Admission Diastolic BP, mmHg			<.0001
Mean (SD)	81.4 (10.9)	88.3(10.2)	
Birthweight, grams			<.0001
Median (IQR)	3250 (2420-3585)	3080 (2695-3475)	
Fetal Demise, N (%)	205 (0.9)	6 (1.7)	0.15
Payor, N (%)			<.0001
Commercial	12174 (55.6)	238 (66.5)	
Public (Medicaid, Managed Medicaid)	9552 (43.6)	119 (33.2)	

447 | Timing of Delivery of Preterm Membrane Rupture at 34 Weeks and Beyond: a Cost-Effectiveness Analysis

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4:00 PM - 6:00 PM

Objective: To examine outcomes and the cost-effectiveness of immediate delivery at 34 weeks' gestation versus expectant management to 35, 36, and 37 weeks in the setting of preterm premature rupture of membranes (PPROM).

Study Design: A decision-analytic model was built using TreeAge software to compare outcomes of immediate delivery versus expectant management to 35, 36, and 37 weeks in a theoretical cohort of 35,913 pregnant people with PPROM at 34 weeks. Clinical outcomes included stillbirth, neonatal death, neurodevelopmental disorder, maternal mortality, healthy neonate, maternal sepsis leading to ICU admission, neonatal sepsis, NICU admission, costs and quality adjusted life years (QALYs). Probabilities, costs, and utilities were derived from literature.

Results: In our cohort, expectant management resulted in fewer neonatal deaths, neurodevelopmental disorders, and NICU admissions, in addition to increasing the number of healthy neonates delivered across all expectant management weeks (Table 1). Conversely, expectant management was found to increase the number of cases of stillbirth, maternal mortality, maternal sepsis, and neonatal sepsis. Each increasing week of expectant management yielded additional QALYs but was associated with increased costs. In this comparison, the optimal outcome and most cost-effective was expectant management to 37 weeks. One-way sensitivity analysis for the cost of antepartum care revealed that when the cost of antepartum admission exceeded $54,267 then management up to 36 weeks became cost-effective as compared to waiting until 37 weeks. One-way sensitivity analysis for the cost of NICU stay demonstrated that at 16 times the NICU cost, expectant management to 36 weeks becomes dominated by 37 weeks.

Conclusion: Management of PPROM at 34-36 weeks' gestation remains controversial, with guidelines incorporating both immediate delivery and expectant management. The current model suggests that ongoing expectant management to 37 weeks may improve outcomes and be a cost-effective strategy.

Figure 1. One-way sensitivity analysis of antepartum stay demonstrating the incremental cost-effectiveness ratios (ICER) for delivery at 34 weeks and expectant management to 35, 36, and 37 weeks.

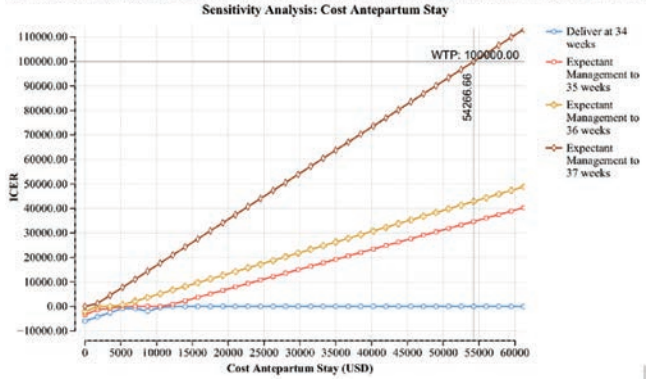

Table 1. Outcomes associated with delivery at 34 weeks, expectant management to 35 weeks, expectant management to 36 weeks, and expectant management to 37 weeks in a theoretical cohort of 35,913 women with PPROM at 34 weeks.

Outcome	Deliver at 34 weeks	Expectant management to 35 weeks	Expectant management to 36 weeks	Expectant management to 37 weeks
Cost (USD)	$1,222,700,202	$1,372,952,843	$1,689,642,023	$2,041,820,315
Effectiveness (QALYs)	1,881,061	1,920,673	1,953,104	1,965,813
Stillbirth	0	6	11	17
Neonatal death	151	111	96	74
Neurodevelopmental disorder	185	117	38	37
Maternal mortality	3	3	3	3
Healthy Neonate	35,577	35,679	35,768	35,785
Maternal sepsis/ ICU admission	0	1	2	3
Neonatal sepsis	0	130	255	384
NICU	32,884	22,782	14,473	11,191
Incremental cost-effectiveness ratio (ICER)		34 versus 35 weeks	35 versus 36 weeks	36 versus 37 weeks
		$3,793.16	$9,764.91	$27,710.86

448 | Safe Reduction of NTSV Cesarean Delivery Rates using Multidisciplinary Quality Improvement Efforts

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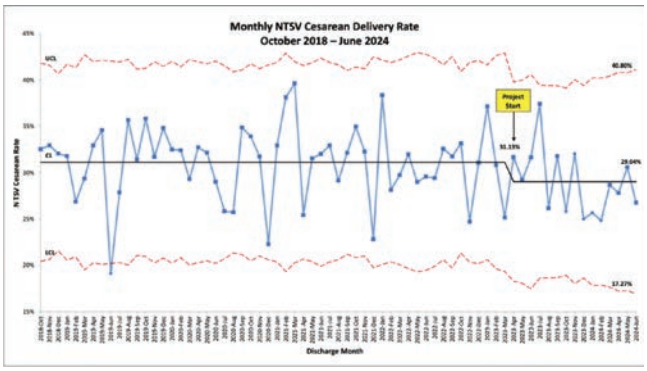
4:00 PM - 6:00 PM

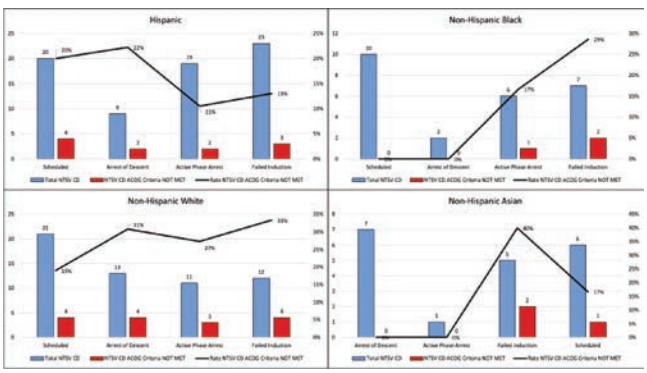
Objective: The rate of cesarean deliveries (CD) in nulliparous, term, singleton, vertex (NTSV) patients at our hospital has been ~30% since we began tracking this measure in 2016. Our aim was to evaluate the impact of quality improvement (QI) initiatives on this metric.

Study Design: Our level IV urban academic center formed a multidisciplinary workgroup in 4/2023. We reviewed CD rates stratified by indication, physician practice, race and ethnicity, which were regularly presented to the department and practice leaders. Nurses audited oxytocin management for adherence to hospital protocol and introduced non-pharmacologic options to help patients cope with labor pain. Retrospective chart review of all NTSV CD from 5-10/2023 determined if the indication for CD met ACOG criteria for failed induction of labor (FIOL), active phase arrest (APA), second stage arrest (SSA), and prelabor CD. Results were presented at departmental meetings and each physician was sent a scorecard with their total NTSV CD and adherence to ACOG criteria.

Results: The NTSV CD rate decreased in concordance with hospital QI efforts, to a nadir of 27.2% in the 2024 calendar year to date (Fig 1). Severe newborn complications (SNC) rate was similar before and after QI efforts (0.44% vs 0.61%, $p = 0.13$). Among all 298 NTSV CD, 13.8% did not meet ACOG criteria. FIOL was the most common indication (23%) that did not meet criteria across all racial and ethnic groups. Prelabor CD not meeting ACOG criteria were highest for White and Hispanic patients, driven by CD for estimated fetal weight lower than ACOG thresholds.

Conclusion: Our hospital NTSV CD rate decreased without an increase in SNC rates. Our chart audit allowed us to identify an opportunity to target FIOL and prelabor CD as future interventions. Sharing disaggregated data coupled with detailed chart review to identify hospital-specific drivers of non-medically indicated CD may be strategies to safely reduce NTSV CD rate and drive quality improvement initiatives.





449 | is Severity of Congenital Cardiac Disease Associated with Increased Perinatal Mood Symptoms

Christina Paidas Teefey[1]; Juliana S. Gebb[2]; Alexandria Budney[3]; Nahla Khalek[1]; Shelly Soni[1]; Desiree Fiorentino[1]; Joanna C.M. Cole[3]; Julie S. Moldenhauer[1]; Jack Rychik[3]
[1]Richard D. Wood Jr. Center for Fetal Diagnosis and Treatment at CHOP, Philadelphia, PA; [2]Richard D. Wood, Jr Center for Fetal Diagnosis and Treatment, Children's Hospital of Philadelphia, Philadelphia, PA; [3]Children's Hospital of Philadelphia, Philadelphia, PA

4:00 PM - 6:00 PM

Objective: To assess whether fetal cardiovascular disease severity is associated with perinatal mood symptoms in mothers with prenatal diagnosis of congenital heart disease (CHD).

Study Design: Expectant mothers completed validated screens for depressive, anxiety and traumatic symptoms following diagnosis of CHD (Time 1) and immediately postpartum (Time 2). Postpartum Depression Screening Scale (PDSS) was used to identify symptoms of depressive risk (≥ 60 and ≥ 21) and Impact of Events Scale (IES-R) was administered to determine traumatic risk (≥ 33) in a cohort of patients at a single fetal therapy center from December 1, 2012 through July 1, 2017. A fetal cardiologist reviewed echocardiographic imaging blinded to clinical course and assigned a Fetal Cardiovascular Disease Severity Score (FCDSS score severity range:1, lowest thru 7, highest) based on previously validated scale (Davey et al., 2014). Demographics were collected including mental health history confirmed by a licensed perinatal psychologist. Statistical analysis was performed using Fisher's exact test and chi squared test for categorical variables and Mann-Whitney U test for continuous variables.

Results: Depressive risk was 47% (n = 177/380) during pregnancy and 34% (n = 129/380) postpartum. Anxiety and traumatic stress risk was 14% (n = 52/380) during pregnancy and 4.7% (n = 18/380) postpartum. Increasing FCDSS did not corelate with clinical depressive, anxiety or traumatic stress risk during pregnancy or postpartum (Table 1). While FCDSS was not associated with increased risk for mood symptoms, patients with a FCDSS ≥ 5 (n = 197), received more psychosocial support during pregnancy (Table 2). History of maternal mental health diagnosis strongly correlated with increased depressive risk in pregnancy (67% vs 43%, p = 0.001) and postpartum (50% vs 31%, p = 0.009).

Conclusion: Severity of fetal cardiovascular disease is not associated with additional depressive, anxiety and traumatic risk. Pre-existing maternal mental health diagnosis is strongly associated with perinatal mood symptoms emphasizing the importance of perinatal psychosocial support.

Table 1: Positive Depressive (PDSS) and anxiety/traumatic (IES-R) Risk in Mothers based on assigned cardiac severity score

Cardiac Disease Severity Scale	N	PDSS		IES-R	
		Time 1	*Time 2*	*Time 1*	*Time 2*
		N Positive (% Positive)	N Positive (% Positive)	N Positive (% Positive)	N Positive (% Positive)
1	1	1 (100.0)	0 (0)	0 (0)	0 (0)
2	23	9 (39.1)	6 (26.1)	3 (13.0)	0 (0)
3	51	25 (49.0)	15 (29.4)	4 (7.8)	4 (7.8)
4	108	47 (43.5)	32 (29.6)	11 (10.2)	4 (3.7)
5	94	45 (47.9)	34 (36.2)	18 (19.1)	4 (4.2)
6	78	36 (46.2)	33 (42.3)	11 (14.1)	5 (6.4)
7	25	14 (56.0)	9 (36.0)	4 (16.0)	1 (4.0)

Table 2: Maternal Psychosocial support encounters documented by cardiac severity score

Cardiac Severity Score	0-5 Psychosocial Support Encounters (n/%)	>/=6 Psychosocial Support Encounters
1	1 (100%)	0
2	21 (91%)	2 (9%)
3	45 (82%)	6 (12%)
4	100 (93%)	8 (7%)
5	79 (76%)	15 (24%)
6	60 (77%)	18 (23%
7	16 (64%)	9 (36%)

450 | Refractory Hypotension with Combined Spinal Epidural and Prophylactic Phenylephrine Infusion During Scheduled Cesarean Delivery

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4:00 PM - 6:00 PM

Objective: Prophylactic phenylephrine infusion is commonly used to manage regional anesthetic-induced hypotension during cesarean deliveries, aiming to stabilize maternal blood pressure and maintain uteroplacental perfusion to prevent fetal and maternal effects. This study evaluates the incidence of refractory hypotension with combined spinal epidural (CSE) despite the use of prophylactic phenylephrine infusion.

Study Design: This retrospective cohort study included all scheduled cesarean deliveries (CD) at term from August 2023 to September 2023, excluding patients with acute indications for CD. All patients received CSE for neuraxial anesthesia. Hypotension was defined as a systolic BP < 90 mmHg or a diastolic BP < 60 mmHg with a 20% decrease from baseline BP. Patients with hypotension post-CSE were compared to those without hypotension. Data on additional vasopressor requirements and neonatal outcomes were collected. Statistical analyses performed included chi-squared, Fisher's exact, and Kruskal-Wallis tests.

Results: Among 170 patients undergoing scheduled cesarean delivery with CSE, 60% experienced hypotension despite prophylactic phenylephrine. Fetal heart rate deceleration occurred in 13.7% of hypotensive patients versus 5.9% of non-hypotensive patients (p = 0.09). Median umbilical cord pH was 7.29 [7.25, 7.31] in hypotensive patients and 7.3 [7.27, 7.33] in non-hypotensive patients (p = 0.03). Neonatal ICU admission rates were similar between groups. Rescue vasopressors were used in 75.5% of hypotensive cases and 32% of non-hypotensive cases (p< 0.01).

Conclusion: The study highlights that while prophylactic phenylephrine infusion is used to prevent hypotension during cesarean deliveries, 60% of patients still experience significant hypotension, requiring additional interventions. Further research is necessary to understand risk factors and interventions for refractory hypotension during combined spinal epidural anesthesia in scheduled cesarean deliveries to optimize maternal and neonatal outcomes.

	Maternal Hypotension	No Maternal Hypotension	
	n=102	n=68	p-value
Age	31 [26, 34]	31 [27, 34]	0.45
Gestational age	39 [39, 39]	39 [39,39]	0.51
Multiple gestation	2 (2%)	1 (1.5%)	1.00
Chronic hypertension	7 (6.9%)	7 (10.3%)	0.43
Hypertensive disorder of pregnancy	8 (7.8%)	11 (16.2%)	0.09
Repeat cesarean	94 (92.2%)	65 (95.6%)	0.37

Table 1. Characteristics of patients with and without maternal hypotension following regional anesthetic administration. Data displayed as n (%) or median and quartiles.

	Maternal Hypotension	No Maternal Hypotension	
	n=102	n=68	p-value
Change in fetal heart rate variability	6 (5.9%)	3 (4.4%)	0.67
New onset fetal heart rate decelerations	14 (13.7%)	4 (5.9%)	0.09
Change of cesarean urgency status	2 (2%)	0 (0%)	1
Rescue vasopressor required	77 (75.5%)	22 (32.4%)	**<0.01**
Umbilical cord pH	7.29 [7.25, 7.31]	7.3 [7.27, 7.33]	**0.03**
NICU admission	8 (7.8%)	5 (7.4%)	0.91

Table 2. Comparison of rescue vasopressor requirements and neonatal outcomes of patients with and without maternal hypotension following regional anesthetic administration. Data displayed as n (%) or median and quartiles.

451 | Effectiveness of Intravenous Ferric Carboxymaltose for Severe Anemia in the Late Third Trimester

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University of Texas Southwestern Medical Center, Dallas, TX

4:00 PM - 6:00 PM

Objective: Iron deficiency anemia is associated with adverse pregnancy outcomes. Prior studies have shown reduced morbidity with intravenous (IV) iron therapy, but the optimal timing of administration is unknown. The objective of this study was to evaluate whether administration timing of IV ferric carboxymaltose in the late third trimester impacts maternal hematologic indices and outcomes.

Study Design: A retrospective cohort study was conducted from October 2020 to May 2024 of IV ferric carboxymaltose for the treatment of severe anemia in the third trimester, defined by a hemoglobin < 8 g/dL or hematocrit < 25%, plus iron < 40 mcg/dL or ferritin < 15 ng/mL. Eligible patients received two infusions one week apart, regardless of gestational age at diagnosis. Patients beginning treatment early, defined as < 36 weeks gestation (WGA), were compared to those with late treatment starting ≥ 36 WGA. Mann-Whitney U and Chi-squared tests were used for statistical analysis.

Results: Of 129 patients, 101 received IV iron < 36 weeks (early) and 28 ≥ 36 weeks (late). Hemoglobin at diagnosis of severe anemia was not different, median 7.3 [7.0,7.7] g/dL in early cohort and 7.6 [7,7.8] g/dL in the late cohort (p = 0.121). The median rise in hemoglobin between diagnosis and delivery was 3.8 [2.7, 5.2] g/dL for the entire population. There was no difference in gestational age at delivery between the cohorts. Importantly, hemoglobin levels at delivery were not different between the early (11.2 [10.5,12.0] g/dL) and late (10.6 [9.6,11.2] g/dL) cohorts (p = 0.251). The incidence of peripartum transfusion was not different, 5.0% in the early cohort and 3.6% in the late cohort (p = 0.759).

Conclusion: Patients receiving IV ferric carboxymaltose for severe anemia ≥36 WGA demonstrated similar improvements in hemoglobin levels compared to those receiving treatment earlier in gestation and were no more likely to require transfusion at delivery. IV ferric carboxymaltose should not be withheld in the late third trimester based on perceived futility with advancing gestational age.

Obstetric Characteristics	Early Cohort (<36 wk) N = 101	Late Cohort (≥ 36 wk) N = 28	p-value
GA at first infusion, weeks	32 [30,34]	37 [36,38]	**0.001**
GA at delivery, weeks	39 [38, 40]	40 [39, 40]	0.582
Hemoglobin, g/dL			
At diagnosis	7.3 [7.0, 7.7]	7.6 [7, 7.8]	0.121
At delivery	11.2 [10.5, 12.0]	10.6 [9.6, 11.2]	**0.251**
Serum iron, mcg/dL	23 [18, 32]	23 [19, 26.5]	0.620
Serum Ferritin, ng/mL	7 [5, 11.0]	7 [6, 10]	0.780
MCV, femtoliters	71.0 [66.8, 77.5]	71 [68.5, 77]	0.657
Peripartum transfusion	5 (5.0%)	1 (3.6%)	**0.759**

Table. Characteristics of patients with severe anemia treated with IV ferric carboxymaltose at varying gestational ages. Data displayed as n (%) or median and quartiles.

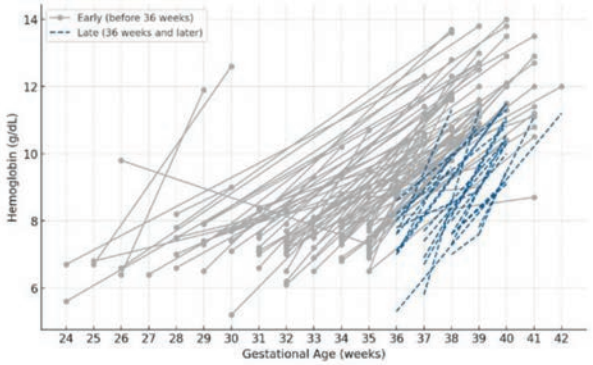

Figure. Rate of rise in hemoglobin level following IV ferric carboxymaltose administration. Each line represents a patient with the hemoglobin at time of iron therapy and hemoglobin at delivery.

452 | Accuracy of Ultrasound-Derived Estimated Fetal Weight in Peri-Viable Births

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4:00 PM - 6:00 PM

Objective: As neonatal resuscitation is offered at increasing extremes of prematurity, ultrasound-derived estimated fetal weight (EFW) is a crucial data point in patient counseling. We aimed to evaluate accuracy of EFW compared to neonatal birthweight (BW) in peri-viable births and identify factors associated with accuracy.

Study Design: Medical records were abstracted for all liveborn, non-anomalous neonates born at 22w0d-24w6d at a single tertiary institution between 1/2013-5/2024, with ultrasound-derived EFW within 7 days of delivery. Primary outcome was absolute percent difference (accuracy) between EFW (Hadlock) and BW. Linear regression and Kruskall-Wallis tests were used to assess associations of accuracy with imaging variables, maternal and pregnancy characteristics. Adjusted linear regression was performed including maternal BMI at EFW (an *a priori* plausible association) and variables associated with accuracy in univariate analyses at p< 0.1.

Results: 141 neonates from 129 pregnancies were included. Median gestational age at delivery was 23w4d, with median BW 560g. Most deliveries (83%) were sequelae of cervical insufficiency, preterm labor, or preterm prelabor rupture of membranes; 17% were iatrogenic for maternal or fetal indications. Median time from EFW to delivery was 2 days. A certified sonographer performed 85% of ultrasounds. EFW was highly correlated with BW (p< 0.001, R^2 = 0.72); 54% of EFWs underestimated BW. Median absolute percent difference was 7.1% [IQR 2.9%,12.2%]. In unadjusted analyses, increasing BW (p = 0.04) and multiple gestations (p = 0.002) were associated with improved accuracy; oligohydramnios was associated with decreased accuracy (p = 0.04). Maternal BMI, sonographer level, fetal presentation and EFW timing were not associated with accuracy. Adjusting for BMI, oligohydramios and multiples, BW remained inversely associated with EFW accuracy (coefficient -0.016, p = 0.013).

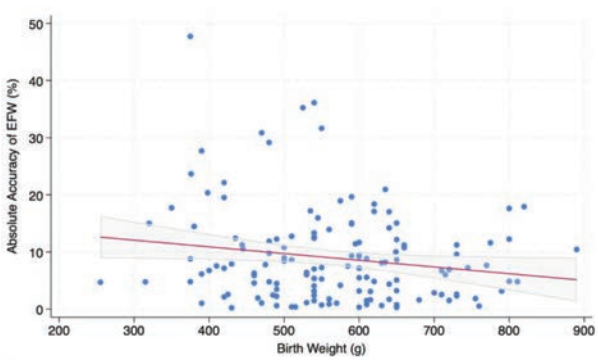
Conclusion: Ultrasound-derived EFW was an excellent predictor of BW among peri-viable deliveries at our institution. Accuracy declined with lower BW, which may be considered in antenatal counseling.

Table. Sample Characteristics & Unadjusted Associations with EFW Accuracy

	Median [IQR] or n (%)	Unadjusted Association with Absolute Accuracy*
Pregnancy Characteristics		
Gestational age at delivery	23w4d [23w0d-24w0d]	0.20
Estimated Fetal Weight (EFW) (g)	553 [489, 645]	0.68
EFW percentile for GA (%) †	38 [13, 56]	0.96
Birthweight (BW) (g)	560 [480, 640]	**0.04**
Days between EFW and delivery	2 [1, 3]	0.28
Sonographer level †		0.34
Professional with MFM read	118 (84.9)	
Resident	15 (10.8)	
Fellow/attending	6 (4.3)	
Fluid amount †		**0.04**
Normal	97 (82.2)	
Oligohydramnios (AFI<5 or MVP <2)	21 (17.8)	
Presentation during EFW ultrasound †		0.41
Cephalic	81 (59.6)	
Breech	42 (30.9)	
Transverse/Variable	13 (5.9)	
Multiple gestation		**0.002**
Singleton gestation	113 (80.1)	
Twin gestation		
Both twins living at delivery	24 (15.6)	
One twin living at delivery	4 (2.8)	
Neonate sex		0.85
Male	72 (51.1)	
Female	69 (48.9)	
Maternal Characteristics		
Maternal age at delivery (yrs)	30 [25, 33]	0.22
Maternal BMI at delivery †	30.8 [26.5, 38.0]	0.11
Maternal Race/Ethnicity (self-report) †		0.30
Hispanic/Latina	12 (8.7)	
Non-Hispanic Black	86 (62.3)	
Non-Hispanic White	31 (22.5)	
Non-Hispanic Other ^	9 (6.5)	

* p-values are from linear regression or Kruskall-Wallis tests for linear or categorical variables, respectively, due to the non-parametric distribution of absolute percent difference
† Missing data: EFW percentile (n=24), sonographer level (n=2), fluid amount (n=23), presentation (n=5), BMI (n=28), maternal race/ethnicity (n=3)
^ Non-Hispanic Other includes Asian (n=6), American Indian or Alaska Native (n=1), multiracial (n=1), other race (not specified) n=1).

Figure. Relationship between Estimated Fetal Weight Accuracy and Birthweight



The red line represents unadjusted linear regression between birth weight and absolute percent difference between EFW and BW (accuracy). Grey shaded area represents 95% confidence interval.
Corr coeff: -0.17
Unadjusted: R-squared 0.03; p=0.039
Adjusted for BMI, oligohydramnios & multiple gestation: R-squared 0.14; p= 0.013

453 | Association Between Instrumental Vaginal Delivery and the Risk of Postpartum Depression

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4:00 PM - 6:00 PM

Objective: Postpartum depression(PPD) affects 10-20% of women and previous studies have identified instrumental vaginal birth(VB) as a risk factor. Our study aimed to test this association, in full-term pregnancies with a trial of vaginal delivery, and to explore mediating factors.

Study Design: We used data from the observational nation-wide population-based study ENP 2021, including women who completed the Edinburgh Postnatal Depression Scale(EPDS) at 2-month. Multiple pregnancies, non-cephalic presentations, preterm births and planned cesareans were excluded. An EPDS score ≥ 13 was used as a validated proxy for PPD. Mode of delivery (spontaneous VB/instrumental VB/cesarean), type and indication of the instrument were collected. The association between instrumental VB and PPD was studied using univariate and multivariate analyses and weighted to account for 2-month attrition. Mediation analyses were conducted after identification of intermediate factors: maternal composite criterion (postpartum hemorrhage+/-obstetric anal sphincter injury), episiotomy, neonatal composite criterion (Apgar score ≤ 7+/-neonatal transfer), pain and disrespectful care during delivery. Two sensitivity analyses were performed among women at low psychiatric risk and using an EPDS score ≥ 11.

Results: The study population included 6084 women: 4473(73.5%) had spontaneous VB, 915(15.0%) instrumental VB and 696 (11.5%) cesareans. PPD prevalence was 16.3%[15.3-17.3] reaching 19.3% for instrumental VB (aOR 1.35[1.10-1.66]) compared with 15.6% for spontaneous VB (reference) and 16.7% for cesareans (aOR 1.05[0.83-1.33]). Fetal heart rate abnormalities indication was associated with higher PPD prevalence. The indirect effect mediated by disrespectful care during delivery explained 18% of the association between instrumental VB and PPD (aOR of indirect effect: 1.04[1.01-1.07]). We found no significant mediation effect for other factors. Sensitivity analyses found similar results.

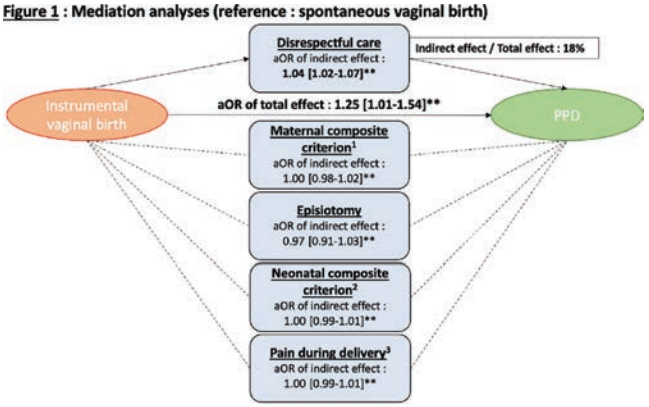
Conclusion: The prevalence of PPD was significantly higher with instrumental VB, an association partly mediated by disrespectful care during delivery.

Table 1: Postpartum depression (PPD) by mode of delivery: prevalence, univariate and multivariate analysis and corresponding crude and adjusted odds ratios

	N	PPD (%) [95%CI]*	Crude OR [95%CI]*	Adjusted OR [95%CI]*,**
Spontaneous vaginal birth	4473	15.6 [14.5-16.9]	1.00	1.00
Emergency cesarean section	696	16.7 [14.0-19.9]	1.08 [0.86-1.37]	1.05 [0.83-1.33]
Instrumental vaginal birth	915	19.3 [16.6-22.3]	**1.29 [1.05-1.58]**	**1.35 [1.10-1.66]**
Model analyzing type of instrument (reference SVD)				
Forceps		21.3 [15.7-28.3]	1.46 [0.99-2.15]	**1.56 [1.05-2.30]**
Spatulas		19.6 [13.5-27.7]	1.32 [0.84-2.08]	1.42 [0.91-2.21]
Vacuum		18.5 [15.2-22.4]	1.23 [0.95-1.59]	1.27 [0.99-1.65]
Model analyzing indication of instrument (reference SVD)***				
Fetal heart rate abnormalities		23.6 [18.4-29.7]	**1.67 [1.20-2.31]**	**1.68 [1.22-2.32]**
Failure to progress		17.7 [14.1-22.0]	1.16 [0.88-1.55]	1.25 [0.94-1.67]
Missing data		15.6 [10.9-21.9]	1.00 [0.65-1.53]	1.07 [0.70-1.63]

CI : confidence interval, OR : odds ratio
** after using a weighting score*
*** after adjustment for age, mother's place of birth, education level, body mass index, no low-risk pregnancy and delivery region*
**** OR of emergency CS not significantly different*

Figure 1 : Mediation analyses (reference : spontaneous vaginal birth)



Mediation analyses included only spontaneous vaginal birth and instrumental vaginal birth
aOR : adjusted odds ratio, CI : confidence interval
*** after adjustment for age, mother's place of birth, education level, body mass index, no low-risk pregnancy and delivery region*
[1] postpartum hemorrhage +/- obstetric anal sphincter injury
[2] Apgar score ≤ 7 +/- neonatal transfer
[3] Visual Analogue Scale ≥ 7

454 | The Association between Post-Traumatic Stress and Perineal Pain in Patients with Birth Injury

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4:00 PM - 6:00 PM

Objective: While the impact of emotional distress on perceived pain has been shown in several studies, few have focused on patients with birth injury. Our goal was to determine whether post-traumatic stress is associated with a higher incidence of reported pain in birth-injured patients.

Study Design: This was a retrospective cohort study of patients seen in a urogynecology clinic specializing in the management of birth injury. Patients completed surveys addressing physical and emotional wellbeing which included a Peritraumatic Stress Inventory (PDI) to assess for childbirth-related trauma symptoms. Demographic and delivery variables were compared between patients who had a PDI score of >14, a cut-off associated with a greater risk of developing post-traumatic stress disorder. Pain was assessed as a binary variable based on response to the question "are you having perineal/vaginal pain?". Demographic

and delivery factors associated with high PDI were added to a multivariable logistic regression model of pain (Table 1). Edinburgh Depression Scale (EPDS) score was excluded given concern for effect mediation.

Results: 48 patients completed the PDI and were included in our analysis. Patients with low PDI were assessed at an average of 11.34 (SD 4.53) weeks postpartum and patients with high PDI at 10.33 weeks (SD 6.24). Incidence of stool and gas incontinence was significantly greater in the high PDI group. While antepartum EPDS scores did not significantly differ, postpartum scores were greater in high PDI group. After adjusting for stool and gas incontinence, patients were more likely to report pain (OR 1.22; 95% CI -0.26, 0.47) but this difference was not statistically significant. However, elevated PDI was associated with leakage of stool in our adjusted model (OR 1.75; 95% CI 1.14, 2.17).

Conclusion: We found that psychologically traumatic birth was positively but insignificantly related to reported pain and significantly associated with increased stool incontinence. While further studies are needed, our results point towards a relationship between an emotionally traumatic birth and physical recovery.

	Low-risk PDI (N=32)	High-risk PDI (N=16)	P-value
Age (mean (SD))	30.72 (5.12)	33.19 (3.58)	0.091
Pre-pregnancy BMI (mean (SD))	24.34 (4.87)	23.67 (3.99)	0.636
Race/ethnicity (n(%))			0.375
Asian	5 (15.6)	4 (25.0)	
Black	2 (6.2)	0 (0.0)	
Hispanic	9 (28.1)	2 (12.5)	
Multiracial	2 (6.2)	3 (18.8)	
White	14 (43.8)	7 (43.8)	
Laceration Type (n(%))			0.313
None	1 (3.1)	0 (0.0)	
1st degree	0 (0.0)	1 (6.2)	
2nd degree	8 (25.0)	5 (31.2)	
3rd degree	22 (68.8)	8 (50.0)	
4th degree	1 (3.1)	2 (12.5)	
Insurance payer (n(%))			0.139
Private	20 (62.5)	14 (87.5)	
Public (Medi-Cal)	7 (21.9)	2 (12.5)	
Other government	5 (15.6)	0 (0.0)	
Parity (prior to current delivery) (n(%))			1
0	31 (96.9)	15 (93.8)	
1	1 (3.1)	1 (6.2)	
Birthweight (n(%))			0.724
0-4000g	23 (71.9)	13 (82.2)	
>4000g	9 (28.1)	3 (18.8)	
Shoulder dystocia (n(%))			0.643
No	29 (90.6)	13 (81.2)	
Yes	3 (9.4)	3 (18.8)	
Vaginal/perineal pain (n(%))			0.137
No	10 (31.2)	2 (6.7)	
Yes	22 (68.8)	14 (93.3)	
Urinary incontinence (n(%))			0.719
No	14 (43.8)	6 (33.3)	
Yes	18 (56.2)	10 (66.7)	
Stool incontinence (n(%))			0.001
No	18 (78.3)	20 (79.2)	
Yes	2 (6.2)	8 (53.3)	
Gas incontinence (n(%))			0.008
No	25 (38.1)	6 (33.3)	
Yes	7 (21.9)	10 (66.7)	
EPDS score, antepartum (mean (SD))	3.57 (3.39)	5.75 (3.97)	0.056
EPDS score, postpartum (mean (SD))	2.66 (3.27)	9.53 (5.24)	<0.001

Table 1. Demographic and delivery characteristics of patients with operative versus spontaneous vaginal delivery. Analyses performed using Chi-Square and Fisher T test.

	OR (95% CI)[1]	p value
No perineal pain	Ref.	--
Perineal pain	1.22 (0.93, 1.61)	0.15
No stool incontinence	Ref.	--
Stool incontinence	1.57 (1.14, 2.17)	**0.0066**
[1]Adjusted for gas incontinence		

Table 2. Odds of pain and stool incontinence based on high-risk PDI final adjusted model.

455 | Adverse Childhood Experiences and Perceived Control Over Birth

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4:00 PM - 6:00 PM

Objective: Adverse childhood experiences (ACEs) have been shown to impact adult health but have not been studied in connection with perceived control over labor, termed labor agentry. We aimed to study the impact of ACEs on labor agentry as recorded on the Labor Agentry Scale (LAS), a 29-item Likert-scale response survey in which higher score corresponds with greater agentry.

Study Design: In this prospective cohort study, patients were enrolled from high-risk obstetric clinics at a single institution from 27-34 weeks gestation. Participants were asked to complete mental health surveys on enrollment including ACE-Q, a 10-item measure to assess adverse experiences prior to age 18. At the time of birth participants completed the LAS. Patients were divided into three conventional ACE categories: low-risk (ACE = 0), moderate-risk (ACE = 1-3), and high-risk (ACE = 4+). LAS was analyzed as a continuous variable. Demographic factors independently associated with ACE scores were included in a multivariable linear regression model of labor agentry score, except history of a mental health condition given concern for effect mediation (Tables 1 and 2).

Results: Of 59 patients that completed the ACE-Q and LAS, 17 (28.8%) were low risk, 29 (49.2%) moderate risk, and 13 (22.0%) high risk. Participants in the high-risk ACE category tended to be younger (Table 1, p = 0.005). Mean labor agentry was 159.9, 166.6, and 162.7 for low, moderate, and high-risk ACE, respectively, and did not differ significantly by ACE group (p = 0.74). Compared to the low-risk ACE group, moderate and high-risk ACE scores were associated with the higher LAS in our adjusted model, but this was not statistically significant.

Conclusion: We did not find significant differences in agentry by ACE score. While additional studies are needed to confirm these findings, is plausible that patients with trauma history are more accustomed to a lack of agentry and this alters their expectations and perceptions during childbirth, attenuating differences that would otherwise be found between groups.

	Low-Risk (ACE = 0) n=17 (28.8%)	Moderate-Risk (ACE = 1-3) n=29 (49.2%)	High-Risk (ACE = 4+) n=13 (22.0%)	p-value
Age (mean, SD)	34.9 (4.2)	33.8 (5.5)	28.3 (6.6)	0.004
Race (n (%))				
White	8 (47.1)	11 (37.9)	7 (53.8)	0.99
Black or African American	1 (5.9)	2 (6.9)	1 (7.7)	
Asian	2 (11.8)	4 (13.8)	1 (7.7)	
Other Race or Mixed Race	5 (29.4)	11 (37.9)	4 (30.8)	
Unknown	1 (5.9)	1 (6.5)	0 (0.0)	
Preferred language other than English	1 (7.7)	0 (0.0)	1 (8.3)	0.28
Language other than English in the home	6 (35.3)	4 (13.8)	3 (23.1)	0.23
History of mental health condition	6 (35.3)	12 (41.4)	13 (100.0)	0.0005

Table 1. Demographic and OB history variables and ACE score. Variables analyzed using Chi square and ANOVA.

ACE Risk Group	Mean LAS (SD)	p-value	Mean difference (95% CI)[1]	p value
Low ACE	159.9 (33.0)	0.74	Ref.	--
Moderate ACE	166.6 (28.9)		6.4 (-11.2, 24.1)	0.47
High ACE	162.7 (19.4)		1.4 (-21.7, 24.5)	0.91
[1] Adjusted for maternal age				

Table 2. Mean LAS for each ACE risk group in final adjusted model.

456 | Comparison of Prophylactic Antibiotics Regimens in Pregnancies Complicated by Cervical Insufficiency Requiring Cervical Cerclage

Daniel J. Martingano[1]; Marwah Al-Dulaimi[2]; Sandra Kumwong[3]; Andrea Ouyang[4]; Lauren Cue[5]; Ashley Nguyen[2]; Francis X. Martingano[6]; Shailini Singh[7]; Alexander Ulfers[8]; Mark Rebolos[2]; Kristin Cohen[9]; Donald Morrish[2]; Iffath A. Hoskins[10]
[1]St. John's Episcopal Hospital-South Shore and William Carey University College of Osteopathic Medicine, Far Rockaway, NY; [2]St. John's Episcopal Hospital-South Shore, Far Rockaway, NY; [3]Touro College of Osteopathic Medicine-Harlem Campus, New York, NY; [4]William Carey University, Hattiesburg, MS; [5]Rutgers University and the Jersey City Medical Center, Jersey City, NJ; [6]NYU Grossman School of Medicine - NYU Brooklyn, New York, NY; [7]AtlantiCare Regional Medical Center, Pamona, NJ; [8]Walter Reed National Military Medical Center, Bethesda, MD; [9]RWJBarnabas Health - Trinitas Regional Medical Center, Elizabeth, NJ; [10]Albert Einstein College of Medicine - Montefiore Medical Center, New York, NY

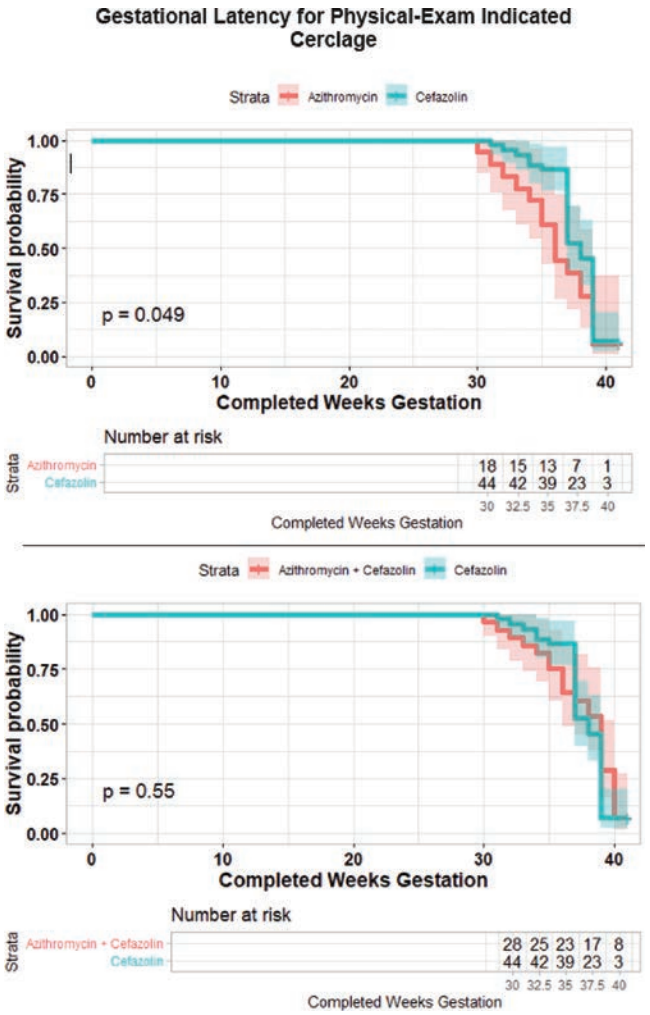
4:00 PM - 6:00 PM

Objective: The effect of prophylactic antibiotics with or without tocolytic medications on gestational latency remains uncertain. This study sought to evaluate the effectiveness of adjunctive antibiotic regimens on increasing gestational latency for pregnancies complicated by cervical insufficiency requiring cervical cerclage.

Study Design: We conducted a multi-center, prospective observational study from 7/2022 to 7/2024 comparing all pregnancies complicated by cervical insufficiency requiring cervical cerclage at a gestational age range of 16 0/7 to 23 6/7 weeks. History-indicated (HC) and physical-exam indicated (PC) cerclages were included. Antibiotic regimens used as covariates included cefazolin and/or azithromycin, and were determined based on physician preference. Each regimen received indomethacin and utilized a vaginal surgical approach. Each regimen was compared to the total patients receiving a different regimen. Patients with multiple gestations, additional tocolytic medication use, or prior vaginal progesterone use, were excluded. The primary outcomes included completed weeks gestation at time of delivery (CW), preterm and term deliveries, as respective, discrete events.

Results: The study included 209 patients with 87 requiring a PC and 112 requiring HC. Demographic factors were not significantly different. In the PC group, 43 (49.4%) received cefazolin, 16 (18.4%) received azithromycin, 28 (32.2%) received both. In the HC group, 78 (70.0%) received cefazolin, 6 (5.4%) received azithromycin, and 28 (25%) received both. Kaplan-Meier survival analysis (Figure 1) noted significantly greater pregnancy latency when comparing cefazolin to azithromycin for PC (p = 0.049). No significant differences in gestational latency or rates of preterm or term delivery were noted in the HC group for any regimen or when comparing other PC regimens.

Conclusion: It is reasonable to administer cefazolin when performing a physical-exam indicated cervical cerclage with a vaginal approach and may offer greater pregnancy latency, with likely no additional benefit when using azithromycin alone or in combination with cefazolin.



457 | Comparison of Antiemetic Regimens for 1st Trimester Pregnancies Complicated by Cannabinoid Hyperemesis Syndrome

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4:00 PM - 6:00 PM

Objective: Cannabinoid hyperemesis syndrome (CHS) is characterized by cyclic vomiting in chronic cannabis users. CHS can

both exacerbate and mimic hyperemesis gravidarum (HG) in 1st trimester pregnancies and is often refractory to antiemetic medications use to treat HG alone. This study sought to compare antiemetic regimens in cases of concurrent CHS in first trimester pregnancies.

Study Design: We conducted a multi-center, prospective observational study from 7/2022 to 7/2024 comparing all pregnant patients with concurrent CHS at gestational age range of 8 0/7 to 13 6/7 weeks. CHS was diagnosed by Rome IV criteria for cyclical vomiting syndrome and cannabis use more than 4 times per week on average. The primary outcomes included need to switch medication and patient-reported resolution confirmed by provider assessment, as discrete events. Patients taking overlapping medications or with allergies to any included medications were excluded. Monotherapy oral medications including metoclopramide, odansetron, cyproheptadine, diphenhydramine, and topical capsaicin were included as covariates. All patients endorsed routine hot-water bathing to aid in resolution of symptoms. Medication choice was determined by physician preference.

Results: The study included 537 patients diagnosed with CHS. Baseline demographic factors were not significantly different. Patients who received metoclopramide were less likely to need to switch to an alternative medication (56.2% v. 28.3%, $p = 0.002$) with a 29% decreased risk when adjusted for confounders (RR 0.71, 95% CI 0.43-0.89, p = 0.002). Patients who received topical capsaicin were more likely to report improvement in appetite (51.9% v. 20.2%, p = 0.032), with a 31% increased likelihood when adjusted for confounders (RR 1.31, 95% CI 1.44-1.93, p = 0.001). This same group, however, demonstrated the lowest compliance rate (11.9% v. 45.9%, p = 0.005).

Conclusion: Metoclopramide and topical capsaicin in conjunction with routine hot-bathing are reasonable and efficacious antiemetic regimens for 1st trimester pregnancies complicated by CHS.

458 | Predicting the need for Blood Transfusion Based on CBC at admission in Normal Vaginal Delivery

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4:00 PM - 6:00 PM

Objective: The relationship between admission complete blood count (CBC) parameters, specifically the Neutrophil-to-Lymphocyte Ratio (NLR), and the requirement for packed red blood cell (pRBC) transfusion following vaginal delivery remains underexplored. This study aims to investigate the association between various CBC parameters, including NLR, and the need for pRBC transfusion, and to evaluate their predictive value for this outcome.

Study Design: A retrospective cohort study was conducted at a tertiary, university-affiliated medical center with about 12,500 annual deliveries (2012-2023). Women were categorized based on the need for blood transfusion, determined by severe ongoing haemorrhage, symptomatic anemia with Hb levels of 7–8 g/dL, or postpartum Hb levels < 7 g/dL. Maternal demographics, CBC characteristics at admission, and delivery outcomes were analyzed. Multivariate logistic regression identified predictors for pRBC transfusion, and a risk prediction score was developed and evaluated using the ROC curve

Results: During the study period, 145,833 women delivered in our center. The CBC parameters of 37,631 women who delivered vaginally were available. Of them, 957 (2.5%) required pRBC transfusion.

Advanced maternal age, nulliparity, and conception by IVF were associated with increased pRBC transfusion. In contrast, spontaneous onset of delivery (compared to induction) was associated with a lower likelihood of transfusion.

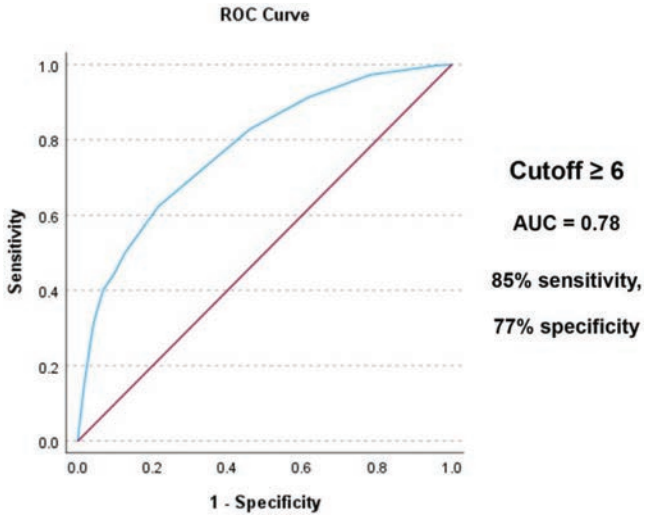
Regarding admission CBC parameters, Hemoglobin < 10.5 g/dL (OR: 6.8, 95% CI: 5.8-8.02, p< 0.001) and Neutrophil to Lymphocyte Ratio (NLR) > 5 (OR: 1.55, 95% CI: 1.3-1.87, p = 0.001) were associated with an increased rate of pRBC transfusion.

A scoring model, using a cutoff of 6 [Table 1], successfully predicted blood cell transfusion with an area under the curve of 0.78 (95% CI: 0.75-0.79, p-value < 0.001), achieving 85% sensitivity and 77% specificity. (Figure 1]

Conclusion: CBC parameters, especially hemoglobin and NLR, along with maternal factors, are valuable predictors for the need of pRBC transfusion in vaginal deliveries.

Table 1: **Score for Packed Red Blood Cells transfusion by using Complete Blood Count at Admission**

Maternal age >40 years old	
Yes	1
No	0
Body Mass Index > 30	
Yes	0
No	1
Nulliparity	
Yes	2
No	0
Previous Cesarean Delivery	
Yes	3
No	0
In Vitro pregnancy	
Yes	2
No	0
Spontaneous onset of delivery	
Yes	0
No	1
Pre-Eclampsia	
Yes	2
No	0
Hemoglobin at admission < 10.5 gr/dl	
Yes	6
No	0
Hematocrit > 40	
Yes	0
No	1
Neutrophil to Lymphocyte Ratio > 5	
Yes	1
No	0



459 | Risk Factors for Prolonged Hospitalization following Vacuum-Assisted Delivery

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4:00 PM - 6:00 PM

Objective: We aimed to determine risk factors for prolonged hospitalization following vacuum-assisted delivery (VAD).

Study Design: A retrospective cohort study, in a single, university-affiliated tertiary medical center with approximately 12,500 deliveries annually (2012-2022) was conducted. Standard practice in our department entails a post-vaginal delivery hospital stay of 48 to 72 hours. Length of stay following a VAD was analyzed and parturients who underwent VAD were categorized into two groups by length of hospitalization (more and less than 7 days). Maternal and neonatal characteristics were compared. Risk factors for prolonged hospitalization were examined using univariate and multivariate logistic regression.

Results: (1) Overall, 133,035 deliveries occurred during the study period. Of them, 9,440 (7.1%) were by VAD.

(2) The post-partum hospitalization period was distributed as follows: 9134 (96.76%) women were hospitalized for up to 7 days, and 306 (3.34%) were hospitalized for more than 7 days.

(3) Using multivariate analysis: preterm delivery (delivery prior to 37 weeks) (RR 5.4 95%CI [1.6-17], p = 0.005); preeclampsia (RR 6.0 95%CI [1.9-19], p = 0.002), induction of labor (RR 3.4 95%CI [1.8;6.3], p< 0.001), obstetric anal sphincter injury (RR 3.2 95%CI [1.2-8], p = 0.013), postpartum hemorrhage which required blood transfusion (RR 3.3 95%CI [1.3-8.4], p = 0.012), and Apgar Score under 7 at minute 5 (RR 3.4 95%CI [1.4-39], p = 0.015), were identified as independent risk factors for prolonged hospitalization [Table]

Conclusion: Risk factors associated with prolonged hospitalization following a VAD can be identified, with preterm delivery and Apgar score < 7 at minute 5 being the most prominent.

	aOR (95% CI)	p-value
Maternal age at delivery	1.01 (0.9 -1.1)	0.7
Pre gestational BMI	0.9 (0.9-1.04)	0.6
Delivery under week 37	5.4 (1.6-17)	0.005
Multiple gestation	1.2 (0.1-11)	0.8
Gestational Diabetes Mellitus	1.3 (0.6-2.9)	0.5
Pre-Eclampsia	6 (1.9-19)	0.002
Vaginal birth following CD	0.6 (0.1-5)	0.6
Induction of labor	3.4 (1.8-6.3)	<0.001
Oxytocin use	1.5 (0.4-4)	0.4
Epidural anesthesia	2.4 (0.3-19)	0.4
Intrapartum Fever	1.8 (0.6-5.4)	0.2
Prolonged third phase	2.4 (1-6)	0.05
OASI	3.2 (1.2-8)	0.013
PPH requiring blood transfusion	3.3 (1.3-8.4)	0.012
Apgar < 7	7.6 (1.4-39)	0.015

aOR: adjusted odd ratio; CI: Confidence Interval; CD: Cesarean Delivery; OASI: Obstetric Anal Sphincter Injury; PPH: Postpartum Hemorrhage

460 | Diagnostic Value of CFDNA Fetal Fraction in Patients with Prenatally Suspected Placenta Accreta Spectrum Disorder

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4:00 PM - 6:00 PM

Objective: The pathophysiology of placenta accreta spectrum (PAS) is unknown but thought to be related to myometrial disruption at the uterine-placental interface. Noninvasive prenatal testing (NIPT) analyzes circulating placental DNA, and it has been postulated that PAS may affect the fetal fraction (FF) of cell-free DNA (cfDNA). The purpose of this study is to investigate the relationship between FF and PAS pathology in patients with prenatally suspected PAS.

Study Design: This was a case-control study utilizing a large database of pregnancies with suspected or proven PAS delivered between 6/2012 and 7/2024 at a single academic institution. Pregnancies were excluded if FF was not reported. Other exclusion criteria were lack of suspicion for PAS on prenatal imaging, twins, fetal demise, abnormal NIPT, fetal structural anomalies, or postnatal diagnosis of a genetic/metabolic disorder. The primary outcome was mean FF in pregnancies with a final clinical diagnosis of no PAS or FIGO1-2 (less complex) versus FIGO3A-C (more complex). A generalized linear mixed model was used and FF was log-transformed to achieve normality. Results were reported as mean FF ± standard error of the mean. Adjusted means were also reported after assessing for confounders.

Results: Of the 468 pregnancies assessed, 165 had NIPT results reporting FF. Of these, 128 met full inclusion criteria. The mean FF in the less complex group did not differ from the more complex group (9.6% ± 0.49, n = 81 vs 10.7% ± 0.64, n = 47; p = 0.22). However, after adjusting for number of prior cesarean deliveries and maternal BMI, the mean FF in the less complex group was significantly lower than the more complex group (9.3% ± 0.48 vs 11.1% ± 0 .64, p = 0.03). Other factors including maternal age, maternal medical comorbidities, gestational age at time of NIPT, and placenta previa were not found to correlate with FF or FIGO grade.

Conclusion: Higher FIGO grade PAS may be associated with a higher FF in pregnancies with prenatal suspicion for PAS. Thus, NIPT may have the potential to assist with delivery preparation and prognostication in this high-risk patient population.

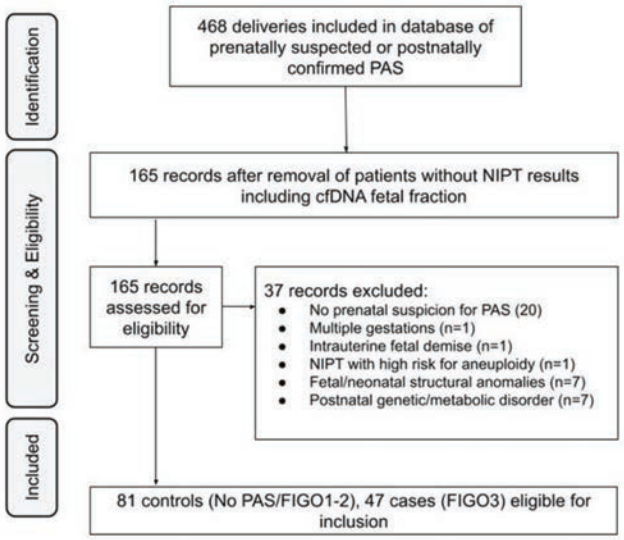

Figure 1: Records from an institutional PAS database were reviewed and eligibility for inclusion determined based on the criteria above.

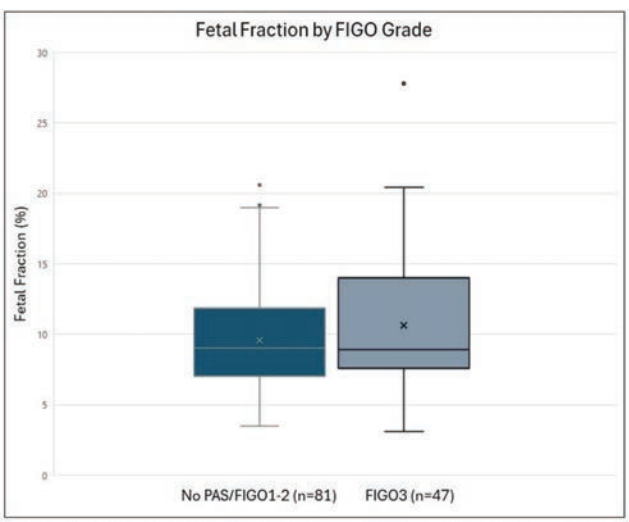

Figure 2: Fetal fraction cfDNA on NIPT in patients with prenatal suspicion for PAS grouped by final clinical diagnosis (less complex vs more complex).

461 | Gestational Diabetic Placental T-Cells Cause Hypertension and Impaired Glucose Utilization in Pregnant GDM Rat Model

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4:00 PM - 6:00 PM

Objective: Gestational diabetes mellitus (GDM) refers to glucose intolerance, insulin sensitivity and beta islet cell dysfunction during pregnancy. GDM pathogenesis is associated with hypertension, impaired placental and renal function, oxidative stress and increased circulating CD4+ T cells. Importantly, there are limited animal models available to study GDM or alternative treatment options. This study sought to determine if a possible mechanism for GDM is placental CD4+ T cell programming in the patient and to test alternative treatment options for GDM.

Study Design: Upon delivery, blood and placental GDM (GDM-CD4+ T cells) and normotensive (NP+NP) placental CD4+ T cells were collected. Purified CD4+T cells were injected into pregnant nude athymic rats on gestational day (GD) 12. On GD 13, a separate cohort rats were treated with Metformin (GDM+Met; 300 mg/kg/day) or MitoTempo (GDM+Mito;1 mg/kg/d). Mean arterial pressure (MAP), circulating glucose, and glucose tolerance tests (GTT) were performed on GD 19. Mitosox Red was used to measure mtROS production in HUVECs incubated with sera from GDM, GDM women treated with Metformin (GDM+Met) or Normotensive women. A one-way ANOVA was used for statistical analysis.

Results: MAP was higher in GDM-CD4+ T cell rats (121±2, n = 8, $p < 0.05$) compared to GDM+MET (95±2, n = 6), GDM+Mito (95±4, n = 7), NP+NP CD4+ T cells (96±4, n = 7), NP+NP MET (99±4, n = 8), and NP nude controls (105±3 mmHg, n = 8) rats. Blood glucose was elevated in GDM-CD4+ T cell rats (227±39 mg/dl, n = 8, $p < 0.05$) compared to GDM+MET (111±11 mg/dl, n = 7), GDM+Mito (97±2 mg/dl, n = 7), NP+NP CD4+ T cells (89±3 mg/dl, n = 7), NP+NP MET (96±2 mg/dl, n = 8), and NP nude controls (82±9 mg/dl, n = 8) rats. GTT was impaired in GDM CD4+ T rats, but was improved with Met and Mito treatment. Mitochondrial ROS was increased in HUVECS treated with GDM patient sera ($p < 0.05$) compared to GDM+Met or Normotensive patient sera.

Conclusion: Our findings indicate that GDM CD4+ T cells cause a diabetic phenotype suggesting a new model to investigate mechanisms and therapies.

462 | Outcomes in Individuals with Expectant Management of Previable PROM in Texas following SB8

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4:00 PM - 6:00 PM

Objective: We sought to compare outcomes of pregnant individuals diagnosed with previable PROM and expectantly managed at our center before and after implementation of Texas Senate Bill 8 (SB8).

Study Design: This is a retrospective cohort study across three tertiary care hospitals from January 1, 2018-March 31, 2023. ICD-10 codes were used to identify all hospital deliveries of individuals with previable PROM. Trained research staff completed chart review. Patients with singleton or twin gestions and clinical diagnosis of PROM < 22 wks 0 days were studied, excluding those with IUFD and/or active PTL. Expectant management was defined as continuation of pregnancy (no immediate delivery) after admission and delivery for spontaneous PTL, IUFD, or development of a medical indication (infection, bleeding, or other indications). We compared clinical characteristics and outcomes of individuals with expectant management before and after the implementation of SB8 on September 1, 2021. Our primary outcome was composite adverse outcome, which

included ICU admission, transfusion, and/or sepsis. Adjusted relative risk (aRR) with 95% CIs was calculated. Multivariable Poisson regression was used to adjust for confounding factors for the primary outcome.

Results: Over the 5-year study period, 118 individuals met inclusion criteria (49 pre-SB8 vs 69 post-SB8). There were no differences in clinical characteristics pre- vs post-SB8 (Table 1). There was no difference in the rate of the composite adverse outcome (26.5% vs 37.7%, aRR = 1.50, 95% CI = 0.85-2.62), after adjusting for age, race and ethnicity, and gestational age at delivery. Time from rupture to delivery was significantly longer in the post-SB8 cohort (median [IQR]: 3 [1-7] days vs 6 [2-12] day, p = 0.048). The post-SB8 cohort demonstrated a higher rate of sepsis (12.2% vs 31.9%, aRR = 2.69, 95% CI = 1.20-6.03).

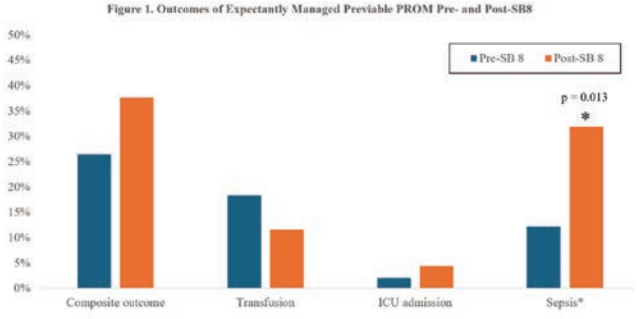
Conclusion: After SB8, individuals with PROM < 22 wks had longer latency period and higher rates of sepsis compared to those before SB8. We speculate this may be due to delayed intervention by providers to wait for medical indications that qualify as "medical emergency."

Table 1. Baseline characteristics of patients presenting with previable PROM < 22 weeks pre- and post-SB8 with expectant management

	Pre-SB 8 (n = 49)	Post-SB 8 (n = 69)	p-value
Age (years)			0.90
<25	9 (18.4%)	11 (15.9%)	
25-34	26 (53.1%)	36 (52.2%)	
≥35	14 (28.6%)	22 (31.9%)	
Race/ethnicity			0.12
White	2 (4.1%)	9 (13.0%)	
Black/African American	23 (46.9%)	25 (36.2%	
Hispanic	10 (20.4%)	21 (30.4%)	
Other	6 (12.2%)	10 (14.5%)	
Unknown/Not reported	8 (16.3%	4 (5.8%)	
Gravidity	2.8 (1.9)	2.7 (1.5)	0.70
Parity	1.0 (1.4)	1.0 (1.2)	0.91
Term	0.8 (1.2)	0.7 (0.9)	0.77
Preterm	0.2 (0.6)	0.3 (0.7)	0.46
Abortion	0.8 (1.3)	0.7 (1.2)	0.60
Gestational age at rupture	18.7 (2.4)	18.4 (2.1)	0.41
Tobacco/alcohol/drug use	4 (8.2%)	3 (4.4%)	0.45
BMI at delivery			0.69
<30	21 (42.9%)	27 (39.1%)	
≥30	28 (57.1%)	42 (60.9%)	
Anemia at admission	1 (2.0%)	6 (8.7%)	0.24
COVID positive on admission	0 (0.0%)	1 (1.5%)	1.00
STI during pregnancy	3 (6.1%)	8 (11.6%)	0.36
Chronic hypertension	4 (8.2%)	8 (11.6%)	0.76
Twin gestation	3 (6.1%)	7 (10.1%)	0.52
Fetal anomalies	0 (0.0%)	3 (4.4%)	0.41
Mode of delivery			0.72
Vaginal	45 (91.8%)	61 (88.4%)	
Primary cesarean	1 (2.0%)	3 (4.4%)	
Repeat cesarean	3 (6.1%)	3 (4.4%)	
Dilation and evacuation	0 (0.0%)	2 (2.9%)	

Data presented as n (%) or mean (SD)

Figure 1. Outcomes of Expectantly Managed Previable PROM Pre- and Post-SB8



*Sepsis defined as a diagnosis of clinical IAI and two or more of the following: maternal tachycardia > 100, maternal fever 38C/100.4F, respiratory rate > 20 breaths per minute, WBC > 15,000, evidence of organ dysfunction/failure (including altered mental status, lactic acidosis, SBP <90 or SBP drop ≥40 mm Hg of normal, AKI).

463 | Characteristics of Gestational Surrogate Pregnancy in a Large Integrated Healthcare Setting

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4:00 PM - 6:00 PM

Objective: To describe maternal and infant characteristics of gestational surrogate (GS) pregnancies in an integrated healthcare system with a large, diverse pregnant population.

Study Design: An electronic health records (EHR)-based retrospective cohort study of pregnant members delivered at 20-44 weeks' gestation at Kaiser Permanente Southern California from 01/01/2008–12/31/2023 (N = 636,300) was performed. Unstructured data abstracted from EHRs were used to determine GS status via natural language processing (NLP), validated by manual chart review (positive predictive value = 96%). Hospital in- and outpatient physician encounters, and laboratory records were used to ascertain medical and obstetrical histories. Adjusted risk ratios (aRR) and 95% confidence intervals (CI) derived from robust Poisson regression were used to describe the magnitude of associations.

Results: Among pregnant members who delivered during the study period, 1,109 (1.7/1000) were GS pregnancies. Maternal age ≥ 25 years, non-Hispanic white, multiple gestation (aRR: 10.12, 95% CI: 8.6-11.92), and privately funded KP membership (aRR: 2.48, 95% CI: 2.12-2.89) were more likely to be associated with gestational surrogacy. GS patients were more likely to be overweight (aRR: 1.93, 95% CI: 1.56-2.14) and obese (aRR: 2.15, 95% CI: 1.80-2.56). Patients with a GS pregnancy were less likely to smoke (aRR: 0.34, 95% CI: 0.17-0.69) or drink alcohol (aRR: 0.54, 95% CI: 0.47-0.63) during pregnancy. Children of GS were more likely to be born preterm (20-33 weeks [aRR: 2.32, 95% CI: 1.73-3.10], 34-36 [aRR: 2.50, 95% CI: 2.08-3.01] weeks of gestation), and at a birthweight < 2500g (aRR: 1.57, 95% CI: 1.26-1.95), whereas no difference in child's sex was observed.

Conclusion: The findings suggest that gestational surrogates tended to be older, non-Hispanic white, overweight or obese, and seldom smoked or consumed alcohol during pregnancy. They tended to have multiple gestation, preterm and low birthweight children, and privately funded KP membership.

464 | Evaluation of Maternal and Neonatal Outcomes Based on Indication for Cerclage

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4:00 PM - 6:00 PM

Objective: Comparison of pregnancy outcomes in those undergoing ultrasound, history, and exam-indicated cerclage placement in a large US hospital system.

Study Design: Retrospective cohort study of singleton pregnancies requiring cerclage at multiple hospitals in a large hospital system between 2020-2023. Subjects were included if they had a cerclage placed during pregnancy and available maternal and neonatal outcomes. They were excluded if maternal and neonatal outcomes were not available. Patients were then separated into three groups based on cerclage indication: history (HI), ultrasound (US) and exam indicated (EI). Our primary outcome was delivery < 37 weeks. Maternal and neonatal outcomes were then compared between groups using Chi-squared analysis, ANOVA, as well as logistic and linear regression, with a p-value < 0.05 being considered statistically significant.

Results: 405 singleton pregnancies were analyzed (201 history-indicated, 132 ultrasound-indicated, 72 exam-indicated). Groups were similar in terms of BMI, race, ethnicity, marital status and insurance type, but exhibited a statistical difference in maternal age and nulliparity. Patients in the EI cohort delivered earlier than HI and US groups at an average gestational age of 33.7 w (p = 0.004) . Delivery at < 32 w was most common in EI and US cohorts compared to HI (30.6% vs 18.9% and 12.9%, p = 0.004). Delivery < 32w and < 28w were associated with EI and US groups compared to HI after controlling for confounders . Incidence of neonatal Grade III or IV IVH, sepsis and NICU admission were higher in the EI and US groups compared to HI group. Duration of NICU stay (in days) and incidence of fetal or neonatal demise were greater in the EI cohort compared to the HI group, and these findings persisted in the adjusted analysis (aLRC 37.63, 95%CI 2.82-72.43 and aOR 9.01, 95% CI 1.25-64.87, respectively).

Conclusion: Exam-indicated cerclage is associated with delivery at earlier gestation, greater risk of delivery at < 32 w and < 28 w, longer NICU admission, and increased risk of fetal or neonatal demise compared with history-indicated cerclage.

Regression analysis comparing US-indicated and exam-indicated to history-indicated cerclage				
	US-indicated compared to history-indicated cerclage		Exam-indicated compared to history-indicated cerclage	
	OR/LRC (95% CI)	aOR/aLRC (95% CI)	OR/LRC (95% CI)	aOR/aLRC (95% CI)
Gestational age at delivery	-0.49 (-1.60 to 0.62)	**-2.79 (-4.90 to -0.68)**	**-2.30 (-3.66 to -0.93)**	**-3.58 (-6.13 to -1.03)**
Preterm delivery <37 weeks	1.25 (0.80-1.96)	1.52 (0.62-3.73)	**1.96 (1.14-3.38)**	1.88 (0.63-5.62)
Preterm delivery <32 weeks	1.57 (0.86-2.86)	**3.29 (1.07-10.12)**	**2.96 (1.55-5.67)**	**4.17 (1.14-15.32)**
Preterm delivery <28 weeks	1.23 (0.60-2.51)	**4.84 (1.32-17.69)**	**2.31 (1.09-4.90)**	**5.34 (1.20-23.81)**
Controlled for Age, nulliparity, chronic hypertension, history of preterm delivery, gestational age at cerclage placement, dilation (yes/no), prolapsing membranes, antibiotics, indomethacin				

Regression analysis comparing US-indicated and exam-indicated to history-indicated cerclage				
	US-indicated compared to history-indicated cerclage		Exam-indicated compared to history-indicated cerclage	
	OR/LRC (95% CI)	aOR/aLRC (95% CI)	OR/LRC (95% CI)	aOR/aLRC (95% CI)
Meconium	2.39 (0.53-10.70)	2.39 (0.53-10.70)	3.15 (0.50-19.70)	3.15 (0.50-19.70)
5 minute Apgar <7	1.48 (0.71-3.11)	**5.35 (1.41-20.36)**	2.09 (0.92-4.74)	4.36 (0.89-21.47)
Composite adverse outcome	1.18 (0.75-1.86)	2.48 (0.99-6.21)	1.58 (0.92-2.74)	2.60 (0.86-7.81)
Resp. assistance or intubation	1.31 (0.82-2.09)	1.67 (0.67-4.20)	1.46 (0.83-2.56)	1.69 (0.56-5.12)
RDS	1.52 (0.84-2.72)	0.82 (0.24-2.75)	**2.06 (1.06-4.01)**	0.95 (0.24-3.79)
Neonatal or fetal demise	0.82 (0.30-2.28)	**6.70 (1.26-35.52)**	2.16 (0.83-5.60)	**9.01 (1.25-64.87)**
Grade III or IV IVH	3.08 (0.28-34.28)	1.05 (0.01-78.15)	8.70 (0.89-84.99)	3.85 (0.04-415.44)
Necrotizing enterocolitis	3.08 (0.28-34.28)	13.90 (0.25-760.60)	5.71 (0.51-64.00)	51.60 (0.45-5915.25)
Neonatal sepsis	1.53 (0.09-24.62)	5.78 (0.14-241.74)	8.70 (0.89-84.99)	-
NICU admission	1.52 (0.94-2.46)	0.88 (0.33-2.30)	**1.98 (1.12-3.50)**	0.91 (0.29-2.82)
NICU length of stay	9.9 (-5.87 to 25.72)	23.5 (-6.39 to 53.29)	**21.4 (3.3 to 39.5)**	**37.63 (2.82 to 72.43)**
Controlled for Age, nulliparity, chronic hypertension, history of preterm delivery, gestational age at cerclage placement, dilation (yes/no), prolapsing membranes, antibiotics, indomethacin				

465 | Evaluation of Prophylactic Antibiotic use in Ultrasound-Indicated Cerclage Placement in a Large Us Hospital System

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4:00 PM - 6:00 PM

Objective: Compare pregnancy outcomes in patients that did and did not receive antibiotic prophylaxis for ultrasound-indicated cerclage placement

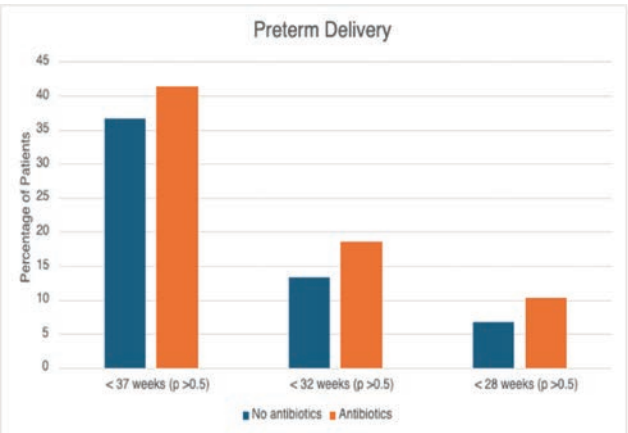
Study Design: Retrospective cohort study of singleton pregnancies undergoing ultrasound-indicated (US) cerclage at multiple hospitals within a large US hospital system between 2020-2023. Subjects were included if they met criteria for US-indicated cerclage. They were excluded if they did not have detailed operative notes and pre- and post-op documentation, or if the maternal and neonatal outcomes were not available. Patients were separated into two groups: those who received antibiotics at the time of cerclage placement and those that did not. Patient demographics, socio-economic factors, and medical co-morbidities were compared as well as operative findings and use of indomethacin. The primary outcome was gestational age at delivery. Secondary outcomes included rates of cesarean section and preterm delivery at < 37 weeks (w), < 32 w, and < 28 w. Student's t-test, chi-squared, and logistic and linear regression were used for statistical analysis, and p-value < 0.05 was considered statistically significant.

Results: 127 singleton pregnancies were analyzed, with 97 receiving antibiotics. Patients across both cohorts were similar in terms of age, parity, BMI, race, ethnicity, marital status, and type of insurance. Additionally, patients did not differ significantly regarding their medical co-morbidities. Those who received antibiotics were more likely to have a dilated cervix at the time of cerclage placement (53.6% vs 26.7%, p = 0.010) as well as prolapsed

membranes (17.5% vs 0%, p = 0.014). Indomethacin use did not vary significantly between groups. Gestational age at delivery as well as incidence of delivery at < 37 w, < 32 w, and < 28 w did not vary significantly between the two groups, even when adjusting for confounding factors (table). There was no difference in rate of cesarean between the groups.

Conclusion: Antibiotic use at the time of ultrasound-indicated cerclage is not associated with a decreased risk for preterm delivery.

	OR/LRC (95% CI)	aOR/aLRC (95% CI)
Gestational age at delivery	-0.06 (-2.46 to 1.24)	-0.06 (-2.57 to 1.36)
Preterm delivery <37 weeks	1.26 (0.54-2.94)	1.01 (0.40-2.53)
Preterm delivery <32 weeks	1.48 (0.46-4.77)	1.47 (0.41-5.32)
Preterm delivery <28 weeks	1.61 (0.33-7.79)	2.65 (0.44-15.81)
Cesarean delivery	1.92 (0.78-4.77)	1.97 (0.74-5.23)



467 | Maternal Morbidity Disparities Amongst Native Hawaiian and Pacific Islander Populations Following Implementation of Safety Bundles

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4:00 PM - 6:00 PM

Objective: The Alliance for Innovation on Maternal Health (AIM) has developed evidence-based patient safety bundles (PSB) to decrease severe maternal morbidity (SMM) for several obstetric outcomes including hemorrhage, severe hypertension, and sepsis. Ten of 12 hospitals with birthing facilities in Hawaii adopted AIM PSB in 2021. With evidence of racial disparity among SMM, there is limited data on Native Hawaiian and Pacific Islander people. Our goal was to examine racial and ethnic differences in SMM among OB hemorrhage cases since the implementation of AIM PSB in Hawaii.

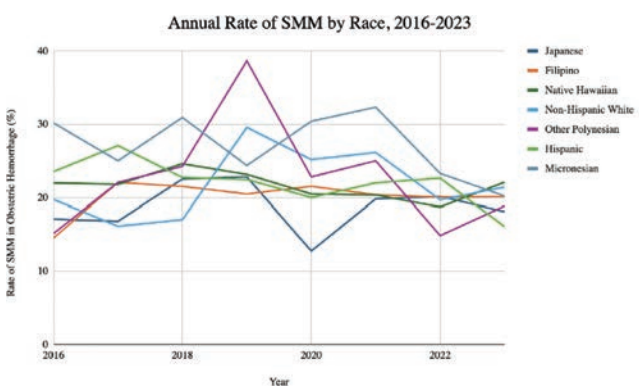
Study Design: We abstracted AIM SBP data from the AIM Data Center, and stratified SMM among OB hemorrhage (excluding ectopic pregnancy and spontaneous abortion) by patient race and year. The groups reported were those with 5 or more incidence of hemorrhage in any given year: Japanese, Filipino, Native Hawaiian, Micronesian, Other Polynesian, Non-Hispanic White, and Hispanic.

Results: From 2016 to 2023, 9545 deliveries were included. Micronesian patients had the highest average SMM rates among OB hemorrhage (27.1%, Table 1), then Other Polynesian (22.7%) and Hispanic (22.1 %) patients. Japanese patients had the lowest rate (18.7%). By year, Micronesian patients had a 30.4% and 32.3% SMM rate in 2020 and 2021, respectively, to 20.2% by 2023 (Graph 1) . Similarly, patients identifying as Other Polynesian had a 38.6%, 22.8%, and 25% SMM rate from 2019-2021, to 14.9% and 18.9% in 2022 and 2023. Native Hawaiian patients had a SMM rate of 20.4% in 2021, 18.7% in 2022, and 22.1% in 2023.

Conclusion: Micronesian and Polynesian patients experienced clinically significant reduction in SMM among OB hemorrhage after the implementation of AIM PSB in 2021. Native Hawaiian patients did not experience a similar decrease. Native Hawaiian and Pacific Islanders are overrepresented in Hawai'i's birthing population compared to the general population, but experience worse outcomes relative to other racial groups. Further studies are warranted to investigate why select populations may benefit from these interventions and how we might provide more equitable care.

Average Rate of SMM by Race/Ethnicity for combined years 2016 – 2023

Race/Ethnicity	Average SMM rate
Japanese	18.76
Filipino	20.09
Native Hawaiian	21.65
Non-Hispanic White	21.86
Other Polynesian	22.70
Hispanic	22.06
Micronesian	27.08



468 | Timing of Delivery in Pregnancies Complicated by Small for Gestational Age with Concurrent Chronic Hypertension

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4:00 PM - 6:00 PM

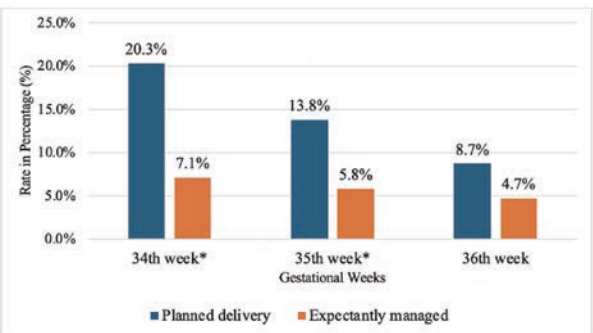
Objective: The American College of Obstetricians and Gynecologists recommends delivery at 34 0/7 - 37 6/7 weeks for pregnancies complicated with fetal growth restriction and concurrent maternal conditions, such as chronic hypertension (CHTN), based on limited evidence. Our objective was to assess neonatal morbidity at birth for each week of gestation in births complicated with small for gestational age (SGA) and CHTN to assess optimal timing of delivery between 34 0/7 - 37 6/7 weeks.

Study Design: This was a population-based cohort study of non-anomalous, singleton, live births complicated by CHTN and SGA between 34 and 37 completed weeks using data from the U.S. Natality Vital Statistics Database from 2015 to 2022. Planned deliveries were births at each completed week from 34 to 37 weeks that had a labor induction or cesarean delivery without labor, excluding spontaneous labor. Expectant management group included all births that delivered on or after the following week (i.e., planned birth at 34 0/7-34 6/7 compared to all births ≥ 35 0/7 weeks). The primary outcome was a neonatal adverse composite, which was compared between both groups at each week using multivariable analyses.

Results: There were 157,985 births that met inclusion criteria. After adjusting for the differences between both groups, planned delivery prior to 36 weeks was associated with greater odds of neonatal morbidity than those expectantly managed (planned 34 weeks birth: 20.3% vs expectant births > 35 weeks: 7.1%, aOR 3.83, 95% CI 3.12-4.70; planned 35 weeks birth: 13.8% vs expectant births > 36 weeks: 5.8%, aOR 2.18, 95% CI 1.74-2.75). Planned delivery ≥ 36 0/7 had similar odds of composite neonatal morbidity than those expectantly managed (Figure 1).

Conclusion: In births complicated by SGA and concurrent CHTN, planned delivery prior to 36 weeks was associated with greater odds of neonatal morbidity compared to expectant management. This data suggests that optimal delivery timing is ≥ 36 weeks. A randomized trial is needed to confirm these findings.

Figure 1. Neonatal composite between planned deliveries and expectant management



Composite neonatal morbidity consists of APGAR score at 5 minutes <5, assisted ventilation use > 6 hours, neonatal seizures, not living at time of report
*significant difference noted on multivariable analyses

469 | Change in Late Preterm PROM Guidelines Result in Increased Expectant Management

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4:00 PM - 6:00 PM

Objective: To investigate the rates of expectant management of preterm prelabor rupture of membranes (PPROM) past 34w0d before and after practice guideline changes in March 2020 at a tertiary level medical center and the corresponding maternal and neonatal outcomes.

Study Design: This is a retrospective cohort study of 299 gravid, singleton patients who underwent PPROM prior to 36w6d and delivered at 34w0d to 36w6d between June 2015 and June 2022. The primary outcome is NICU admission rate, and secondary outcomes include PPROM latency, corticosteroid administration, composite neonatal morbidity (5-minute Apgar < 7, umbilical artery pH < 7.10, assisted ventilation, respiratory distress syndrome, hypoxic ischemic encephalopathy, antibiotic administration >72 hours, intraventricular hemorrhage, seizures, death) and composite maternal morbidity (chorioamnionitis, placental abruption, maternal sepsis, maternal transfusion).

Results: 176 patients (58.9%) before and 123 patients (41.1%) after March 2020 were included. No patients before 2020 and 6 patients (4.8%) after 2020 experienced PPROM before 34w0d and delivered in the late preterm period. There was no difference in PPROM and delivery gestational ages (Table 1). PPROM latency was longer after 2020 (1.01±0.32 vs. 0.52±0.11 days, p = 0.001). More patients underwent expectant management (26.8% vs. 11.9%, p< 0.001) and received corticosteroids (78.0% vs. 60.2%, p = 0.001) after 2020. There was no difference in NICU admission rates and composite neonatal and maternal morbidities (Table 1). In the patients who underwent expectant management, PPROM occurred at a higher gestational age prior to March 2020 (Table 2, p = 0.04). There was no difference in delivery gestational age, latency, NICU admission rates, and composite neonatal and maternal morbidities in patients who underwent expectant management (Table 2).

Conclusion: Significantly more patients underwent expectant management of PPROM past 34w0d after March 2020, but there was no difference in NICU admission rates and composite maternal and neonatal morbidities, even in those who underwent expectant management.

Table 1. PPROM Outcomes Before and After March 2020

	Before March 2020 (n=176)	After March 2020 (n=123)	P-value
PPROM gestational age	35 weeks and 2.8±0.9 days	35 weeks and 2.7±1.2 days	0.98
Delivery gestational age	35 weeks and 3.4±0.9 days	35 weeks and 3.6±1.1 days	0.76
PPROM latency (days)	0.52±0.11	1.01±0.32	**0.001**
Expectant management (n, %)	21 (11.9)	33 (26.8)	**<0.001**
Antenatal corticosteroids (n, %)	106 (60.2)	96 (78.0)	**0.001**
NICU admission (n, %)	94 (53.4)	53 (43.1)	0.08
Composite neonatal morbidity (n, %)	61 (34.7)	42 (34.1)	0.69
Composite maternal morbidity (n, %)	18 (10.2)	12 (9.8)	0.89

Table 2. PPROM Outcomes in Patients who Underwent Expectant Management

	Before March 2020 (n=21)	After March 2020 (n=33)	P-value
PPROM gestational age	35 weeks and 3.5±2.8 days	34 weeks and 6.5±2.4 days	**0.04**
Delivery gestational age	35 weeks and 4.0±2.7 days	35 weeks and 1.6±2.2 days	0.16
PPROM latency (days)	0.64±0.25	1.71±1.05	0.11
Antenatal corticosteroids (n, %)	9 (42.9)	30 (90.9)	**<0.001**
NICU admission (n, %)	10 (47.6)	11 (33.3)	0.29
Composite neonatal morbidity (n, %)	6 (28.6)	9 (27.3)	0.92
Composite maternal morbidity (n, %)	4 (19.0)	4 (12.1)	0.48

470 | Comparison of Weight Gain versus BMI During Pregnancy on Perinatal Outcomes in Singleton Term Pregnancies

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4:00 PM - 6:00 PM

Objective: Excessive gestational weight gain (GWG) and obesity have significant adverse perinatal risks. Our study compares the impact of excessive GWG on maternal and neonatal outcomes in pregnancies with normal pre-pregnancy BMI (18.5–24.9) to those who had pre-pregnancy BMI ≥ 25 with recommended weight gain.

Study Design: We performed a retrospective cohort study using the National Vital Statistics Database and included singleton, non-anomalous live births who delivered at term from 2016-2022. We excluded patients with multifetal gestations, chronic hypertension and pre-gestational diabetes. We compared three groups: Group 1 (normal pre-pregnancy BMI with excessive GWG), Group 2 (overweight pre-pregnancy BMI (25.0–29.9) with recommended GWG) and Group 3 (obese pre-pregnancy BMI (≥ 30) with recommended GWG). Recommended GWG was defined according to AIUM standards across BMI strata. Multivariate Poisson regression models with robust error variance were used to examine the association. Adjusted relative risk (aRR) with 95% confidence intervals were calculated.

Results: Our study included 6,352,304 patients. Compared to Group 1, overweight and obese patients had a higher risk of composite adverse maternal outcome, mostly due to increased risk of gestational diabetes and cesarean birth. Those with recommended GWG despite being overweight or obese were less likely to have hypertensive disorders (Group 2 aRR 0.92, 95% CI 0.91-0.92) and operative vaginal birth (Group 2 aRR 0.93, 95% CI 0.92-0.94; Group 3 aRR 0.73, 95% CI 0.72-0.74). Compared to Group 1, Group 2 had a reduced risk of the composite neonatal adverse outcome (aRR 0.74, 95% CI 0.74-0.74), mostly due to a reduced risk of large for gestational age fetuses (aRR 0.64, 95% CI 0.64-0.64) and NICU admission (aRR 0.98, 95% CI 0.98-0.99).

Conclusion: While pre-pregnancy BMI is a crucial predictor of these outcomes, recommended weight gain during pregnancy mitigates these risks by improving maternal and neonatal outcomes. Additional studies are needed to quantify the risk of excessive GWG in those with other high-risk conditions.

Table 1. Composite and Individual Maternal Adverse Outcomes

Outcomes	Groups	Total live births	n	%	Crude RR (95% CI)	aRR (95% CI)
Composite maternal adverse outcome	Total	6,348,546	2,632,256	41.5		
	Group 1	3,336,568	1,258,973	37.7	*Reference*	*Reference*
	Group 2	1,578,988	634,495	40.2	1.06 (1.06-1.07)	1.06 (1.06-1.06)
	Group 3	1,432,990	738,788	51.6	1.37 (1.36-1.37)	1.28 (1.28-1.28)
Gestational diabetes	Total	6,352,304	406,694	6.4		
	Group 1	3,338,661	101,085	3.0	*Reference*	*Reference*
	Group 2	1,579,934	128,952	8.2	2.70 (2.67-2.72)	2.44 (2.42-2.46)
	Group 3	1,433,709	176,657	12.3	4.07 (4.04-4.10)	3.76 (3.73-3.79)
Hypertensive disorders (gestational hypertension, preeclampsia)	Total	6,352,304	429,472	6.8		
	Group 1	3,338,661	198,282	5.9	*Reference*	*Reference*
	Group 2	1,579,934	84,050	5.3	0.90 (0.89-0.90)	0.92 (0.91-0.92)
	Group 3	1,433,709	147,140	10.3	1.73 (1.72-1.74)	1.68 (1.67-1.69)
Cesarean birth	Total	6,350,814	1,836,621	28.9		
	Group 1	3,337,862	872,342	26.1	*Reference*	*Reference*
	Group 2	1,579,562	437,064	27.7	1.06 (1.06-1.06)	1.02 (1.02-1.02)
	Group 3	1,433,390	527,215	36.8	1.41 (1.40-1.41)	1.22 (1.22-1.22)
Operative vaginal birth	Total	6,350,814	214,048	3.4		
	Group 1	3,337,862	135,515	4.1	*Reference*	*Reference*
	Group 2	1,579,562	47,019	3.0	0.73 (0.73-0.74)	0.93 (0.92-0.94)
	Group 3	1,433,390	31,514	2.2	0.54 (0.54-0.55)	0.73 (0.72-0.74)

RR = relative risk; aRR = adjusted relative risk; CI = confidence interval
aRR is adjusted for maternal age, race, ethnicity, education, insurance, prenatal care, nulliparity, prior preterm birth, prior cesarean section, smoking during pregnancy, gestational age at delivery, infant sex and year.

Table 2. Composite and individual neonatal outcomes

Outcomes	Groups	Total live births	n	%	Crude RR (95% CI)	aRR (95% CI)
Composite neonatal adverse outcome	Total	6,343,825	892,374	14.1		
	Group 1	3,334,644	496,153	14.9	*Reference*	*Reference*
	Group 2	1,577,412	173,284	11.0	0.74 (0.73-0.74)	0.74 (0.74-0.74)
	Group 3	1,431,769	222,937	15.6	1.05 (1.04-1.05)	0.99 (0.99-1.00)
5-minute Apgar < 5	Total	6,344,352	24,511	0.4		
	Group 1	3,335,086	12,905	0.4	*Reference*	*Reference*
	Group 2	1,577,492	5,429	0.3	0.89 (0.86-0.92)	1.03 (1.00-1.07)
	Group 3	1,431,774	6,177	0.4	1.11 (1.08-1.15)	1.17 (1.13-1.21)
Large for gestational age fetuses	Total	6,351,342	645,392	10.2		
	Group 1	3,338,089	368,146	11.0	*Reference*	*Reference*
	Group 2	1,579,727	112,539	7.1	0.65 (0.64-0.65)	0.64 (0.64-0.64)
	Group 3	1,433,526	164,707	11.5	1.04 (1.04-1.05)	0.99 (0.98-1.00)
NICU admission	Total	6,350,861	267,017	4.2		
	Group 1	3,337,824	138,689	4.2	*Reference*	*Reference*
	Group 2	1,579,636	62,879	4.0	0.96 (0.95-0.97)	0.98 (0.98-0.99)
	Group 3	1,433,401	65,449	4.6	1.10 (1.09-1.11)	1.02 (1.01-1.03)

RR = relative risk; aRR = adjusted relative risk; CI = confidence interval
aRR is adjusted for maternal age, race and ethnicity, education, insurance, prenatal care, nulliparity, prior preterm birth, prior cesarean section, smoking during pregnancy, gestational age at delivery, intra-amniotic infection, gestational diabetes, hypertensive disorders, cesarean birth, infant sex, year

471 | The Impact of Maternal Comorbidities on Neonatal Outcomes in Growth Restricted Fetuses

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4:00 PM - 6:00 PM

Objective: To determine the impact on neonatal outcomes in fetal growth restricted fetuses (FGR) in patients with and without medical comorbidities.

Study Design: A retrospective cohort study performed on singleton gestations from 2018-2022.Patients included had FGR at the last scan prior to delivery. A composite of maternal comorbidities included: chronic hypertension(cHTN), pregestational diabetes(DM), connective tissue disease(CT), IVF, IBD, thrombophilia and maternal age >40. A sub-group of comorbidities with a vascular component (DM, cHTN, CT) was reviewed. FGR was divided into 3 groups: Mild(mFGR): EFW >10% with AC< 10%, Moderate (MFGR):EFW 3rd-10%, Severe (sFGR):EFW< 3rd%.The primary outcome was a neonatal composite: NICU Admission, APGAR < 5 at 5 minutes, and hypoglycemia. Logistic regressions were used to examine the relationship between

maternal comorbidities, timing of FGR diagnosis, and neonatal outcomes.

Results: Total patients were 534: 297 mFGR, 184 MFGR, and 53 with sFGR. Of 534 patients, 105(19.7%) had comorbidities (of these 48 had vascular comorbidities); 429 had no comorbidities. 127(23.8%) of 534 had an adverse neonatal outcome. Adverse outcomes increased significantly with severity of FGR:15.8% in mFGR; 26.6% in MFGR;58.5% in sFGR. In a univariable analysis, cHTN, AMA, early FGR diagnosis, and FGR severity were significantly associated with an increased risk of adverse outcomes (Table 1).The odds of an adverse outcome were 2.17 times more in those with any comorbidity compared to those without comorbidities(OR 2.17, 95% CI 1.37-3.4).When a vascular comorbidity was present, an adverse outcome was 4.50 times more likely compared to those with no comorbidities(OR 4.5, 95% CI 2.45-8.28).The presence of a vascular comorbidity < 32wks had a significant association with an adverse neonatal outcome in all severities of FGR (Table 2).

Conclusion: In the setting of FGR, the presence of maternal medical comorbidities, particularly vascular, had significantly increased risk of adverse neonatal outcomes.These findings could help us better counsel patients in regards to antepartum testing and patients' expectations.

Table 1: Association of maternal comorbidities with adverse neonatal outcomes

Characteristic	All (n=534)	No adverse outcome¶ (n=407)	Adverse outcome¶ (n=127)	Odds ratio§ (95% CI)	P value§
Pre-gestational diabetes – no. (%)	7 (1.3)	3 (0.7)	4 (3.1)	4.38 (0.97, 19.83)	0.06
CHTN – no. (%)	37 (6.9)	15 (3.7)	22 (17.3)	5.47 (2.74, 10.92)	<0.0001
Connective tissue disease – no. (%)	8 (1.5)	4 (1.0)	4 (3.1)	3.28 (0.81, 13.29)	0.10
IVF – no. (%)	27 (5.1)	22 (5.4)	5 (3.9)	0.72 (0.27, 1.93)	0.51
IBD – no. (%)	22 (4.1)	18 (4.4)	4 (3.1)	0.70 (0.23, 2.12)	0.53
Thrombophilia – no. (%)	2 (0.4)	1 (0.2)	1 (0.8)	3.22 (0.20, 51.89)	0.41
Maternal age > 40 years	26 (4.9)	14 (3.4)	12 (9.4)	2.93 (1.32, 6.51)	0.008
FGR diagnosis prior 32 weeks – no. (%)	142 (26.6)	70 (17.2)	72 (56.7)	6.30 (4.08, 9.74)	<0.0001
Comorbidity with vascular component† – no. (%)	48 (9.0)	22 (5.4)	26 (20.5)	4.50 (2.45, 8.28)	<0.0001
Any comorbidity‡ – no. (%)	105 (19.7)	67 (16.5)	38 (29.9)	2.17 (1.37, 3.44)	0.0008
FGR group – no. (%)					<0.0001
sFGR (EFW < 3rd percentile)	53 (9.9)	22 (5.4)	31 (24.4)	7.49 (4.00, 14.06)	<0.0001
MFGR (EFW 3 – 10th percentile)	184 (34.5)	135 (33.2)	49 (38.6)	1.93 (1.23, 3.03)	0.004
mFGR (EFW > 10th percentile & AC < 10th percentile)	297 (55.6)	250 (61.4)	47 (37.0)	1.00 (ref)	--

¶ Neonatal adverse outcome included NICU admission, APGAR score < 5 at 5 minutes and neonatal hypoglycemia.
† Comorbidity with vascular component included pre-gestational diabetes, CHTN and connective tissue disease.
‡ Any comorbidity included pre-gestational diabetes, CHTN, connective tissue disease, IVF, IBD/IBS, thrombophilia, and maternal age > 40 years.
§ Univariable logistic regression models were used.

Table 2: Comorbidities with vascular component and adverse neonatal outcomes based on severity of FGR

Severity of FGR	Characteristic	No adverse outcome¶ N = 250	Adverse outcome¶ N = 47	Unadjusted Odds ratio§ (95% CI)	Unadjusted P value§	Adjusted for early diagnosis Odds ratio§ (95% CI)	Adjusted for early diagnosis P value§
Mild FGR N=297	Comorbidity with vascular component† – no. (%)	12 (4.8)	8 (17.0)	4.07 (1.56, 10.59)	0.004	2.35 (0.78, 7.10)	0.13
	FGR diagnosis prior 32 weeks – no. (%)	25 (10.0)	25 (53.2)	10.22 (5.05, 20.73)	<0.0001	9.29 (4.53, 19.05)	<0.0001
Moderate FGR N=184	Comorbidity with vascular component† – no. (%)	8 (5.9)	10 (20.4)	4.07 (1.50, 11.03)	0.006	3.38 (1.21, 9.45)	0.02
	FGR diagnosis prior 32 weeks – no. (%)	35 (25.9)	25 (51.0)	2.98 (1.51, 5.87)	0.002	2.69 (1.34, 5.39)	0.005
Severe FGR N=53	Comorbidity with vascular component† – no. (%)	2 (9.1)	8 (25.8)	3.48 (0.66, 18.32)	0.14	4.60 (0.79, 26.66)	0.09
	FGR diagnosis prior 32 weeks – no. (%)	10 (45.5)	22 (71.0)	2.93 (0.94, 9.19)	0.06	3.56 (1.05, 12.01)	0.04

¶ Neonatal adverse outcome included NICU admission, APGAR score < 5 at 5 minutes and neonatal hypoglycemia.
† Comorbidity with vascular component included pre-gestational diabetes, CHTN and connective tissue disease.
§ Univariable and multivariable logistic regression models were used.

472 | Determining the Role of Pregnancy-Induced Alterations to B Cells in Decreasing Risk for Breast Cancer

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4:00 PM - 6:00 PM

Objective: An early age of first pregnancy (< 25 years) decreases the lifelong risk of developing breast cancer (BC). This study characterizes how B cells that infiltrate the gland during pregnancy and lactation may play a role in preventing BC.

Study Design: Wildtype female mice and a mouse model of Brca1 loss ($Krt5^{CRE\text{-}ERT2}Brca1^{fl/fl}p53^{+/-}$) were used in this study. Single-cell RNA-seq (scRNA-seq) datasets were generated from mammary tissue of nulliparous and parous mice with Brca1 loss without tumors. B cell receptor (BCR)-seq datasets were generated from nulliparous and parous wildtype mice. Differential gene expression and clustering analyses were performed using the R pipeline Seurat. Clonotype analysis and extraction of BCR sequences were performed using Loupe V(D)J Browser by 10X Genomics. Recombinant post-pregnancy mammary IgG antibodies were synthesized by the CSHL Antibody & Phage Display Core Facility and tested by immunofluorescent (IF) staining.

Results: scRNA-seq analysis showed that parous mice with Brca1 loss have an expansion of antibody-secreting B cells in their mammary glands (MGs), suggesting that B cells that infiltrate the MG during pregnancy remain there and may secrete antibodies that inhibit mammary tumor formation. To analyze these B cells on a clonal level, we analyzed BCR-seq data to identify the most abundant IgG clones unique to the parous MG. We extracted the sequences of these clones and used them to synthesize recombinant IgG antibodies. Using IF staining of mammary tissue from healthy mice (nulliparous, pregnant, and parous) and mice with mammary pre-neoplasia, we found that post-pregnancy IgG antibodies recognize antigens induced by pregnancy and lactation that are also present in mammary pre-neoplastic tissue. We are currently testing these antibodies in our mouse model of Brca1 loss to evaluate their ability to block mammary tumor development.

Conclusion: In addition to their role in secreting antibodies into breastmilk that confer immunity to the nursing infant, our results suggest a role for pregnancy-induced antibody-secreting B cells in long-term breast oncoprotection.

473 | Change in BMI Category: Impact on Maternal and Neonatal Outcomes

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4:00 PM - 6:00 PM

Objective: Pre-pregnancy BMI is a risk factor for the development of hypertensive disorders of pregnancy (PIH). However, the association between weight gain during pregnancy and the development of hypertensive disorders is understudied. The objective was to determine if change in BMI category change (eg overweight to class I obesity) was associated with development of PIH. Secondary outcomes were maternal composite outcome and fetal composite outcome.

Study Design: This was a retrospective cohort study performed using data from the National Vital Statistics Database of individuals with singleton, non-anomalous neonates from 2016-2020. Pregnancies with multiple gestations, anomalous neonates, pre-gestational diabetes, or chronic hypertension were excluded. Demographic and obstetrical variables were recorded. Groups were determined as no change in BMI (Group 1) or change in BMI (Group 2) from pre-pregnancy to delivery. Differences between groups were examined using chi-square or Fisher's exact test. Multivariate regression models were used to calculate adjusted relative risk (aRR) with 95% confidence intervals (CI).

Results: A total of 19,718,555 pregnancies met inclusion criteria and 15,426,805 (78%) pregnancies were noted to have a change in BMI category. The overall rate of PIH was 6.6%. After multivariable adjustment, there was a significant difference in the rate of PIH. Compared to individuals in Group 1, individuals with a Group 2 were more likely to develop PIH (aRR of 1.39 (95% CI [1.38-1.39], p< 0.001). In the secondary outcome analysis, Group 2 compared to Group 1 had higher rates of maternal composite outcome (aRR 1.11, CI [1.11-1.11, p< 0.001]) and fetal composite outcome (aRR 1.37, CI [1.37-1.38], p< 0.001).

Conclusion: There was a significant association between change to a higher BMI category and development of PIH along with an increase in composite adverse maternal and fetal outcomes. Future studies are required to further delineate risks for patients whose delivery BMI changes to class III obesity as well as stratified risks for women with pre-pregnancy class IV obesity and above.

Table 1: Primary outcomes

	N	Case Number	%	Crude RR (95% CI)	Adjusted RR* (95% CI)
Pregnancy-induced hypertension					
Group 1: No change	4,291,750	223,209	5.2%	1.35 (1.34-1.35)	1.38 (1.38-1.39)
Group 2: BMI change	15,426,805	1,080,499	7%		

*Adjusted for maternal age, ethnicity, education, insurance, prenatal care, nulliparity, preterm delivery, cesarean section, smoking status, gestational age, fetal sex.

Table 1: Secondary outcomes

	N	Case Number	%	Crude RR (95% CI)	Adjusted RR* (95% CI)
Maternal composite[a]					
Group 1: No change	4,288,389	1,274,776	29.7%	1.16 (1.16-1.17)	1.11 (1.11-1.11)
Group 2: BMI change	15,416,639	5,340,067	34.6%		
Fetal composite[b]					
Group 1: No change	4,285,124	430,765	10.1%	1.43 (1.43-1.44)	1.37 (1.37-1.38)
Group 2: BMI change	15,406,905	2,215,533	14.4%		

*Adjusted for maternal age, ethnicity, education, insurance, prenatal care, nulliparity, preterm delivery, cesarean section, smoking status, gestational age, fetal sex.
a Maternal composite: chorioamnionitis, cesarean section, operative delivery, perineal laceration, blood transfusion, ruptured uterus, unplanned hysterectomy, admission to ICU
b Fetal composite: 5-minute APGAR <5, assisted ventilation >6 hours, neonatal seizure, large for gestational age, NICU admission, neonatal death, infant death

474 | The Impact of Watching an Informative-Video on Possible Obstetric Emergencies Before Labor-A Randomized Controlled Trial

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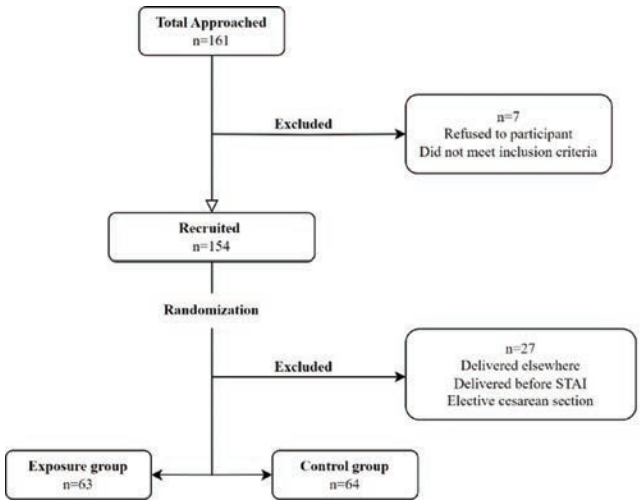
4:00 PM - 6:00 PM

Objective: In most obstetric departments women (especially nulliparous) are rarely counseled in detail regarding possible obstetric emergencies that might occur during labor. This randomized controlled trial aimed to evaluate the effect of an informative video regarding possible obstetric emergencies during labor on maternal anxiety, childbirth experience, and peripartum satisfaction among nulliparous women anticipating vaginal delivery.

Study Design: Participants (≥37 weeks gestation) were randomly assigned to an intervention group or a control group. The intervention group watched a 5-minute video planned and produced by our department on the management of delivery and "what to expect" during common obstetric emergencies, including fetal bradycardia, assisted delivery, emergency cesarean delivery, and postpartum hemorrhage. The control group received standard obstetric care. Anxiety levels were assessed at three points using the State-Trait Anxiety Inventory (STAI): at recruitment prior to video exposure (STAI 1), upon admission to the delivery room (STAI 2), and postpartum (STAI 3). Both groups also completed an 11-item Childbirth Experience Questionnaire (CEQ). The study was powered to detect a 5 points difference in the primary outcome (STAI 2).

Results: A total of 161 participants were approached, and 127 were included in the final analysis after completing all study questionnaires. Of these, 63 were in the exposure group, and 64 in the control group (figure). There were no significant demographic differences between the groups, and baseline anxiety levels were comparable (STAI 1). Upon admission to the delivery room, anxiety levels remained similar between the control and exposure groups (STAI 2: 41 [33-48] vs. 42 [34-48], respectively; p = 0.84). Notably, immediate postpartum anxiety levels were significantly lower in the exposure group (STAI 3: 30 [24-38] vs. 28 [21-33]; p = 0.03). There were no differences in the CEQ between the groups (table).

Conclusion: Watching the pre-delivery informative video about possible obstetric complications was associated with lower anxiety levels immediately postpartum.



	Control group (n=64)	Exposure group (n=63)	p-value
Selected demographics			
Maternal age (years)†	27.1 ± 4.7	27.7 ± 5.9	0.54
BMI†	28.0 ± 6.9	27.6 ± 6.4	0.72
Education (years)†	13.4 ± 2.2	14.0 ± 2.1	0.08
GA at delivery (weeks)†	39.9 ± 1	39.5 ± 1.1	0.08
Mode of delivery			
Normal vaginal delivery	49 (76.6%)	53 (84.1%)	0.28
Instrumental delivery	7 (10.9%)	4 (6.3%)	0.53
Cesarean section	7 (10.9%)	5 (7.9%)	0.56
Selected outcomes‡			
STAI 1	42 (36-51)	43 (35-51)	0.84
STAI 2	41 (33-48)	42 (34-48)	0.84
STAI 3	30 (24-38)	28 (21-33)	**0.03**
CEQ	40 (36-41)	40 (36-42)	0.67

BMI, body mass index; GA, gestational age; STAI, The State-Trait Anxiety Inventory; CEQ, childbirth experience questionnaire.
†Data are presented as mean ± standard deviation.
‡Data are presented as median (interquartile range) and compared using Mann-Whitney test.

475 | Differences in Intimate Partner Violence Screening During Pregnancy for Us-Born Versus Immigrant Birthing People

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4:00 PM - 6:00 PM

Objective: Investigate whether socioeconomic and language barriers to healthcare unique to immigrant birthing people in the US are reflected in differences in frequency of screening for intimate partner violence (IPV) in the preconception, pregnancy, and postpartum periods.

Study Design: Cross-sectional study using Pregnancy Risk Assessment Monitoring System (PRAMS) data from 2020 to 2021. PRAMS collected data on screening for physical and emotional IPV before, during and after pregnancy, as well as experience of IPV before and during pregnancy. The prevalence of screening was compared between immigrant versus US-born status, and relative risks calculated. Weighted analyses of PRAMS data were employed to be reflective of representative state populations using predefined methods.

Results: There were 63,761 respondents in the study period, representative of an estimated population of 3,039,459 from participating US states. Sociodemographic characteristics differed between US-born and immigrant status (Table 1). Approximately 3 out of 4 respondents reported being screened for IPV during pregnancy, with screening rates lower for IPV before and after pregnancy. Immigrant respondents were overall less likely to be screened for IPV before pregnancy than US-born, but more likely to be screened during and after pregnancy (Table 2). US-born respondents were more likely to experience IPV before and during pregnancy than immigrant respondents; however, there was no significant association between being screened for IPV and foreign-born status among those reporting having experienced IPV.

Conclusion: Approximately 1 in 4 patients reported not been screened for IPV. Among those who reported experiencing IPV, over one-third were not screened. While multiple barriers to IPV screening exist, immigrant-born status was not associated with lower rates of IPV screening during or after pregnancy. This highlights the importance of IPV screening among all pregnancies, regardless of perceived risk status.

Table 1: Sociodemographic Characteristics by Birthplace

	Birthplace		p-value
Characteristic	**US**	**Foreign Country**	
Study Total, number (%)	2,469,865 (81)	569,594 (19)	
Maternal Age			<0.0001
<18	1.2	0.7	
18-34	74.4	64.2	
>34	17.5	27.8	
Race			<0.0001
Asian	1.4	22.4	
Black	14.0	11.6	
Hispanic	11.8	45.0	
White	68.7	15.9	
Other	4.1	5.2	
Level of Education			<0.0001
< High School Diploma	8.2	23.4	
HS Diploma/GED	24.7	25.1	
Some College	27.5	18.3	
Bachelor's Degree	24.0	18.9	
Graduate Degree	15.5	15.4	
Use of WIC	28.7	39.2	<0.0001
Insurance Status			<0.0001
Private insurance	57.1	39.0	
Medicaid	37.4	52.8	
Self-pay	2.2	4.3	
Other	1.0	1.4	
Primiparous	32.2	32.2	0.949
Obesity (Pre-pregnancy)	33.6	24.9	<0.0001
Tobacco Use	7.4	0.6	<0.0001
Chronic Hypertension	3.1	2.0	<0.0001
Pre-pregnancy Diabetes	1.1	1.3	0.262
Gestational Diabetes	7.1	12.7	<0.0001
Infertility Treatment	2.3	2.2	0.353
Prenatal Care			<0.0001
Limited (≤ 5 visits)	7.1	9.8	
Moderate (6-8 visits)	22.4	27.4	
Recommended ≥9	70.5	62.8	

Data in the cells of table 1 are percentages of the n reported at the top of the table.

Table 2: Prevalence of IPV and Screening by Birthplace

	Birthplace			
	All	US	Foreign Country	RR (95% CI)
Pre-Pregnancy	2,115,360	1,798,386	316,974	
Screened for IPV, overall population	53.6	54.3	49.9	0.84 (0.78-0.91)
Reported IPV	1.4	1.5	0.9	0.62 (0.47-0.80)
% of reported screened	61.4	68.4	63.2	0.80 (0.47-1.34)
Pregnancy	2,962,280	2,419,923	542,357	
Screened for IPV, overall population	74.6	74.3	76.0	1.09 (1.02-1.18)
Reported IPV	1.1	1.2	0.9	0.81 (0.61-1.07)
% of reported screened	73.1	74.7	87.4	1.60 (0.90-2.84)
Postpartum	2,672,841	2,195,787	477,054	
Screened for IPV, overall population	61.8	59.5	72.3	1.78 (1.65-1.91)

Data in the cells of table 2 are percentages of the n reported at the top of the table.

476 | Prenatal Fentanyl Exposure and Replication of a Novel Neonatal Syndrome Study at a Single Institution

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4:00 PM - 6:00 PM

Objective: To determine if findings from a previous study on a novel neonatal syndrome associated with prenatal fentanyl exposure (Wadman et al., 2023) can be identified at our institution.

Study Design: Potential cases of this novel syndrome were identified from a prospectively collected database of obstetric patients with substance use disorder (SUD) enrolled in a multispecialty treatment program from 2014 to 2024. The database was screened for neonatal findings consistent with this novel syndrome in cases with prenatal fentanyl exposure resembling Smith-Lemli-Opitz (SLO) syndrome including microcephaly, cleft palate, clubfoot, rocker bottom feet, toe syndactyly, single palmar crease, hypoplastic corpus callosum, and hypospadias.

Results: 639 patients were enrolled in a perinatal substance use treatment program and study. Of the 103 patients found to have neonates with a small head size (head circumference < 10%), 34 individuals self-reported fentanyl use in the 30 days prior to enrollment in the program, with an additional 17 reporting use within the last year. Six of these individuals had confirmatory drug screening for fentanyl. Of the 6 cases with confirmed fentanyl use on drug screening, all patients screened positive in the first trimester. Four neonates displayed characteristic anomalies consistent with a SLO-like syndrome (Table 1). All cases shared lagging head growth, while additional anomalies identified included cleft palate, short nasal tip, thin upper lip, micrognathia, and hypospadias. Of the cases with anomalies, all individuals had polysubstance use. Genetic screening/diagnostic testing varied but an assessment of cholesterol metabolism was not performed.

Conclusion: This study suggests the potential association of prenatal fentanyl exposure with a novel syndrome. As the opiate crisis continues, fueled by rising fentanyl use, more data is needed to confirm and delineate this association and determine the possible long-term developmental effects of such a syndrome.

Table 1: Characteristics of Cases with Microcephaly and Relevant Fetal Anomalies

Individuals	1	2	3	4
Sex	Male	Female	Female	Male
Prenatal Exposure	Buprenorphine, fentanyl, tobacco	Benzodiazepine, cocaine, buprenorphine, fentanyl, alcohol, tobacco	Methadone, fentanyl, tobacco	Buprenorphine, methamphetamine, fentanyl, tobacco
Gestational Age (w)	39.6	39.3	35.1	38.0
Birthweight, g (%)	2940 (9)	3040 (28)	2020 (16)	2892 (28)
Length, cm (%)	51 (60)	48 (11)	49 (90)	51 (74)
Head Circumference, cm (%)	31 (1)	32 (4)	29 (3)	32 (9)
Cleft Palate	Yes	Yes	Yes	No
Short Nasal Tip	No	Yes	No	No
Thin Upper Lip	No	Yes	No	No
Micrognathia	No	No	Yes	No
Single Palmar Crease	No	No	No	No
2,3 Toe Syndactyly	No	No	No	No
Clubfoot	No	No	No	No
Rocker Bottom Feet	No	No	No	No
Hypospadias	No	No	No	Yes
Hypoplastic Corpus Callosum	No	No	No	No
Genetic Testing	None	Normal CMA*	CMA c/w CMT1A**	Low risk NIPT***

*CMA: Chromosomal microarray; **CMT1A: Charcot-Marie-Tooth disease Type 1a; ***NIPT: Noninvasive prenatal testing.

Reference: Wadman, E., Fernandes, E., Muss, C., Powell-Hamilton, N., Wojcik, M. H., Madden, J. A., Carreon, C. K., Clark, R. D., Stenftenagel, A., Chikalard, K., Kimonis, V., Brucker, W., Alves, C., & Gripp, K. W. (2023). A novel syndrome associated with prenatal fentanyl exposure. Genetics in Medicine Open, 1(1), 100834. https://doi.org/10.1016/j.gimo.2023.100834

477 | Asymmetrical vs. Symmetrical Large for Gestational Age Infants in Pregestational Diabetics: Differences in Neonatal Morbidity

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4:00 PM - 6:00 PM

Objective: Research has highlighted the importance of distinguishing between asymmetrical large for gestational age (aLGA) and symmetrical large for gestational age (sLGA) infants, with the former being associated with higher risk of neonatal complications. We hypothesized that the prevalence and complications of aLGA is higher in infants born to mothers with type 1 diabetes (T1D) compared to type 2 diabetes (T2D).

Study Design: Women with insulin-treated pregestational diabetes (PGDM) were recruited and managed prospectively. Singleton pregnancies recruited before 14 weeks were included in this analysis. Patients were seen every 1-2 weeks and glycemic control was strictly managed using standardized protocols. Infants were weighed and measured immediately after birth and monitored for hyperbilirubinemia, hypoglycemia, and acidosis. LGA (birthweight > 90^{th}%ile) was categorized as aLGA if ponderal index (PI = weight/length^3) was > 90^{th}%ile for gestational age, and sLGA if the PI was ≤ 90^{th}%ile. Outcomes were compared between infants with sLGA and aLGA and between infants born to mothers with T1D and T2D. Characteristics are reported as n (%), mean +/- standard deviation, or median and 25^{th} and 75^{th}

percentiles. Statistical analyses included t-test, Wilcoxon rank sum, chi-square and logistic regression, as appropriate.

Results: The study included 132 LGA infants born to 321 women with T1D (41%) and 26 LGA infants born to 55 women with T2D (47%). The incidences of aLGA and sLGA in both groups and patient characteristics are presented in Table 1. In T2D, aLGA was associated with higher 2nd and 3rd trimester HbA1 compared to sLGA. There was a trend for a similar association in T1D. Most infant outcomes did not differ between groups nor did overall composite outcomes (Table 2).

Conclusion: There is a high rate of LGA, and particularly aLGA, among infants of mothers with both T1D and T2D. However, we identified few differences in infant outcomes between the groups, suggesting the need for further study into the clinical significance of aLGA as compared to sLGA.

Table 1: Maternal and neonatal characteristics of aLGA vs sLGA infants in T1D and T2D

	T1D aLGA (n=49)	T1D sLGA (n=83)	p-value	T2D aLGA (n=12)	T2D sLGA (n=14)	p-value	p-value T1D vs T2D aLGA
Age (years)	25.5 (21.5,29.0)	26.5 (22.5,29.5)	0.44	28.5 (23.8,33.0)	29.8 (26.0,34.5)	0.66	0.10
Duration of diabetes (years)	14.0 (9.0,18.0)	11.0 (6.0,18.0)	0.11	4.50 (2.00,6.50)	2.50 (1.00,5.00)	0.23	<.0001
BMI at LMP (kg/m^2)	23.6 (21.8,24.9)	21.9 (20.8,24.4)	0.02	31.6 (25.1,39.2)	38.9 (36.4,46.8)	0.03	0.002
Mean HbA1 Trimester 1 (SD)	2.53 (1.00,4.13)	2.53 (1.29, 3.42)	0.49	2.93 (0.80,5.20)	3.10 (0.23,4.22)	0.70	0.82
Mean HbA1 Trimester 2 (SD)	1.10 (-0.04,3.07)	0.67 (-0.13, 1.73)	0.09	1.07 (0.52,3.14)	-0.89 (-1.43,0.77)	0.046	0.95
Mean HbA1 Trimester 3 (SD)	0.93 (0.13,2.33)	0.34 (-0.13, 1.47)	0.12	1.67 (0.55,3.33)	0.03 (-0.97,0.89)	0.03	0.22
GA at delivery (wk)	38.0 (37.0,39.0)	37.5 (36.5,38.0)	0.08	39.0 (36.0,39.8)	38.2 (36.0,39.5)	0.86	0.32
Birth weight (grams)	4060 (3860,4200)	3874 (3710,4075)	0.04	4010 (3840,4705)	3960 (3680,4180)	0.41	0.71
Birth length (cm)	50.0 (48.0,51.0)	52.0 (51.0,53.0)	<.0001	49.8 (48.0,51.2)	52.5 (52.0,53.0)	0.002	0.96
Ponderal index (kg/m^3)	3.21 (3.13,3.36)	2.80 (2.68,2.94)	<.0001	3.25 (3.15,3.46)	2.74 (2.47, 2.89)	0.0003	0.50

HbA1 reported as number of standard deviations from normal mean according to the laboratory

Table 2: Neonatal outcomes of aLGA vs sLGA and T1D vs T2D for aLGA

	T1D aLGA (n=49)	T1D sLGA (n=83)	p-value	T2D aLGA (n=12)	T2D sLGA (n=14)	p-value	p-value T1D vs T2D aLGA
Hyperbili	3 (6.1%)	6 (7.4%)	0.78	2 (16.7%)	2 (14.3%)	0.87	0.23
Hypogly (<40/dL)	25 (51.0%)	51 (64.6%)	0.13	3 (25.0%)	7 (50.0%)	0.19	0.11
Hypogly (<30/dL)	15 (30.6%)	30 (38.0%)	0.40	2 (16.6%)	2 (14.3%)	1.00	0.48
Hypogly (<20/dL)	9 (18.4%)	12 (15.2%)	0.64	0	1 (7.1%)	1.00	0.18
Acidosis	7 (14.3%)	1 (1.2%)	0.003	2 (16.7%)	0	0.11	0.83
Polycythemia	8 (16.3%)	17 (21.5%)	0.47	3 (25.0%)	2 (14.3%)	0.49	0.48
RDS	5 (10.2%)	5 (6.0%)	0.38	1 (8.3%)	0	9.27	0.85
Transient Tachypnea	5 (10.2%)	9 (11.1%)	0.43	4 (33.3%)	0	0.02	0.047
Any of above using hypogly <40 mg/dL	33 (67.4%)	63 (75.9%)	0.29	8 (66.7%)	8 (57.1%)	0.62	0.96
Any of above using hypogly <30 mg/dL	27 (55.1%)	52 (62.6%)	0.39	8 (66.7%)	4 (28.6%)	0.05	0.47

478 | Early Indicators and Clinical Characteristics of Preeclampsia in Pregnant Women with Insulin-Treated Pregestational Diabetes

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4:00 PM - 6:00 PM

Objective: Pregestational diabetes (PDM) is a known risk factor for preeclampsia (PE); however, various co-existing factors can affect the risk of developing PE in this high-risk population. The purpose of this study was to identify early indicators predictive of PE in pregnant women with insulin-treated PDM.

Study Design: Pregnant women with PDM from a prospectively managed cohort were classified as with or without PE based on current ACOG criteria. Patients were seen every 1-2 weeks during pregnancy and were managed by a dedicated team utilizing pre-specified protocols. Individual clinical characteristics, diabetes-related complications, blood pressure measurements, indices of glycemic control, and pregnancy outcomes were compared between patients who did and did not develop PE using t-test, Wilcoxon rank sum test, or chi-square, as appropriate.

Results: Patient characteristics are presented in Table 1 as n (%), mean ± standard deviation, or median and 25th and 75th percentiles. Of the 424 pregnancies, 87 (20.5%) developed PE. Duration of diabetes, microvascular complications, early pregnancy (8-20 weeks) mean arterial blood pressure (MAP), and urine protein levels at 16 weeks were associated with an increased risk of developing PE. Weekly odds ratios for PE based on diastolic blood pressure were highest at 8-10 weeks gestation. There was a trend towards higher Glycohemoglobin A1 (HgbA1) levels in the PE group during the first 20 weeks of pregnancy. PE was associated with earlier gestational age at delivery, lower birth weight, lower placental weight, and cesarean delivery. Live birth and neonatal death rates were similar in both groups (98% vs. 97% and 1% vs. 2% in the PE and non-PE groups, respectively).

Conclusion: In PDM pregnancies, several factors may serve as early predictors for the risk of developing PE, including blood pressure and glycemic control early in pregnancy. These two modifiable risk factors suggest that there may be an opportunity to intervene early in pregnancy and possibly modify the risk of ultimately developing PE.

Table 1: Characteristics of Study Cohort by Preeclampsia (PE) Group

Characteristic	PE n=87 (20.6%)	No PE n=337 (79.5%)	p-value
Age at LMP (years)	26.7 (4.87)	26.0 (5.43)	0.33
Duration of diabetes (years)	14.3 (7.15)	10.8 (6.74)	<.0001
Nulliparity	46 (52.9%)	147 (43.9%)	0.13
Retinopathy	24 (27.6%)	20 (6.0%)	<.0001
Nephropathy	48 (55.2%)	18 (5.4%)	<.0001
Urine protein, week 16 (mg)	771 (230, 1550)	84 (30, 200)	<.0001
HgbA1, first 20 weeks (std)	2.84 (2.24)	2.36 (2.19)	0.09
Systolic BP, first 20 weeks	127 (12.2)	113 (10.4)	<.0001
Diastolic BP, first 20 weeks	75.0 (8.06)	67.2 (7.31)	<.0001
MAP, first 20 weeks	92.4 (8.33)	82.5 (7.66)	<.0001

HgbA1 reported as standard deviation according to the laboratory units, as two different assays were used over the course of the study.

479 | Inequities in Postpartum Opioid Prescribing by Race-Ethnicity and Insurance Status Across Statewide Quality Collaborative

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4:00 PM - 6:00 PM

Objective: To describe differences in discharge opioid prescribing following vaginal (VB) and cesarean births (CB) across historically marginalized groups.

Study Design: Retrospective cohort study of nulliparous, term, singleton, vertex births from 1/1/2023-10/13/2023 in a clinical registry from 71 hospitals participating in a quality improvement collaborative supported by Blue Cross Blue Shield of Michigan. Eligible patients had a VB or CB, were ≥ 18 years, and did not have a history of opioid use, postpartum length of stay ≥ 7 days, maternal transfer to another hospital, and invalid or incomplete opioid prescription data. Patients who underwent repair of a 3rd or 4th degree laceration, hysterectomy, or dilation and curettage were also excluded. We report adjusted opioid prescribing rates by race-ethnicity and insurance status, stratified by mode of delivery.

Results: Of 14,690 VB, 87.4% (n = 12,837) had a spontaneous VB without additional procedures, of whom 1.1% (n = 146) received an opioid prescription. There was no significant difference in receipt of an opioid prescription based on race-ethnicity or insurance after VB. Of 5,957 CB, 99.7% (n = 5,938) had a CB without additional procedures, of whom 89.2% (n = 5,298) received an opioid prescription. Following CB, NHB patients were more likely to receive an opioid prescription compared to NHW patients (Table 1; NHB: OR 1.57, 95% CI 1.16-2.12). Patients with Medicaid were more likely and patients without insurance or self-pay patients were less likely to receive an opioid prescription compared to privately insured patients (Table 1; Medicaid: OR 1.30, 95% CI 1.05-1.62; Self-pay/None: OR 0.43, 95% CI 0.20-0.93).

Conclusion: Discharge opioid prescribing after VB without additional procedures was rare, and without inequities. In contrast, discharge opioid prescribing following CB was common, and higher among historically marginalized groups.

Table 1: Adjusted opioid prescribing rates by race-ethnicity and insurance status, stratified by mode of delivery.

	Odds Ratio	*P* value	95% CI	
Race/ethnicity (ref group: Non-hispanic white)				
Asian	1.301	0.187	0.880	1.926
Hispanic	1.067	0.704	0.763	1.493
Multiracial	0.980	0.968	0.380	2.533
Non-Hispanic black	1.567	0.004	1.158	2.119
Other	0.937	0.893	0.362	2.427
Unknown	1.553	0.007	1.128	2.139
Insurance (ref group: Private)				
Medicaid	1.302	0.016	1.050	1.615
Other	1.371	0.431	0.625	3.005
Self-pay/none	0.429	0.031	0.199	0.927

480 | Pregnancy Outcomes in Patients Living with Hiv Managed with Atazanavir Versus Darunavir-Based Antiretroviral Therapy

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4:00 PM - 6:00 PM

Objective: Pregnant patients with HIV require effective antiretroviral therapy (ART) during pregnancy to prevent perinatal transmission and manage their own health, but the choice of regimen can impact pregnancy outcomes. Limited data are available comparing the safety and efficacy of second-generation protease-inhibitors (Atazanavir and Darunavir-based ART) in pregnancy despite their associated risks of hyperbilirubinemia and cholestasis. Therefore, we compared the maternal and neonatal outcomes in pregnant patients living with HIV managed with Atazanavir versus Darunavir-based ART.

Study Design: This multi-center observational cohort study used data from 192 hospitals in 38 US states, sourced from the Vizient Clinical Database. We included pregnant patients with HIV on Atazanavir or Darunavir-based ART, who delivered between January 2021- April 2024. The primary outcome was intrahepatic cholestasis of pregnancy (ICP), with secondary outcomes including hypertensive disorders, preterm birth, and neonatal outcomes. We computed adjusted odds ratios (aOR) using multivariable logistic regression to adjust for potential confounders (maternal age, gestational age, diabetes mellitus, hypertension, baseline viral load and CD4 cell count).

Results: There were 251 patients in the Atazanavir and 218 patients in the Darunavir group. In the overall cohort at study entry, the median (interquartile range, IQR) maternal age was 31 (IQR 27-36) years with most patients identifying as Black (63.4%) . The frequency of ICP was similar in both groups (2.0% vs 2.8%; P = .59) - *Table 1*. The adjusted odds ratios (aOR) of ICP (aOR 1.83; 95% CI 0.51, 6.58), preterm birth (aOR 0.93; 95% CI 0.41, 2.12), gestational hypertension (aOR 0.82; 95% CI 0.44, 1.54), pre-eclampsia (aOR 1.07, 95% CI 0.58, 1.96), placental abruption (aOR 2.71; 95% CI 0.25, 28.93) and stillbirth (aOR 0.66; 95% CI 0.18, 2.25) were similar between both groups (*Table 2*).

Conclusion: Atazanavir and Darunavir-based ART were safe for use during pregnancy and had similar pregnancy and neonatal outcomes.

Table 1: Pregnancy outcomes according to ART use in pregnancy in patients living with HIV

Variable	Atazanavir-Based ART (n = 251)	Darunavir-Based ART (n = 218)	P-value
GA at delivery in weeks (mean, SD)	37.1 (3.31)	37.3 (3.69)	0.67
Preterm birth, n (%)	16 (6.4)	12 (5.5)	0.69
Pre-eclampsia, n (%)	26 (10.4)	27 (12.4)	0.48
Pregnancy induced hypertension, n (%)	26(10.4)	20 (9.2)	0.67
Eclampsia, n (%)	0 (0)	1 (0.5)	0.28
Cholestasis of pregnancy, n (%)	5 (2.0)	6(2.8)	0.59
Oligohydramnios, n, (%)	5 (1.9)	4 (1.8)	0.90
Polyhydramnios, n (%)	10 (3.9)	7 (3.2)	0.66
Placenta abruption, n (%)	1 (0.4)	3 (1.4)	0.25
CD4 (median, Q1, Q3)	478 (251, 710)	386.5 (195, 687)	0.26
CD8 (median, Q1, Q3)	521 (323, 817)	583.5 (319, 886)	0.66
Viral load <50 copies/mL (median, Q1, Q3)	238 (94.8)	210 (96.3)	0.43
AST (median, Q1, Q3)	24.0 (18.5, 31.0)	23.0 (18.0, 29.0)	0.81
ALT (median, Q1, Q3)	22.0 (16.0, 33.0)	22.9 (15.0, 33.0)	0.86
Serum creatinine (median, Q1, Q3)	0.90 (0.70, 1.1)	0.86 (0.68, 1.03)	0.009
Mode of delivery, n (%) - Vaginal delivery - Cesarean delivery	 136 (54.1) 115 (45.9)	 123 (56.4) 95 (43.6)	0.63
Stillbirth, n (%)	6 (2.4)	6 (2.8)	0.68

Table 2: Univariable and multivariable logistic regression models

	Univariable logistic regression			Multivariable logistic regression		
	Odds Ratio (OR)	95% confidence interval	P value	Adjusted Odds Ratio (aOR)	95% confidence interval	P value
Intrahepatic cholestasis	1.39	0.42, 4.63	0.54	1.83	0.51, 6.58	0.35
Preterm birth	0.86	0.40 1.85	0.69	0.93	0.41, 2.12	0.87
Gestational HTN	0.87	0.47, 1.61	0.67	0.82	0.44, 1.54	0.54
Pre-eclampsia	1.22	0.69, 2.17	0.49	1.07	0.58, 1.96	0.83
Placental abruption	3.49	0.36, 33.78	0.28	2.71	0.25, 28.93	0.41
Stillbirth	0.76	0.21, 2.74	0.68	0.66	0.18, 2.25	0.53

Models were adjusted for maternal age, gestational age at study entry, obesity, baseline viral load and CD4 count, history of pre-gestational diabetes, and chronic hypertension.

481 | Postpartum Hemorrhage Requiring Transfusion Increases Short-Term Risk of Readmission for Cardiovascular Disease

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[1]Rutgers Robert Wood Johnson Medical School, Edison, NJ; [2]Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ; [3]Rutgers Robert Wood Johnson, New Brunswick, NJ

4:00 PM - 6:00 PM

Objective: Postpartum hemorrhage (PPH) is a common obstetric complication that, in severe cases, may necessitate blood transfusion. We hypothesized that severe PPH constitutes a cardiovascular insult that confers risk beyond the immediate postpartum period and that necessitating blood transfusion serves as a marker of the severity of PPH. Severe PPH may plausibly be linked to cardiovascular disease (CVD) by large-volume acute blood loss causing hypoperfusion and ischemia, leading to impaired cardiac function.

Study Design: We performed a retrospective cohort study of discharges from delivery hospitalizations in the United States, 2010-2020, using the Healthcare Cost and Utilization Project's Nationwide Readmissions Database. ICD 9 and 10 coding were used to identify deliveries complicated by PPH with and without blood transfusion. Associations between PPH and non-fatal CVD readmissions within the calendar year following delivery were derived from Cox proportional hazard models expressed in confounder-adjusted hazard ratios (HR) with 95% confidence intervals (CI).

Results: Of 18,600,829 delivery admissions, 3.9% (n = 752,891) were complicated by PPH. Of these, 13.7% (n = 103,040) received a blood transfusion. The risk of CVD readmission was 170, 197, and 476 per 100,000 hospital deliveries for patients without PPH, PPH without transfusion, and PPH with transfusion, respectively. Compared to those without PPH, patients with PPH and no transfusion had an increased risk of CVD readmission (HR 1.19, CI 1.11-1.28), with more than a doubling of risk among patients with PPH with transfusion (HR 2.20, CI 1.97-2.47). The risks were highest after PPH with transfusion for atherosclerotic heart disease (HR 4.42, CI 3.04-6.42), ischemic heart disease (HR 2.79, CI 2.09-3.71), and acute myocardial infarction (HR 2.39, CI 1.58-3.63)(Figure 1).

Conclusion: PPH, particularly when requiring blood transfusion, is associated with an increased risk of non-fatal CVD readmission within the year following delivery. These findings underscore the burden of CVD risk with PPH and the need for active management to reduce CVD morbidity.

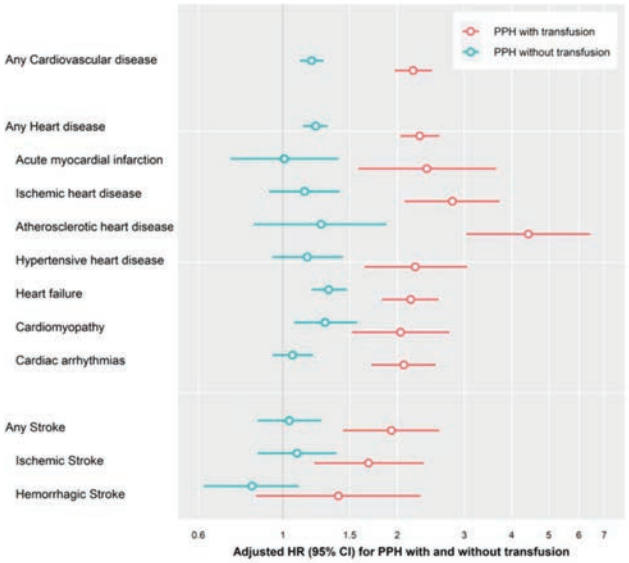

Figure 1. Associations between PPH without and with transfusion and non-fatal cardiovascular disease readmissions within the year following delivery

482 | Postpartum Hemorrhage Requiring Transfusion Increases Short-Term Risk of Cardiovascular Disease Mortality

Emily E. Daggett[1]; Rachel Lee[2]; Ruby Lin[2]; Morgan C. Dunn[3]; Julia Knypinski[2]; Cande V. Ananth[2]
[1]Rutgers Robert Wood Johnson Medical School, Edison, NJ; [2]Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ; [3]Rutgers Robert Wood Johnson, New Brunswick, NJ

4:00 PM - 6:00 PM

Objective: Postpartum hemorrhage (PPH) is a common obstetric complication that, in severe cases, may necessitate blood transfusion. We hypothesized that severe PPH constitutes a cardiovascular insult that confers risk beyond the immediate postpartum period and that necessitating blood transfusion can serve as a marker of the severity of PPH. Severe PPH may plausibly be linked to cardiovascular disease (CVD) by large-volume acute blood loss causing hypoperfusion and ischemia, leading to impaired cardiac function.

Study Design: Using the Healthcare Cost and Utilization Project's Nationwide Readmissions Database, we designed a retrospective cohort study of discharges from delivery hospitalizations in the United States, 2010-2020. ICD 9 and 10 coding were used to identify deliveries complicated by PPH with and without blood transfusion. Associations between PPH and CVD-related mortality within the calendar year following delivery were derived from Cox proportional hazard models expressed in confounder-adjusted hazard ratios (HR) with 95% confidence intervals (CI).

Results: Of 18,600,829 delivery admissions, 3.9% (n = 752,891) were complicated by PPH. Of these, 13.7% (n = 103,040) received a blood transfusion. The risk of CVD mortality was 3.3, 4.0, and 13.6 per 100,000 deliveries for patients without PPH, PPH without transfusion, and PPH with transfusion, respectively. Compared to those without PPH, patients with PPH and no transfusion had a similar risk of CVD mortality (HR 1.07, CI 0.71-1.60). However, there was a three-fold increased mortality risk among patients

with PPH with transfusion (HR 2.98, CI 1.65-5.40), including heart disease mortality (HR 2.93, CI 1.53-5.63)(Table 1).

Conclusion: While PPH without transfusion does not appear to increase the risk of CVD mortality in the year following delivery, PPH with transfusion (suggestive of disease severity) has a substantially higher risk of heart disease and stroke mortality. These findings underscore the significance of CVD risk with severe PPH and the need for active management to reduce CVD mortality.

Table 1. Cardiovascular disease mortality within the year of delivery amongst patients with and without postpartum hemorrhage and transfusion in the United States, 2010-2020

	No PPH	PPH without Transfusion	PPH with Transfusion
	Rate per 100,000 deliveries (adjusted hazard ratio, 95% confidence interval)		
All-cause mortality	5.7 (1.00, Reference)	13.4 (2.26, 1.80-2.83)	87.4 (11.85, 8.88-15.81)
Cardiovascular disease mortality	3.3 (1.00, Reference)	4.0 (1.07, 0.71-1.60)	13.6 (2.98, 1.65-5.40)
Heart Disease mortality	2.8 (1.00, Reference)	3.5 (1.11, 0.71-1.72)	11.6 (2.93, 1.53-5.63)
Stroke mortality	0.9 (1.00, Reference)	—*	—*

* Fewer than 10 cases suppressed as specified in the HCUP data-use agreement

483 | Postpartum Hemorrhage is Associated with Reduced Rates of Breastfeeding in a Low-Risk Nulliparous Population

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4:00 PM - 6:00 PM

Objective: To examine the association of postpartum hemorrhage (PPH) with reduced rates of breastfeeding at 4-8 weeks postpartum.

Study Design: Secondary analysis of a multicenter randomized controlled trial of elective induction of labor at 39 weeks' gestation vs. expectant management in low-risk nulliparous women from 2014-2017 (MFMU ARRIVE trial). Participants with singleton, non-anomalous pregnancies with no medical or obstetric indication for induction (as assessed at 38 weeks' gestation/enrollment) were included. Those requiring ≥2 uterotonics in addition to oxytocin, transfusion, or surgical interventions to control bleeding (including peripartum hysterectomy) were considered to have PPH. At 4-8 weeks postpartum, participants self-reported infant feeding, categorized as exclusive breast (EBF), breast feeding in combination with formula (CF), or exclusive formula feeding (EFF). The primary outcome was any breastfeeding (EBF of CF) at 4-8 weeks postpartum. Multivariable logistic regression was used to model the relationship between PPH and breastfeeding.

Results: Of 5454 participants that met inclusion criteria, 251 (5%) had a PPH, and 90/251 (36%) required blood transfusion. Clinical cohort characteristics are shown in table 1. At 4-8 weeks postpartum, 33% were EBF, 31% were CF, and 35% were EFF. Of those with a PPH, 72 (28.7%) were EBF, 84 (33.5%) were CF, and 95 (37.9%) were EFF ($p > 0.05$). In regression models, PPH was associated with a non-statistically significant reduced odds of EBF or breastfeeding at all (Table 2). In regression models limited to those with PPH requiring blood transfusion, however, there was a significantly reduced odds of EBF or breastfeeding at all compared to those EFF (Table 2).

Conclusion: In a low-risk nulliparous population, PPH requiring blood transfusion was associated with reduced odds of breastfeeding at 4-8 weeks postpartum. Women who have a PPH, especially if they require transfusion, may benefit from targeted breastfeeding support.

Table 1. Clinical characteristics of cohort. Data are n (row %) or mean (standard deviation) unless noted.

Characteristic	Exclusive breastfeeding n=1807	Breastfeeding in combination with formula n=1694	Exclusive formula feeding n=1953
Maternal age (years)	26.2 (4.8)	24.8 (5.1)	22.9 (4.6)
Self-identified race			
Black	227 (16.4)	392 (28.2)	769 (55.4)
White	1405 (20.1)	1072 (30.6)	1027 (29.3)
Asian	67 (44.4)	64 (42.4)	20 (13.25)
NHOPI	12 (57.1)	4 (19.1)	5 (23.8)
AIAN	7 (43.8)	6 (37.5)	3 (18.8)
More than one	40 (23.5)	66 (38.8)	64 (37.7)
Unknown	49 (24.0)	90 (44.1)	65 (37.7)
Hispanic	309 (21.3)	642 (44.2)	501 (34.5)
Married	1451 (44.3)	1028 (31.4)	796 (24.3)
Employment status			
Full time	1003 (45.6)	666 (30.3)	532 (24.2)
Part time	216 (33.2)	184 (28.3)	251 (38.6)
Not working	580 (22.4)	842 (32.6)	1164 (45.0)
Private Insurance	1247 (49.9)	724 (29.0)	528 (21.1)
Smoker	61 (14.7)	84 (20.3)	269 (65.0)
BMI ≥30	805 (28.09)	921 (32.1)	1140 (39.8)
Cesarean	284 (25.8)	393 (35.7)	423 (38.5)
Preeclampsia	154 (24.7)	179 (28.7)	290 (46.6)
NICU admission	182 (27.6)	211 (32.0)	267 (40.5)

Abbreviations: NHOPI, Native Hawaiian or Pacific Islander; AIAN, American Indian or Alaskan Native; BMI, body mass index; NICU, neonatal intensive care unit

Table 2. Multivariable logistic regression model for the association of PPH with breastfeeding, exclusively or in combination with formula, in comparison to exclusive formula feeding.

	Sample size	Exclusive breastfeeding		Breastfeeding, exclusively or in combination with formula	
		OR (95%CI)	aOR* (95%CI)	OR (95%CI)	aOR (95%CI)
No PPH	5203	Ref (1.0)	Ref (1.0)	Ref (1.0)	Ref (1.0)
PPH	251	0.81 (0.59-1.11)	0.78 (0.55-1.11)	0.91 (0.70-1.18)	0.86 (0.65-1.14)
PPH requiring blood transfusion	90	**0.39 (0.22-0.69)**	**0.32 (0.17-0.60)**	**0.58 (0.38-0.88)**	**0.57 (0.36-0.88)**

Abbreviations: PPH, postpartum hemorrhage; OR, odds ratio; aOR, adjusted odds ratio
*Adjusted for neonatal birth weight, maternal age >35, race, employment status, private insurance, use of assisted reproductive technology, smoking in pregnancy, alcohol use in pregnancy, and body mass index ≥30
Bolded if significant.

484 | First-Trimester Virtual Placental Biopsy to Estimate Vascularization and Risk of Preeclampsia: a Prospective Study

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4:00 PM - 6:00 PM

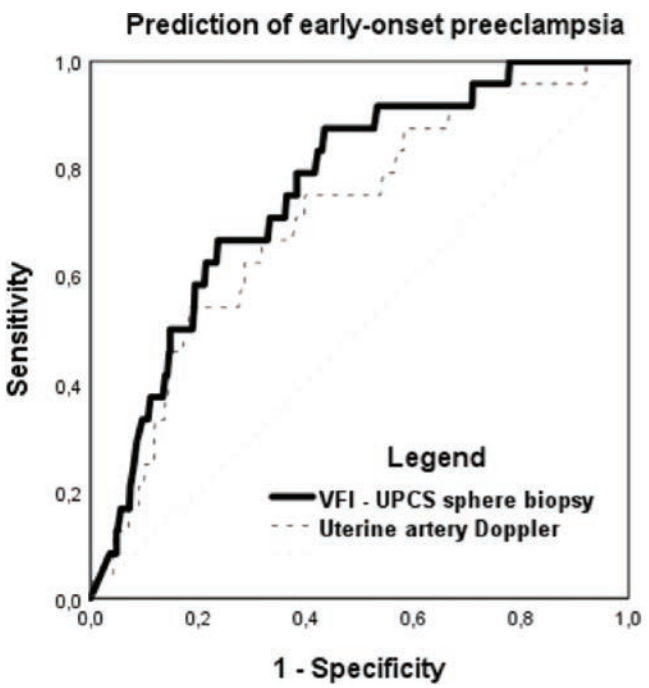
Objective: While preliminary studies have suggested its effectiveness (Dar et al. AJOG 2010), we aimed to assess whether 3-dimensional power Doppler (3DPD) of the uteroplacental circulation space (UPCS) or of the whole placenta, measured in the first trimester was able to predict preeclampsia.

Study Design: A prospective observational study of singleton pregnancies between 11 and 14 weeks. The 3DPD indices, vascularization index (VI), flow index (FI), and vascularization flow

index (VFI), were determined on a UPSC sphere biopsy with the virtual organ computer-aided analysis (VOCAL) program. We also studied the vascularization of the entire placenta and the Doppler of the uterine arteries. Non-parametric and ROC curve analyses were performed.

Results: Among 12,424 women recruited, 498 (4%) had preeclampsia, including 33 (0.3%) with early-onset preeclampsia (< 34 weeks). We were able to determine that all vascularization indices, but particularly the VI and the VFI of the whole placenta and UPCS were largely decreased in early-onset preeclampsia (all with p< 0.01). Taken alone, biopsy sphere VFI is faster to measure than uterine artery Doppler and has a sensitivity of 50% for early preeclampsia with a false-positive rate of 15% (p< 0.001).

Conclusion: First-trimester vascularization indices are decreased among women who will develop early-osnet preeclampsia. Rapid assessment of placental vascularity by virtual UPCS biopsy, as proposed by Dar et al., is feasible on large populations, and is effective in predicting early-onset preeclampsia.



485 | Anticoagulation Preventive Therapy Versus no Therapy and the Risk for Venous Thromboembolism During the Postpartum

Enav Yefet[1]; Sally Hosari Mahamed[2]; Yael Skinez[2]; Zohar Nachum[3]

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4:00 PM - 6:00 PM

Objective: Until 2011, enoxaparin was given for postpartum venous thromboembolism (VTE) prophylaxis in women with thrombophilia or previous VTE (pre-protocol). Since 2012, VTE prophylaxis protocol was implemented and enoxaparin was given also to women with risk factors according to the RCOG. We aimed to compare the efficacy and safety of enoxaparin treatment postpartum before and after protocol implementation.

Study Design: Retrospective cohort study was conducted at Emek medical center in Israel. One delivery per woman was chosen randomly. The study included two periods; the pre-protocol period between 2003 and 2011 (N = 19,783), and the protocol period from 2012 to 2020 (N = 20520). Enoxaparin was administered for 6 weeks in case of thrombophilia or past VTE and 7-10 days in case of other risk factors. The primary outcome was the rate of VTE. Secondary outcomes were bleeding complications. Assuming that the protocol will reduce the rate for VTE from 1:1000 to 1:4000, 34,860 women were required (5% 2-sided alpha, 80% power).

Results: Patients' characteristics and outcomes are presented in the table. In the pre-protocol period, 531 women (2.7%) were treated with enoxaparin in the postpartum period. After protocol implementation, 964 (4.7%) women were treated due to known thrombophilia or past VTE event (P< 0.0001). Another 6.5% of the women received enoxaparin due to risk factors. The rate of VTE events in the postpartum period was 3 (0.02%) and 4 (0.02%) cases before and after the protocol implementation, respectively, (P = 1). Postpartum bleeding complications were comparable between the before and after protocol implementation groups, including postpartum hemorrhage (16 (0.08%) vs. 24 (0.12%), respectively, P = 0.25) or the need for blood transfusions (2 (0.01%) vs. 5 (0.02%), respectively, P = 0.45).

Conclusion: Protocol for postpartum VTE prophylaxis according to risk factors with enoxaparin treatment did not lower the rate of VTE events, which are rare to begin with. The guidelines for postpartum VTE prophylaxis should be re-evaluated.

Table 1: Maternal medical history, pregnancy characteristics and study outcomes

	Pre-protocol N= 19,783	Protocol N= 20,520	P-value
Maternal medical history and pregnancy characteristics			
Age, years	30.5 ± 5.7	29.9 ±5.6	<.0001
Age≥35 years	4027 (20%)	3623 (18%)	<.0001
Birth number	2.7 ± 1.6	2.2 ± 1.3	<.0001
Multiparity ≥3 births	9,379 (48%)	6,583 (32%)	<.0001
Delivery week	39.0 ± 2.3	39.0 ±2.3	0.22
Preterm delivery	1,812 (9.2%)	1,698 (8.3%)	<.001
Singleton delivery	19,141 (97%)	19,803 (97%)	0.06
Twins delivery	620 (3%)	706 (3%)	
Triplets delivery	22 (0.1%)	11 (0.05%)	
Epidural use during delivery	1,986 (10%)	6,041(29%)	<.0001
Cesarean delivery	4,540 (23%)	4,108 (20%)	<.0001
Vacuum delivery	471 (2%)	940 (5%)	<.0001
Known thrombophilia	527 (2.7%)	930 (4.5%)	<.0001
Previous VTE	4 (0.02%)	34 (0.17%)	<.0001
Primary and secondary outcomes			
VTE	3 (0.02%)	4 (0.02%	1
Postpartum hemorrhage	16 (0.08%)	24 (0.12%)	0.25
Blood Transfusion	2 (0.01%)	5 (0.02%)	0.45
Residua	8 (0.04%)	10 (0.05%)	0.69
Intrauterine intervention (curettage/hysteroscopy)	11 (0.06%)	12 (0.06%)	0.9
VTE	3 (0.02%)	4 (0.02%	1

Values are presented as mean±SD or number (percent)
Missing data – multiparity 68, preterm delivery 71, VTE – venous thromboembolism

486 | Implementation of a Standardized Fetal Surveillance Protocol for Stillbirth Risk-Reduction

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4:00 PM - 6:00 PM

Objective: Antenatal surveillance is recommended by the American College of Obstetricians despite the lack of published data proving a direct reduction in fetal mortality. We sought to evaluate the impact of a standardized antenatal fetal surveillance protocol on stillbirth rates at our level IV maternal care, safety-net hospital.
Study Design: Our institution implemented an updated, heightened antepartum surveillance protocol based on the ACOG Committee Opinion #828 in March of 2023. A retrospective cohort study was performed reviewing stillbirths one year pre- and one year post-implementation of the protocol. Cases involving known, life-limiting or lethal fetal anomalies, multi-fetal gestations, and complete absence of prenatal care in the hospital system were excluded from the analysis. Stillbirth was defined as fetal death occurring between 20 0/7 weeks gestation until delivery. Secondary outcomes evaluated neonatal intensive care unit (NICU) admission rates, APGAR scores, and induction rates. Inductions were stratified into late preterm, early term, term, and late-term groups. Chi-square and Fisher's exact test were used for comparisons as appropriate to compare rates between cohorts.
Results: A total of 4078 deliveries occurred pre-implementation (3/10/2022–3/10/2023) with 18 stillbirths identified (0.4%). A total of 4985 deliveries occurred post-implementation (06/10/2023–06/10/2024), with 19 stillbirths identified (0.4%). Overall stillbirth rates did not change despite protocol implementation ($p = 0.74$), nor when evaluated by gestational age time epoch ($p > 0.05$). Rates of induction, however, were significantly decreased for early term and term pregnancies ($p = 0.02$, $p = 0.02$, respectively) in the post-implementation period. NICU admission rates and APGAR scores were not noted to have significant difference across groups.
Conclusion: Our data suggests that increased surveillance does not significantly impact stillbirth rates at our institution but does decrease incidence of early term and term inductions without adverse impact on NICU admission rates or APGAR scores.

Gestational Epoch	Pre-protocol			Post-protocol			
	Stillbirth	Deliveries	Rate	Stillbirth	Deliveries	Rate	P-value
Early preterm (20 0/7 - 33 6/7)	12	238		15	277		
			5.04%			5.42%	p = 1.0
Late preterm (34 0/7 - 36 6/7)	4	412		1	447		
			0.97%			0.22%	p = 0.2
Early term (37 0/7 - 38 6/7)	2	1274		3	1477		
			0.16%			0.20%	p = 1.0
Term (39 0/7 - 40 6/7)	0	1963		0	2498		
			0.00%			0.00%	p = 1.0
Late term/post dates (41 0/7 - 42 6/7)	0	191		0	286		
			0.00%			0.00%	p = 1.0
Total	18	4078		19	4985		
			0.44%			0.38%	p = 0.74

*exclusions including: multifetal gestations, known life-limiting or lethal fetal anomalies, lack of prenatal visit in hospital system, fetus measurement <20 weeks gestation at time of diagnosis

Gestational Epoch	Pre-protocol			Post-protocol			
	Induction	Deliveries	Rate	Induction	Deliveries	Rate	P-value
Early preterm (20 0/7 - 33 6/7)	54	238		60	277		
			22.69%			21.66%	p = 0.83
Late preterm (34 0/7 - 36 6/7)	162	412		147	447		
			39.32%			32.89%	p = 0.06
Early term (37 0/7 - 38 6/7)	547	1274		570	1477		
			42.94%			38.59%	p = 0.02
Term (39 0/7 - 40 6/7)	808	1963		938	2498		
			41.16%			37.55%	p = 0.02
Late term/post dates (41 0/7 - 42 6/7)	121	191		182	286		
			63.35%			63.64%	p = 1.0
Total	1692	4078		1897	4985		
			41.49%			38.05%	p = 0.74

487 | Diagnostic Accuracy of Non-Invasive Prenatal Test for Fetal Red Blood Cell Antigen Genotyping

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4:00 PM - 6:00 PM

Objective: To investigate non-invasive prenatal testing (NIPT) diagnostic accuracy in identifying fetal red blood cell (RBC) antigen genotypes.
Study Design: A systematic search was conducted into four databases up to May 2024. We included studies implementing NIPT for fetal RBC antigen detection in pregnancies at risk of alloimmunization. We calculated sensitivity, specificity, diagnostic odds ratios, and area under the curve. Analysis was conducted per laboratory technique including polymerase chain reaction (PCR) and next-generation sequencing (NGS) and subgroup analyses were performed per fetal antigen into RhC, Rhc, RhD, RhE, Kell, and Duffy (Fya) antigens.
Results: A total of 52 studies of which 48 (37228 maternal samples) used PCR and 4 (170 maternal samples) used NGS were included in the analysis. The diagnostic accuracy for the six antigens (RhC, Rhc, RhD, RhE, Kell, and Fya) in order are i) using PCR technique, the pooled sensitivity is 100% (95% C 99-100), 98% (95% CI 95-100), 100% (95% CI 99-100), 100% (95% CI 98-100), and 98% (95% CI 94-100), respectively and the pooled specificity is 99% (95% CI 99-100), 100% (95% CI 97-100), 100%(95% CI 91-100), 99% (95% CI 98-99), 100% (95% CI 99-100), and 100% (95% CI 97-100), respectively, and ii) using NGS technique, the pooled sensitivity is 100% (95% CI 75-100), 100% (95% CI 92-100), 100% (95% CI 89-100), 100% (95% CI 95-100), 100% (95% CI 93-100), 100% (95% CI 70-100), respectively and the pooled specificity is 100% (95% CI 79-100), 100% (95% CI 78-100), 100% (895% CI 6-100), 100% (95% CI 93-100), 100% (95% CI 96-100), 100% (95% CI 80-100), respectively.
Conclusion: NIPT can accurately detect six fetal blood group antigens of which antibodies are associated with fetal anemia. Clinical adoption of NIPT for the detection of fetal antigens for both alloimmunized and RhD-negative non-alloimmunized

pregnant individuals may streamline care and reduce unnecessary treatment, monitoring, and patient anxiety.

Table 1. Diagnostic Accuracy of non-invasive prenatal test for fetal red blood cell antigen testing

Technique	Antigen type	Number of studies	Number of samples for each antigen	Sensitivity% (95% CI)	Specificity% (95% CI)	DOR (95% CI)	AUC
PCR	All antigens	48	37205	99 (99-100)	99 (99-100)	5121 (2428-10799)	0.989
	RhC	4	183	100 (99-100)	100 (97-100)	1287 (175 – 9475)	0.988
	Rhc	5	183	98 (96-100)	100 (93-100)	442 (83 – 2355)	0.977
	RhD	44	35654	100 (99-100)	99 (98-99)	5096 (2306 – 11262)	0.989
	RhE	6	260	100 (98-100)	100 (99-100)	1149 (225 – 5864)	0.986
	Kell	5	231	98 (94-100)	100 (97-100)	715 (152 –3350)	0.982
NGS	All antigens	4	170	100 (97-100)	100 (99-100)	964 (144 -6447)	0.987
	RhC	2	17	100 (75-100)	100 (79-100)	62 (3 – 1204)	0.886
	Rhc	3	33	100 (92-100)	100 (78-100)	84 (7 – 940)	0.956
	RhD*	1	28	100 (89-100)	100 (86-100)	825 (15-44516)	0.986
	RhE	3	46	100 (95-100)	100 (93-100)	179 (17 – 1934)	0.972
	Kell	2	62	100 (93-100)	100 (96-100)	449 (25 – 8210)	0.986
	Duffy (Fya)	2	15	100 (70-100)	100 (80-100)	65 (3-1246)	0.963

AUC = area under the curve; CI = confidence interval; DOR = diagnostic odds ratio; NIPT = non-invasive prenatal testing; NGS = next generation sequencing; PCR = polymerase chain reaction; Rh=Rhesus
*Study data was included for reference. Analysis was not possible given that it was only one study.

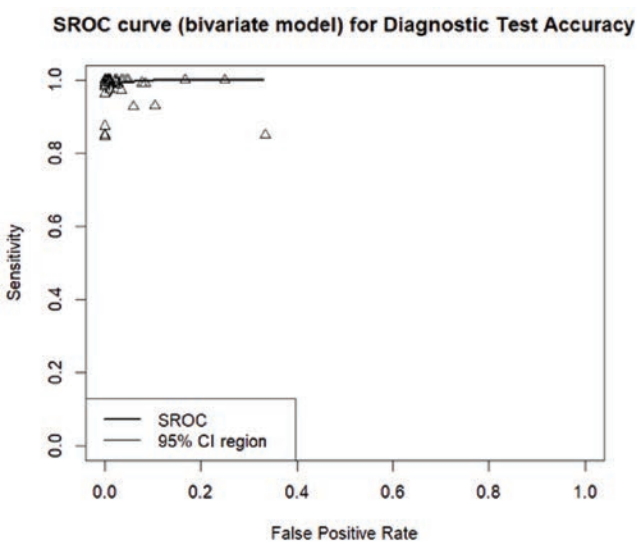

Figure 1. Summary Receiver Operating Characteristic (SROC) Curve for diagnostic test accuracy of NIPT for fetal RBC antigen genotyping using a bivariate model.

488 | Aspreo Secondary Analysis

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4:00 PM - 6:00 PM

Objective: A recent meta-analysis (4 trials) concluded that aspirin dose of 150-162 mg vs 75-81 mg initiated < 16 weeks gestational age (GA) decreased rates of preterm preeclampsia and preeclampsia with severe features (sPE). However, 3 of the 4 trials included were of low quality, and primary outcome was preeclampsia in only 1 of the trials. We conducted a secondary analysis of an RCT with primary outcome of sPE, and compared rates of sPE and preterm sPE between 162 vs 81 mg aspirin when initiated at < 16 weeks GA.

Study Design: Secondary analysis of a RCT in high-risk obese gravidas comparing aspirin 162 (ASA 2) vs aspirin 81 mg (ASA 1) for preeclampsia prevention (ASPREO). Inclusion criteria were BMI $\geq$30 kg/m^2 and $\geq$ 1 high risk factor: PE in prior pregnancy, at least stage I hypertension in the index pregnancy, diabetes. Exclusion criteria were: delivery < 20 weeks GA or delivery outcome data not available. For this analysis we focused on those enrolled < 16 weeks GA. The primary outcome was: sPE. Secondary outcomes were: preterm sPE, total PE, abruption, postpartum hemorrhage, severe maternal morbidity. Relative risks with 95% CIs were reported.

Results: A total of 107/209 (51%) were enrolled prior to 16 weeks GA (54 on ASA 2, 53 on ASA 1). Baseline characteristics were similar between groups (Table 1). There was no statistical difference in rates of sPE (28% vs 40%, RR: 0.7 (0.41-1.21)), or preterm sPE (13% vs 24%, 0.53 (0.23-1.22)) in those receiving ASA 2 vs ASA 1. Also, no differences were found in any of the analyzed secondary outcomes (Table 2).

Conclusion: When comparing aspirin 162 mg vs 81 mg started prior to 16 weeks, we found a trend towards reduced rates of preeclampsia with severe features and preterm preeclampsia with severe features in those receiving the 162 mg dose, although this was not statistically significant. A large RCT is needed to address the optimal dose and timing of initiation of aspirin for preeclampsia prevention.

Table 1. Baseline Characteristics in those enrolled < 16 weeks GA on Aspirin 162 mg vs Aspirin 81 mg

Characteristic	Aspirin 162 mg N = 54[1]	Aspirin 81 mg N = 53[1]	P Value
Age, years	29.5 (25, 34)	29 (26, 34)	0.91
Race/Ethnicity			0.48
African American	20 (37%)	26 (49%)	
Hispanic/Latina	21 (39%)	13 (25%)	
White	4 (7%)	6 (11%)	
Unknown/not reported	9 (17%)	8 (15%)	
Insurance type			0.87
Private	5 (9.3%)	5 (9.6%)	
Government assisted	49 (91%)	47 (90%)	
BMI, Kg/m2	39 (32, 44)	38 (34, 46)	0.64
Nulliparity	8 (15%)	14 (26%)	0.14
SLE	0 (0%)	0 (0%)	-
Tobacco use	1 (1.9%)	0 (0%)	1.00
Stage I HTN in current pregnancy	13 (24%)	16 (30%)	0.62
Preeclampsia in prior pregnancy	18 (33%)	14 (26%)	0.43
Type 1 Diabetes	3 (5.6%)	1 (1.9%)	0.61
Type 2 Diabetes	22 (41%)	26 (49%)	0.39
GDM diagnosed < 20 weeks	2 (3.7%)	6 (11%)	0.11

[1]Median (IQR); n (%)
SLE= Systemic Lupus Erythematosus
HTN= Hypertension

Table 2. Outcomes in those enrolled < 16 weeks GA on Aspirin 162 mg vs Aspirin 81 mg

Outcome	Aspirin 162 mg N = 54[1]	Aspirin 81 mg N = 53[1]	RR[2]	95% CI[2]	P Value
Preeclampsia with severe features	15 (28%)	21 (40%)	0.70	0.41, 1.21	0.20
Preterm Preeclampsia with severe features	7 (13%)	13 (24.5%)	0.53	0.23, 1.22	0.12
Total Preeclampsia	18 (33%)	24 (45%)	0.74	0.46, 1.19	0.20
Adjudicated preeclampsia with severe features	13 (24%)	14 (26%)	0.91	0.47, 1.75	0.78
Abruption	2 (3.7%)	1 (1.9%)	1.96	0.18, 21.0	0.58
Postpartum Hemorrhage	7 (13%)	7 (13%)	0.98	0.37, 2.61	0.97
Severe maternal morbidity	5 (9.3%)	8 (15%)	0.61	0.21, 1.75	0.36

[1]n (%)
[2]RR = Relative Risk; Aspirin 81 mg as reference group, CI = Confidence Interval
Total Preeclampsia: Preeclampsia with severe features and Preeclampsia without severe features
Postpartum hemorrhage: defined as blood loss $\geq$ 1000 cc

489 | Prediction of Cesarean Delivery Using Maternal Measurements–Secondary Analysis of a Prospective Multicenter Study

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4:00 PM - 6:00 PM

Objective: Prediction of intrapartum cesarean delivery (CD) would be of significant benefit in reducing labor-associated morbidity. While different fetal sonographic biometric parameters have been studied to develop individual patient CD risks, they are subject to ultrasound resource limitations, as well as interobserver variability in ultrasound precision. Our objective was to evaluate whether simple, easily repeatable measurements of a pregnant woman's head circumference and her height could provide an easy method of CD risk prediction in routine antenatal clinics.

Study Design: A multi-center prospective study recruited 2,336 nulliparous women with a vertex presentation between 39+0 and 40+6 weeks' gestation at seven hospitals to examine a range of CD predictors. Maternal head circumference (MHC) and maternal height (MH) were recorded at the first antenatal visit, with data entered into a prospective database at study enrolment at 39+0 to 40+6 weeks' gestation. Maternal proportionality of MHC to MH was assessed using the ratio MHC:MH.

Results: From a total enrolled cohort of 2,336 nulliparous patients, 491 (21%) had an unplanned CD. Mean MHC was 56.2cm (SD = 1.8cm, range = 50.0-65.5cm). Mean MH was 165.5cm (SD = 6.3cm, range = 142-188cm). The mean MHC:MH ratio was 0.346 (SD = 0.015), and this was used to standardize the MHC:MH ratio (sMHC:MH) for risk calculation. Table 1 shows that the sMHC:MH ratio was more predictive of emergency intrapartum CD than any maternal or fetal measurement individually (OR = 1.65, 95%CI 1.49-1.83, p< 0.001, AUC = 0.64). Table 2 shows delivery outcomes based on quartile of sMHC:MH.

Conclusion: We have demonstrated that a simple ratio of MHC to MH is a useful predictor of CD, showing that the shortest patients with the largest maternal head measurements have a 1 in 3 chance of requiring CD, with CD at full dilation and failure to progress being significantly more likely. In particular when late pregnancy ultrasound resources may be limited, a simple maternal biometry ratio can be a powerful predictor of emergency intrapartum CD, at no cost.

Table 1: Relative performance of maternal and fetal factors for predicting emergency intrapartum CD

Parameter	Odds Ratio	95% CI	Area under curve
Maternal age	1.21	1.07 – 1.31	0.55
Fetal Abdominal Circumference	1.29	1.17 – 1.43	0.57
Fetal Head Circumference	1.36	1.34 – 1.39	0.56
BMI (Kg/m2)	1.36	1.24 – 1.50	0.59
Maternal height (cm)	1.61	1.45 – 1.79	0.63
Standardized sMHC:MH ratio	1.65	1.49 – 1.83	0.64

Table 2: Delivery outcomes based on quartile of maternal head circumference to maternal height ratio (sMHC:MH)

Outcome	1st quartile Ratio ≤ 0.33 (N=595)	2nd quartile 0.33 < Ratio ≤ 0.34 (N=593)	3rd quartile 0.34 < Ratio ≤ 0.35 (N=580)	4th quartile Ratio > 0.35 (N=567)	P-value†
Emergency CD	74 (12.4%)	101 (17.5%)	124 (21.4%)	188 (33.2%)	<0.0001
Emergency CD at full dilation	13 (2.2%)	9 (1.5%)	15 (2.6%)	25 (4.4%)	0.0101
Instrumental Delivery	213 (35.8%)	225 (37.9%)	229 (39.5%)	197 (34.7%)	0.1557
Indication, failure to progress	98 (16.5%)	127 (21.4%)	122 (21.0%)	157 (27.7%)	<0.0001
Duration of labour > 12 hours	53 (9.0%)	87 (15.2%)	68 (12.3%)	71 (13.1%)	0.1196
Shoulder dystocia‡	6 (1.2%)	7 (1.4%)	6 (1.3%)	10 (2.6%)	0.1212
3rd/4th degree tear‡	20 (3.8%)	17 (3.5%)	22 (4.8%)	17 (4.5%)	0.4273
NICU admission	30 (5.0%)	52 (8.8%)	42 (7.2%)	52 (9.2%)	0.0261
Postpartum hemorrhage	61 (10.3%)	74 (12.5%)	76 (13.1%)	67 (11.8%)	0.3663

†Cochrane-Armitage trend test. ‡ Vaginal delivery is used as the denominator.

490 | Cost-effectiveness of External Fetal and Maternal Heart Rate Monitoring vs. External Fetal Heart Rate Alone

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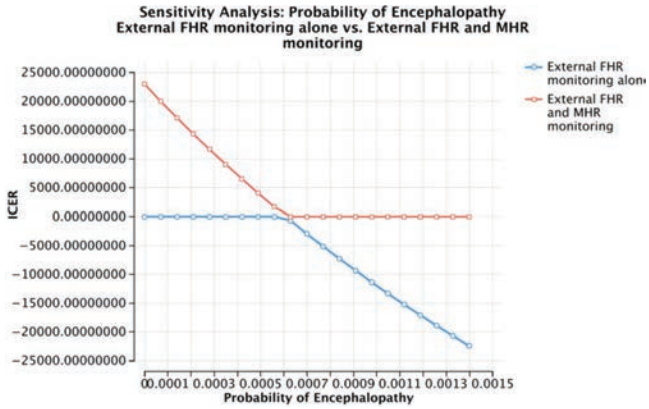
4:00 PM - 6:00 PM

Objective: Standard observation of a fetus during labor involves the use of external fetal monitoring to track fetal status. Recent evidence suggests that dual monitoring of external fetal heart rate (FHR) with concurrent maternal heart rate (MHR) can reduce the incidence of adverse neonatal outcomes. This study examined the cost-effectiveness of concurrent MHR and FHR monitoring during labor.

Study Design: We constructed a decision-analytic model using TreeAge Pro to compare neonatal outcomes between external FHR monitoring alone and dual external FHR and MHR monitoring. Outcomes examined included cost, neurodevelopmental delay (NDD), encephalopathy, death, NICU admission, and quality-adjusted life years (QALYs). The theoretical cohort was 2,512,945 patients, the estimated annual singleton vaginal births at term. We applied a willingness-to-pay threshold of $100,000 per QALY for the incremental cost-effectiveness ratio (ICER). The model inputs were sourced from literature and the QALYs were calculated using a 3% discount rate.

Results: In our theoretical cohort of 2,512,945 patients, dual MHR and FHR saved $843,454,354 and increased QALYs by 37,644. There would be 223 fewer patients with NDD, 1,131 fewer patients with encephalopathy, 8,325 fewer NICU admissions, and 291 fewer neonatal deaths. The negative ICER of $-22,406/QALY suggests that not only is this strategy more effective, but also cost-saving. Univariate sensitivity analysis of neonatal encephalopathy indicates that the dual monitoring would be cost-saving once the probability of encephalopathy exceeds 0.06% (Figure 1).

Conclusion: In our study, the use of dual external FHR and MHR monitoring during labor is a cost-saving strategy when compared to external FHR monitoring alone. Standardizing labor protocols to include external MHR monitoring may reduce dire neonatal outcomes.



	FHR Alone	FHR+MHR	Difference
Cost (USD)	18,513,090,886	17,669,636,532	843,454,354
Effectiveness (QALY)	141,235,080	141,272,724	-37,644
Neurodevelopmental Delay (NDD)	3,287	3,064	223
Encephalopathy	3,512	2,381	1,131
Neonatal death	493	202	291
NICU Admission	57,802	49,478	8,325
ICER	Dominated	Dominant	

491 | Interpregnancy Interval and Uterine Rupture Risk in Women Undergoing Trial of Labor After Cesarean

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4:00 PM - 6:00 PM

Objective: The interpregnancy interval (IPI) is the time between the end of one pregnancy and the start of the next. A short IPI, defined as 18 months or less, linked to negative outcomes like uterine rupture and preterm delivery. This study examines how the length of IPI affects the risk of uterine rupture and other major maternal and neonatal complications in women attempting a trial of labor after cesarean (TOLAC).

Study Design: A retrospective cohort study was conducted at a single tertiary care center between 2010 and 2024. The study population included pregnant women with a history of one previous cesarean delivery (CD) who attempted a TOLAC. Participants were stratified based on interpregnancy interval (IPI) of less than or greater than 18 months. The primary outcome was the incidence of uterine rupture. Secondary outcomes encompassed other maternal and neonatal complications.

Results: A total of 2386 women attempting TOLAC were included in the study, with 2151 (90.1%) in the IPI > 18 months group and 198 (9.9%) in the IPI $\leq$ 18 months group. Baseline characteristics, including indication for previous CD, were comparable between the two groups (Table 1).

When attempting TOLAC, there was no significant difference in the incidence of uterine rupture between the two groups (0.5% vs. 0.8%, p = 0.235; Table 2). Vaginal delivery rate was also similar between group, with failed TOLAC rate was ~38%. Other maternal and neonatal adverse outcomes did not differ significantly between the groups (Table 2).

Conclusion: Our study found no association between short IPI and an increased risk of uterine rupture or other maternal and neonatal complications in women attempting TOLAC. These findings suggest that IPI may not be a strong predictor of adverse maternal or neonatal outcomes in women undergoing TOLAC. However, the small number of women in the short IPI group, limits the strength of these conclusions. Further research with larger sample sizes is needed to confirm these findings and to explore other factors that may influence outcomes in this population.

Table 1: Delivery characteristics

Characteristics	IPI≤18m N=198	IPI>18 N=2151	P-value
PREVIOUS DELIVERY			
Maternal age, years, mean ± SD	27.89±4.74	28.12±4.17	0.423
Gestational age at delivery, mean ± SD	38.38±2.76	38.53±2.49	0.671
CD indication, n (%)			0.934
Elective	74 (41.3)	802 (42.4)	
Obstructed labor	44 (24.6)	443 (23.4)	
NRFHR	61 (34.1)	646 (34.2)	
CURRENT DELIVERY			
Maternal age, years, mean ± SD	29.15±4.74	31.58±4.41	**<0.001**
Parity, median (range)	2 (2-13)	2 (2-11)	0.353
In Vitro Fertilization, n (%)	2 (1.0)	91 (4.2)	**0.021**
Gestational diabetes, n (%)	16 (8.1)	180 (8.4)	0.404
Hypertensive disease	14 (7.1)	123 (5.8)	0.709
Chorioamnionitis, n (%)	5 (2.5)	100 (4.6)	0.208
Regional anesthesia, n (%)	167 (84.3)	1807 (84)	0.282
Gestational age at delivery, weeks, mean ± SD	39.46±1.24	39.54±1.12	0.298
Birthweight at delivery, grams, mean ± SD	3265.19±416.94	3313.75+432.398	0.088

PTB, preterm birth; CD, cesarean delivery; SD, standard deviation; n, number. P < 0.05 was considered significant.

Table 2: maternal and neonatal outcomes

Characteristics	IPI≤18m N=231	IPI>18 N=2405	P-value
Maternal Outcomes			
Delivery mode, n (%)			0.226
Spontaneous	102 (51.5)	1116 (51.9)	
Vacuum assisted	15 (7.6)	241 (11.2)	
Cesarean delivery	81 (40.9)	794 (36.9)	
Dehiscence, n (%)	2 (1.0)	14 (0.7)	0.639
Uterine rupture, n (%)	3 (1.5)	17 (0.8)	0.235
Bladder injury, n (%)	1 (0.5)	22 (1)	0.716
PPH, n (%)	5 (2.5)	99 (4.6)	0.208
Blood transfusion, n (%)	3 (1.5)	46 (2.1)	0.795
3rd/4th degree lacerations, n (%)	4 (2.0)	22 (1.0)	0.271
Postpartum fever > 38c, n (%)	0 (0)	2 (0.1)	1
ICU admission, n (%)	0 (0)	2 (0.1)	1
Postpartum maternal hospitalization ≥ 5 days, n (%)	49 (24.7)	521 (24.2)	0.863
Neonatal Outcomes			
RDS	0 (0)	5 (0.2)	1
Hypoglycemia < 40	3 (1.5)	40 (1.9)	1
Apgar score < 7 at 5 min	0 (0)	7 (1.2)	1
Sepsis	1 (0.5)	8 (0.4)	0.548
Arterial cord pH < 7.0	0 (0)	7 (1.2)	1
Admission to Neonatal ICU	3 (1.5)	47 (2.2)	0.796

PPH, postpartum hemorrhage; ICU, intensive care unit; RDS, respiratory distress syndrome; SD, standard deviation; n, number. P < 0.05 was considered significant.

492 | Cost Analysis of Permissive Intrapartum Glucose Control for Diabetes: The PERMIT Randomized Controlled Trial

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Objective: In PERMIT randomized controlled trial (RCT), permissive intrapartum glucose control led to reduced need for maternal insulin drip and equivalent neonatal blood glucose when compared to usual care for patients with diabetes (Bitar, AJOG 2024). We aimed to evaluate its economic impact.

Study Design: This is a pre-planned cost analysis of a multisite RCT of permissive intrapartum glucose control (target maternal blood glucose 70–180mg/dL) or usual care (70–110 mg/dL) in patients with diabetes. Costs were assessed from the hospital perspective and included the facility costs for all the inpatient services provided to all enrolled parturients and their neonates during the delivery and birth admissions, respectively, as recorded in the cost-accounting system of the participating sites. Costs were inflated to 2024 based on the medical Consumer Price Index. We assessed differences in total combined maternal and neonatal costs (primary economic outcome), as well as individual maternal and neonatal costs, using frequentist generalized linear models (GLMs). We assessed the probability of reduction in costs using a Bayesian GLM model with a neutral prior assuming no benefit (rate ratio [RR] = 1.0; 95% credible interval, 0.3–3.3). All frequentist and Bayesian models used gamma distribution with log link and adjusted for the stratifying variables (site and type of diabetes).

Results: Costs were determined for all 96 maternal-infant pairs. In intent-to-treat analysis, the total maternal and neonatal costs for permissive care were similar to those of usual care ($20,135 vs. $20,654; RR = 1.00 [95% CI, 0.77–1.30], p = 0.99; 49% probability of reduction). Costs between permissive care and usual care were similar for both the parturients ($13,480 vs. $14,119; RR = 0.96 (0.78–1.18), p = 0.70; 69% probability of reduction) and the neonates ($6,655 vs. $6,535; 1.04 (0.63–1.73), p = 0.87; 41% probability of reduction).

Conclusion: Permissive care is clinically equivalent and cost-neutral for both total maternal-neonatal costs and individual costs. These findings require validation in additional sites.

Table. Cost Outcomes by Treatment Group

	Permissive Care (N=48)	Usual Care (N=48)	Adjusted Risk Ratio†	*P* Value	Bayesian Probability of Cost Decrease
Hospital costs* mean (95% CI)					
Total combined costs	$20,135 ($16,710–$23,560)	$20,654 ($15,678–$25,631)	1.0 (0.77–1.30)	0.99	49%
Maternal costs	$13,480 ($11,823–$15,138)	$14,119 ($11,217–$17,022)	0.96 (0.78–1.18)	0.70	69%
Neonatal costs	$6,655 ($4,147–$9,163)	$6,535 ($3,693–$9,378)	1.04 (0.63–1.73)	0.87	41%

*Costs are reported in 2024 U.S. dollars.

†Estimates of differences between the two treatment groups were obtained using generalized linear models with gamma distribution and a log link function. The models included the dependent variable (cost), treatment groups (permissive care or usual care) and the stratifying variables (site and type of diabetes) as covariates.

493 | Maternal Cardiac and Perinatal Outcomes Among Pregnant Individuals with Ebstein's Anomaly

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Objective: Ebstein's anomaly, a congenital cardiac condition, is defined by apical displacement of the tricuspid valve and atrialization of the inlet portion of the right ventricle. Advancement in cardiac intervention over time has led to an increase in people with Ebstein's anomaly surviving into the reproductive years. Due to its historical early lethality, the impacts of this condition are not well known in pregnancy. The objective of this study was to describe the maternal cardiac and perinatal outcomes associated with maternal Ebstein's anomaly in pregnancy through use of a large, contemporary dataset.

Study Design: Utilizing Epic Cosmos, an integrated dataset from over 1500 hospitals across the United States and includes 250 million patients, we identified a cohort of pregnancies among individuals with maternal Ebstein's anomaly. Individuals with simultaneous diagnoses codes for maternal Ebstein's anomaly and pregnancy between July 2021 and July 2024 were identified. Descriptive statistics, including demographics, cardiac and perinatal outcomes were obtained.

Results: During the study period, 487 individuals with a maternal Ebstein's anomaly and pregnancy were identified. Subjects were

a mean age of 32.0 years old (±9 years) and identified as predominately White (78.9%). Approximately 30.8% of patients experienced a cardiac arrhythmia, while 14.8% developed heart failure. The most common arrhythmias were supraventricular tachycardias (SVT) (52%) and atrial fibrillation/flutter (36%). There was complete obstetric outcome data available for 235 individuals (48.2%). The average gestational age at delivery was 35.4 weeks (± 9.1 weeks) with 13.2% experiencing a preterm birth less than 37 weeks. Regarding mode of delivery, 77.0% had a vaginal delivery, while 23.0% had a cesarean delivery.

Conclusion: Ebstein's anomaly is associated with significant cardiac risks in pregnancy, specifically cardiac arrhythmia. Further prospective studies are needed in modern cohorts to guide optimal management of pregnant patients with Ebstein's anomaly and to determine the highest risk time period for cardiac complications.

Table 1. Demographics, Cardiac and Perinatal Outcomes of Perinatal Individuals with Ebstein's Anomaly

Demographics	Patients with Ebstein's anomaly (n=487)
Age (mean ± SD)	32.0 years old ± (9)
Race*	
American Indian/Alaskan Native	<10
Asian	19 (3.9%)
Black	47 (9.7%)
White	384 (78.9%)
Other	89 (18.3%)
Ethnicity	
Hispanic	89 (18.3%)
Non-Hispanic	340 (69.8%)
Unknown	58 (11.9%)
Cardiac Outcomes	(n=487)
Cardiac Arrhythmia	150 (30.8%)
Supraventricular tachycardia (SVT)	78 (52.0%)
Atrial Fibrillation/Atrial Flutter	54 (36.0%)
Other Arrhythmia	18 (12.0%)
Heart Failure	72 (14.8%)
Maternal Death	<10
Perinatal Outcomes†	(n=235)
Gestational Age at Delivery (Mean ± SD)	35.4 weeks (±9.1)
Preterm Delivery (<37 weeks)	31 (13.2%)
Neonatal Birthweight (Mean ± SD)	3002.2 grams (±612.3)
Mode of Delivery	
Vaginal or Assisted Vaginal Delivery	181 (77.0%)
Cesarean Delivery	54 (23.0%)

All data are summarized as n(%) or mean ± standard deviation. Cells with less than 10 subjects are noted as <10 due to the nature of dataset and protection of patient identity.
*Subjects may identify with multiple races.
†Complete perinatal outcomes were only available for a subset of subjects.

494 | Exposure to Maternal Chronic Hypertension (UNRELATED to PREECLAMPSIA) and Offspring Risk for Long-Term Cardiovascular Morbidity

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Objective: Women with chronic hypertension are at an increased risk for adverse perinatal outcomes, such as superimposed preeclampsia and preterm labor. Both complications are associated with the maternal preexisting vascular disease that alters maternal adaptation to pregnancy and may expose the offspring for both short and long-term adverse consequences. However, most studies regarding offspring long-term outcomes included preeclampsia and chronic hypertension together. In this study we investigate the long-term cardiovascular morbidity of children exposed to maternal chronic hypertension, unrelated to preeclampsia.

Study Design: We conducted a population-based retrospective cohort study of singleton deliveries occuring between the years 1991-2021 at a tertiary center. Deliveries of women with chronic hypertension were compared with deliveries of women without chronic hypertension or any other hypertensive disorders of pregnancy. Offspring long-term (up to 18 years) cardiovascular morbidity was compared using diagnoses from hospitalizations of the offspring involving a cardiovascular morbidity. A Kaplan–Meier survival curve was used to compare the cumulative incidence of cardiovascular morbidity and a Cox regression model was constructed to control for confounders.

Results: During the study period, 342,365 singleton deliveries occured, among them 3,097 (0.9%) were in mothers with chronic hypertension. Offspring total cardiovascular morbidity rate was significantly higher in children of mothers with chronic hypertension as compared with children from pregnancies uncomplicated by hypertensive disorders (**Table**). Also, the cumulative incidence of cardiovascular morbidity was higher for children exposed to maternal chronic hypertension (**Figure**). The Cox regression model, controlling for maternal and gestational age, found that maternal chronic hypertension is an independent risk factor for long-term cardiovascular morbidity of the offspring (**Table**).

Conclusion: Maternal chronic hypertension, unrelated to preeclampsia, is an independent risk factor for offspring long-term cardiovascular morbidity.

Figure. Kaplan-Meier survival curve demonstrating the cumulative incidence of cardiovascular morbidity in children exposed and unexposed to maternal chronic hypertension

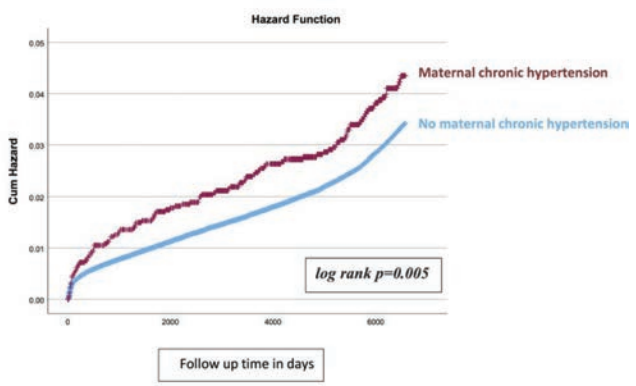

Table. Long-term cardiovascular morbidity of children born to mothers with and without chronic hypertension: crude and adjusted hazards ratio (HR)

	Maternal chronic hypertension (n=3,097)	No maternal chronic hypertension (339,538)	Odds ratio (95%CI)	Adjusted* HR
Total cardiovascular morbidity, n (%)	108 (3.5%)	7,170 (2.1%)	1.67 (1.38 – 2.03)	1.28 (1.06 – 1.55)

* The model adjusted for maternal and gestational age

495 | Fertility Treatments Resulting in Twin Pregnancy and the Risk for Childhood Respiratory Morbidity

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Objective: The increasing use of fertility treatments in the last decades has led to a significant rise in multiple pregnancies. While singletons born using fertility treatment were found to have an increased risk for perinatal and long-term adverse outcomes as compared with spontaneous pregnancies, twin pregnancies achieved using fertility treatments were scarcely investigated. We investigated the long-term respiratory morbidity of twins born following fertility treatments as compared with twins of spontaneous pregnancies

Study Design: A population-based retrospective cohort study of twin deliveries born between the years 1991-2021 at a tertiary center was conducted. Twins born using fertility treatments including ovulation induction (OI) and in-*vitro* fertilization (IVF) were compared with twins of spontaneous pregnancies. Respiratory morbidity was collected from community clinics and hospitalizations of offspring up to the age of 18 years. A Kaplan–Meier survival curve was used to compare the cumulative incidence of respiratory morbidity and a Cox regression model was used to control for confounders

Results: A total of 7790 twins were included: 696 (8.9%) were born after OI and 1380 (17.7%) following IVF. The total respiratory morbidity rate was significantly higher in twins born following fertility treatments and specifically in IVF twins ($p< 0.01$; using the chi-square test for trends), as compared with twins from spontaneous pregnancies (**Table**). Likewise, the cumulative incidence of respiratory morbidity was higher for twins of fertility treatments, with IVF showing the highest cumulative incidence (**Figure**). The Cox model, controlling for maternal and gestational age, hypertensive disorders, diabetes mellitus and ethnicity, found that IVF, but not OI, was an independent risk factor for long-term respiratory morbidity of the twin offspring (adjusted HR (aHR) for IVF = 1.22, 95%CI 1.1-1.3, $p< 0.001$ and aHR for OI = 1.04, 95%CI 0.9-1.1, $p = 0.585$; compared with spontaneous twins)

Conclusion: IVF treatments resulting in twin pregnancies are independently associated with long-term respiratory morbidity of the offspring

Figure. Kaplan-Meier survival curve demonstrating the cumulative incidence of respiratory morbidity among study groups

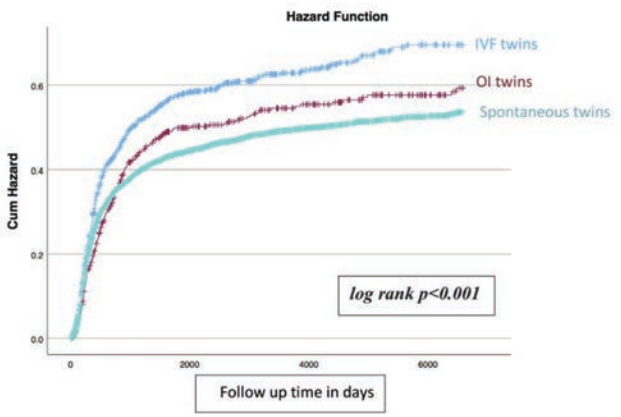

Table. Selected long-term respiratory morbidities of twins born following fertility treatments and after spontaneous twin pregnancies

Respiratory morbidity	IVF twins (n=1,380)	OI twins (n=696)	Spontaneous twins (n=5,714)	P value
Asthma, n (%)	569 (41.2%)	252 (36.2%)	1,883 (33.0%)	<0.001
Obstructive sleep apnea (OSA), n (%)	34 (2.5%)	11 (1.6%)	94 (1.6%)	0.109
Other, n(%)	6 (0.4%)	4 (0.5%)	45 (0.7%)	0.336
Total respiratory morbidity, n (%)	592 (42.9%)	265 (38.1%)	2,019 (35.3%)	<0.001

496 | Reproductive Planning in Kidney Disease: Survey of Patients with Chronic Kidney Disease and Preconception Counseling

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Objective: Chronic kidney disease (CKD) is associated with greater rates of adverse maternal and fetal outcomes in pregnancy. Although preconception counseling (PCC) is recommended by the Centers for Disease Control and Prevention as primary prevention for pregnancy complications, the utilization and impact of PCC among patients with CKD is unknown.

Study Design: Patients assigned female sex at birth and aged 18-45 years with CKD who received care at a nephrology clinic in an urban academic setting received a survey between January and May 2024. In this cross-sectional analysis, data was analyzed using Chi-square test or Fisher's exact test. Uni- and multivariable logistic regressions were performed to identify characteristics associated with inadequate PCC.

Results: Of 122 surveys distributed, 108 (88%) were completed. Overall, 74% of respondents received PCC, including 17% who received PCC from a maternal-fetal medicine (MFM) provider. Respondents who received PCC from an MFM provider were significantly more likely to report discussing medication safety, maternal complications, and fetal complications, compared to those who received PCC without an MFM provider (Table 1). PCC recipients also reported greater concern about the effect of CKD on fertility and less knowledge about preconception and pregnancy with CKD. Respondents who reported a loss of libido were more likely to report PCC (OR 3.6, 95% CI 1.2-10.5).

Conclusion: PCC for patients with CKD remains suboptimal, with 26% of respondents reporting no receipt of PCC. Our finding that topics discussed varied between MFM and non-MFM providers suggest the opportunity for PCC standardization and equitable access to MFM providers. Furthermore, our finding that patients who did not receive PCC reported lower concern and greater knowledge than PCC recipients suggests false reassurance in the setting of lack of education and reaffirms the need for PCC.

Table 1. Components of preconception counseling with and without a MFM provider among those who received counseling

	Total (N=80)	Counseling without MFM Provider (N=62)	Counseling with MFM Provider (N=18)	P-value
Conversation Initiation, n (%)				0.421[1]
Patient	47 (59.5%)	34 (55.7%)	13 (72.2%)	
Family member or partner	3 (3.8%)	3 (4.9%)	0 (0.0%)	
Physician	29 (36.7%)	24 (39.3%)	5 (27.8%)	
Topics Discussed during Counseling, n (%)				
Birth Control	48 (60.0%)	35 (56.5%)	13 (72.2%)	0.497[1]
Specific Birth Control Method	61 (76.3%)	44 (71.0%)	17 (94.4%)	0.202[1]
Future Childbearing	40 (50.0%)	27 (43.5%)	13 (72.2%)	0.127[1]
Medication Safety	34 (42.5%)	22 (35.5%)	12 (66.7%)	**0.045**[2]
Maternal Complications	25 (31.3%)	11 (17.7%)	14 (77.8%)	**<.001**[2]
Fetal Complications	24 (30.0%)	13 (21.0%)	11 (61.1%)	**0.003**[2]

[1]Fisher Exact p-value; [2]Chi-Square p-value

497 | Predicting Early Onset Preeclampsia (EOPE): Leveraging Demographics, Biophysical, and Biochemical Markers for Effective Aspirin Intervention

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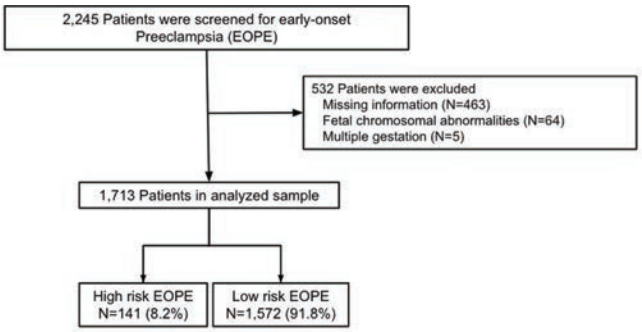
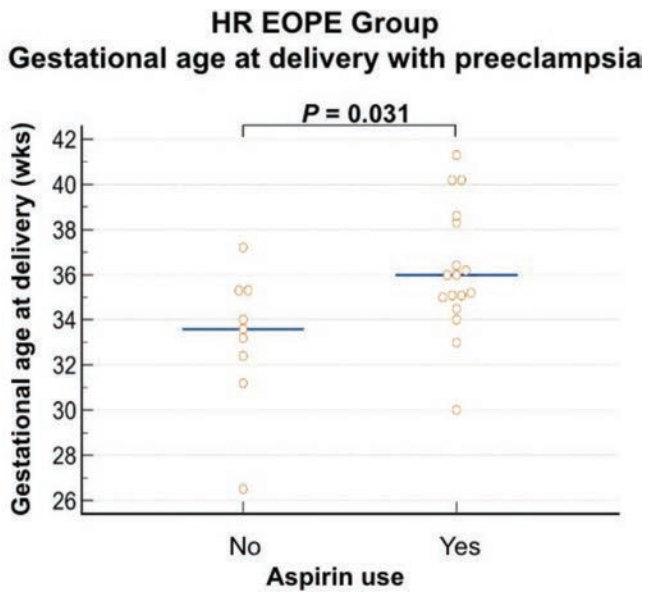
Objective: We hypothesized that combined screening using maternal demographics with biophysical and biochemical markers is a reliable method of predicting early onset preeclampsia (EOPE), requiring delivery prior to 34 weeks. Our secondary objective was to evaluate the effect of aspirin (ASA) on the performance of our prediction algorithm.

Study Design: This prospective cohort study assessed the risk of EOPE in pregnant patients between 11-13 weeks of gestation using the EOPE risk calculator (published by the Fetal Medicine Foundation). Risk assessment included maternal demographics, biophysical data (BMI, blood pressure, uterine artery pulsatility index), and biochemical markers (PAPP-A and PlGF). Patients were categorized as high risk (HR, ≥1:50) or low risk (LR, < 1:50). HR patients were advised to take 162mg of ASA, with compliance monitored via chart review. Logistic regression models considered factors such as history of preeclampsia, chronic hypertension, renal disease, and maternal age. The primary outcome was the development of EOPE, with secondary outcomes evaluating the impact of ASA on preventing preeclampsia.

Results: A total of 2,245 patients were screened, with 532 excluded (Figure 1). Among the remaining 1,713 patients, 141 (8.2%) were HR and 1,572 (91.8%) were LR. HR patients were more likely to be younger, Black, and have a history of hypertension and preeclampsia. HR individuals had a higher likelihood of developing EOPE (aOR: 4.38, 95% CI: 1.68-11.42, p< 0.001) despite ASA recommendations. Among HR patients, 9 (6%) did not use ASA, and all developed preeclampsia, with 6 cases being EOPE. ASA significantly reduced development of EOPE (OR: 0.08, 95% CI: 0.008-0.76, p = 0.03). Those using ASA had a higher median gestational age at delivery compared to non-users (36 weeks vs. 33.6 weeks, p = 0.03) (Figure 2).

Conclusion: Preeclampsia screening which combines maternal factors with biophysical and biochemical markers effectively identifies high risk individuals. ASA use in high risk individuals significantly reduces the risk of early-onset disease and delays gestational age at delivery.





498 | Antenatal Fetal Surveillance: Impact on Pregnancy Outcomes

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Objective: Serial antenatal testing is often recommended for high-risk pregnancies to reduce the stillbirth risk. However, the impact of testing recommendations on delivery outcomes is not well-studied. We explored how fetal testing impacts delivery outcomes to better inform patients.

Study Design: In this retrospective cohort, we identified all singleton pregnancies that delivered at 1 of 3 hospitals within an academic health system between 1/2022 and 5/2023. We then identified those that had undergone serial outpatient antenatal testing and collected testing indication and recommendations for the final testing visit prior to delivery. Primary outcomes included iatrogenic delivery < 39 weeks, iatrogenic preterm birth < 37 weeks (PTB), cesarean delivery (CS), and NICU admission. Stepwise regression models were used to assess the association

between demographic variables and testing indications and outcomes.

Results: A total of 3992 patients were included, with 480 (12.1%) recommended for delivery based on their final test. Overall, 370 (9.3%) were sent for delivery < 39 weeks and 161 (4.0%) patients were sent for iatrogenic PTB. Testing patients sent for delivery had a 50.4% CS rate, which was significantly higher than the CS rate amongst those not sent for delivery due to a testing visit (37.4%, P< 0.001). Overall NICU admission rate was 12.6% (N = 501). Nulliparity was only associated with increased likelihood of CS (aOR: 1.2; 1.0-1.4); whereas race was not associated with any of the outcomes. There were significant differences in NICU admission by hospital, likely related to NICU protocols. Several testing indications were significantly associated with each outcome (Table 1).

Conclusion: For patients undergoing antenatal testing, there is an overall low risk of iatrogenic preterm delivery or delivery prior to the 39-week elective induction window. Certain testing indications are associated with increased risk of adverse pregnancy outcomes. These data can be used to help high-risk patients understand their pregnancy risks when being recommended for serial fetal testing.

Table 1: Association of Fetal Testing Indication and Perinatal Outcomes

Testing indication	Frequency (n=3992)	Iatrogenic delivery <39 weeks	Iatrogenic delivery <37 weeks	Cesarean delivery	NICU admission
Advanced maternal age (AMA)	17.91% (n=715)	NS	NS	2.19 (1.84-2.62)	NS
Thrombophilia	4.83% (n=193)	NS	NS	NS	NS
Chronic hypertension (on medications)	11.40% (n=455)	2.33 (1.71-3.16)	5.34 (3.49-8.17)	1.73 (1.41-2.12)	2.10 (1.60-2.76)
Pre-gestational diabetes	5.71% (n=228)	NS	NS	2.83 (2.13-3.76)	2.54 (1.81-3.56)
Insulin-controlled gestational diabetes (GDMA2)	10.40% (n=415)	NS	1.85 (1.06-3.25)	1.52 (1.23-1.89)	NS
Obesity (BMI ≥ 40)	23.40% (n=934)	NS	NS	1.79 (1.52-2.10)	NS
Cholestasis	2.53% (n=101)	NS	NS	NS	NS
Fetal growth restriction (FGR)	17.94% (n=716)	2.77 (2.15-3.55)	5.46 (3.74-7.96)	NS	2.62 (2.08-3.29)
Oligohydramnios	0.38% (n=15)	24.16 (8.45-69.11)	20.74 (5.46-78.89)	NS	NS
Polyhydramnios (AFI ≥ 30)	1.95% (n=78)	NS	NS	2.93 (1.82-4.70)	2.18 (1.20-3.93)
Post-dates (GA ≥ 41w)	6.81% (n=272)	NS	NS	NS	NS
History of intrauterine fetal demise (IUFD)	3.21% (n=128)	NS	NS	NS	NS
Placental abruption[1]	2.15% (n=86)	NS	4.87 (2.17-10.89)	4.89 (3.06-7.84)	3.65 (2.20-6.06)
Gestational hypertension and/or preeclampsia	10.05% (n=401)	3.40 (2.54-4.55)	9.17 (6.13-13.73)	1.72 (1.38-2.14)	2.37 (1.78-3.15)
Chronic decreased fetal movement	2.20% (n=88)	NS	NS	NS	NS
Other medical comorbidity[2]	3.33% (n=133)	NS	NS	1.80 (1.25-2.59)	NS
Other[3]	4.88% (n=195)	NS	3.90 (2.16-7.05)	1.52 (1.12-5.06)	NS

[1]Vaginal bleeding with known placenta previa or history of chronic abruption
[2]Includes persistent or uncontrolled asthma, autoimmune conditions (e.g. SLE), and cardiac disease
[3]Examples: known aneuploidy, two-vessel cord, isoimmunization

499 | The Risk of ICP Recurrence in the Subsequent Pregnancy: a Retrospective Analysis

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4:00 PM - 6:00 PM

Objective: The recurrence risk of intrahepatic cholestasis of pregnancy (ICP) has been reported to be between 40-90% based on small studies with homogeneous populations. Our aim was to determine the recurrence risk of ICP and identify variables associated with recurrence in a larger, more diverse population.

Study Design: Retrospective cohort study of singleton, non-anomalous gestations complicated by ICP at a single academic center between 2015-2024. The EMR was used to identify patients with a first delivery complicated by ICP (initial) and a subsequent pregnancy with or without ICP (subsequent), both delivering at the same institution. The primary outcome was the recurrence of ICP in the subsequent pregnancy; secondary outcomes include identifying variables associated with ICP recurrence. Univariable and multivariable logistic regression were used to calculate the odds ratio and 95% confidence interval (OR [95% CI]) adjusting for advanced maternal age, history of hepatobiliary disease, and gestational diabetes.

Results: A total of 104 patients with ICP were identified, 46 (44%) of whom developed ICP in the subsequent pregnancy [Table 1]. In the group that had recurrent ICP, more patients self-identified as Hispanic (84.8% vs. 65.5%), but there were no differences in age or comorbidities in the initial pregnancy. The recurrent group had more patients with peak total bile acids (TBA) >40 (31. % vs. 7.6%, p = 0.01) and alkaline phosphatase (ALP) twice the upper limit of normal (37.0% vs. 19.0%, p = 0.04) in the initial pregnancy [Table 1]. In a multivariable regression, index pregnancy peak TBA >40 was associated with recurrence (aOR 6.03 Cl 1.81-20.07) and short-interval pregnancy was associated with decreased recurrence (aOR 0.40 Cl 0.17-0.96) [Table 2].

Conclusion: In this ICP cohort, the risk of recurrence in the subsequent pregnancy was 44%. Only peak TBA >40 in the initial pregnancy was associated with recurrence. Given the wide range of reported ICP recurrence rates in the literature, larger studies are warranted to improve pre-conception counseling.

Table 1: Maternal baseline demographics, clinical characteristics and laboratory findings in index pregnancy and subsequent pregnancy

	Non-Recurrent ICP (n=58, 55.8%)	Recurrent ICP (n= 46, 44.2%)	p-value
Initial Pregnancy			
Age, mean +/- SD	29.0 +/- 5.5	27.9 +/- 5.7	0.33
Obesity, n (%)	15 (25.9)	17 (37.0)	0.22
Ethnicity, n (%)			0.14
Hispanic	38 (65.5)	39 (84.8)	
Bengali	11 (19.0)	2 (4.4)	
African	1 (1.7)	1 (2.2)	
Southeast Asian	2 (3.5)	2 (4.4)	
Other	6 (10.3)	2 (4.4)	
Nulliparous	43 (74.2)	33 (71.7)	0.78
Prior Unexplained IUFD, n (%)	0 (0.0)	2 (4.4)	0.11
Comorbidities			
Pre-gestational DM	1 (1.7)	0 (0.00)	0.37
Gestational DM	10 (17.2)	4 (8.7)	0.21
Hypertensive Disorders of Pregnancy	8 (13.8)	2 (4.4)	0.11
Any Prior Hepatobiliary disease	6 (10.3)	6 (13.0)	0.67
History Hyperlipidemia	4 (6.9)	2 (4.4)	0.58
ICP Characteristics			
Gestational age (GA) at diagnosis, mean +/- SD (weeks)	35.2 +/- 3.8	34.3 +/- 4.7	0.33
Peak TBA (mean, SD)	22.2 +/- 21.3	41.6 +/- 50.6	<0.01
GA at peak TBA (weeks)	35.8 +/- 3.3	35.0 +/- 3.3	0.23
TBA Cohorts			<0.01
Peak TBA 10-19	34 (64.2)	19 (42.2)	
Peak TBA 20-39	15 (28.3)	12 (26.7)	
Peak TBA > 40	4 (7.6)	14 (31.1)	
Max ALT at diagnosis or during/after treatment	63.8 +/- 128.0	61.1 +/- 76.3	0.90
Max AST at diagnosis or during/after treatment	47.6 +/- 79.0	42.1 +/- 37.2	0.6
ALP > 280 (twice upper limit of normal)	11 (19.0)	17 (37.0)	0.04
Ursodiol Treatment	24 (42.1)	28 (60.9)	0.06
Obstetric Outcomes			
GA at delivery, mean +/- SD (weeks)	37.8 +/- 1.6	36.9 +/- 1.9	0.02
Delivery <37 weeks	7 (12.1)	13 (28.3)	0.04
Meconium-stained fluid	3 (5.2)	6 (13.0)	0.16
Subsequent Pregnancy			
Advanced maternal age	19 (32.8)	15 (32.6)	0.99
Interval between pregnancies (months)	32.7 +/- 19.3	44.3 +/- 23.7	<0.01
Short-interval pregnancy	26 (44.8)	11 (23.9)	0.03

Table 2: Univariable and multivariable logistic regression for recurrent ICP

	Univariable OR (95% CI)	*Multivariable* aOR (95% CI)
Initial Pregnancy		
Peak TBA 10-19	Ref	Ref*
Peak TBA 20-39	1.43 (0.56-3.68)	1.42 (0.55-3.69) *
Peak TBA >40	6.26 (1.80-21.75)	6.03 (1.81-20.07) *
PTB <37 weeks	2.87 (1.04-7.94)	1.74 (0.55-5.49) **
Subsequent Pregnancy		
Short Interval Pregnancy	0.39 (0.16-0.91)	0.40 (0.17-0.96) *

*Analysis includes the following: history of any hepatobiliary disease, advanced maternal age, and gestational diabetes.

**Analysis includes the following: history of any hepatobiliary disease, advanced maternal age, gestational diabetes, and peak total bile acid level

500 | Predictors of Pregnancy Duration and Gestational Age at Delivery after Laser Photocoagulation for Twin-Twin-Transfusion Syndrome

Henry L. Galan[1]; Michael V. Zaretsky[2]; Stephen P. Emery[3]; Zhaoxing Pan[4]; Nicholas Behrendt[4]; Sarkis C. Derderian[2]; Anthony Johnson[5]; Greg Ryan[6]; William H. Goodnight[7]; On behalf of the NAFTNet

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Objective: Limited data exist regarding the impact of peri-operative factors on pregnancy duration after fetoscopic laser photocoagulation (FLP) for twin-twin transfusion syndrome (TTTS). The objective of this study was to determine the best predictors of duration of pregnancy (latency) and gestational age (GA) at delivery following FLP for TTTS.

Study Design: TTTS cases treated with FLP between 2001-2023 were identified through the North American Fetal Therapy Network monochorionic twin registry containing perioperative variable and pregnancy outcomes. Higher order multiples, fetal anomalies and karyotypic abnormalities were excluded. Multiple perioperative variables were analyzed to determine the best predictors of latency and GA at delivery. Kaplan-Meier and COX regression were used in univariate analysis to identify significant factors that then had interplay evaluation with multiple Cox regression to determine the best predictors.

Results: Of 2317 TTTS cases treated with FLP, 1740 met inclusion criteria with sufficient information for analysis. Shown as Mean ± S.D, the GA at time of laser was 20.7±2.7 wks, the procedure time was 52.5±25.5 min, the latency period was 10.2±5.3 wks and GA at delivery was 30.8±4.9 wks. While univariate analysis found multiple factors significantly associated with both reduced latency (Table) and earlier delivery GA, Cox regression analysis (N = 865) showed the best predictors to be cervical length (CL) of < 25mm, amnioinfusion volume, laser time and earlier GA at time of FLP (Table). Early GA at time of surgery carried longer latency to delivery (Figure) but resulted in earlier delivery. The longer latency with early surgery persists regardless of whether CL is < or ≥ 25mm (Figure). The hazard to early delivery GA decreased by 4.3% if surgery occurs a week later as opposed to a week earlier.

Conclusion: From this large registry, the best predictors of both latency and GA at delivery after FLP for TTTS are the GA at time of the procedure, laser time, a short cervix and volume of amnioinfusion during FLP. These are factors to consider in the management of TTTS.

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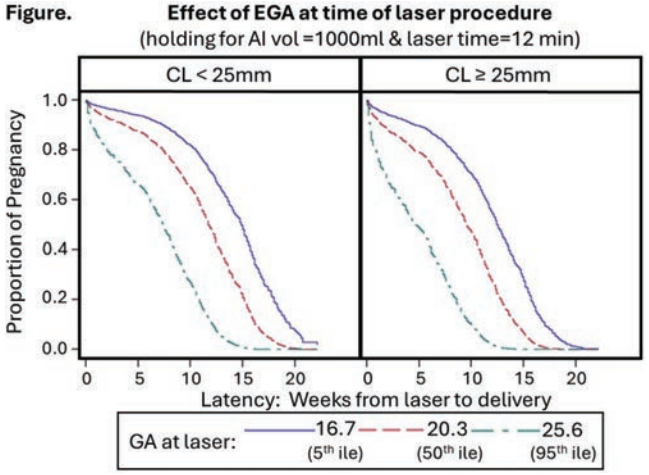
Table. **Survival analysis for duration of pregnancy after surgery for continuous and categorical variables**

Predictor variable	Hazard ratio (95% CI)			
	Univariate Analysis[a]	p	Multivariate Analysis[b]	p
Maternal Age	0.991 (0.98, 1.00)	0.05	-	
Maternal BMI	1.014 (1.01, 1.00)	0.0010	-	
Race (Black vs. others)	1.299 (1.00, 1.68)	0.0082	-	
GA at diagnosis (per 1wk increase)	1.193 (1.16, 1.22)	0.0001	-	
Number of livebirths	1.083 (1.04, 1.13)	0.0004	-	
Prior PPROM <34 weeks	1.784 (1.17, 2.72)	<0.0070	-	
Prior Pregnancy >20 wks or Not	0.844 (0.76, 0.94)	0.035	-	
GA at Laser (per 1wk increase)	1.239 (1.21, 1.26)	<0.0001	1.24 (1.20,1.27)	<0.001
Laser at <18 wks vs ≥18 wks	2.019 (1.77, 2.31)	<0.0001	-	
CL post Laser (per 1 cm longer)	0.981 (0.98, 0.99)	<0.0001	-	
CL <25mm vs ≥25mm	0.593 (0.53, 0.66)	<0.0001	0.57 (0.49,0.66)	<0.001
Cerclage (No vs. Yes)	0.631 (0.52, 0.76)	0.0001	-	
Fetoscopy time (per 10 min longer)	1.051 (1.03, 1.07)	<0.0001	-	
Laser time: (per 1 min increase) (per 10 min increase)	0.997 (0.99, 1.00) 0.971 (0.94-0.99)	0.0364 0.0364	0.996 (0.99,1.0) 0.96 (0.92-0.99)	0.032 0.032
Amnioinfusion volume (per 100ml increase)	1.005 (1.00, 1.10)	0.055	1.01 (1.00,1.02)	0.008
Amnioreduction volume (per 100 ml reduction)	1.000 (1.00, 1.00)	0.0001	-	
Laser to abruption	0.984 (0.98, 0.99)	<0.0001	-	
Laser to PPROM	0.982 (0.98, 0.99)	<0.0001	-	
GA at PPROM	0.935 (0.92, 0.95)	<0.0001	-	
Initial MVP Rec	1.036 (1.00, 1.07)	<0.0001	-	
TTTS Stage 1/2 vs 3/4	0.832 (0.67, 1.04)	0.033	-	

[a] All factors with p<0.1 are reported here.
[b] Significant factors <0.05 in the final model from step-down Cox regression. PPROM, preterm premature rupture of membranes; CL, cervical length; MVP, max vertical pocket

Figure. **Effect of EGA at time of laser procedure**



501 | Prevention of Preterm Birth in Twin Pregnancies: International Delphi Consensus

Hiba J. Mustafa[1]; Jameela Sheikh[2]; Vincenzo Berghella[3]; William A. Grobman[4]; Alireza A. Shamshirsaz[5]; Sanne J. Gordijn[6]; Wessel Ganzevoort[7]; Amanda Roman[8]; Asma Khalil[9]; On behalf of the PTB in the Twins Working Group

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4:00 PM - 6:00 PM

Objective: To use a Delphi process to gain insight into approaches to the management of preterm birth (PTB) in twin pregnancies, including those with twin-to-twin transfusion (TTTS).

Study Design: A three-round Delphi procedure was conducted among an international panel of experts to assess their approach to PTB prevention, monitoring, and management strategies in twins. Experts were chosen based on expertise, relevant publications, or affiliations. Response options included multiple-choice answers or a 5-point Likert scale. A priori, a cut-off of ≥70% was used to define "consensus".

Results: 115 experts joined the first round and 94/115 (82%) completed the subsequent rounds. There was representation from 22 countries on five continents. At least 70% performed routine screening of cervical length (CL) via transvaginal (TV) scan between 18 and 23 weeks with CL≤25 mm to diagnose a short cervix in twin pregnancies. In twin pregnancies with short CL, most experts offered vaginal progesterone and not pessary or expectant management. There was significant agreement but no consensus to offer cerclage for CL≤10. In twin pregnancies with asymptomatic dilated cervix, consensus was reached for cerclage placement as well as adjunctive practices surrounding the cerclage placement procedure. Similarly, at least 70% of experts agreed that serial TV CL assessment was warranted in those who had a current singleton pregnancy with a previous twin pregnancy requiring physical exam-indicated cerclage. In those with TTTS, a laser procedure generally was offered by most regardless of whether the cervix was short or dilated. For those with TTTS and a short CL, most experts would recommend cerclage or progesterone but not pessary or expectant management. However, no consensus was reached on PTB prevention measures in TTTS with cervical dilation.

Conclusion: This Delphi shows the practice variations among obstetric providers worldwide in evaluations and management of PTB in twin pregnancies, which often differs from what is recommended by national and international societies.

Table: Demographics and practice characteristics of participating experts

Characteristic	Respondents (n=115)
Region of practice	
United States	59 (51.3)
United Kingdom	14 (12.2)
The Netherlands	10 (8.7)
France	4 (3.5)
Spain	4 (3.5)
Italy	3 (2.6)
Two each of Albania, Belgium, Brazil, Egypt, Germany	2 (1.7)
Each of Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Australia, Canada, Hong Kong, Lebanon, Mexico, Sri Lanka	1 (0.9)
Practice setting	
Academic/University hospital	110 (83.3)
Community hospital	7 (5.3)
Private practice (group is independently owned)	6 (4.5)
Private practice (owned by the health system or hospital)	4 (3)
Military	2 (1.5)
Other	3 (2.3)
Academic rank	
Professor	53 (40.2)
Specialist/Consultant	23 (17.4)
Associate / Assistant professor	52 (39.4)
Specialty trainee/Registrar/Resident	2 (1.5)
Fellow	2 (1.5)
Years in practice	
<5	8 (6.1)
5-9	19 (14.4)
10-14	34 (25.8)
15-19	26 (19.7)
20-24	24 (18.2)
≥ 25	21 (15.9)
Annual number of cerclages placed in twin pregnancies at the expert's institution	
None	2 (1.7)
Less than 5	36 (30.8)
5-14	49 (41.9)
15-24	12 (10.3)
25-34	7 (6.0)
≥ 35	4 (3.4)
Unsure	6 (5.1)
Annual number of twin pregnancies who had cerclage and gave birth at the expert's institution	
None	6 (5.1)
Less than 5	39 (33.3)
5-14	41 (35.0)
15-24	15 (12.8)
25-34	4 (3.4)
More than 35	1 (0.9)
Unsure	11 (9.4)
Participants performing laser surgery for twin-t-twin transfusion syndrome (N=45)	
Annual number of twin pregnancies require laser therapy for TTTS at institution	
Less than 5	49 (45.8)
5-15	29 (27.1)
15-25	9 (8.4)
25-35	6 (5.6)
35-50	6 (5.6)
More than 50	8 (7.5)

Table: Highlighted Delphi results along with related national and international societies' opinions

Topic		United States (ACOG, SMFM)	United Kingdom (RCOG, NICE)	Canada (SOGC)	ISUOG	FIGO	France (CNGOF)	Germany (AWMF)	Agreement	Current Delphi	Current Delphi-USA participants
US screening of CL	Routine screening	R	R	R	R	R	NR	R	No	Yes by 71.9%	Yes by 70.2%
	Timing	18-23 weeks	16-20 week	Anatomy scan	18-24 weeks	18-24 weeks	-	20 weeks	No	18-23 weeks	18-23 weeks
	Approach	TA, if suspected to be short then TV	-	TA or TV	-	TV	-	-	No	TV	TV
Definition of short CL		≤25 mm	≤25 mm	-	≤25 mm	≤20 mm	-	≤25 mm	No	≤25 mm	≤25 mm
Prevention of PTB in short CL	Vaginal progesterone	NR	200 mg until 34 weeks	400 mg of CL ≤25 mm at 16-24 weeks	May be considered	-	NR	200-2400 mg if CL <25 mm at <24 weeks	No	Yes by 78.4%	Yes by 89.1%
	Cerclage	NR	NR	Consider if CL≤15 mm	NR	May consider for CL≤15 mm	NR	NR	No	Yes by 62.6% for CL≤10 mm and yes by 61.5% for CL≤5 mm	Yes by 63% for CL≤10 mm and yes by 66% for CL≤5 mm
	Pessary	NR	NR	NR	NR	NR	NR	Can be placed if CL≤25 mm at <24 weeks	No	No by 78.6%	No by 91.3%
Cerclage for cervical dilation		May be considered	May be considered	R	May be considered	R	-	May be considered	Yes	Yes by 88.6%	Yes by 95.7%

ACOG: American College of Obstetricians & Gynecologists, SMFM: Society of Maternal-fetal Medicine, RCOG: Royal College of Obstetricians and Gynaecologists, SOGC: Society of Obstetricians and Gynaecologists of Canada, ISUOG: International Society of Ultrasound in Obstetrics and Gynecology, FIGO: The International Federation of Gynecology and Obstetrics, CNGOF: College National des Gynecologues et Obstetriciens Francais, AWMF: Association of Scientific Medical Societies in Germany, US: ultrasound, CL: cervical length, PTB: preterm birth, R: recommended, NR: not recommended

502 | Elevated Levels of Circulating Endothelial Cells in Pregnancies Complicated by Preeclampsia And/OR Fetal Growth Restriction

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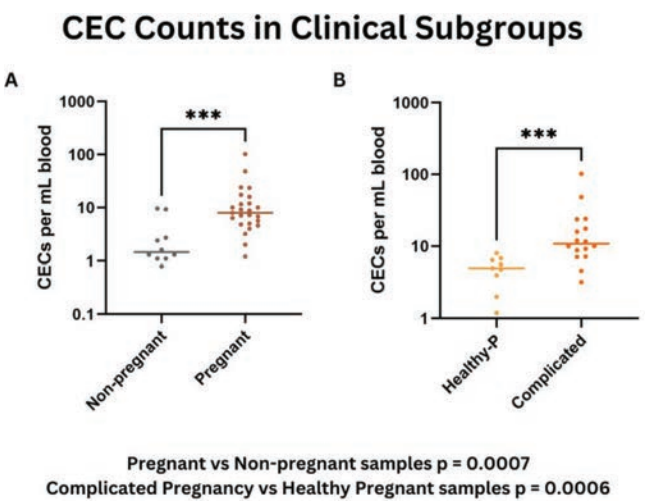
4:00 PM - 6:00 PM

Objective: To develop a circulating endothelial cell (CEC) assay to measure maternal blood CEC numbers in pregnancy and begin exploratory studies comparing pregnancies complicated by preeclampsia (PE) and fetal growth restriction (FGR).

Study Design: We used model human umbilical vein endothelial cells (HUVECs) to develop a 4-parameter immunofluorescence assay (IF) on the established RareCyte liquid biopsy platform with the following markers: Sytox (nucleus), VE-Cadherin (CD144, positive CEC marker #1), MCAM (CD146, positive CEC marker #2), and CD45 (white blood cell exclusionary marker). CECs were defined as nucleated cells, negative for CD45, and positive for either or both CD144 and CD146. Using the HUVEC spike-in model system, we analytically validated assay performance by evaluating specificity, sensitivity and limit of detection across clinically relevant CEC count ranges. In clinical studies, CEC numbers in healthy, non-pregnant female subjects of child-bearing age (20-40 years old; N = 10) were compared to third trimester pregnancy samples (N = 17 total, including N = 9 uncomplicated, N = 8 FGR, N = 5 PE, N = 3 FGR + PE). All pregnant subjects were enrolled after informed consented at Swedish Medical Center, Seattle, WA.

Results: Analytic validation studies demonstrated sensitivity and specificity of CD144 and CD146 of 99–100% and lower limit of detection of 1 cell in >1 million. CEC count was higher in pregnancy compared to non-pregnant reproductive age subjects and was higher in pregnancies with PE +/- FGR compared to those with uncomplicated outcomes. Results are shown in Figure 1A and B.

Conclusion: We have developed a robust assay for enumeration of CECs in pregnancy. Elevated levels of CECs in third trimester pregnant patients were observed in both PE and FGR relative to healthy third trimester pregnancies. These preliminary studies support further investigation of CEC enumeration as a predictive biomarker of pregnancy complications.



503 | Project PEN-FAST: Unmasking Allergies for Antibiotic Optimization

Hope Brandon[1]; Noelle Leung[2]
[1]*University of Kentucky College of Pharmacy, Lexington, KY;*
[2]*University of Kentucky HealthCare, Lexington, KY*

4:00 PM - 6:00 PM

Objective: Assess the clinical impact of the PEN-FAST scoring tool within the obstetric group at a single academic medical center.

Study Design: This was a single center, retrospective, observational analysis of pregnant patients with a documented penicillin or cephalosporin allergy admitted to the birthing center between January and June 2023 who also received an antibiotic and/or had a PEN-FAST assessment completed.

Results: Sixty-four patients were included in the final analysis. Within the analyzed cohort, 53 (83%) of patients had a PEN-FAST assessment completed, 17 (32%) of whom had their penicillin allergy successfully de-labeled. Among patients with a penicillin allergy that was not de-labeled, 11 (31%) had a score or assessment indicating that a cephalosporin could be safely utilized, nine (25%) had a score of three or greater, indicating a non-beta lactam antibiotic should be employed, and seven (19%) patients declined de-labeling despite a PEN-FAST assessment indicating a low-risk penicillin allergy, and the remaining nine (25%) were either referred for further workup or not de-labeled due to other reasons. Of the patients who had a PEN-FAST assessment completed, 38 (72%) received a penicillin or cephalosporin and 15 (28%) received alternate or no antibiotics. Comparatively, of the 11 patients who did not have a PEN-FAST assessment completed, two (18%) received a penicillin or cephalosporin and nine (82%) received an alternate antibiotic. Among all patients analyzed, there were no identified adverse reactions to penicillins or cephalosporins.

Conclusion: Within our cohort, 32% of patients had their penicillin allergy successfully de-labeled using the PEN-FAST assessment. Even without de-labeling due to factors such as patient preference, utilization of the PEN-FAST assessment resulted in a dramatic increase in the use of pencillins and cephalosporins as opposed to alternate antibiotics. Overall, the PEN-FAST assessment was an efficient and safe tool for stratifying risk of penicillin allergies within this cohort of patients and did impact antibiotic choice for the patients included.

504 | The Perinatal Effects of a Mindfulness Phone App - a Pilot Randomized Controlled Trial

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4:00 PM - 6:00 PM

Objective: Sleep disturbances are commonly reported during pregnancy, are difficult to treat and are associated with adverse perinatal outcomes. We aimed to assess the feasibility of the use of a mobile mindfulness application (App) in pregnant people with self-reported sleep disturbance to improve sleep quality and perinatal outcomes.

Study Design: Pilot randomized controlled trial (RCT). Pregnant people with a singleton pregnancy, between 20-30 weeks gestation and self-reporting sleep disturbances were assessed for recruitment. Participants were randomized to either the use of a standard pregnancy sleep leaflet or to the addition of funded access to a commercially available mindfulness App. Both groups received and were instructed to use a sleep actigraph. The co-primary outcomes were: 1) recruitment rate and quantitative use of the mindfulness app. 2) Sleep quality actigraph measures and the change in PSQI score. Perinatal outcomes were collected and reported.

Results: Of 1576 potential participants,629 (39.9%) declined, 706 were not assessed and 113 were excluded leaving 128 randomized participants, 64 to each group. Baseline characteristics did not differ between groups. In the mindfulness group 35/64 (54.7%) used the App for an average of 9.9 (0.02–90) minutes per day and a mean of 8 (1-47) sessions per pregnancy. Actigraph use was similar with 30/64 (46.9%) and 32/64 (50%) providing data in the mindfulness and control groups respectively. No significant reduction was found in PSQI scores, actigraph measures or measures of stress, anxiety or depression (Table 1). Perinatal outcomes did not differ between groups except for the rate of post-partum hemorrhage which was increased in the intervention group (11.9% vs 1.6%, P = 0.03).

Conclusion: Performing a RCT using a mindfulness App is feasible, but recruitment and usage rates were lower than expected. Although exploratory, the use of a mindfulness App did not appear to improve sleep parameters when compared to routine sleep education.

Table 1: Sleep, stress anxiety and depression parameters during pregnancy

Parameter	Intervention (Mindfulness App)	Control	P value
Sleep latency (Mean (SD)	18.58 (4.6)	21.92 (0.1)	0.39
Wake episodes (Mean (SD)	3.88 (1.44)	3.64 (1.52)	0.46
Sleep quality (Mean (SD)	5.91 (1.74)	6.33 (1.61)	0.26
Poor sleep quality (<5)	29%	25%	0.95
PSQI score change	-0.97	-0.6	0.6*
PSS	-1.26	-3.12	0.08*
BAI	-1.44	-4.45	0.09*
EPDS	-1.65	-2.06	0.66*

PSQI = Pittsburgh Sleep Quality Index.

PSS= Perceived Stress Scale.

BAI - Beck Anxiety Inventory.

EPDS = Edinburgh Postnatal Depression Scale.

*P value is for score change by group interaction

505 | The Association Between Hepatitis C Virus Infection During Pregnancy and Risk of Infant Death

Ilish Gedestad[1]; Kriti N. Vedhanayagam[2]; Sergio Karageuzian[3]; Stephen Contag[4]; Synia Chunn[2]; Megan Marquez[5]; Rang Kim[5]; Ruofan Yao[2]
[1]Loma Linda University School of Medicine, Redlands, CA; [2]Loma Linda University School of Medicine, Loma Linda, CA; [3]Loma Linda University School of Medicine, Pasadena, CA; [4]University of Minnesota, Minneapolis, MN; [5]Loma Linda University School of Medicine, Loma Linda University, CA

4:00 PM - 6:00 PM

Objective: To investigate the association between Hepatitis C Virus (HCV) status and the likelihood of infant death.

Study Design: This retrospective cohort study used data from the National Center for Health Statistics Vital Statistics database. The cohort linked birth and infant death data files from 2015 to 2021 that were used for this study. The study included all births in the United States during the study period with known HCV status. The outcome of interest was infant death. Univariate analysis was performed to determine the association between HCV and infant death. Multivariate logistic regression was then performed to estimate the effect of HCV status on infant death adjusting for potential confounding variables. Interaction analysis was then performed to determine if the effect of HCV on infant death is modified by race and obesity.

Results: Of the 26,456,956 women, 122,485 (0.46%) were identified with HCV infection. HCV infection was associated with

high rate of infant mortality (1.0% vs 0.5%, p< 0.001; aOR 2.34 [2.21-2.47]). Compared to White, both Black and Asian race demonstrated a protective effect on infant mortality among individuals with HBV infection (aOR 0.55; 95% CI [0.39 - 0.77] and aOR 0.54 95% CI [0.37-0.78]). Compared to underweight group, individuals with class III obesity also had lower infant death (aOR 0.48; 95% CI [0.28-0.82]).

Conclusion: This study demonstrates that HCV infection is associated with a significant increase in the risk of infant death, which is modified by other risk factors.

Hepatitis C	Infant Death 0	Infant Death 1	Total
0	26,205,312 (99.51%)	129,159 (0.49%)	26,334,471 (100.00%)
1	121,231 (98.98%)	1,254 (1.02%)	122,485 (100.00%)
Total	26,326,543 (99.51%)	130,413 (0.49%)	26,456,956 (100.00%)

Variable	Odds Ratio	P value	[95% Conf. Interval]
HCV * Normal BMI	1.147641	0.362	0.8536816 - 1.542823
HCV * Overweight	1.044829	0.782	0.7661673 - 1.424841
HCV * Class I Obesity	0.8891428	0.502	0.6311943 - 1.252506
HCV * Class II Obesity	0.8022718	0.296	0.5309565 - 1.212227
HCV * Class III Obesity	0.4756539	0.008	0.2755505 - 0.8210714
HCV * Unknown BMI	0.791465	0.202	0.5525191 - 1.133747
HCV * History of Diabetes	0.9783878	0.933	0.5890401 - 1.625089
HCV * History of Chronic Hypertension	0.7362591	0.102	0.5100461 - 1.062801

506 | The Association Between Hepatitis B Virus Infection During Pregnancy and Risk of Infant Death

Ilish Gedestad[1]; Sergio Karageuzian[2]; Kriti N. Vedhanayagam[3]; Stephen Contag[4]; Synia Chunn[3]; Megan Marquez[5]; Rang Kim[5]; Ruofan Yao[3]

[1]Loma Linda University School of Medicine, Redlands, CA; [2]Loma Linda University School of Medicine, Pasadena, CA; [3]Loma Linda University School of Medicine, Loma Linda, CA; [4]University of Minnesota, Minneapolis, MN; [5]Loma Linda University School of Medicine, Loma Linda University, CA

4:00 PM - 6:00 PM

Objective: To investigate the association between Hepatitis B Virus (HBV) status and the likelihood of infant death.

Study Design: This retrospective cohort study used data from the National Center for Health Statistics Vital Statistics database. The cohort linked birth and infant death data files from 2015 to 2021 that were used for this study. The study included all births in the United States during the study period with known HBV status. The outcome of interest was infant death. Univariate analysis was performed to determine the association between HBV and infant death. Multivariate logistic regression was then performed to estimate the effect of HBV status on infant death adjusting for potential confounding variables. Interaction analysis was then performed to determine if the effect of HBV on infant death is modified by race and obesity.

Results: Of the 26,456,956 women, 56,299 (0.21%) were identified with HBV infection. HBV infection was associated with higher but not statically significant rate of infant mortality (0.52% vs 0.49%, p = 0.757; aOR 0.98 [0.87-1.10]). Compared to White, both Black and Asian races demonstrated a protective effect on infant mortality among individuals with HBV infection (aOR 0.55; 95% CI [0.39 - 0.77] and aOR 0.54; 95% CI [0.37 - 0.78]).

Conclusion: HBV infection is not significantly associated with an increased risk of infant death, however other risk factors may modify this outcome.

Hepatitis B	Infant Death 0	Infant Death 1	Total
0	26,270,534 (99.51%)	130,123 (0.49%)	26,400,657 (100.00%)
1	56,009 (99.48%)	290 (0.52%)	56,299 (100.00%)
Total	26,326,543 (99.51%)	130,413 (0.49%)	26,456,956 (100.00%)

Variable	Odds Ratio	P value	[95% Conf. Interval]
HBV * Black	0.5486008	0	0.3926934 - 0.7664067
HBV * Hispanic	0.7277776	0.191	0.4518934 - 1.172091
HBV * Asian	0.5365429	0.001	0.3678883 - 0.7825155
HBV * Other	0.556045	0.12	0.2652613 - 1.165591

507 | The Use of a Novel Point-Of-Care (POC) IgM Test for the Diagnosis of Congenital Syphilis

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4:00 PM - 6:00 PM

Objective: The only hematologic test used for congenital syphilis (CS) diagnosis is the neonatal nontreponemal (NT) serologic combined antibody test directed towards *T. pallidum* antigens. This includes IgG antibodies which cross the placenta and may reflect maternal antibodies rather than neonatal infection. In contrast, any syphilis-specific IgM immunoglobulins detected in the neonate are fetal in origin and may reflect CS. This pilot study aims to determine the test performance of a POC IgM test for the diagnosis of CS.

Study Design:

After institutional review board approval, serum from 2 controls and 23 pregnant patients with syphilis and their newborns was collected between 05/24-06/24. Duplicate 20 µL aliquots were tested using the research-use only rapid lateral flow test developed by Diagnostics Direct, LLC for detection of syphilis IgM. This test uses a purified specific anti-IgM polyclonal antibody coupled with colloidal gold in the sample pad to form rose colored visually read test and control lines. A proprietary Protein is used to bind all IgG from reacting with the antigen test line, producing only IgM for visual results detection. Duplicate 50 µL aliquots from the samples were tested for IgM using two CE-marked Western Blot (WB) tests with different treponema targets as comparators (ViraBlot, Germany and Euroimun, Germany). Mother-baby dyads were staged for syphilis according to the Centers for Disease Control and Prevention guidelines and were also considered for test performance analytics.

Results: The positive and negative percent agreement (PPA, NPA) between the POC IgM test and the Virablot WB was 86% and 78% and for Euroimun, PPA and NPA were 80% and 86% respectively (Table 1). Clinical correlates were similar, demonstrating a

90% PPA and a 93.3% NPV between the POC IgM test and syphilis diagnosis for dyads (Table 2).

Conclusion: The syphilis POC IgM test demonstrated excellent test performance when compared to reference WB tests and clinical correlates. Given poor sensitivity of current lab tests for CS, further studies evaluating this POC IgM test for at-risk neonates are warranted.

Table 1. IgM Rapid POC test compared to reference IgM Virablot and Euroimun Western Blots tests.

		Virablot IgM						Euroimun IgM				
		+	-	Total	PPA	NPA		+	-	Total	PPA	NPA
IgM POC	+	6	4	10			+	8	2	10		
	-	1	14	15			-	2	13	15		
	Total	7	18	25	86%	78%	Total	10	15	25	80%	86%

PPA: positive predictive agreement
NPA: negative predictive agreement

Table 2. IgM Rapid POC test compared to mother-baby dyads with syphilis

	Pregnant Patient and Neonatal Syphilis Infection Status			
		+	-	Total
IgM Rapid POC	+	9	1	10
	-	1	14	15
	Total	10	15	25
	PPA = 9/10 = 90% (C.I.= 55.5 - 99.7)			
	NPA = 14/15 = 93.3% (C.I. = 68.1 - 99.8)			

508 | Sibling Analysis of Long-Term Morbidities in Preterm Twins: Vaginal versus Cesarean Delivery

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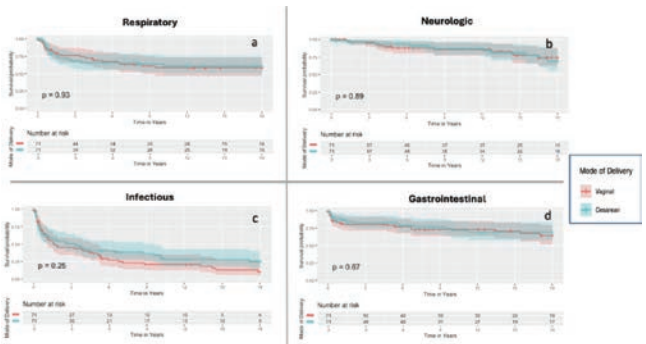
4:00 PM - 6:00 PM

Objective: Given the gap in knowledge regarding mode of delivery's impact on the premature twin population, we aimed to investigate the association between mode of delivery and long-term respiratory, neurologic, infectious, and gastrointestinal (GI) morbidities in preterm twin siblings, with the first delivered vaginally (VD) and the second by cesarean delivery (CD).

Study Design: A retrospective population-based cohort study was conducted at a tertiary medical center between 1991-2021. The study compared preterm twins where the first-born twin was vaginally delivered, and the second-born twin was delivered via CD, excluding cases with congenital malformations or perinatal deaths. Follow-up ended at the age of 18, end of the study period, or diagnoses of any morbidity from the studied outcomes. Kaplan-Meier survival curves were used to compare cumulative incidences, and Cox proportional hazards models were applied to adjust for potential confounders.

Results: The cohort included 71 offspring born via CD and 71 via VD, representing 3.5% of all preterm twin births at this center. No difference in the cumulative incidence of respiratory, neurologic, infectious, and gastrointestinal morbidity was noted between the groups (respiratory: 24% VD vs. 23% CD, p = 0.85; neurologic: 12% VD vs. 12% CD, p = 1.00; infectious: 52% VD vs. 45% CD, p = 0.20; GI: 20% VD vs. 17% CD, p = 0.56, Table, Figure). Similarly, the Cox model, adjusted for maternal age, ethnicity, gestational age group, repeated pregnancies, offspring's birth year, gestational diabetes mellitus, preeclampsia, weight group, and clustering within pregnancy, showed no association between delivery mode and long-term morbidity (respiratory: aHR 0.93, 95% CI 0.56–1.55; neurologic: aHR 1.16, 95% CI 0.47–2.27; infectious: aHR 0.81, 95% CI 0.59–1.12; GI: aHR 0.86, 95% CI 0.47–1.59, Table).

Conclusion: No significant differences in long-term respiratory, neurologic, infectious, and GI morbidities exist between preterm twin siblings when the first-born was delivered vaginally and the second-born by CD. Further research on larger cohorts is needed to confirm these findings.



Vaginal versus cesarean delivery and associated long term morbidities, incidence, hazard ratios and adjusted hazard ratios

	Disease Incidence			Crude HR (95%CI)	aHR* (95%CI)
	Vaginal[1] 71 (50%)	Cesarean[1] 71 (50%)	p[2]		
Respiratory	24 (34%)	23 (32%)	0.85	0.97 (0.55, 1.72)	0.93 (0.56, 1.55)
Neurologic	12 (17%)	12 (17%)	1.00	1.06 (0.47, 2.35)	1.16 (0.47, 2.27)
Infectious	52 (73%)	45 (63%)	0.20	0.79 (0.53, 1.18)	0.81 (0.59, 1.12)
Gastrointestinal	20 (28%)	17 (24%)	0.56	0.87 (0.46, 1.66)	0.86 (0.47,1.59)

*Adjusted for maternal age, ethnicity, gestational age group, maternal recurrence, offspring's birth year, gestational diabetes mellitus, preeclampsia, weight group, clustering within pregnancy.
Abbreviations: HR; Hazard Ratio, aHR; adjusted Hazard Ratio
[1]n (%) [2]Pearson's Chi-squared test

509 | Elective Inductions of Labor at 39 Weeks versus Expectant Management in Multiparous Patients

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4:00 PM - 6:00 PM

Objective: The ARRIVE trial demonstrated a reduction in cesarean section with similar perinatal outcomes in low risk nulliparas undergoing induction of labor (IOL) compared to

expectant management (EM). We compared outcomes in low-risk multiparous patients undergoing IOL vs EM.

Study Design: We performed a retrospective cohort study of multiparous patients with low-risk singleton pregnancies at 39 weeks gestation from 2020-2022. All multiparous patients who delivered after 39 weeks were included, and patients undergoing IOL for medical or fetal indications were excluded. The primary outcome was composite neonatal morbidity. The secondary outcomes were cesarean section, postpartum hemorrhage (defined as estimated blood loss ≥1000 ml), and chorioamnionitis. These outcomes were compared between patients undergoing scheduled IOL between 39w0d and 39w6d and those undergoing expectant management at 39 weeks. Multivariable Firth's penalized logistic regression was used to adjust for potential confounders.

Results: Of the 841 multiparous patients during the study period, 454 (54%) underwent IOL and 387 (46%) were EM. Among EM, 54 (14%) ultimately underwent an IOL. There were no significant differences in odds of having composite neonatal morbidity (aOR 1.04, 95% CI 0.63-1.71, p = 0.88), cesarean delivery (aOR 2.09, 95% CI 0.9-4.79, p = 0.09), or chorioamnionitis (aOR 0.58, 95% CI 0.13-2.57, p = 0.48) in IOL group as compared to EM group. The odds of having postpartum hemorrhage were 2.6 times higher in IOL as compared to EM patients (aOR 2.59, 95% CI 1.24-5.42, p = 0.011.)

Conclusion: Multiparous patients undergoing elective IOL have similar odds of cesarean section and neonatal morbidity as those undergoing EM. IOL is associated with an increased risk of hemorrhage compared to EM.

Table: Neonatal morbidity and cesarean section rates in multiparous patients undergoing elective IOL versus expectant management

	Expectant management *Reference* (N=387)	IOL (N= 454)	OR (95% CI)	aOR (95% CI) *
Perinatal Outcomes				
Composite neonatal morbidity	32(8.3)	44(9.7)	1.19 (0.74, 1.91)	1.04 (0.63, 1.71)
Perinatal death	0(0.0)	0(0.0)		
Respiratory support within 72 hours of life	27(7.0)	40(8.8)		
APGAR ≤3 at 5 minutes	0(0.0)	1(0.22)		
Hypoxic ischemic encephalopathy	1(0.26)	0(0.0)		
Seizure	1(0.26)	0(0.0)		
Infection	6(1.6)	7(1.5)		
Meconium aspiration syndrome	1(0.26)	1(0.22)		
Birth trauma	4(1.0)	0(0.0)		
Intracranial/subgaleal hemorrhage	2(0.52)	0(0.0)		
Maternal Outcomes				
Cesarean section	8(2.1)	22(4.8)	2.32 (1.04, 5.18)	2.07 (0.90, 4.79)
Postpartum hemorrhage	10(2.6)	32(7)	2.77 (1.36, 5.63)	**2.59 (1.24, 5.42)**
Chorioamnionitis	4(1)	2(0.44)	0.47 (0.10, 2.23)	0.58 (0.13, 2.57)

IOL: induction of labor
Statistics presented as Mean ± SD, Median [P25, P75], or N (column %).
* Adjusted for tobacco use and BMI group (3 BMI groups considered: <30, 30-40, and >=40).

510 | Dysglycemia Phenotypes in Pregnancy and the Risk of Fetal Shoulder Dystocia at Birth

Jasmine Hitt[1]; Eric K. BRONI[2]; Maria Som[3]; Cassandra Seifert[3]; May Blanchard[1]
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4:00 PM - 6:00 PM

Objective: Maternal diabetes is a well-established risk factor for fetal shoulder dystocia (ShD). However, data on the differential risk of ShD among women with dysglycemia subtypes in pregnancy are scarce. We evaluated whether the risk of fetal ShD differs by maternal dysglycemia subtype.

Study Design: We investigated 202 mothers who delivered infants with ShD and 747 randomly selected controls from a cohort of women who received antenatal care at an urban, tertiary medical center from 2012- 2023. Maternal dysglycemia phenotypes include [Type 1 diabetes (T1D), Type 2 diabetes (T2D), Gestational diabetes controlled by diet and exercise (GDMA1), Gestational diabetes requiring hypoglycemic agents (GDMA2)], Elevated 1-hour GCT without 3-hour GTT (E1GCT) and Elevated 1-hour GCT with normal 3-hour GTT (E1N3GTT). We used adjusted logistic regression models to estimate the risk of infant ShD among women in the different dysglycemia subgroups.

Results: Pregnant women who had infants with ShD were younger (27 vs 31 years, p< 0.001), more likely to be Black (72.8% vs 46.5%), delivered at later gestational age (39.3 vs 38.4 wks, p< 0.001), were more likely to have vaginal delivery (96% vs 53%, p< 0.001) and a history of smoking (17.3% vs 7.4%) **Table 1**. Compared to pregnant women with normoglycemia, those with E1GCT had a 4.4-fold [aOR, 4.35 (1.23–15.45)] higher risk of delivering an infant with ShD, even after controlling for maternal age, gestational age at delivery, race/ethnicity, parity, mode of delivery, prior delivery with ShD. Similarly, those with T2D had a 2.6-fold [aOR, 2.62 (1.19–5.75)] higher odds of delivering an infant with ShD. Additionally, women with E1N3GTT had a 3.4-fold [aOR, 3.36 (1.33-8.44)] higher odds of delivering an infant with ShD. **Table 2**.

Conclusion: Different dysglycemia phenotypes in pregnancy are independently associated with a higher risk of shoulder dystocia at birth. Continuous surveillance of pregnant women with dysglycemia, especially those with T2D and elevated 1-hour GCT (± 3-hour GTT), will reduce the risk of fetal shoulder dystocia and concomitant perinatal complications.

Table 1: Baseline Characteristics of Study Participants

Characteristic	Dystocia N=202	No dystocia N=747	P- value
Maternal age, years; median (IQR)	27(23-31)	31(27-36)	< 0.001
Race			< 0.001
White	33 (16.34)	273 (36.55)	
Hispanic	3 (1.47)	76 (10.17)	
Black	147 (72.77)	347 (46.45)	
Asian	3 (1.49)	24 (3.21)	
Other	16 (7.92)	27 (3.61)	
Parity			0.004
0	72 (23.43)	175 (23.43)	
1	74 (36.63)	279 (37.35)	
2	32 (15.84)	172 (23.03)	
3-4	17 (8.42)	95 (12.72)	
≥ 5	7 (3.47)	26 (3.48)	
Prior dystocia history	13 (37.14)	22 (62.86)	0.020
Delivery type			<0.001
Vaginal delivery	193 (95.54)	393 (52.61)	
Cesarean section	1 (0.50)	344 (46.05)	
Vacuum delivery	8 (3.96)	10 (1.34)	
Delivery gestational age, wks; median (IQR)	39.3 (38.5 - 40.2)	38.4 (37.1 – 39.2)	< 0.001
*BMI at delivery, kg/m², (IQR)	33 (28 – 38.2)	36 (31.7 – 42.4)	<0.001
Smoking, %	35 (17.33)	55 (7.36)	<0.001
Hypertension Phenotype			0.036
Hypertensive disorder of pregnancy, %	23 (11.39)	108 (14.46)	
Chronic hypertension	13 (6.44)	87 (11.65)	

Data were presented as median (Interquartile range) and frequency (percentages).

Abbreviation: BMI, body mass index; IQR, interquartile range. *Sample size for maternal BMI at delivery was 881.

Table 2: Associations between Dysglycemia in Pregnancy and Shoulder Dystocia at Birth

	No Diabetes/ No Dysglycemia (Reference) (N=579)	Type 1 Diabetes (N=32)	Type 2 Diabetes (N=96)	GDMA 1 (N=75)	GDMA 2 (N=115)	Elevated 1 hr. GCT Without 3 hr. GTT (N=15)	Elevated 1 hr. & Normal 3 hr. GTT (N=37)
	Shoulder Dystocia versus No Shoulder dystocia [aOR (95% CI)]						
Model 1	1	0.88 (0.19 - 4.03)	**2.19 (1.09 – 4.38)**	0.95 (0.46 – 1.97)	1.51 (0.83 – 2.74)	**4.08 (1.31-12.75)**	**2.34 (1.08 – 5.07)**
Model 2	1	0.68 (0.14 – 3.07)	**2.09 (1.02 – 4.30)**	1.01 (0.49 – 2.08)	1.37 (0.75 – 2.48)	**4. 67 (1.51 – 14.42)**	1.48 (0.72 – 3.13)
Model 3	1	0.89 (0.18 – 4.34)	**2.65 (1.19 – 5.90)**	1.27 (0.57 – 2.80)	1.41 (0.74 – 2.67)	**4.50 (1.29 – 15.65)**	1.58 (0.69 – 3.63)
Model 4	1	0.89 (0.19 – 4.21)	**2.38 (1.16 – 4.87)**	1.01 (0.48 – 2.14)	1.46 (0.79 – 2.70)	**4.11 (1.26 – 13.36)**	**2.23 (1.01 – 4.96)**
Model 5	1	1.19 (0.25 – 5.73)	**3.22 (1.50 – 6.93)**	1.17 (0.52 – 2.63)	1.87 (0.96 – 3.64)	1.68 (0.46 – 6.14)	**3.36 (1.33- 8.44)**
Model 6	1	1.11 (0.22 – 5.57)	**2.62 (1.19 – 5.75)**	1.50 (0.66 – 3.42)	1.71 (0.89 – 3.30)	**4.35 (1.23 – 15.45)**	2.35 (0.97 – 5.69)

aOR, adjusted Odds Ratio; CI, confidence interval; DM, diabetes mellitus; GDMA1, Gestational diabetes controlled by diet and exercise; GDMA2, gestational diabetes requiring hypoglycemic agents; GCT, Glucose challenge test; GTT, Glucose tolerance test.
Statistically significant results are in bold font.
Model 1: adjusted for maternal age, gestational age at delivery and race/ethnicity
Model 2: adjusted for gestational age at delivery and maternal BMI
Model 3: adjusted for gestational age at delivery, maternal BMI at delivery and mode of delivery
Model 4: adjusted for gestational age at delivery, maternal age, race/ethnicity, and history of shoulder dystocia
Model 5: adjusted for maternal age, gestational age at delivery, race/ethnicity, EFW at 3rd trimester USG
Model 6: adjusted for maternal age, gestational age at delivery, race/ethnicity, history of shoulder dystocia, parity, and mode of delivery

511 | Impact of Weight Discordance on Short-term Postnatal and Neurodevelopmental Outcomes in Triplet Pregnancies

Jeesun Lee[1]; Joon Hyung Lee[2]; JI HOI KIM[3]; Hee Young Cho[4]; Seung Mi Lee[1]; Chan-Wook Park[1]; Joong Shin Park[1]; Jong Kwan Jun[5]

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4:00 PM - 6:00 PM

Objective: Weight discordance (WD) in multifetal pregnancies is a key concern due to its association with selective fetal growth restriction (sFGR). Although much research has focused on twins, studies on triplets are limited. This study evaluates the impact of WD on short-term postnatal and neurodevelopmental outcomes in triplets.

Study Design: We analyzed triplets delivered at Seoul National University Hospital from November 1997 to December 2022. WD was calculated as: ((birthweight of the largest fetus–birthweight of the smallest fetus) × 100) / birthweight of the largest fetus. Short-term outcomes included neonatal death, respiratory distress syndrome, bronchopulmonary dysplasia, persistent pulmonary hypertension, apnea of prematurity, intraventricular hemorrhage, periventricular leukomalacia, retinopathy of prematurity, necrotizing enterocolitis, and early-onset sepsis. Neurodevelopmental outcomes were assessed up to 60 months using the Korean Ages and Stages Questionnaires and the Bayley Scales of Infant and Toddler Development, 3rd Edition. ROC curves and Generalized Estimating Equations (GEE) were used to analyze the predictive value.

Results: A total of 436 triplets were analyzed. Short-term outcomes were linked to gestational age but not to WD or birthweight order. ROC curve analysis showed an AUC of 0.550 for short-term outcomes, indicating limited predictive value. GEE analysis found adjusted hazard ratios of 1.08 (95% CI 0.74-1.59) for the middle-sized fetus and 1.48 (95% CI 0.99-2.22) for the smallest fetus, suggesting minimal impact of birthweight order. Neurodevelopmental outcomes also showed no significant correlation with WD, with an AUC of 0.645. No differences in outcomes based on WD were seen when analyzed by chorionicity.

Conclusion: This study found no strong association between WD and short- or long-term complications in liveborn triplets. WD does not appear to be a significant predictor of adverse outcomes in triplet pregnancies, though further research is needed for a thorough understanding.

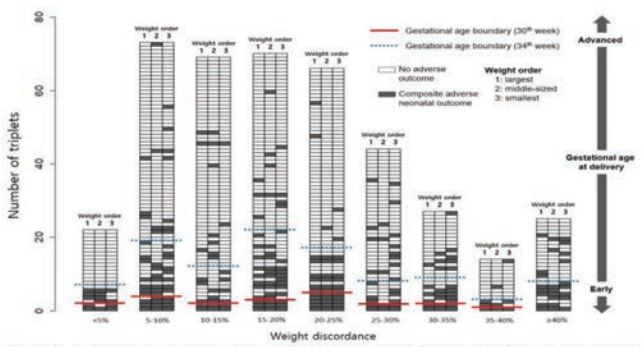

Figure 1. Occurrence of short-term adverse postnatal outcomes according to the weight discordance

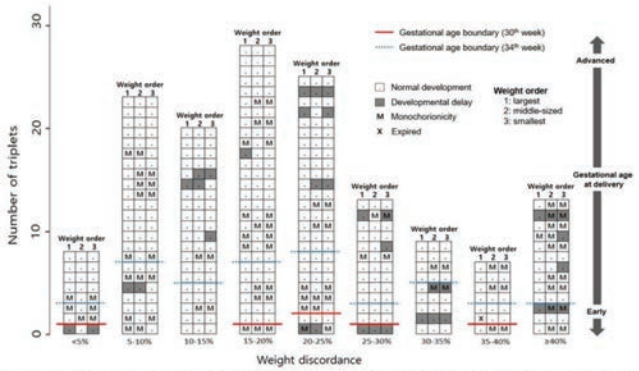

Figure 2. Occurrence of developmental delay in triplet children according to the weight discordance

512 | Azithromycin to Improve Latency in Exam-Indicated Cerclage: a Multicenter Randomized Control Trial (ALEC)

Jenani S. Jayakumaran[1]; Kavisha Khanuja[2]; Stephanie A. Fisher[3]; Emily S. Miller[4]; Emily B. Rosenfeld[5]; Justin S. Brandt[6]; Megan Piacquadio[7]; Adeeb Kalifeh[8]; Rupsa C. Boelig[9]
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4:00 PM - 6:00 PM

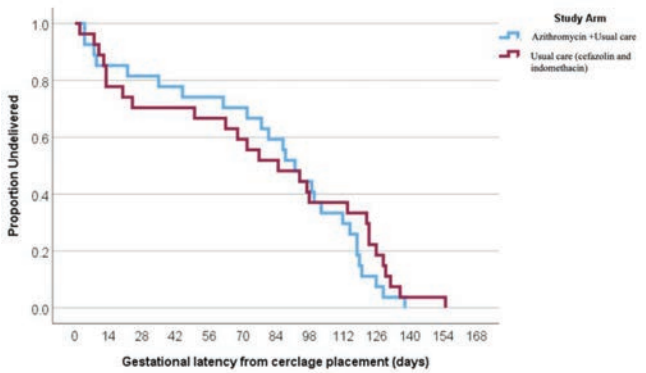
Objective: While prophylactic azithromycin has been shown to increase latency in the setting of cervical shortening, its use in physical exam-indicated cerclage (PEIC) has been understudied. Our objective is to determine whether adding azithromycin prior to PEIC increases gestational latency to usual care (cefazolin and indomethacin).

Study Design: This RCT included pregnant people with singleton gestations < 24 weeks gestational age (GA) planning a PEIC at one of four sites across the United States. Participants were randomized 1:1 to usual care (cefazolin 1-2 g IV and indomethacin 50 mg IV preoperatively, then 2 additional doses at 8 and 16 hours postoperatively) or usual care plus azithromycin (azithromycin 1g IV once perioperatively). Primary outcome was gestational latency (days) from cerclage placement to delivery. Secondary outcomes included preterm birth (< 37, < 34, < 32, < 28, and < 24 weeks), GA at birth, chorioamnionitis, birthweight, NICU admission, and composite neonatal morbidity and mortality. Fifty participants needed to be randomized to demonstrate a 20±25 days improvement in latency with 80% power. Assuming a 10% loss to follow-up, we aimed to recruit 55 individuals. Kaplan-Meier survival curve, Mann Whitney U test, and chi squared analyses were conducted. The study was registered at clinicaltrials.gov (NCT05132829).

Results: A total of 55 participants were randomized from December 2021 to September 2023; 27 to usual care, 27 to adjunctive azithromycin, and 1 excluded from analysis when found not to meet study criteria after randomization. Protocol adherence was 100% for each arm. The median gestational latency after PEIC did not differ between the usual care and azithromycin groups (median difference -1 day, 95% CI -20 to 26 days; Figure). Additional secondary obstetric and neonatal outcomes were similar between groups (Table).

Conclusion: A single perioperative dose of azithromycin in addition to usual care (cefazolin and indomethacin) does not improve latency to delivery or other obstetric or neonatal outcomes for individuals undergoing PEIC.

Figure
Kaplan-Meier survival curve for gestational latency to delivery (days) by study arm



Mantel-Cox log-rank p-value=0.46.

Table
Obstetric and neonatal outcomes by study arm

	Azithromycin + Usual Care (n=27)	Usual Care (n=27)	P value	RR (95% CI) or MD (95% CI)
Obstetric Outcomes				
Median gestational latency from cerclage placement to delivery (days)	92 [45-118]	85 [20-123]	0.93	-1 (-20 to 26)
Median gestational age at delivery (weeks)	34.3 [26.3-39.9]	33.4 [24.4-38.9]	0.78	0.6 (-2.4 to 4.6)
Delivery less than 37 weeks	18 (66.7)	17 (63.0)	0.564	1.1 (0.7 to 1.6)
Delivery less than 34 weeks	12 (44.4)	15 (55.6)	0.414	0.8 (0.5 to 1.4)
Delivery less than 28 weeks	7 (25.9)	9 (33.3)	0.551	0.8 (0.3 to 1.8)
Delivery less than 24 weeks	4 (14.8)	5 (18.5)	1.00	0.8 (0.2 to 2.7)
Suspected intraamniotic infection/inflammation	2 (7.4)	3 (11.1)	1.00	0.7 (0.1 to 3.8)
Chorioamnionitis, histologically proven	8/16 (50.0)	10/20 (50.0)	1.00	1.0 (0.52-1.93)
Fetal demise	1 (3.7)	0	1.00	—
Maternal mortality	0	0	1.00	—
Neonatal Outcomes				
Birth weight (grams)	2154.3±1009.7	2228.6±1283.5	0.821	
Birth weight less than 2500 grams	11 (40.7)	13 (48.1)	0.288	
Male sex	14/26 (53.8)	15/26 (57.7)	0.780	
NICU admission	13 (48.1)	11 (40.7)	0.669	
Composite adverse outcome[a]	12/26 (46.1)	12/27 (44.4)	0.901	

Data presented as n (percent), mean±standard deviation, or median [interquartile range].
RR: relative risk; MD: median difference.
[a]Composite adverse outcome includes: respiratory distress syndrome, bronchopulmonary dysplasia, retinopathy of prematurity, intraventricular hemorrhage grade 3 or 4, patent ductus arteriosus, culture-proven sepsis, necrotizing enterocolitis, and neonatal death.

513 | Characteristics Associated with Compliance Within a Postpartum Hypertension Remote Monitoring Program

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4:00 PM - 6:00 PM

Objective: Remote blood pressure (BP) monitoring has been shown to decrease postpartum Emergency Department (ED)

visits and readmissions. We evaluate characteristics associated with compliance within a remote BP monitoring program.

Study Design: A retrospective cohort study of birthing patients with peripartum hypertension (HTN) at a quaternary care center over 2 years. This study is part of an ongoing postpartum quality improvement project that entails lower BP targets and universal remote BP monitoring. Inclusion criteria were delivery at the study institution and diagnosis of HTN disorder of pregnancy at time of discharge. Primary outcome was compliance with utilizing remote BP monitoring, defined as logging at least one BP within the program. We compared maternal and hypertensive characteristics between groups.

Results: Out of 6410 deliveries between April 2022-April 2024, 2019 (31.5%) pregnancies met inclusion criteria, of which 1509 (74.7%) were compliant with utilizing remote BP monitoring. There were higher rates of compliance with higher maternal age (in years, 34.2±5.0 vs 33.0±6.3, p< 0.001), nulliparity (71.2% vs 56.5%, p< 0.001), lower BMI (in kg/m^2, 30.2±6.1 vs 31.6±7.0, p< 0.001), prenatal aspirin use (41.9% vs 33.1%, p< 0.001), IVF pregnancy (12.3% vs 7.8%, p = 0.006), and private insurance (84.9% vs 59.4%, p< 0.001). Patients discharged on anti-hypertensive medication were more likely to be compliant (36.0% vs 24.1%, p< 0.001) as were those with longer postpartum lengths of stay (in days, 2.4±1.3 vs 2.3±1.2, p = 0.027). Compliance was associated with lower rate of ED visit or readmission (1.8% vs 3.3%, p = 0.039).

Conclusion: Characteristics that are associated with higher rates of compliance with remote BP monitoring include nulliparous, older, and privately insured patients. Compliance was associated with lower rates of postpartum ED visit or readmission. Continued work is needed to identify barriers to remote BP monitoring and target these areas for improvement within programs to improve compliance and further decrease postpartum readmission rates.

Table 1. Baseline Characteristics by Remote Monitoring Compliance

Baseline Characteristic	Using Remote Monitoring (n=1509)	Not using Remote Monitoring (n=510)	P-value[a]
Maternal age in years (mean±SD)	34.2±5.0	33.0±6.3	**<0.001**
Maternal age 35 and above	726 (48.1%)	233 (45.7%)	0.34
Race/Ethnicity[b]			
Asian	287 (19.0%)	66 (12.9%)	**<0.001**
Black	153 (10.1%)	66 (12.9%)	
Caucasian	595 (39.4%)	148 (29.0%)	
Hispanic/Latina	321 (21.3%)	153 (30.0%)	
None of the above/ Mixed Race	153 (10.1%)	77 (15.1%)	
Parity	1.4±0.8	1.7±1.0	**<0.001**
Nulliparity	1074 (71.2%)	288 (56.5%)	**<0.001**
BMI (kg/m^2) at delivery (mean±SD)	30.2±6.1	31.6±7.0	**<0.001**
Obese (>=30 kg/m^2)	681 (45.1%)	273 (53.5%)	**0.001**
Gestational age (mean± SD)	38w2d±15d	38w3d±17d	0.69
Preterm delivery	196 (13.0%)	68 (13.3%)	0.84
Chronic hypertension	257 (17.0%)	98 (19.2%)	0.26
Pre-gestational diabetes mellitus	58 (3.8%)	24 (4.7%)	0.39
Gestational diabetes	137 (9.1%)	50 (9.8%)	0.63
Multifetal pregnancy	38 (2.5%)	15 (2.9%)	0.61
Aspirin use	633 (41.9%)	169 (33.1%)	**<0.001**
IVF pregnancy	186 (12.3%)	40 (7.8%)	**0.006**
Insurance			
Private	1281 (84.9%)	303 (59.4%)	**<0.001**
Public or No Insurance	228 (15.1%)	207 (40.6%)	
Mode of delivery			
Vaginal delivery	1020 (67.6%)	335 (65.7%)	0.43
Cesarean delivery	489 (32.4%)	175 (34.3%)	
Postpartum hemorrhage	226 (15.0%)	79 (15.5%)	0.78
Composite maternal morbidity	21 (1.4%)	6 (1.2%)	0.72
Postpartum length of stay in days (mean±SD)	2.4±1.3	2.3±1.2	**0.027**

Abbreviations: SD, standard deviation; BMI, body mass index; IVF, in vitro fertilization

a. *P*-value significance was set at <0.05 and significant values are bolded.

b. Race and ethnicity were self-classified by the patient according to options defined by the study institution. They were assessed due to findings in previous studies of race and ethnicity being a risk factor for postpartum hypertension readmission.

Table 2. Hypertension Characteristics by Remote Monitoring Compliance

Hypertension Characteristics	Using Remote Monitoring (n=1509)	Not using Remote Monitoring (n=510)	P-value[a]
Hypertension diagnosis at discharge			
Gestational hypertension	791 (52.4%)	261 (51.2%)	**0.024**
Preeclampsia without severe features	269 (17.8%)	118 (23.1%)	
Preeclampsia with severe features or HELLP	268 (17.8%)	70 (13.7%)	
Chronic hypertension only	181 (12.0%)	61 (12.0%)	
Anti-hypertensives at discharge	543 (36.0%)	123 (24.1%)	**<0.001**
Postpartum ED visit or readmission[b]	27 (1.8%)	17 (3.3%)	**0.039**

Abbreviations: HELLP, hemolysis, elevated liver enzymes, low platelets; SD, standard deviation; ED, Emergency Department

a. *P*-value significance was set at <0.05 and significant values are bolded.

b. This indicates if patients had a postpartum ED visit or readmission prior to utilizing the remote monitoring program.

514 | Risk Factors for Discharge on Anti-Hypertensive Medication with Lower Blood Pressure Targets

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4:00 PM - 6:00 PM

Objective: With more institutions implementing lower blood pressure (BP) targets prior to postpartum discharge for patients with hypertensive disorders of pregnancy, a growing number of patients are discharged on anti-hypertensive (anti-HTN) medication. We aim to evaluate risk factors associated with being discharged on anti-HTN medication with lower BP goals.

Study Design: A retrospective cohort study of birthing patients with peripartum hypertension (HTN) at a quaternary care center over 2 years. This study is part of an ongoing postpartum quality improvement project that entails lower BP targets and universal remote BP monitoring. Goal blood pressure was under 140/90 leading up to discharge. Inclusion criteria were delivery at the study institution and diagnosis of HTN disorder of pregnancy. Primary outcome was prescription of anti-HTNs at time of discharge. Characteristics associated with discharge on anti-HTNs were compared between groups.

Results: Out of 6410 deliveries between April 2022-April 2024, 2019 (31.5%) pregnancies met inclusion criteria, of which 666 (33.0%) were discharged on anti-HTN medication. Baseline characteristics associated with discharge on anti-HTN included maternal age 40 and above (17.0% vs 11.8%, p = 0.001), non-Hispanic Black race (13.7% vs 9.5%, p = 0.005), chronic HTN (28.4% vs 12.3%, p< 0.001), prenatal aspirin use (52.1% vs 33.6%, p< 0.001), and having public or no insurance (25.2% vs 19.7%, p = 0.005). Other risk factors for discharge on anti-HTN medication include proteinuria (43.2% vs 23.6%, p< 0.001) and preeclampsia with severe features (40.4% vs 5.1%, p< 0.001). Patients discharged on anti-HTNs were more likely to be compliant with remote BP monitoring (97% vs 94.2%, p = 0.013) and undergo outpatient medication adjustments (24.6% vs 14.5%, p< 0.001).

Conclusion: At an institution implementing lower BP targets aiming for normotension, certain traditional high-risk patients remain at increased risk for discharge on anti-HTN medication. Continued research is needed to identify ways of mitigating long-term comorbidities for this high-risk cohort.

Table 1. Baseline Characteristics by Need for Anti-Hypertensive Medication on Discharge

Characteristic	Medication on Discharge (n=666)	No Medication (n=1353)	P-value[a]
Maternal age in years (mean±SD)	34.4±5.7	33.7±5.2	**0.02**
Maternal age 35 and above	336 (50.5%)	623 (46.0%	0.06
Maternal age 40 and above	113 (17.0%)	160 (11.8%)	**0.001**
Race/Ethnicity[b]			
Asian	118 (17.7%)	235 (17.4%)	**0.005**
Black[c]	91 (13.7%)	128 (9.5%)	
Caucasian	223 (33.5%)	520 (38.4%)	
Hispanic/Latina	170 (25.5%)	304 (22.5%)	
None of the above/ Mixed Race	64 (9.6%)	166 (12.3%)	
Nulliparity	432 (64.9%)	930 (68.7%)	0.08
BMI (kg/m^2) at delivery (mean±SD)	31.6±7.4	30.0±5.8	**<0.001**
Obese (>=30 kg/m^2)	345 (51.8%)	609 (45.0%)	**0.004**
Gestational age (mean± SD)	37w2d±17d	38w6d±12d	**<0.001**
Chronic hypertension	189 (28.4%)	166 (12.3%)	**<0.001**
Pre-gestational diabetes mellitus	57 (8.6%)	25 (1.8%)	**<0.001**
Aspirin use	347 (52.1%)	455 (33.6%)	**<0.001**
Insurance			
Private	498 (74.8%)	1086 (80.3%)	**0.005**
Public or No Insurance	168 (25.2%)	267 (19.7%)	
Mode of delivery			
Vaginal delivery	345 (51.8%)	1010 (74.6%)	**<0.001**
Cesarean delivery	321 (48.2%)	343 (25.4%)	
Postpartum hemorrhage	127 (19.1%)	178 (13.2%)	**<0.001**
Composite maternal morbidity	15 (2.3%)	12 (0.9%)	**0.01**
Postpartum LOS in days (mean± SD)	3.2±1.7	2.0±0.8	**<0.001**

Abbreviations: SD, standard deviation; BMI, body mass index; LOS, length of stay

a. *P*-value significance was set at <0.05 and significant values are bolded.

b. Race and ethnicity were self-classified by the patient according to options defined by the study institution. They were assessed due to findings in previous studies of race and ethnicity being a risk factor for postpartum hypertension readmission.

c. When analyzing non-Hispanic Black race alone compared to all other races, there remained a significant difference between groups (p=0.005).

Table 2. Risk Factors for Discharge on Anti-Hypertensive Medication

Risk Factor	Medication on Discharge (n=666)	No Medication (n=1353)	P-value[a]
Hypertension diagnosis at discharge			
Gestational hypertension	186 (27.9%)	866 (64.0%)	**<0.001**
Preeclampsia without severe features	117 (17.6%)	270 (20.0%)	
Preeclampsia with severe features or HELLP	268 (40.2%)	69 (5.1%)	
Chronic hypertension only	95 (14.3%)	148 (10.9%)	
Proteinuria	288 (43.2%)	319 (23.6%)	**<0.001**
IV anti-hypertensives given	186/268 (67.9%)	10/69 (14.5%)	**<0.001**
Method of diagnosis of preeclampsia with severe features			
Severe range blood pressures	209/268 (78.0%)	11/69 (15.9%)	**<0.001**
Lab abnormalities or Clinical symptoms	59/268 (22.0%)	58/69 (84.1%)	
Remote monitoring compliance	543 (97.0%)	966 (94.2%)	**0.01**
Outpatient Medication Changes	164 (24.6%)	196 (14.5%)	**<0.001**
Postpartum ED visit or readmission	16 (2.4%)	28 (2.1%)	0.63

Abbreviations: HELLP, hemolysis, elevated liver enzymes, low platelets; IV, intravenous; ED, Emergency Department

a. *P*-value significance was set at <0.05 and significant values are bolded.

515 | Can the Supplementation of Ferric-Carboxymaltose Improve Postpartum Depression After Birth? a Randomized, Controlled Clinical Trial

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Objective: This study aims to compare the efficacy of intravenous(IV) ferric-carboxymaltose(FCM) administration versus conventional oral iron supplementation in improving postpartum depression(PPD) in postpartum women with iron-deficiency anemia(IDA).

Study Design: A randomized, open-label, controlled clinical trial was conducted at three centers in South Korea between 2021 and 2023. Postpartum women with (i)moderate IDA, diagnosed with hemoglobin(Hb) levels of 8≤ Hb< 11g/dL and ferritin< 30ng/mL or transferrin saturation(TSAT) < 20%, and with (ii)a high risk of PPD based on the Edinburgh Postnatal Depression Scale(EPDS) score of ≥ 8 within the first three days after delivery, were enrolled. Following randomization, participants received either IV FCM(500-1000 mg) or oral iron(20-400 mg). The primary endpoint was the change in EPDS score from baseline to 8 weeks postpartum. Hematologic parameters, presence of PPD (EPDS score > 11), and maternal fatigue were evaluated at ten days, 4, 6, and 8 weeks.

Results: Among 96 patients, 90 were analyzed, with 45 in each group. The aggregated change in EPDS scores over 8 weeks postpartum did not differ between the groups, while the mean EPDS score(±SD) for the entire study population significantly decreased from 11.5 ± 3.2 initially to 8.6±5.0 at 8 weeks(p-value for trend < 0.001). The prevalence of PPD at 8 weeks was 22.2 %(10/45) in each group, with no significant difference. Variables such as Hb changes and type of iron therapy did not affect the risk of PPD, except for fatigue at 8 weeks (adjusted odds ratio 1.05, 95% confidence interval 1.01–1.09; P = 0.016). Hb levels increased well in both groups, but changes in Hb, ferritin, and TSAT levels at 8 weeks (p < 0.001) and fatigue scores at 6 weeks(p = 0.03) were significantly improved in the IV iron group compared to the conventional group.

Conclusion: While the administration of FCM did not show significant benefits over placebo in improving EPDS scores, the study's findings demonstrated that IV iron was more effective than conventional oral iron in correcting postpartum IDA, iron stores and reducing fatigue.

Table. Comparison of haemoglobin (Hb), haematocrit (Hct), ferritin, Transferrin saturation (TSAT), EPDS score and maternal fatigue between groups over 8 weeks

	Ferric-carboxymaltose group. (N=45)	Conventional group (N=45)	*p value*
Hb			
baseline	9.52 ± 0.78	9.96 ± 0.7	0.006
8weeks	13.32 ± 0.74	12.81 ± 0.79	0.003
Change (baseline – 8 weeks)	3.8 ± 0.87	2.87 ± 0.92	<0.001
Hct			
baseline	28.95 ± 2.56	29.2 ± 4.91	0.7681
8weeks	40.11 ± 2.33	39.29 ± 2.22	0.1044
Change (baseline – 8 weeks)	11.19 ± 2.94	9.53 ± 2.67	0.008
Ferritin			
baseline	47.31 ± 35.56	48.48 ± 32.11	0.8719
8weeks	377.8 ± 217.5	35.91 ± 25.07	<0.001
Change (baseline – 8 weeks)	331.54 ± 223.23	-11.46 ± 36.47	<0.001
TSAT			
baseline	12.06 ± 6.17	14.34 ± 7.46	0.126
8weeks	38.16 ± 11.64	26.47 ± 13.07	<0.001
Change (baseline – 8 weeks)	26.91 ± 12.17	11.73 ± 16.24	<0.001
EPDS			
baseline	11.76 ± 3.56	11.24 ± 2.9	0.458
8 weeks	8.29 ± 5.2	9 ± 4.91	0.507
8 weeks (EPDS > 11)	11 (24.44%)	11 (24.44%)	>0.99
Change (baseline – 8 weeks)	-3.47 ± 5.79	-2.24 ± 5.15	0.293
BFI Fatigue score (BFI)			
baseline	5.47 ± 1.88	5.8 ± 1.69	0.389
8weeks	4.99 ± 1.89	5.54 ± 2.25	0.208
Change (baseline – 8 weeks)	-0.05 ± 0.21	-0.03 ± 0.25	0.599

516 | Postpartum Healthcare Utilization and Morbidity Amongst Diabetic Versus Non-Diabetic Individuals in Remote Hypertension Program

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4:00 PM - 6:00 PM

Objective: Individuals with diabetes (gestational or pregestational) are at increased risk of adverse outcomes, particularly in the setting of chronic hypertension (HTN) or new-onset HTN in pregnancy. Though remote self-measured blood pressure (SMBP) monitoring programs may reduce rates of HTN-related hospital readmission, emergency department (ED) presentations, or severe maternal morbidity (SMM), it is unclear whether the extent of this reduction differs between those with and without diabetes. We aimed to compare outcomes between postpartum patients in our remote SMBP program with versus without diabetes.

Study Design: Postpartum patients with HTN at our tertiary care hospital are offered enrollment in our remote SMBP program, which includes BP monitoring for 6 weeks postpartum. For this analysis, participants were stratified by presence or absence of diabetes (pregestational or gestational). Those with unknown diabetes status were excluded. The primary outcome was a composite of postpartum readmission or ED presentation for HTN within 30 days of delivery hospitalization. Secondary outcomes included HTN-related SMM. A generalized linear model was used to estimate relative risks (RR) after adjustment for differences in demographic, obstetric, and medical conditions from table 1.

Results: Of 2003 participants in the SMBP program, 17.2% had diabetes. Compared to those without, those with diabetes were older, less likely to identify as White, less likely to have gestational but more likely to have chronic hypertension, more likely to be delivered via cesarean, and had a lower median gestational age at delivery (**Table 1**). After adjusting for these factors, there was no difference in the risk of the composite outcome of HTN-related postpartum readmission or ED presentation between those with and without diabetes [15.9% versus 16.6%; adjusted RR 0.9 (0.7, 1.2)]. Similarly, there were no differences in secondary outcomes (**Table 2**).

Conclusion: In our remote SMBP program for postpartum patients with HTN, both unplanned HTN-related healthcare utilization and SMM were similar between those with and without diabetes.

Table 1: Demographics

Variable	With diabetes (n=337; 17.15%)	Without diabetes (N= 1,628; 82.85%)	P value
Age	33 (29, 37)	31 (27, 35)	**<0.001**
Primary insurance type			0.55
Private	170 (50.45%)	868(53.38%)	
Medicaid/Medicare	165 (48.96%)	751 (46.19%)	
None	2 (0.59)	7 (0.43%)	
Race			**0.006**
White	176 (52.23%)	949 (58.29%)	
Black	58 (17.21%)	305 (18.73%)	
Multiracial or other	100 (29.67%)	342 (21.01%)	
Unknown	3 (0.89%)	32 (1.97%)	
Ethnicity			0.67
Hispanic	117 (34.72%)	526 (32.31%)	
Non-Hispanic	218 (64.69%)	1090 (55.47%)	
Unknown	2 (0.59%)	12 (0.74%)	
HDP diagnosis prior to delivery			
Gestational hypertension	66 (19.58%)	494 (30.34%)	**<0.001**
Preeclampsia with severe features	57 (16.91%)	329 (20.21%)	0.18
Preeclampsia without severe features	47 (13.95%)	203 (12.47%)	0.47
Chronic hypertension with superimposed preeclampsia	37 (10.98%)	86 (5.28%)	**.0003**
Eclampsia	0 (0.00%)	5 (0.31%)	0.59
Chronic Hypertension alone	74 (21.96%)	207 (12.71%)	**<0.001**
Gestational age (weeks) at delivery	37.7 (36.5, 39.0)	38.1 (36.9, 39.3)	**<0.001**
Mode of delivery			**<0.001**
Vaginal	131 (39.22%)	849 (52.49%)	
Cesarean	203 (60.78%)	769 (47.53%)	
ICU admission after delivery	4 (1.19%)	6 (0.37%)	0.07
Postpartum day of discharge	3 (2, 4)	3 (2, 4)	**<0.001**

Data presented as n (%) or median (interquartile range) unless otherwise specified

Table 2: Outcomes

	With diabetes (n=337)	Without diabetes (N= 1,628)	P value	Relative Risk (95% CI)	Adjusted RR (95% CI)*
Primary Outcomes					
ED visit or Hospitalization for hypertension	53 (15.92%)	266 (16.56%)	0.81	0.96 (.73-1.26)	0.92 (0.70, 1.21)
Secondary Outcomes					
ED visit due to hypertension	53 (15.92%)	261 (16.24%)	0.93	0.98 (0.75, 1.28)	0.94 (0.72, 1.25)
Hospitalization due to hypertension	30 (9.06%)	161 (10.04%)	0.69	0.90 (0.63, 1.31)	0.85 (0.58, 1.24)
Severe maternal morbidity (any)	40 (11.87%)	191 (11.73%)	0.93	1.01 (0.74, 1.39)	0.92 (0.64-1.31)

Data presented at n (%)

*Adjusted for age, race, gestational hypertension, chronic hypertension, gestational age at delivery,

**Includes any of the following HTN-related condition: stroke, seizure/eclampsia, acute fatty liver of pregnancy, posterior reversible encephalopathy syndrome, pulmonary edema, heart failure, HELLP syndrome, placental abruption, postpartum hemorrhage, acute kidney injury, transaminitis

517 | Socioeconomic Status and Adverse Pregnancy Outcome Increase Risk of Long-Term Cardiovascular Disease, Analyzing Long-Term Cohort

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4:00 PM - 6:00 PM

Objective: Adverse pregnancy outcomes (APO) have been reported to increase the risk of long-term atherosclerotic cardiovascular disease (ASCVD) later in life. Additionally, socioeconomic status (SES) is known to be associated with ASCVD risk. In the current analysis, we determined the interaction between SES and APO, specifically, if low SES further aggravates the ASCVD risk after APO.

Study Design: We conducted the current analysis using data from the UK Biobank, which is a large prospective cohort. This data includes participants in age 40 to 69 years recruited between

2006 and 2010, with ongoing follow-up. APO included hypertensive disease during pregnancy (HDP), gestational diabetes mellitus (GDM), and low birth weight (< 2.5kg). SES was analyzed using the following indicators; household income, education, employment and Townsend Deprived Score. The study population were categorized into four main groups according to APO and SES: no APO/high SES, APO/high SES, no APO/low SES and APO/low SES groups. The incidence of long-term ASCVD events and the cumulative hazard risk (HR) for ASCVD was analyzed according to the APO and SES categories.

Results: In total, 219,147 female participants were analyzed. The results indicated that the APO group had relatively lower SES in all indicators and higher incidence of ASCVD, hypertension, hyperlipidemia, diabetes mellitus, compared to the no APO group. After adjusting for the confounding factors, the risk of ASCVD was highest in the group with APO and low SES group. Specifically, the HR was 2.029 (95 % CI, 1.762-2.338, $p < 0.001$) in those with APO and unemployment.

Conclusion: We found that the CVD risk varied according to SES and APO. This study suggests the importance for support policies tailored to individuals' SES to prevent APO and improve long-term cardiovascular disease.

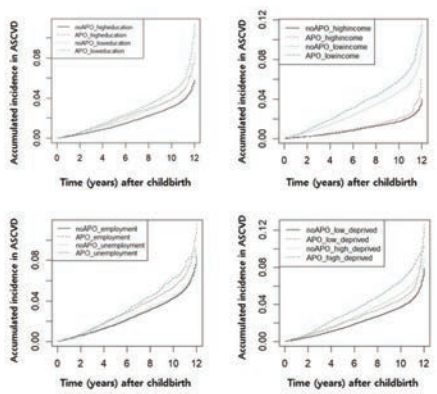

Figure 1. Kaplan-Meier curve for long-term outcome of ASCVD according to SES and APO

518 | The Risk of Long-Term Cardiovascular Disease after Adolescent Pregnancies

JI HOI KIM[1]; Haemin Kim[2]; Manu Shivakumar[3]; Dokyoon Kim[3]; Kue Hyun Kang[4]; Minyoung Park[1]; Chan-Wook Park[5]; Joong Shin Park[5]; Juwon Lim[1]; Jeehoon kang[1]; Seung Mi Lee[5]
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Objective: Previous studies have reported that adolescent pregnancy is associated with higher risks of adverse pregnancy outcomes (APO) compared to pregnancies after the age of 20. Although there have been accumulating evidence regarding age at reproductive event, such as menarche or menopause, and long-term cardiovascular (CVD) risk, there aren't enough research on the effect of adolescent pregnancy on long-term outcome. This study aimed to evaluate the risk of long-term CVD after adolescent pregnancy using large cohort data.

Study Design: This study was based on the UK biobank database. Participants aged 40 to 69 years, who were recruited between 2006 and 2010, were analyzed. Clinical events were collected from the time of enrollment. The study population was divided into groups of first delivery before and after the age of 20. The risk of atherosclerotic cardiovascular disease (ASCVD) was evaluated according to adolescent pregnancy (< 20 years) and adult pregnancy (≥ 20 years).

Results: Among 182,843 women in the UK biobank, 28,090 women had their first delivery at adolescence with an average age at childbirth of 18.69 years. The adolescent pregnancy group had lower rates of hypertensive disease during pregnancy (HDP) compared to the adult pregnancy group. However, the incidence of ASCVD was 8.4 % (2269/28,090) in the adolescent pregnancy group, compared to the adult pregnancy group. Even after adjusting for confounding variables, the risk of ASCVD remained higher in adolescent pregnancy group (HR 1.320; 95 % CI 1.245 to 1.398, $p < 0.001$).

Conclusion: Adolescent pregnancy increases the risk of long-term ASCVD. Healthcare providers should focus on both prenatal care and long-term postpartum management for adolescent pregnancies. To improve potential risks and outcomes, appropriate care and comprehensive support are necessary throughout pregnancy and the postpartum period.

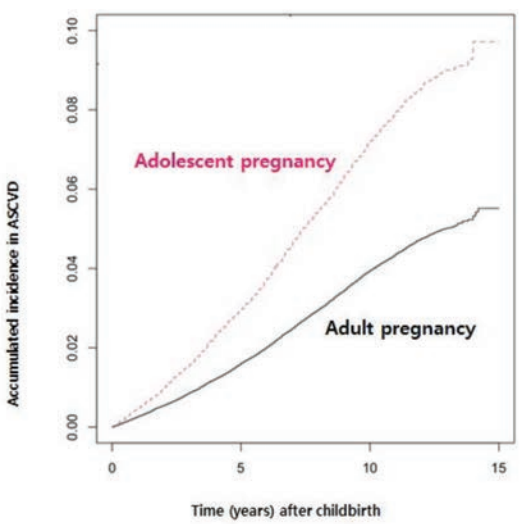

Figure 1. Kaplan-Meier curve for long-term outcome of ASCVD in adolescent pregnancies (<age of 20)

519 | Risk Factors Associated with Unexpected Neonatal Resuscitation Among Term Neonates in Uncomplicated Pregnancies

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Objective: Unexpected neonatal resuscitation (NR) in anticipated smooth deliveries is troubling without available neonatologists. This study evaluated risk factors for unexpected NR in singleton pregnancies with planned cesarean deliveries after 36 weeks gestation and no fetal abnormalities.

Study Design: This retrospective cohort study included singleton pregnant women at our hospital who received prenatal care from the first trimester, had no fetal abnormalities, and delivered via planned cesarean section after 36 weeks of gestation, between 2013 and 2023. Only cases with stable vital signs and no significant blood loss from anesthesia to delivery were included. Women with medical conditions requiring hospitalization were excluded. Cases were divided into the NR group (5-minute Apgar score < 7) and the control group. Maternal characteristics, medical history, and laboratory tests from the first trimester and the last visit before delivery were reviewed. We formulated a scoring model after performing multivariable analysis using adjusted odds ratios (aOR).

Results: A total of 5,324 cases were included, with the NR group comprising 78 cases (1.5%). Five variables were associated with unexpected NR: prior preterm birth (aOR 5.6, 95%CI 1.9-16.2, P = 0.002), psychiatric medication during pregnancy (aOR 10.3, 95%CI 1.8-59.2, P = 0.009), leukocytosis (WBC count ≥15,000/mm^3) in the first trimester (aOR 4.1, 95%CI 1.5-11.2, P = 0.007), leukocytosis just before delivery (aOR 3.1, 95%CI 1.3-7.5, P = 0.010), and increased HbA1c (≥6.0%) just before delivery (aOR 2.7, 95%CI 1.1-7.0, P = 0.048). We formulated a scoring model, assigning each factor a score of 1 to 4 based on the aOR. A score of 4 out of 13 had a sensitivity of 72% and a specificity of 82% for predicting unexpected NR. The AUC was 0.817 (P< 0.001).

Conclusion: Prior PTB, psychiatric medication, leukocytosis in the first trimester, leukocytosis just before delivery, and increased HbA1c just before delivery were identified as risk factors for unexpected NR in uncomplicated pregnancies. This scoring model may provide useful information for predicting unexpected NR.

520 | Association of Isolated Leukocytosis in Early Pregnancy with Adverse Pregnancy Outcomes

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Objective: Animal studies suggest that maternal systemic inflammation in early pregnancy can affect adverse outcomes. There is no clear standard for maternal leukocytosis, and there is limited research on how high white blood cell(WBC) counts affect outcomes. This study aims to investigate how high WBC counts in the first trimester relate to adverse pregnancy outcomes and identify the WBC count level linked to poor prognosis.

Study Design: This retrospective cohort study included healthy, singleton pregnant women who delivered between 2014 and 2023. Cases included only those without fetal anomalies and no fever at the time of the first trimester laboratory test. Women showing signs of infection/inflammation or with autoimmune diseases were excluded. Women with a WBC count of 13,000-14,000 in the first trimester were classified as group I (n = 382), those with a WBC count of 14,000-15,000 as group II (n = 151), and those with a WBC count of ≥15,000 as group III (n = 70). Meanwhile, those with a WBC count of 7,500-8,500 were designated as the control group (n = 1,524). Multivariate analysis was performed considering maternal characteristics.

Results: Groups I/II did not show statistical differences in adverse outcomes compared to the control group. However, group III had significantly higher risks compared to the control group, including the risk of preterm birth(PTB) before 32 weeks (aOR 5.5, 95% CI 1.5-20.6, P = 0.012), before 34 weeks (aOR 8.2, 95%CI 3.4-20.3, P< 0.001), and before 36 weeks (aOR 2.9, 95%CI 1.4-6.1, P = 0.006). Additionally, the risks of gestational diabetes(GDM) (aOR 2.1, 95%CI 1.2-3.7, P = 0.013), cesarean delivery(CD) (aOR 1.8, 95%CI 1.1-3.1, P = 0.029), transient tachypnea(TTN) (aOR 2.6, 95%CI 1.1-6.3, P = 0.036), and neonatal jaundice (aOR 1.7, 95%CI 1.1-2.8, P = 0.039) were also elevated in group III compared to the control group.

Conclusion: Associations between high WBC counts (≥15,000) in early pregnancy and increased risks of PTB, GDM, CD, TTN, and neonatal jaundice have been observed. High first-trimester WBC counts may help predict adverse pregnancy outcomes.

521 | Opt-Out and Rapid Syphilis Testing in Pregnant Patients Presenting to the Ed: a Pre-Post Study

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Objective: According to regional pilot data, 35% of pregnant patients with newborns diagnosed with congenital syphilis (CS) visited the emergency department (ED) during pregnancy but were not tested for syphilis. This represents a critical missed opportunity to identify and treat syphilis in pregnant patients and reduce the incidence of CS. This pre- and post-implementation study aims to determine if implementing an opt-out laboratory-based and rapid syphilis testing program improves the detection and treatment of syphilis during pregnancy in the ED.

Study Design: This pre-post implementation study was conducted at the University of Texas Health Science Center, Houston, TX after institutional approval. During the pre-implementation phase (11/01/2023 - 02/29/2024), eligible pregnant patients presenting to the ED underwent standard lab-based syphilis testing only when clinically indicated. In the post-implementation phase (03/01/2024 - 06/25/2024), pregnant patients without a documented syphilis result or prenatal care received lab-based

opt-out syphilis testing with or without the Syphilis Health Check (SHC) point-of-care test, with coordinators facilitating linkage to prenatal care for all patients.

Results: During the pre-implementation period, 302 pregnant patients presented to the ED for care, with only 6 (2%) undergoing syphilis testing, yielding no positive results. In the post-implementation period, 322 pregnant patients presented to the ED. Of these, 79 (24.5%) were tested for syphilis, representing a 12.5-fold increase in screening ($p < 0.001$). Three patients tested positive for syphilis, indicating a 3.8% prevalence rate. Moreover, 70% of those who tested positive were scheduled for prenatal care by research coordinators dedicated to the project.

Conclusion: The implementation of an opt-out and rapid syphilis testing program for underserved pregnant patients in the ED led to a significant increase in syphilis testing and referral for treatment. The public health impact of this program for adults and neonates is likely to demonstrate further substantial benefits, particularly in high-prevalence regions.

Periods	Pre (11/01/2023 - 02/28/2024)	Post (03/04/2024 - 06/25/2024)
Pregnant patients coming to ED, n	302	322
Patients tested, n(%)	6 (2%)	79 (24.53%)
Newly reactive (positive), n	0	3

522 | The Texas Experience: The Impact of Levels of Care on Severe Maternal Morbidity

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Objective: The State of Texas instituted Levels of Maternal Care (LoMC) Designation in 2018, with all hospitals that provide maternity services receiving a formal LoMC designation by August 31, 2021. We sought to assess the impact of instituting LoMC in Texas on the rates of severe maternal morbidity (SMM) across levels of care.

Study Design: We conducted a retrospective, cross-sectional study for years 2018 and 2022 using Texas Medicaid Data, prior to- and after- LoMC designation occurred. Data extracted included total SMM rate, hysterectomy rate, and hospital level of care. Data related to total SMM (without transfusion), hysterectomy rate, and eclampsia rates were compared pre- and post-implementation.

Results: There are 219 facilities that have achieved maternal designation (55–level I, 88–level II, 44–level III, 32–level IV) by 2021. The number of Medicaid births increased significantly from 2018 to 2022 in level I, II, III facilities ($p< 0.001$), and was not statistically different in the level IV facilities ($p = 0.33$). Of the 260,986 deliveries included in 2018 and 258,674 deliveries included in 2022, there were 4675 (1.79%) and 4533 (1.75%) SMM events, respectively ($p = 0.29$). There was a decrease of 0.5% in SMM rates in level I centers from 2018-2022 ($p = 0.001$, Table). There were no statistically significant differences between SMM events in level II, III, IV centers. SMM among hemorrhage cases was noted to be reduced from 2018 to 2022, and was statistically decreased in level I ($p = 0.002$) and level IV centers ($p = 0.04$). SMM among cases of patients with preeclampsia was significantly reduced in Level I-IV centers ($P< 0.01$). There was a non-statistically significant decrease in hysterectomies in Level I/II facilities from 2018 (64/204, 31.4) to 2022 (92/319, 28.8%), ($p = 0.54$).

Conclusion: Using Texas Medicaid data, which includes approximately 50% of births in Texas, there was a statistically significant decrease in SMM rates in Level 1 centers after implementation of LoMC. Additionally, there was a reduction in both hemorrhage- and preeclampsia-related SMM during this timeframe.

Table: Severe Maternal Morbidity Across Levels of Maternal Care

	Level	2018	2022	p-value
Severe Maternal Morbidity (Excluding Transfusion Only) Among All Deliveries	Level I	245/13823 (1.78%)	196/15072 (1.3%)	**0.001**
	Level II	1324/83546 (1.58%)	1419/84196 (1.69%)	0.104
	Level III	1218/65352 (1.86%)	1232/69585 (1.77%)	0.200
	Level IV	1707/88366 (1.93%)	1645/87250 (1.89%)	0.478
	Total	*4675/260986 (1.79%)*	*4533/258674 (1.75%)*	*0.288*
Severe Maternal Morbidity (Excluding Transfusion Only) Among Hemorrhage Cases	Level I	69/941 (7.3%)	53/1261 (4.2%)	**0.002**
	Level II	248/5130 (4.8%)	301/6509 (4.6%)	0.60
	Level III	231/4163 (5.6%)	279/5719 (4.9%)	0.14
	Level IV	420/8092 (5.2%)	392/8687 (4.5%)	**0.04**
	Total	*989/18942 (5.2%)*	*1033/22424 (4.61%)*	**0.004**
Severe Maternal Morbidity (Excluding Transfusion Only) Among Preeclampsia Cases	Level I	61/587 (10.4%)	48/722 (6.7%)	**<0.001**
	Level II	382/3610 (10.6%)	468/5325 (8.8%)	**0.005**
	Level III	380/3256 (11.7%)	409/5446 (7.5%)	**<0.001**
	Level IV	548/5872 (9.33%)	539/7685 (7.0%)	**<0.001**
	Total	*1428/13656 (10.5%)*	*1469/19313 (7.6%)*	**<0.001**

523 | Tranexamic Acid Prevents Postpartum Hemorrhage During Cesarean Delivery: A Meta-Analysis

Jordan A. McKinney[1]; Gustavo Vilchez[2]; Luis Sanchez-Ramos[3]

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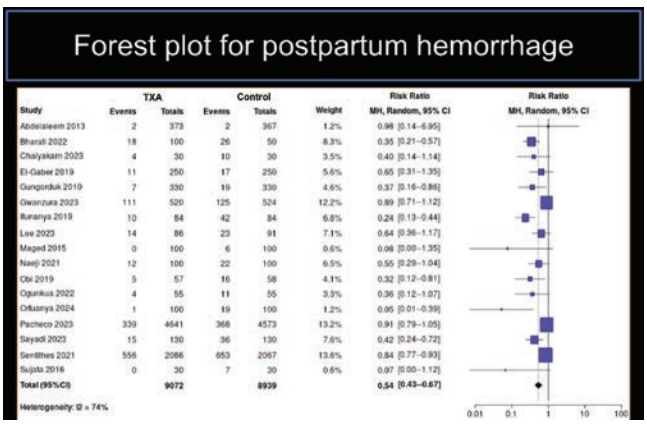
Objective: Postpartum hemorrhage remains a leading cause of maternal morbidity and mortality worldwide, particularly following cesarean delivery. Effective prophylactic interventions are critical to mitigate this risk and improve maternal outcomes. Tranexamic acid (TXA), an antifibrinolytic agent, has shown promise in reducing blood loss in various surgical contexts. This updated systematic review and meta-analysis aimed to assess the impact of prophylactic tranexamic acid on preventing postpartum hemorrhage and the need for blood transfusion in patients undergoing cesarean delivery.

Study Design: We systematically searched multiple electronic databases and grey literature from their inception up to May 24, 2024, to identify randomized controlled trials (RCTs) that compared prophylactic TXA with placebo or no treatment in patients undergoing cesarean delivery. The primary outcome was postpartum hemorrhage. The need for a blood transfusion was the secondary outcome. We performed a meta-analysis using random-effects models to calculate odds ratios (OR) along with 95% confidence intervals (CI). We also performed an extensive literature review to investigate the cost-effectiveness for the prophylactic TXA at the time of cesarean.

Results: Data from 29 RCTs involving 22,003 participants was collected. The meta-analysis showed that prophylactic TXA in cesarean delivery reduces the risk of postpartum hemorrhage (RR

0.54; 95% CI 0.43-0.67; FI 84) and the need for blood transfusion (RR 0.45; 95% CI 0.34-0.60; FI 63) compared to placebo/no treatment.

Conclusion: Our findings indicate that the use of prophylactic TXA in cesarean delivery reduces the risk of postpartum hemorrhage and the need for blood transfusion. These results support the routine use of prophylactic TXA in cesarean deliveries for individuals at high risk of postpartum hemorrhage.



524 | Antenatal Corticosteroids Show Limited Benefit in Improving Neonatal Outcomes in Late-Preterm Fetuses: A Meta-Analysis

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4:00 PM - 6:00 PM

Objective: Recent large-scale trials highlight the evolving landscape of antenatal corticosteroid (ACS) use in late preterm gestations (34–36 weeks), emphasizing the need for reassessment of current practices due to limited data on long-term psychiatric and neurodevelopmental outcomes. This systematic review and meta-analysis synthesize current evidence on the benefits and risks of ACS administration during this period.

Study Design: We conducted a search of electronic databases and gray literature from inception to February 1, 2024. We included randomized trials (RCTs) that assessed neonatal outcomes in newborns whose mothers received ACS during the late preterm period, compared to those whose mothers received a placebo or no treatment. Pooled unadjusted odds ratios (OR) with 95% confidence intervals (CI) were calculated using a random-effects model. Primary outcomes included the need for respiratory support and neonatal hypoglycemia, with other adverse neonatal outcomes as secondary. We also calculated fragility indices, 95% prediction intervals, and performed subgroup analyses to evaluate the robustness of the results.

Results: Data from 12 RCTs were included in the meta-analysis. ACS administration did not significantly reduce the likelihood of neonates requiring any form of respiratory support compared to placebo or no treatment (OR, 0.74; 95% CI, 0.54-1.02). Neonates exposed to ACS did not have a significantly increased chances of hypoglycemia (OR, 1.37; 95% CI, 0.99-1.90). However, ACS exposure was associated with reduced odds of requiring resuscitation at birth (OR, 0.54; 95% CI, 0.35-0.83) and a lower probability of developing respiratory distress syndrome (OR, 0.63; 95% CI, 0.40-0.99).

Conclusion: The findings of this meta-analysis suggest that late preterm ACS administration may offer limited benefits in preventing neonatal respiratory morbidity and improving other neonatal outcomes. Current evidence highlights the importance of shared decision-making in providing patient-centered care and underscores the need for further research into the efficacy and safety of late preterm ACS.

Pooled odds ratios and fragility indices of neonatal outcomes

Outcome	ACS Group, n/N (%)	Control Group, n/N (%)	OR (95% CI)	P-value	FI/rFI	Heterogeneity, I²
Need for any respiratory support	353/3,014 (11.7)	445/2,983 (14.9)	0.74 (0.54-1.02)	0.06	2	82.9%
Hypoglycemia	471/2,838 (16.6)	319/2,758 (11.6)	1.37 (0.99-1.90)	0.06	1	50.9%
RDS	508/5,821 (8.7)	671/5,663 (11.8)	0.63 (0.40-0.99)	0.04	1	39.1%
TTN	193/2,561 (7.5)	225/2,485 (9.1)	0.87 (0.66-1.15)	0.34	6	15.5%
Need for resuscitation at birth	276/2,903 (9.5)	373/2,833 (13.2)	0.54 (0.35-0.83)	0.01	10	68.4%
Need for mechanical ventilation	46/2,671 (1.7)	62/2,638 (2.4)	0.73 (0.50-1.06)	0.12	4	0.00%
Need for Surfactant	28/1,690 (1.7)	53/1,650 (3.2)	0.45 (0.11-1.84)	0.27	4	49.4%
NICU admission	1,073/3,012 (35.6)	1,133/2,931 (38.7)	0.83 (0.64-1.06)	0.07	16	59.1%
Neonatal mortality	13/2,190 (0.60)	14/2,103 (0.67)	0.94 (0.33-2.68)	0.91	10	12.2%
Neonatal sepsis	34/2,785 (1.2)	38/2,703 (1.4)	0.85 (0.53-1.36)	0.50	10	0.00%
Hyperbilirubinemia	428/2,112 (20.3)	398/2,065 (19.3)	1.06 (0.89-1.26)	0.53	30	0.70%
Necrotizing enterocolitis	2/1,973 (0.1)	2/1,937 (0.1)	0.87 (0.14-5.42)	0.88	8	1.60%

525 | Maternal Immune Microenvironment in Fetal Congenital Heart Disease

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Objective: This study was undertaken to evaluate the relationship between maternal immunological milieu (cytokines and chemokines) and complex fetal congenital heart disease (CHD).

Study Design: We performed a prospective, non-interventional, case-control study of pregnancies with complex fetal CHD (cases) at a single tertiary academic fetal care center matched to those with normal fetal cardiac anatomy (controls). Maternal serum was collected after CHD diagnosis based on fetal echocardiogram evaluation. Serum cytokine and chemokine levels were assessed using multiplex enzyme-linked immunosorbent assay (ELISA) and compared across groups. Demographic (age, race, parity, insurance) and clinical characteristics (obesity, diabetes, hypertension, connective tissue / thyroid disorder, In-vitro fertilization and history of CHD) were abstracted from electronic medical records and compared using student's t test and chi squared / Fisher's exact test for continuous and categorical data respectively. Statistical significance was set at $p < 0.05$.

Results: ELISA was performed for 23 cases with fetal CHD and 25 matched controls. The predominant CHD phenotypes were hypoplastic (left/right) heart syndrome (9/23, 39%), tetralogy of Fallot (4/23, 17%), and coarctation (3/23, 13%). Demographic and clinical characteristics were similar across both groups except gestational age at specimen collection [cases: 30.1±4.4 vs controls 27.5±2.8 weeks (mean ± SD), $p = 0.02$]. Multiplex analysis of

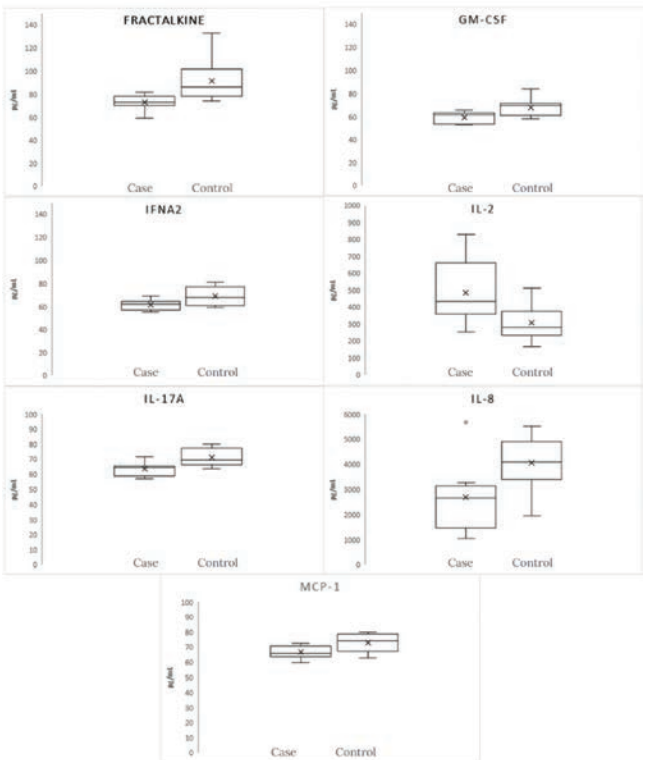
38 pro- and anti-inflammatory cytokines and chemokines was performed. Of those assayed, IL-2 was significantly overexpressed in cases vs control (positive fold change 1.58, p = 0.03). Other analytes–including IL-8 (p = 0.03) fractalkine (p = 0.02), GM-CSF (p = 0.01), IFNα2 (p = 0.04), IL-17A (p = 0.01), and MCP-1(p = 0.03) were significantly under expressed in cases compared to controls.

Conclusion: Significant differences were noted in immunoregulatory cytokine and chemokine expression among pregnancies with and without fetal CHD. Our findings suggest a predominant involvement of the Th1 cell line in fetal CHD pathogenesis.

Table 1: Cytokine/chemokine expression between cases and controls

	Case		Control			
Cytokine/Chemokine	Mean (±SD) (pg/mL)	Range (pg/mL)	Mean (±SD) (pg/mL)	Range (pg/mL)	Fold-change	p-value
Fractalkine	73.0 (6.9)	71.8 - 82.0	91.4 (18.3)	74.3 - 132.8	0.80	0.02
GM-CSF	59.4 (5.1)	52.7 - 65.8	68.1 (7.65)	58.0 - 73.5	0.87	0.01
IFNα2	61.7 (4.7)	55.0 - 68.8	69.0 (8.50)	62.8 - 81.3	0.89	0.04
IL-2	486.3 (193.3)	253.3 - 717.8	308.7 (112.7)	167.5 - 490.5	1.58	0.03
IL-8	2689.4 (1430.4)	1050.2-5681.8	4068.6 (1063.9)	1949.7 - 5522.7	0.66	0.03
IL-17A	63.7 (4.76)	57.3 - 71.8	71.2 (5.9)	63.7 - 80.2	0.90	0.01
MCP-1	66.7 (4.3)	59.8 - 72.7	73.0 (6.4)	63.0 - 80.33	0.91	0.03

Figure 1: Cytokine chemokine expression between cases and controls



526 | Association Between Antibiotic Regimen and Adverse Outcomes in Pregnancies Complicated by Chorioamnionitis

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4:00 PM - 6:00 PM

Objective: We aimed to assess the association between antibiotic regimen choice subsequent to a change in institutional treatment guidelines for management of chorioamnionitis and adverse maternal and neonatal outcomes.

Study Design: Passive prospective, single center, cohort study of pregnancies complicated by chorioamnionitis treated with either intravenous ampicillin, gentamicin, ± clindamycin (AGC, 2010-2017) or piperacillin/tazobactam with clindamycin (PTC, 2017-2021). Acute chorioamnionitis was defined based on accepted clinical and histopathological criteria. We assessed the univariate associations between pregnancy characteristics and antibiotic regimen administered in addition to our composite adverse outcome: maternal sepsis, atonic postpartum hemorrhage, and/or neonatal sepsis with antibiotic administration prior to delivery, readmission for endometritis, wound infection, and/or maternal temperature of 99.5 for >24 hours after administration of first antibiotic dose. Factors with P < 0.2 on one or both univariate analyses were considered for incorporation into a multivariable model predictive of the primary outcome.

Results: Of 403 pregnancies, 211 were treated with AGC vs 192 with PTC regimens. Most characteristics were similar between antibiotic regimen groups, however women receiving AGC were younger and fewer had a public payor source. The 88 (22%) pregnancies with the primary outcome had a longer median duration of rupture of membranes prior to delivery (20.6 vs 14.3 hours, $P < 0.01$), more underwent cesarean delivery (CD) (36% vs 11%, $P < 0.0001$), and more received the AGC regimen (27 % vs 16%, P 0.01). Factors associated with the primary outcome on multivariable analysis include BMI >30, substance use, delivery < 37 weeks, CD, and treatment with AGC regimen (aOR 2.15, 95% CI 1.08-3.46). The 5-covariate model had an optimism-corrected bootstrapped (1000 replicates) AUROC of 0.76 (95% CI 0.69-0.80).

Conclusion: Treatment of intrapartum acute chorioamnionitis with the PTC regimen has the potential to lead to improved maternal and neonatal outcomes.

Figure 1. Odds of composite adverse outcome among pregnancies treated for suspected acute chorioamnionitis (N=403)

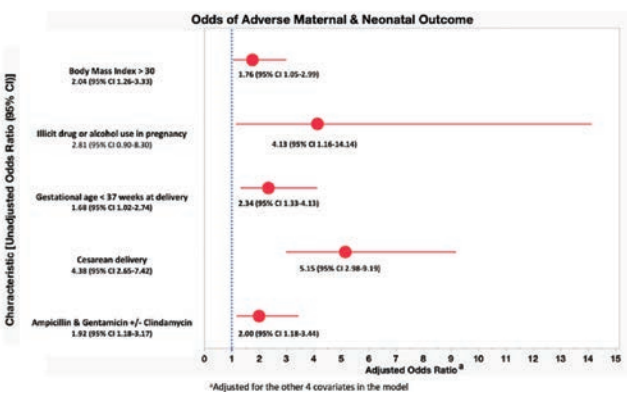

Table 1. Characteristics of pregnancies that underwent treatment of suspected acute chorioamnionitis by antibiotics received (N=403)

	Ampicillin & Gentamicin ± Clindamycin (n = 211)	Piperacillin / tazobactam with Clindamycin (n = 192)	P
Age (y)	26.2 ± 5.6	27.8 ± 5.8	<.01
Body mass index (kg/m^2)	30.9 ± 8.7	31.1 ± 8.6	.80
Self-reported race / ethnicity			.28
Non-Hispanic Black	139 (65.9)	125 (65.1)	
Non-Hispanic White	56 (26.5)	43 (22.4)	
Other race or Hispanic ethnicity	16 (7.6)	23 (12.0)	
Public insurance	116 (55.0)	131 (69.3)	<.01
Percentage of population living below poverty	18.6 ± 11.3	19.4 ± 10.6	.47
Nulliparity	139 (65.9)	112 (58.3)	.12
Multiple gestation	10 (4.7)	10 (5.2)	1.0
Tobacco use	17 (8.1)	15 (9.8)	.68
Marijuana use	16 (7.6)	24 (12.5)	.13
Other illicit drug or alcohol use	5 (2.4)	9 (4.7)	.28
Colonization / infectious status			
Group B streptococcus colonization[a]	38 (19.0)	39 (21.3)	.61
Trichomonas	14 (6.6)	14 (7.4)	.85
Gonorrhea	1 (0.5)	2 (1.1)	.60
Chlamydia	9 (4.3)	10 (5.3)	.65
Bacterial vaginosis	5 (2.4)	3 (1.6)	.73
Cervical insufficiency with cerclage	43 (20.4)	25 (13.0)	.062
Mode of delivery			.26
Spontaneous vaginal delivery	113 (53.6)	103 (53.9)	
Operative vaginal delivery	4 (1.9)	9 (4.7)	
Cesarean delivery	94 (44.6)	79 (41.4)	
Median duration of ROM prior to delivery (IQR)	15.0 (7.9-25.1)	15.5 (8.3-27.4)	.47
Median gestational age at delivery, w (IQR)	38.9 (30.1-39.9)	38.4 (34.3-39.7)	.83
Median birthweight, g (IQR)	2995 (1492-3509)	3080 (2140-3440)	.75
Adverse outcome[b]	57 (27)	31 (16)	.016
Maternal sepsis and/or readmission for endometritis or wound infection	10 (5)	5 (3)	.31
Neonatal sepsis	11 (5)	6 (3)	.31
Postpartum hemorrhage secondary to atony	10 (5)	14 (7)	.40
Persistent maternal temperature ≥ 99.5 for >24 hours after initiation of antibiotics	32 (15)	17 (9)	.07

ROM, rupture of membranes, *IQR*, interquartile range

[a]Unknown for 20

[b]Maternal sepsis, neonatal sepsis or postpartum hemorrhage secondary to uterine atony following antibiotic initiation >1.5 hours prior to delivery, readmission for endometritis, wound infection, or maternal temperature of ≥ 99.5 for >24 hours after administration of first dose of gentamicin or piperacillin/tazobactam or clindamycin

527 | Management and Referral Patterns for Opioid and Other Substance Use Disorder in Pregnancy

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4:00 PM - 6:00 PM

Objective: To explore how various outpatient clinic types providing obstetric services manage care for birthing people with opioid and other substance use disorder (OUD/SUD) in pregnancy.

Study Design: Prenatal care providers from across the state of Michigan were identified through systematic web searches and snowball sampling. We conducted semi-structured surveys supported by Blue Cross Blue Shield of Michigan on routine prenatal care practices including management of high-risk conditions such as OUD/SUD. Specifically, we queried if clinics manage OUD/SUD in pregnancy, co-manage with another provider, or refer patients to other providers. We assessed practices across clinic attributes using chi-square tests.

Results: Of the 18 clinics across 8 out of 10 designated prosperity regions in Michigan who completed the survey, 7 clinics self-managed OUD/SUD, 6 clinics utilized co-management, and 5 clinics utilized referrals for specialized care. Federally Qualified Health Centers and outpatient clinics associated with hospitals were more likely to self-manage patients with OUD/SUD than private practices (p = 0.01). All respondents from private practices reported referring as their primary management strategy. Clinics with Epic or Cerner electronic health record (EHR) systems were more likely to manage or co-manage OUD/SUD than clinics with local EHR systems (p = 0.01). Management strategy did not differ by the clinic population size, state designated prosperity regions, or insurance limitations.

Conclusion: OUD/SUD is the leading cause of pregnancy associated mortality in the state of Michigan. Different practice patterns for managing birthing people with OUD/SUD warrant further exploration to define the most effective, efficient, and patient-centered models of care to improve outcomes for this population.

Table 1: Management Patterns of Substance Use Disorder in Pregnancy by Clinic Attributes

	Clinic Manages (n=7)	Co-Manages (n=6)	Refers (n=5)	p value**
Clinic Type				
FQHC	5	2	2	p = 0.01
Outpatient	2	4	0	
Private practice	0	0	3	
Number of patients served (n=13)				
<50	0	0	2	p = 0.14
50-100	0	0	1	
100-400	2	2	1	
>400	0	4	1	
Region				
2	1	1	0	p = 0.36
4	0	2	0	
5	1	0	1	
6	0	1	1	
7	1	0	0	
8	1	1	0	
9	2	0	0	
10	1	1	3	
EHR Type				
National (EPIC/Cerner)	5	5	0	p = 0.01
Local (Other)	2	1	5	
Patients served*				
No limits	5	5	2	p = 0.30
Limits	2	1	3	

FQHC=Federally Qualified Health Center; EHR=Electronic Health Record
*Refers to the insurance type accepted by the clinic. Limits include not accepting patients with Medicaid or no insurance
**Tests of comparison performed with Chi Square

528 | Impact of Prolonged Induction of Labor on Maternal and Neonatal Morbidity

Jourdan E. Triebwasser[1]; Evan J. Keil[1]; Rebecca Wardrop[1]; Xilin Chen[1]; Rebecca F. Hamm[2]; Lisa Kane Low[1]; Abigail Ramseyer[3]; Molly J. Stout[4]; Michelle Moniz[1]
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4:00 PM - 6:00 PM

Objective: To evaluate the association of prolonged induction of labor (IOL) on severe maternal morbidity (SMM) and severe neonatal morbidity (SNM) among nulliparous, term, singleton, vertex (NTSV) births.

Study Design: Retrospective cohort study across 70 hospitals using clinically abstracted data from the Obstetrics Initiative, a quality improvement initiative supported by Blue Cross Blue Shield of Michigan and Blue Care Network. We included NTSV IOL from 01/2022 to 12/2023. Prolonged IOL was defined as duration > 75th percentile for the cohort. Primary outcomes were SMM (Centers for Disease Control criteria) and SNM (unexpected

complications in term newborns, PC-06). Secondary outcomes were postpartum hemorrhage (PPH, blood loss > 1000 mL) and obstetric infection (chorioamnionitis or endometritis). A 1-to-1 propensity score-matched analysis was performed between those with and without prolonged IOL within a hospital using greedy nearest neighbor matching. Adjusted odds ratios (aOR) were calculated adjusting for hospital characteristics (teaching status, higher level neonatal care) to account for hospital-level clustering. Results were stratified by mode of delivery.

Results: Among 29,340 NTSV inductions, the 75th percentile for IOL length was 31 h 47 min. In unadjusted analyses, prolonged IOL was associated with SMM (4.5% vs. 3.0%, $p < 0.001$), SNM (6.1% vs. 4.0%, $p < 0.001$), cesarean (50% vs. 28%, $p < 0.001$), PPH (19% vs. 10%, $p < 0.001$), and obstetric infection (10% vs. 5.2%, $p < 0.001$). After propensity score matching (**Table**), prolonged IOL was associated with SMM (aOR 1.43, 95% CI 1.06-1.92) and SNM (aOR 1.37, 95% CI 1.07-1.75) among vaginal, but not cesarean births (**Figure**). Prolonged IOL was associated with increased risk of PPH for vaginal (aOR 1.70, 95% CI 1.40-2.07) and cesarean births (aOR 1.30, 95% CI 1.13-1.50). Similarly, prolonged IOL was associated with obstetric infection for vaginal (aOR 2.07, 95% CI 1.68-2.54) and cesarean births (aOR 1.48, 95% CI 1.20-1.81).

Conclusion: Prolonged IOL is associated with maternal and neonatal morbidity, particularly for vaginal births.

Figure. Forest plot of maternal and neonatal morbidity outcomes, stratified by delivery mode

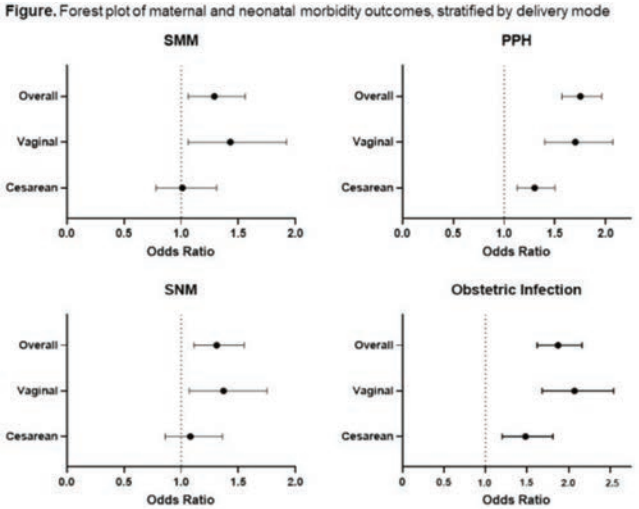

Table. Obstetric and demographic characteristics after propensity score match

Characteristic	Control (n = 5492)[1]	Prolonged IOL (n=5492)[1]	Difference[2]
Maternal age	28.0 (24.0, 32.0)	28.0 (24.0, 32.0)	-0.05
Admission BMI, kg/m2	35 (30, 40)	36 (31, 42)	-0.16
Admission cervical dilation, cm	1.0 (0.0-1.0)	0.5 (0.0-1.0)	0.16
Gestational diabetes	671 (12%)	765 (14%)	-0.05
Pregestational diabetes	101 (1.8%)	147 (2.7%)	-0.06
Hypertensive disorders of pregnancy	1829 (33%)	2073 (38%)	-0.09
Chronic hypertension	409 (7.4%)	558 (10%)	-0.10
SUD	910 (17%)	1020 (19%)	-0.05
Social vulnerability index	0.43 (0.26, 0.59)	0.44 (0.27, 0.59)	-0.01

BMI, body mass index; SUD, substance use disorder (tobacco, opioid, or alcohol use during pregnancy)
[1]Median (IQR); n (%)
[2] Standardized mean difference; values <0.1 indicate negligible difference between groups

529 | Is There a Role for Maternal Oxygen for Fetal Resuscitation in High Risk Gestations?

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4:00 PM - 6:00 PM

Objective: Level 1 evidence indicates that maternal oxygen (O2) administration is ineffective for fetal resuscitation in low-risk patient populations. We investigated whether intrapartum maternal O2 administration benefits patients at high risk of placental insufficiency in labor.

Study Design: This is a secondary analysis of two randomized controlled trials at a single center comparing O2 at 10L/min to room air (RA) in term patients with Category II fetal heart tracings in active labor. For this analysis, patients were categorized into high- and low- risk cohorts, with high-risk defined as those with fetal growth restriction, chronic hypertension, hypertensive disorders of pregnancy, tobacco use, and/or gestational diabetes requiring medications. The primary outcome was umbilical artery (UA) pH < 7.20. Multivariable logistic regression was used to account for potential confounders. Interaction testing was performed to assess effect modification.

Results: 320 patients were recruited across both trials, among which 265 had validated UA pH values and were included. There were no statistically significant demographic or delivery differences between those receiving O2 versus RA in the total cohort or among high-risk gestations (Table 1). There was no difference in rate of pH < 7.2 between O2 and RA groups in the entire cohort (28.9% vs 23.9%, aOR 1.27 (95% confidence interval 0.73, 2.21). In a stratified analysis assessing pH < 7.2 in high- and low-risk groups, O2 was not associated with a significant reduction in pH < 7.2 in either group, with no evidence of effect modification (p for interaction = 0.97)

Conclusion: This secondary analysis suggests that there is no differential benefit for intrapartum maternal O2 supplementation among high risk gestations. This supports ACOG's recommendation to deimplement this practice.

Table 1: Selected demographic characteristics and delivery outcomes in high risk cohort

	Oxygen *n=35*	Room air *n=29*	p
Gestational age (weeks)	38.5 ± 0.98	38.8 ± 1.02	0.29
Prepregnancy obesity	16 (45.7%)	14 (48.3%)	0.84
Nulliparous	9 (25.7%)	9 (31.0%)	0.64
Induction of labor	29 (82.9%)	27 (93.1%)	0.22
Epidural anesthesia	33 (94.3%)	28 (96.6%)	0.67
Gestational diabetes requiring medication	2 (5.7%)	3 (10.3%)	0.65
Hypertensive disorder of pregnancy	10 (28.6%)	8 (27.6%)	0.93
Chronic hypertension	10 (28.6%)	8 (27.6%)	0.93
Triple I	1 (2.9%)	0 (0%)	1.0
FGR	7 (20.0%)	5 (17.2%)	1.0
Cesarean delivery	4 (11.4%)	3 (10.3%)	1.0
NICU admission	1 (3.5%)	1 (2.9%)	1.0
Therapeutic hypothermia	0 (0%)	0 (0%)	--
Apgar <7 at 5 minutes	0 (0%)	0 (0%)	--
Umbilical artery pH <7.2	6 (17.1%)	6 (20.7%)	0.72
Umbilical artery pH <7.1	1 (2.9%)	0 (0%)	1.0
From 2nd oxygen study	20 (57.1%)	12 (41.4%)	0.32

Data presented as mean ± standard deviation or n(%)
Abbreviations: FGR, fetal growth restriction; NICU, neonatal intensive care unit

Table 2: Risk of umbilical artery pH <7.2 by risk category

	Oxygen *n=135*	Room Air *n=130 Ref*	aOR (95% CI)	P for interaction
Entire Cohort *n=265*	39 (28.9%)	31 (23.9%)	1.27 (0.73, 2.21)	--
High risk cohort *n=64*	6 (17.1%)	6 (20.7%)	0.57 (0.15, 2.21)	0.97
Low risk cohort *n=201*	33 (33.0%)	25 (24.8%)	1.5 (0.81, 2.78)	

Data presented as n (percentage) or adjusted odds ratio (95% confidence interval). Odds ratios adjusted for parent study.
High risk cohort defined as patients with fetal growth restriction, chronic hypertension, tobacco use, hypertensive disorder of pregnancy, or gestational diabetes requiring medications.

530 | Impact of Recipient Or Donor Velamentous Cord Insertion in Patients Undergoing Laser for TTTS

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4:00 PM - 6:00 PM

Objective: To determine whether recipient or donor velamentous cord insertion (VCI) is associated with perioperative complications and worse outcomes after laser for Twin-Twin Transfusion Syndrome (TTTS).

Study Design: Retrospective analysis of prospectively collected data from a monochorionic (MC) pregnancy registry at a Level III fetal care center. The records of patients with MC twins that underwent laser for TTTS between 1/2013-1/2024 were reviewed. Pregnancy characteristics and outcomes were then compared between patients that had recipient VCI versus recipient non-VCI as well as donor VCI versus donor non-VCI. Statistical analysis included Mann-Whitney U, chi-square, and Fisher's exact tests, as appropriate.

Results: 373 patients underwent laser over the study period including 77 (20.6%) with recipient VCI, 92 (24.7%) with donor VCI, and 18 (4.9%) with both recipient and donor VCI. Although postoperative outcomes were similar between groups (Tables 1-2), patients with recipient VCI had a lower estimated fetal weight (EFW) discordance (13 vs 18, p< 0.001), larger recipient deepest vertical pocket (10.4 vs 9.5, p = 0.004), later gestational age at laser (20.6 vs 19.6, p< 0.001) and lower need for amnioexchange (6.5 vs 17.9%, p = 0.014) compared to those with recipient non-VCI. On the contrary, patients with donor VCI had higher EFW discordance (23 vs 16, p< 0.001) and earlier gestational age at laser (19.3 vs 20.2, p = 0.001) compared to those with donor non-VCI.

Conclusion: In our cohort, although recipient and donor VCIs were associated with differences in baseline characteristics at laser, they were not associated with worse pregnancy outcomes.

	Velamentous recipient cord insertion n=77	Non-velamentous recipient cord insertion n=296	p-value
Maternal age	31.0 [26.0-35.0]	31.0 [27.0-34.0]	0.819
Maternal BMI	28.3 [24.7-32.4]	28.0 [24.4-32.4]	0.828
Use of assisted reproductive technology	16 (20.8%)	38 (12.8%)	0.078
Cervical length	3.7 [3.1-4.3]	3.6 [3.1-4.1]	0.415
TTTS Stage			0.064
1	7 (9.0%)	36 (12.2%)	
2	51 (66.2%)	152 (51.4%)	
3	14 (18.2%)	94 (31.8%)	
4	5 (6.5%)	14 (4.7%)	
EFW Discordance	13 [6-19]	18 [12-27]	**<0.001**
Cardiac score	5 [2-7]	4 [2-8]	0.845
Donor DVP	0.8 [0.2-1.5]	0.9 [0.5-1.5]	0.309
Recipient DVP	10.4 [8.5-12.3]	9.5 [8.2-11.1]	**0.004**
GA at laser	20.6 [19.4-22.2]	19.6 [18.1-21.6]	**<0.001**
Unable to complete laser	2 (2.6%)	3 (1.0%)	0.275
OR time (minutes)	52 [37-66]	52 [40-66]	0.886
Amnioexchange performed	5 (6.5%)	53 (17.9%)	**0.014**
Number of anastomoses	12 [7-16]	13 [9-17]	0.080
Chorioamniotic membrane separation	7 (9.0%)	41 (13.9%)	0.266
PPROM			
Within 1 week	4 (5.2%)	14 (4.7%)	0.772
Any PPROM	15 (19.5%)	36 (12.2%)	0.096
Need for additional therapy	2 (2.6%)	17 (5.7%)	0.386
Fetal demise			
Donor demise	4 (5.2%)	38 (12.8%)	0.068
Recipient demise	10 (13.0%)	26 (8.8%)	0.266
Dual	4 (5.2%)	7 (2.4%)	0.248
Gestational age at delivery	33.3 [29.0-35.3]	34 [30.2-36.0]	0.211
Livebirth			0.473
0	8 (10.4%)	20 (6.8%)	
1	13 (16.9%)	61 (20.6%)	
2	56 (72.7%)	212 (71.6%)	
Lost to follow-up	0	3 (1.0%)	
Donor birthweight	1970 [1270-2285]	1767 [1270-2235]	0.296
Recipient birthweight	1986 [1480-2370]	1987 [1535-2381]	0.830
Residual anastomoses	3/33 (20%)	13/116 (9.9%)	0.288

Table 1: Pregnancy and outcome data in patients with recipient velamentous vs non-velamentous cord insertion who underwent laser for Twin Twin Transfusion Syndrome (BMI=body mass index; DVP=deepest vertical pocket; EFW=estimated fetal weight; GA=gestational age; PPROM=preterm premature rupture of membranes; TTTS=twin twin transfusion syndrome).

	Velamentous donor cord insertion n=92	Non-velamentous donor cord insertion n=281	p-value
Maternal age	32.0 [28.0-35.0]	31.0 [27.0-35.0]	0.443
Maternal BMI	27.7 [24.4-32.0]	28.2 [24.5-35.5]	0.795
Use of assisted reproductive technology	18 (19.6%)	36 (12.8%)	0.110
Cervical length	3.7 [3.0-4.2]	3.6 [3.1-4.1]	0.971
TTTS Stage			0.824
1	11 (12.0%)	32 (11.4%)	
2	47 (51.1%)	156 (55.5%)	
3	30 (32.6%)	78 (27.8%)	
4	4 (4.3%)	15 (5.3%)	
EFW Discordance	23 [15-30]	16 [10-24]	**<0.001**
Cardiac score	4 [3-7]	5 [2-8]	0.558
Donor DVP	0.9 [0.5-1.4]	0.9 [0.4-1.5]	0.846
Recipient DVP	9.7 [8.1-11.2]	9.7 [8.3-11.4]	0.537
GA at laser	19.3 [18.0-20.5]	20.2 [18.4-22.2]	**0.001**
Unable to complete laser	0	5 (1.8%)	0.339
OR time (minutes)	52 [40-67]	51 [39-65]	0.607
Amnioexchange performed	14 (15.2%)	44 (15.7%)	0.919
Number of anastomoses	13 [9-18]	12 [9-17]	0.080
Chorioamniotic membrane separation	13 (14.1%)	35 (12.5%)	0.677
PPROM			
Within 1 week	6 (6.5%)	12 (4.3%)	0.382
Any PPROM	14 (15.2%)	37 (13.2%)	0.246
Need for additional therapy	5 (5.4%)	14 (5.0%)	0.753
Fetal demise			
Donor demise	12 (13.0%)	30 (10.7%)	0.533
Recipient demise	10 (10.9%)	26 (9.3%)	0.649
Dual	4 (4.3%)	7 (2.5%)	0.475
Gestational age at delivery	34.0 [30.4-36.0]	33.6 [30.0-35.5]	0.393
Livebirth			0.304
0	10 (10.9%)	18 (6.4%)	
1	20 (21.7%)	54 (19.2%)	
2	62 (67.4%)	206 (73.3%)	
Lost to follow-up	0	3 (1.1%)	
Donor birthweight	1893 [1380-2262]	1770 [1270-2240]	0.615
Recipient birthweight	2140 [1585-2408]	1943 [1480-2375]	0.164
Residual anastomoses	5/29 (17.2%)	11/120 (9.2%)	0.208

Table 2: Pregnancy and outcome data in patients with donor velamentous vs non-velamentous cord insertion who underwent laser for Twin Twin Transfusion Syndrome (BMI=body mass index; DVP=deepest vertical pocket; EFW=estimated fetal weight; GA=gestational age; PPROM=preterm premature rupture of membranes; TTTS=twin twin transfusion syndrome).

531 | Impact of Second Trimester Vaginal Bleeding on Outcomes in Patients Undergoing Laser for TTTS

Juliana S. Gebb[1]; Alekhya Jampa[2]; Violetta Bakunina[1]; Desiree Fiorentino[2]; Christina Paidas Teefey[2]; Shelly Soni[2]; Edward R. Oliver[1]; Julie S. Moldenhauer[2]; Nahla Khalek[2]
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4:00 PM - 6:00 PM

Objective: To determine whether second trimester vaginal bleeding is associated with perioperative complications and worse outcomes after laser for Twin-Twin Transfusion Syndrome (TTTS).

Study Design: Retrospective analysis of prospectively collected data from a monochorionic (MC) pregnancy registry at a Level III fetal care center. The records of patients with MC twins that underwent laser for TTTS between 1/2013-1/2024 were reviewed to determine the incidence of second trimester vaginal bleeding prior to the laser procedure. Those without clear documentation of bleeding were excluded. Pregnancy characteristics and outcomes were then compared between patients that had second trimester bleeding versus those that did not using Mann-Whitney U, chi-square, and Fisher's exact tests, as appropriate.

Results: Of 373 patients that underwent laser over the study period, 359 (96.2%) had clear documentation of whether they had second trimester vaginal bleeding including 30 (8.4%) that did and 329 (91.6%) that did not, respectively. Although demographic characteristics and survival outcomes were similar between groups, patients with second trimester vaginal bleeding had longer median operating room times (61 vs 50 minutes, p = 0.032), higher need for amnioexchange (33.3 vs 14.3%, p = 0.006), and higher incidence of preterm premature rupture of membranes within 1 week after the laser procedure (16.7 vs 3.3%, p = 0.001).

Conclusion: In our cohort, second trimester vaginal bleeding was associated with a higher incidence of perioperative complications surrounding laser for TTTS. This information can be utilized to guide future studies and in counseling patients prior to the laser procedure.

	Vaginal Bleeding n=30	No Vaginal Bleeding n=329	p-value
Maternal age	30.5 [27.0-36.0]	31.0 [27.0-34.0]	0.768
Maternal BMI	29.7 [25.5-37.3]	28.1 [24.1-32.3]	0.111
Cervical length	3.8 [3.4-4.2]	3.6 [3.1-4.1]	0.153
TTTS Stage			0.482
1	4 (13.3%)	38 (11.6%)	
2	13 (43.3%)	183 (55.6%)	
3	12 (40%)	92 (30.0%)	
4	1 (3.3%)	16 (4.9%)	
EFW Discordance	21 [10-27]	17 [11-26]	0.506
Cardiac score	5 [2-8]	4 [2-7]	0.661
Donor DVP	0.9 [0.5-1.4]	0.9 [0.4-1.5]	0.821
Recipient DVP	9.0 [8.3-10.9]	9.6 [8.2-11.2]	0.687
GA at laser	19.0 [18.2-21.0]	20.1 [18.2-21.6]	0.163
Unable to complete laser	1 (3.3%)	4 (1.2%)	0.355
OR time (minutes)	61 [48-75]	50 [39-63]	**0.032**
Amnioexchange performed	10 (33.3%)	47 (14.3%)	**0.006**
Number of anastomoses	11 [7-15]	13 [9-17]	0.080
Chorioamniotic membrane separation	7 (23.3%)	38 (11.6%)	0.062
PPROM			
Within 1 week	5 (16.7%)	11 (3.3%)	**0.001**
Any PPROM	7 (23.3%)	41 (12.5%)	0.094
Gestational age at PPROM	19.2 [17.2-27.3]	25.1 [23.0-30.5]	0.074
Need for additional therapy	2 (6.7%)	16 (4.9%)	0.654
Fetal demise			
Single	7 (23.3%)	59 (17.9%)	0.456
Dual	2 (6.7%)	9 (2.7%)	0.232
Gestational age at delivery (weeks)	34 [30.5-36.4]	34 [30.2-35.6]	0.559
Livebirth			0.309
0	4 (13.3%)	24 (7.3%)	
1	7 (23.3%)	65 (19.8%)	
2	18 (60%)	238 (72.3%)	
Lost to follow-up	1 (3.3%)	2 (0.6%)	
Residual anastomoses	2/10 (20%)	13/131 (9.9%)	0.288

Table: Demographic, pregnancy and outcome data in patients with and without vaginal bleeding prior to laser for Twin Twin Transfusion Syndrome (BMI=body mass index; DVP=deepest vertical pocket; EFW=estimated fetal weight; GA=gestational age; PPROM=preterm premature rupture of membranes; TTTS=twin twin transfusion syndrome).

532 | Validation of the Delivery Trauma Scale for Evaluation of Emotional Burden Secondary to Birth

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4:00 PM - 6:00 PM

Objective: The purpose of this study is to assess the validity of the Delivery Trauma Scale (revised City Birth Trauma Scale) in a U.S. population. The aim is to determine if this questionnaire is appropriate for use in assessing emotional burden secondary to birth (previously referred to as postpartum post-traumatic stress disorder) in the target population and to propose a new name for the questionnaire that better suits the birth and postpartum stress response.

Study Design: The study conducted is a methodological non-interventional study aimed at establishing the validity and reliability of a scale to assess delivery-related trauma. In the first stage of the study, face validity and content validity were established via expert review of the individual items on the questionnaire and subsequent content validity index analysis. The questionnaire was then administered to women in the postpartum period at

least 18 years of age who has delivered an infant within the past 12 months. The construct validity and reliability of the questionnaire was evaluated via statistical analysis using Cronbach's alpha coefficient and confirmatory factor analysis.

Results: The initial review of the questionnaire by experts resulted in a content validity index of 1. This can be interpreted as every question being appropriate for and relevant to the evaluation of emotional burden secondary to birth. The Cronbach's alpha coefficient for the questionnaire was calculated to be 0.898 (Bootstrap 95% CI 0.82-0.93) indicating a very high degree of internal consistency within the questionnaire. Confirmatory factor analysis showed statistical significance of all symptom categories ($p < 0.001$) with the exception of the category of negative symptoms (Table 1).

Conclusion: The Delivery Trauma Scale is validated for use in assessment of emotional burden secondary to birth in a U.S. population, though it should be used cautiously in evaluation for negative symptoms. Overall, the DTS is a promising tool that can be used in the postpartum period to identify patients who may benefit from additional mental health resources and support.

Table 1. Confirmatory Factor Analysis

Cronbach's alpha	0.898			
Bootstrap 95% CI	0.82 - 0.93			
	Estimate	Standard Error	z-value	P (> | z |)
Intrusions				
Recurrent memories	1.000			
Bad dreams or nightmares	0.947	0.089	10.687	0.000
Flashbacks	0.759	0.076	9.948	0.000
Upset when reminded	1.192	0.075	15.878	0.000
Tense when reminded	1.119	0.066	17.082	0.000
Avoidance				
Avoid thinking	1.000			
Avoid reminders	0.687	0.036	19.032	0.000
Negative Mood				
Not able to remember	1.000			
Blaming self	5.220	4.974	1.049	0.294
Negative emotions about birth	6.641	6.379	1.041	0.298
Negative emotions about self	5.638	5.464	1.032	0.302
Something awful might happen	5.557	5.410	1.027	0.304
Loss of interest in activities	6.465	6.197	1.043	0.297
Feeling detached	6.346	6.139	1.034	0.301
No positive emotions	7.033	6.826	1.030	0.303
Hyperarousal				
Irritable/aggressive	1.000			
Self destructive/reckless	1.407	0.265	5.307	0.000
Tense/on edge	0.800	0.800	7.910	0.000
Jumpy/startled	0.800	0.874	7.908	0.000
Problems concentrating	-0.922	0.077	-11.914	0.000
Problems sleeping	0.778	0.111	7.033	0.000

Table 2. Delivery Trauma Scale Symptom Onset and Impact

Characteristic		N(%)
Believed self or baby would be seriously injured		18(19.0)
Believed self or baby would die		11 (5.6)
Symptom start	Before the birth	20 (10.6)
	First 6 months	15(7.9)
	Greater than 6 months	1 (0.5)
	Not applicable	153 (81.0)
Length of symptoms	<1 month	28 (14.8)
	1-3 months	3 (1.6)
	3 months or more	6 (3.2)
	Not applicable	152 (80.4)
Symptoms cause distress	Yes	2 (1.1)
	No	166 (89.7)
	Sometimes	17 (9.2)
Prevent from doing normal things	Yes	6 (3.2)
	No	176 (93.6)
	Sometimes	6 (3.2)
Symptoms could be due to medication, alcohol, or drugs	Yes	0 (0.0)
	No	184 (97.9)
	Maybe	4 (2.1)
Has had professional help or treatment	Yes	9 (4.9)
	No	173 (93.5)
	Maybe	3 (1.6)
Desires professional help or treatment	Yes	6 (3.2)
	No	169 (91.4)
	Maybe	10 (5.4)

N = 199

533 | Comparison of Fetal Abdominal Circumference References for the Prediction of Sga

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4:00 PM - 6:00 PM

Objective: Small for gestational age (SGA) infants are at increased risk for adverse neonatal outcomes. Fetal growth restriction (FGR) is defined as estimated fetal weight (EFW) < 10% or abdominal circumference (AC) < 10%. In the United States, the Hadlock reference is the most widely used method for estimating the fetal AC, however, several other methods exist including the INTERGROWTH-21st standard and the Chitty standard. We sought to compare the ability of three antenatal AC standards to predict SGA and adverse neonatal outcomes.

Study Design: In this secondary analysis of a cohort of singleton gestations that underwent fetal growth assessment between 26 and 36 weeks of gestation, fetuses with chromosomal or congenital malformations and those without delivery information were excluded. The Hadlock, Chitty, and INTERGROWTH-21st fetal AC methods' ability to detect SGA and adverse neonatal outcomes were compared by calculating the area under the receiver operating curve of clinical characteristics, sensitivity, specificity, positive predictive value, and negative predictive value.

Results: Of 1054 patients, 122 had an AC < 10% by Hadlock, 31 by Chitty, and 50 by INTERGROWTH-21st (Table 1). The Hadlock definition for AC < 10th was a better identifier for SGA. AUC and 95% CI for SGA for Hadlock, Chitty, and INTERGROWTH-21st were 0.73 [0.69 -0.77] vs 0.59 [0.55 -0.61] vs 0.62 [0.59-0.66]) ($p < 0.001$), respectively (Figure 1). All AC standards had suboptimal performance for the prediction of adverse neonatal outcomes.

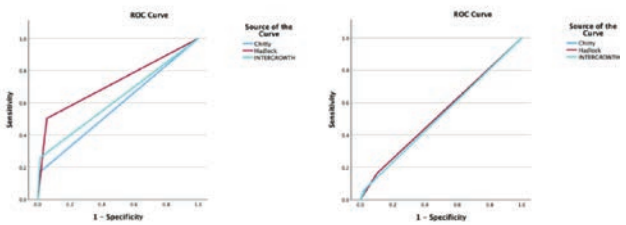
Conclusion: The Hadlock AC < 10% was a better predictor than Chitty or INTERGROWTH-21st for SGA. All references

had a suboptimal ability to predict composite adverse neonatal outcomes. The Hadlock reference chart should be utilize in obstetrical practice.

Table 1

Test characteristic	Sensitivity	Specificity	PPV	NPV	AUC (95% CI)
Hadlock AC < 10 (122)					
Neonatal SGA (n=139)	0.50	0.94	0.57	0.93	0.73 (0.69 – 0.77)
Composite adverse neonatal outcome (n=221)	0.16	0.90	0.30	0.80	0.53 (0.50-0.56)
Chitty AC < 10 (31)					
Neonatal SGA	0.17	0.99	0.74	0.89	0.59 (0.55-0.61)
Composite adverse neonatal outcome	0.06	0.98	0.42	0.80	0.52 (0.50-0.54)
INTERGROWTH-21st AC < 10 (50)					
Neonatal SGA	0.26	0.99	0.72	0.90	0.62 (0.59-0.66)
Composite adverse neonatal outcome	0.08	0.96	0.34	0.80	0.52 (0.50-0.54)

Figure 1



A – SGA

B– composite adverse neonatal outcome

534 | Screening Analysis for Autism Spectrum Disorders in FNAIT-Affected Children with and without Intra-Cranial Hemorrhage

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4:00 PM - 6:00 PM

Objective: Fetal/neonatal alloimmune thrombocytopenia (FNAIT) results from parental platelet antigen incompatibility. De Vos et al. identified increased neurodevelopmental issues in FNAIT-affected children without ICH. Members of NAITbabies suggested increased autism in FNAIT-affected children. Our survey evaluated neurodevelopmental issues (autism) in FNAIT-affected children, with and without ICH.

Study Design: A de-identified survey was distributed via Qualtrics to mothers in NAITbabies and assessed neurodevelopment using 4 age-specific autism screening scales to identify FNAIT-affected children at high risk: Q-CHAT-10 for 18-24 months; M-CHAT 2–4 yrs; AQ10-Child 4 -11; and AQ10-Adolescent for $\geq$12 with 20, 61, 173, and 70 children. Mothers reported if autism diagnosis was known prior to screening and responses were scored using algorithms.

Results: There were 324 children across the 4 age groups, 55 with ICH and 269 without. Autism diagnoses were more prevalent in the ICH groups across all ages, except the 18–24-mo group (no reported autism) see Table 1. Most notably, for 2-4yr olds, none of 49 children without ICH reported a diagnosis or screened at risk. Among 4-11yr-olds, screening showed 33% with ICH and 13% without ICH. The highest levels were in the 12+ age group, reporting 36.4% with ICH and 11.8% without ICH, with screening identifying autism risk in 45% with ICH and 37% without ICH. Overall, while the ICH group showed more high-risk screening compared to pre-reported diagnoses across the 3 older ages, screening totals never exceeded 45% of ICH cases. In the non-ICH groups, at-risk screening was seen in > 1/3 of the 12+ age group.

Conclusion: Autism and other neurodevelopmental issues become more apparent with age in ICH and non-ICH groups. The screening tool is NOT a specific diagnostic test for autism and identifies non-specific neurologic damage. Children affected by FNAIT, especially adolescents, are at risk for "autism" even without ICH. These results indicate the need for periodic screening for autism and neurologic damage in general in children affected by FNAIT, regardless of ICH occurrence.

Table 1. Summary of reported autism diagnosis, autism screening results and ICH status across 4 Age Groups

Age Group	ICH Status	Number of Children	Reported Autism Dx	Screened at Risk
18 – 24 months	ICH	5	0 (0%)	3 (60%)
	NO ICH	15	0 (0%)	0 (0%)
24 months – 4 years	ICH	12	1 (8%)	2 (16.6%)
	NO ICH	49	0 (0%)	0 (0%)
4 – 11 Years	ICH	27	2 (7.4%)	9 (33%)
	NO ICH	146	10 (6.8%)	23 (13%)
12+ Years	ICH	11	4 (36%)	5 (45%)
	NO ICH	59	7 (11.8%)	22 (37%)

535 | Racial Disparities in Severe Maternal Morbidity: Identifying Predictors for Designing Interventions and Risk Reduction

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4:00 PM - 6:00 PM

Objective: To evaluate differences in severe maternal morbidity (SMM) and identify key predictors of SMM among Non-Hispanic Black (NHB) versus Non-Hispanic White (NHW) pregnancies

Study Design: We undertook a retrospective cohort study of all patients receiving prenatal care and delivering at a single academic tertiary medical center from 2017–2013. The cohort was divided based on self-identified race into 2 subgroups - i.e. NHB vs NHW. Our primary outcome was SMM as defined by the Centers for Disease Control (CDC). Demographic and clinical characteristics were abstracted from electronic records and compared across study groups using Student's T test and chi2/Fischer's exact test for continuous and categorical data, respectively. The Kruskal Wallis test was used to compare nonparametric data. Multivariable regression analyses were used to identify the key predictors of SMM in each cohort.

Results: Of the 6403 patients, 4200 (66%) identified as NHB, while 2203 (34%) identified as NHW. NHB patients were significantly younger (p< .01), had governmental insurance (p< .01) with a higher BMI (p< .01), and presented at later gestational

age at prenatal care initiation (p< .01). Overall, 417/6403 (7%) of the cohort had a SMM event with a higher incidence of SMM among NHB patients as compared to their NHW counterparts [307/4200 (7%) vs 110/2203 (5%), p< .05]. Rates of individual SMM events were similar across both groups except for higher rates of sickle cell disease with crisis (p = .02) and hemorrhage (p< .01) in NHB Patients. Among NHB patients–gestational hypertension [aOR: 1.61 (1.10–2.330], cesarean delivery [aOR: 2.82 (2.17–3.67)] and gestational age at delivery [aOR:1.87 (1.13–2.99)] were identified as key predictors of SMM. In NHW patients–gestational hypertension [aOR: 3.73 (1.88–7.16) and cesarean delivery [aOR: 3.71 (2.36–5.94)] had the highest impact on SMM risk.

Conclusion: Key clinical predictors of SMM were identified in our study with a differential risk impact among NHB and NHW patients as an opportunity for risk reduction and maternal mortality prevention.

536 | Epidural Placement Early in Cervical Ripening: is There a Negative Impact?

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4:00 PM - 6:00 PM

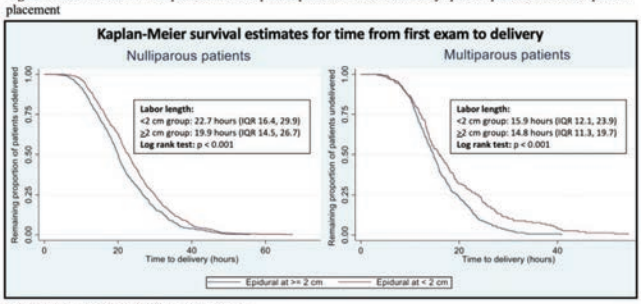
Objective: National guidelines recommend epidural anesthesia be offered at any point in labor. At our institution, patients undergoing induction of labor (IOL) often request "early" epidurals during cervical ripening or prior to mechanical ripening. Our objective was to evaluate if early epidural placement during IOL impacts labor duration.

Study Design: This is a secondary analysis of a prospective cohort study of term patients from a single institution. We included all patients who presented for IOL and received either a prostaglandin or mechanical cervical ripening. Patients with history of cesarean and those without an epidural were excluded. Patients were divided into two groups based on the exam prior to epidural placement: early epidural (EE) if < 2 cm and late epidural (LE) if ≥ 2 cm. Analysis was stratified by parity. The primary outcome was length of IOL, defined as interval between first cervical exam and delivery. Secondary outcomes were mode of delivery, intraamniotic infection, 3rd/4th degree lacerations, and neonatal outcomes. Time to event analysis was performed and the log-rank test was used to compare the primary outcome between groups. Cox proportional hazards modeling was used to adjust for potential confounders.

Results: 1704 patients were included with 816 (48%) in the EE group and 888 (52%) in the LE group. Median Bishop score on admission was 1 for both groups. IOL duration was significantly longer in patients with EE (22.7 hours vs 19.9 hours in nulliparous and 15.9 hours vs 14.8 hours in multiparous, both P< 0.001) (Figure). There was no difference in second stage duration between groups. After adjusting for confounders, there was no association between timing of epidural and rates of cesarean delivery, operative vaginal delivery, intraamniotic infection, 3rd/4th degree lacerations, or neonatal outcomes (Table).

Conclusion: Early epidural placement < 2 cm is associated with a statistically longer total duration of IOL with an absolute difference of no more than 2-3 hours. Early epidural is not associated with adverse maternal or neonatal outcomes or a longer second stage of labor.

Figure: Labor duration in nulliparous and multiparous patients in those with early epidural placement vs late epidural placement



Abbreviations: cm, centimeters; IQR, interquartile range

Table: Maternal and neonatal outcomes by timing of epidural placement

	Nulliparous				*Multiparous*			
	Epidural <2 cm (n=586)	Epidural ≥2 cm (n=506)	p	aHR (95% CI)	Epidural <2 cm (n=159)	Epidural ≥2 cm (n=358)	p	aHR (95% CI)
Cesarean delivery	235 (40.1%)	175 (34.6%)	0.060	0.86 (0.71, 1.05)	30 (18.9%)	31 (8.7%)	**0.01**	1.26 (0.74, 2.13)
Operative vaginal delivery	40 (6.8%)	39 (7.7%)	0.58	0.68 (0.44, 1.06)	7 (4.4%)	8 (2.2%)	0.175	1.41 (0.49, 4.03
Chorioamnionitis	58 (9.9%)	39 (7.7%)	**.021***	1.68 (0.69, 1.55)	8 (5.0%)	4 (1.1)	**0.006***	1.68 (0.43, 6.45)
OASIS injuries	21 (3.6%)	19 (3.8%)	0.88	0.39 (0.396, 1.38)	1 (0.6%)	2 (0.6%)	1.00*	--
Umbilical artery pH ≤7.10	16 (2.7%)	12 (2.4%)	0.72[b]	0.93 (0.43, 1.98)	7 (4.4%)	4 (1.1%)	**0.04***	8.08 (0.63, 8.1)
Apgar <7 at 5 minutes	35 (5.9%)	19 (3.8%)	0.09	1.18 (0.67, 2.06)	4 (2.5%)	10 (2.8%)	1.0*	0.57 (0.17, 1.87)
NICU admission	25 (4.3%)	11 (2.2%)	0.053	1.45 (0.71, 2.95)	3 (1.9%)	6 (1.7%)	1.0*	0.58 (0.13, 2.58)

Abbreviations: cm, centimeters; aHR, adjusted hazard ratio; CI, confidence interval; OASIS, obstetric anal sphincter injury; NICU, neonatal intensive care unit
All co-variates were found to be non-significant and were removed from Cox proportional hazards model except as noted
[a]adjusted for SGA; [b]adjusted for public insurance, chronic hypertension, and pregestational diabetes
*Fisher's exact test

537 | Maternal Covid-19 and Placental Expression of Senescence-Associated Secretory Phenotype Genes

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4:00 PM - 6:00 PM

Objective: Maternal COVID-19 increases the risk for adverse pregnancy outcomes related to placental dysfunction, including preeclampsia and stillbirth, however, the biologic basis remains underexplored. Based on recent work showing the association between placental senescence and preeclampsia, we hypothesized that senescence-associated secretory phenotype (SASP) genes are dysregulated in COVID-19 placentas.

Study Design: We analyzed a single-nucleus RNA sequencing dataset of placentas from symptomatic COVID-19 patients at birth (n = 4) and gestational age-matched controls (n = 4) to characterize the response of different trophoblast populations to COVID-induced stress. Differentially expressed gene (DEGs) in COVID-19 v. controls were identified for villous syncytiotrophoblasts (STB), membrane extravillous trophoblasts (EVT-M), and membrane

cytotrophoblasts (CTB-M) using the Seurat (v4.3.0) in R given that these populations are likely sources of circulating placental proteins. Our analysis focused on DEGs belonging to a previously defined set of SASP genes.

Results: The baseline characteristics for COVID-19 patients and control groups were similar for maternal age (26 vs 28 years-old), gestational age (36 vs 38 weeks) and BMI (37 vs 34 kg/ m2). DEG analysis showed upregulation of distinct SASP pathway genes in STB, EVT-M, and CTB-M populations. Follistatin-like 3 (FSTL3) was significantly upregulated in COVID-19 samples across all cell populations, but predominantly expressed in EVT-M and CTB-M($P \leq 0.0001$)(Figure 1). In contrast, activin A (INHBA) was only upregulated in the STB and EVT-M populations, but predominantly expressed in STBs ($P \leq 0.0001$)(Figure 2).

Conclusion: Compared with control placentas, trophoblast populations from COVID-19 positive patients showed an increased expression of senescence genes. Our data reveals cell type-specific expression of senescence genes, suggesting that SASP proteins in the maternal circulation have different sources. This increased expression of senescence genes among COVID-19 positive patients may provide potential insight into the link between COVID-19 and preeclampsia.

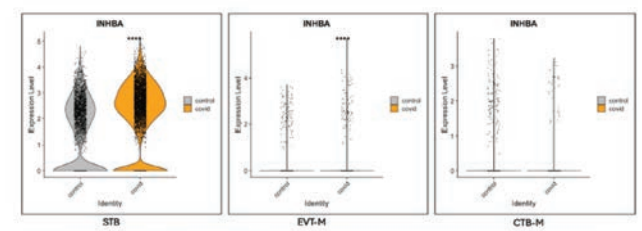

Figure 1: Violin plot of the composite fold change in relative gene expression of the significant expressed SASP proteins INHBA in different trophoblast populations from COVID-19 patients and controls. **** P ≤ 0.0001

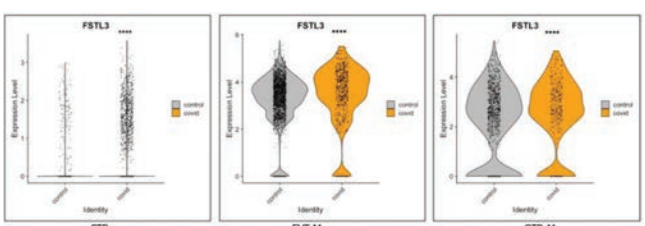

Figure 2: Violin plot of the composite fold change in relative gene expression of the significant expressed SASP proteins FSTL3 in different trophoblast populations from COVID-19 patients and controls. **** P ≤ 0.0001

538 | The Association Between Hepatitis B Virus Infection During Pregnancy and Risk of Primary Cesarean Delivery

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4:00 PM - 6:00 PM

Objective: To investigate the association between hepatitis B virus (HBV) status and the likelihood of primary cesarean section (C-section) delivery compared to vaginal delivery.

Study Design: This retrospective cohort study used data from the National Center for Health Statistics Vital Statistics database. The cohort linked birth and infant death data files from 2015 to 2021 was used for this study. The study included all births in the United States during the study period, with known HBV status and without prior Cesarean Delivery (CD). The outcome of interest was mode of delivery. Univariate analysis was performed to determine the association between HBV and CD rate. Multivariate logistic regression was then performed to estimate the effect of HBV status on CD adjusting for potential confounding variables. Interaction analysis was then performed to determine if the effect of HBV on CD is modified by race and obesity.

Results: The rate of CD was higher in pregnancies complicated by HBV infection compared to uninfected individuals (22.4% vs 21.9%, $p = 0.004$).The effect of HBV on CD is modified by both race and obesity. Specifically, HBV infection increases risk of primary CD (aOR 1.39; 95% CI [1.25-1.54]). Compared to White, both Black and Asian race demonstrated a protective effect on primary CS among individuals with HBV infection (aOR 0.93; 95% CI [0.87 - 0.99] and (aOR 0.74; 95% CI [0.85-0.79]). Compared to underweight group, individuals in the higher weight groups complicated by HBV infection also demonstrated a protective effect on primary CD.

Conclusion: This study demonstrated that HBV infection increased the risk of primary CD in otherwise uncomplicated pregnancies. However, in pregnancies complicated by racial categories and high BMI groups with already increased risk of primary CD, HBV infection demonstrated a protective effect.

HBV	C-section rate	Vaginal Delivery
Positive	4,880,527 (21.86%)	17,442,141 (78.14%)
Negative	10,296 (22.43%)	35,616 (77.57%)

Variable	Odds Ratio	95% CI Lower	95% CI Upper
Hepatitis B (HBV)	1.390368	1.251937	1.544107
HBV#Race: Black	0.9303611	0.8676978	0.9975497
HBV#Race: Hispanic	0.9862453	0.9035711	1.076484
HBV#Race: Asian	0.7444275	0.6978452	0.7941192
HBV#BMI: Normal	0.8974302	0.8144788	0.98883
HBV#BMI: Overweight	0.7784642	0.7016298	0.8637126
HBV#BMI: Class I	0.7362746	0.6566498	0.8255547
HBV#BMI: Class II	0.749861	0.6533465	0.8606329
HBV#BMI: Class III	0.6882588	0.5881494	0.8054079
HBV#BMI: Unknown	0.7877702	0.6782637	0.9149566
HBV#History of Diabetes Mellitus (DM)	0.8021484	0.6658804	0.9663029
HBV#History of Chronic Hypertension (CHTN)	1.07023	0.9314794	1.229649

539 | How Much is Enough? Incomplete Treatment Course of Intravenous Iron to Prevent Postpartum Blood Transfusions

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4:00 PM - 6:00 PM

Objective: To compare the benefit of partial and full doses of IV iron treatment in reducing postpartum blood transfusions.

Study Design: This was a retrospective cohort study of patients with Iron Deficiency Anemia (IDA) who presented for prenatal care at a tertiary urban academic center from June 2020 to June 2024. Women were included if they received IV iron antepartum and excluded if they had contraindications to blood transfusion. The primary outcome was postpartum blood transfusion. Secondary outcomes included hemoglobin (Hg) levels at admission and percent change in Hg (pre-treatment to admission). Fisher's exact, chi square, parametric and non-parametric tests were used. Median (interquartile range) and mean +/- standard deviation shown.

Results: Among 224 patients with IDA, 116(52%) completed the calculated IV iron dose based on the iron deficit (Full dose, Group 1) and 108(48%) initiated, but did not complete the prescribed treatment (Partial dose, Group 2). The median dose of IV iron was 900 mg (400-1800) in Group 1 and 400 mg (200-1200) in Group 2 ($p< 0.0001$). Pre-treatment Hg was similar between Groups 1 and 2 (8.7 +/- 0.89 vs 8.6 g/dL +/- 0.92 respectively, $p = 0.71$). However, Group 2 had more short interval pregnancies [8(7%) vs 24(22%) in Groups 1 and 2, $p = 0.001$], later gestational age at treatment initiation [median 34(20-38) vs 36 weeks (24-40), $p< 0.0001$] and a higher median delivery blood loss [285(200-543) vs 361 mL(200-612), $p = 0.04$]. There was no difference in postpartum transfusions between Groups 1 and 2 [8(7%) vs 11(10%), $p = 0.33$]. However, Group 1 had a higher mean admission Hg than Group 2 (10.8 +/- 0.92 vs 9.7 g/dL +/- 0.98, $p< 0.0001$), a higher median percent increase in Hg [25% (12-36) vs 11% (4-21), $p< 0.0001$], and a higher mean postpartum day 1 Hg (9.8 +/- 1.18 vs 8.3 +/- 1.19 g/dL, $p< 0.0001$).

Conclusion: A full course of IV iron improved Hg response and admission Hg compared to partial course but did not significantly decrease postpartum blood transfusions. Partial treatment still benefits pregnant patients with anemia, even when optimal treatment cannot be completed.

540 | Creating Optimal Pain Management FOR Tailoring (COMFORT) Guidelines for Pain Management: Postpartum Recommendations

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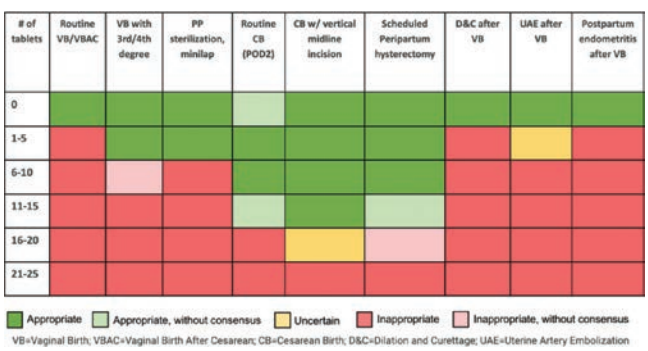
4:00 PM - 6:00 PM

Objective: To develop a new clinical practice guideline for postpartum pain management that promotes opioid stewardship, patient-centeredness, and health equity.

Study Design: We developed the COMFORT (Creating Optimal Pain Management FOR Tailoring pain management after surgery in pregnancy and childbirth) guideline using a rigorous, evidence-based, eDelphi process, the RAND-UCLA Appropriateness Method. After a systematic review, we identified 19 procedures, 6 populations, and 5 postpartum pain management strategies. Interprofessional panelists (n = 17) and public members (n = 3) rated the appropriateness of pain management strategies in 3 eDelphi rounds. Two consensus conferences were held between rounds with panelists and public members to resolve discrepancies and ensure public contributions. Quantitative ratings were assessed using basic statistics and the RAM definitions for consensus. Key findings from the panel discussion were summarized using a qualitative content analysis and matched to quantitative findings.

Results: Key panel recommendations for postpartum patients include: 1) provide robust patient education on postpartum pain management and opioid risk-reduction; 2) use scheduled non-opioid medications (e.g., acetaminophen, Non-steroidal Anti-Inflammatory Drugs); 3) utilize non-pharmacologic strategies as additive pain management; 4) utilize alternative inpatient strategies for individuals with complex pain; 5a) use judicious opioid prescribing as needed; 5b) utilize tailored prescription benchmarks to determine appropriate opioid prescription sizes for shared decision making (Table 1).

Conclusion: New guidelines for pain management after surgery in pregnancy and after childbirth may standardize care, reduce risks of opioid prescribing, and improve patient-centeredness and equity.



541 | Preconception and First Trimester Blood Pressure: Risks of Hypertensive Disorders in Pregnancy Using AHA Guidelines

Lior Heresco[1]; Tal Biron-Shental[2]; Tzipi Hornik-Lurie[3]; Ella Pardo[1]; Gil Shechter Maor[1]; Michal Kovo[1]

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4:00 PM - 6:00 PM

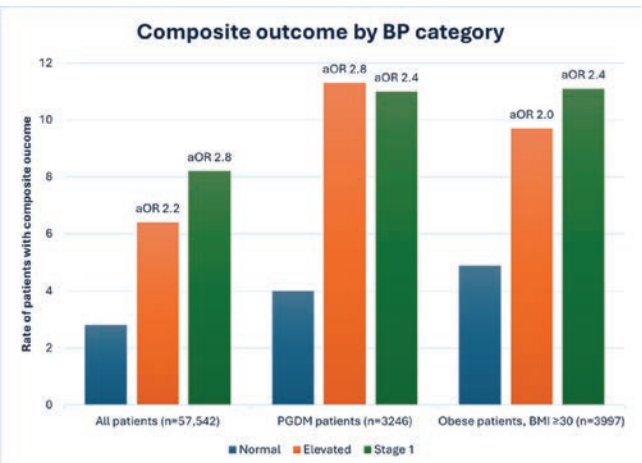
Objective: Hypertensive disorders during pregnancy (HDP) significantly contribute to maternal morbidity. We aimed to assess the risk of HDP according to the 2017 American Heart Association AHA criteria based on preconception and early pregnancy blood pressure (BP) measurements.

Study Design: This retrospective study utilized the Clalit Health Services database, and included all singleton pregnancies from 2010 to 2023 with at least one BP measurement within one year before conception until 13 weeks of gestation. Participants were classified into three groups according to the AHA guidelines:normotensive, elevated BP (systolic BP [SBP] of 120-129

mm Hg with diastolic BP [DBP] < 80 mm Hg), and stage 1 hypertension (SBP of 130-139 mm Hg or DBP of 80-89 mm Hg). Patients with chronic hypertension were excluded. Maternal, neonatal, and composite hypertensive outcomes were compared between the groups. Subgroup analyses were conducted for patients with obesity (BMI ≥ 30) and those with pre-gestational diabetes mellitus (PGDM). A logistic regression model adjusted for maternal age, aspirin use, BMI, and PGDM was utilized.

Results: The study included 57,524 women. Of these, 46,924 (81.6%) were normotensive, 6,636 (11.5%) had elevated BP, and 3,964 (6.9%) had stage 1 hypertension. The incidence of composite hypertensive adverse outcome increased in a dose-response manner: 2.8% in the normotensive group, 6.4% in the elevated BP group, and 8.2% in the stage 1 hypertension group (p< 0.001). Neonatal NICU admissions were more common in the elevated BP and stage 1 hypertension groups compared to the normotensive group (p< 0.001). Logistic regression revealed that elevated BP, stage 1 hypertension, maternal age ≥35 years, and PGDM were independently associated with increased odds of composite hypertensive outcome: OR 2.22 (95% CI 1.94-2.55), OR 2.75 (95% CI 2.34-3.24), OR 1.88 (95% CI 1.57-2.27), and OR 1.55 (95% CI 1.29-1.86), respectively (p< 0.001 for all).

Conclusion: Preconceptional and first-trimester elevated BP and stage 1 hypertension, as defined by the AHA guidelines, are associated with an increased risk of maternal HDP.



	Total	Normal BP [a]	Elevated BP [b]	Stage1 BP [c]	p value
	n=57524	n=46924	n=6636)	n=3964	
Maternal outcomes:					
Gestational age at delivery					0.201
<34	348 (0.6)	278 (0.6)	37 (0.6)	33 (0.8)	
34-36+6	2613 (4.5)	2106 (4.5)	311 (4.7)	196 (4.9)	
Composite outcome*	2077 (3.6)	1326 (2.8)	426 (6.4)[a]	325 (8.2)[a,b]	<.001
Composite outcome < 32 wk	86 (0.1)	50 (0.1)	15 (0.2)	21 (0.5)	0.071
PE without severe features	1556 (2.7)	954 (2.0)	350 (5.3)[a]	252 (6.4)[a]	<.001
PE with severe features	670 (1.2)	465 (1.0)	107 (1.6)[a]	98 (2.5)[a,b]	<.001
HELLP syndrome	12 (0)	8 (0)	2 (0)	2 (0.1)	0.322
Eclampsia	75 (0.1)	50 (0.1)	11 (0.2)	14 (0.4)[a]	<.001
Placental abruption	569 (1.0)	469 (1.0)	54 (0.8)	46 (1.2)	0.190
Maternal ICU admission	186 (0.3)	152 (0.3)	16 (0.2)	18(0.5)	0.174
Mode of delivery					<.001
Spontaneous vaginal delivery	34218 (68.6)	28087 (68.9)[b,c]	3876 (67.3)	2255 (66.1)	
Assisted vaginal delivery	5889 (11.8)	4896 (12.0)[b]	620 (10.8)	373 (10.9)	
Cesarean delivery	9801 (19.6)	7759 (19.0)	1260 (21.9)[a]	782 (22.9)[a]	
Neonatal complications:					
IUGR	2455 (4.3)	1996 (4.3)	277 (4.2)	182 (4.6)	0.554
IUFD	4 (0)	4 (0)	0 (0)	0 (0)	0.636
Perinatal mortality	106 (0.2)	85 (0.2)	13 (0.2)	8 (0.2)	0.932
NICU admission	4221 (7.3)	3301 (7.0)	573 (8.6)[a]	347 (8.8)[a]	<.001

*Composite hypertensive adverse outcome included one or more of: preeclampsia with and without severe features, eclampsia, and HELLP syndrome
PE=preeclampsia; HELLP= Hemolysis, Elevated Liver enzymes and Low Platelets; GDM=gestational diabetes; ICU = intensive care unit; IUGR =intrauterine growth restriction; IUFD = intrauterine fetal demise; NICU = neonatal intensive care unit.
Results are based on two-sided tests. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion. Significance level for upper case letters (a,b,c).

542 | Standardized Clinical Assessment and Management Plan Improves Neonatal Outcomes in prenatally suspected Congenital Heart Disease

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4:00 PM - 6:00 PM

Objective: Prenatal diagnosis of congenital heart disease (CHD) has been associated with early-term and cesarean births. We implemented a standardized clinical assessment and management plan (SCAMP) aimed at reducing early-term and cesarean births. We aimed to evaluate the SCAMP's impact on neonatal outcomes focusing on survival at discharge rate and birthweight in pregnancies complicated by fetal CHD.

Study Design: Neonatal data from historical and intervention cohorts before and after SCAMP implementation were analyzed. Neonates with complete data on birth mode, birthweight, and survival at discharge were included. The primary outcome was survival at discharge. Secondary outcomes included birthweight and survival differences based on birth mode (vaginal birth, IOL, and cesarean birth). Statistical comparisons used t-tests for continuous and chi-square tests for categorical variables.

Results: A total of 424 pregnancies were included in the study, comprising 177 historical pregnancies and 247 intervention cohort pregnancies. Mean birthweight increased from 2808g in the historical cohort to 2967g in the post-SCAMP intervention cohort ($p = 0.02$). The overall survival rate to discharge was higher in the intervention cohort (91.1%) compared to the historical cohort (83.1%) ($p = 0.012$). In the cesarean birth group, survival rates were higher in the intervention cohort (89.1%) compared to the historical cohort (76.1%) ($p = 0.02$). There were no significant differences in survival rates for induction of labor and spontaneous births between the historical and intervention cohorts ($p = 0.8$ and $p = 0.1$, respectively).

Conclusion: The implementation of a SCAMP focused on reducing early-term and cesarean birth significantly improved neonatal

outcomes, notably increasing neonates with CHD survival rates at discharge. This improvement was most pronounced in cesarean births. Clinical pathways focused on the prenatal course of pregnancies affected by CHD improve neonatal outcomes.

	Historical (n=177)	Intervention (n=247)	P value
Neonatal birth wight (g)	2808	2967	0.02
Survival at discharge n(%)	147(83.1)	225(91.1)	0.01
Survival at discharge -spontaneous birth n,total(%)	41/46(89.1)	81/90(90.0)	0.81
Survival at discharge -Induction of labor n,total(%)	37/42(88.1)	54/56(96.4)	0.11
Survival at discharge -Caesarean Birth n,total(%)	51/67(76.1)	90/101(89.1)	0.02

543 | Predictive Modeling for Antenatal Shoulder Dystocia Risk

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4:00 PM - 6:00 PM

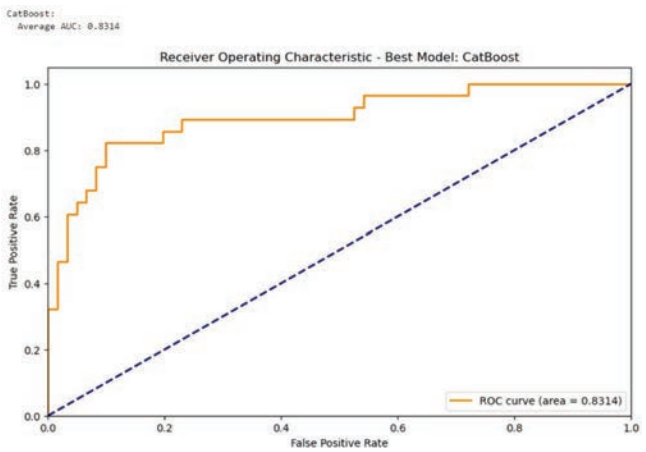
Objective: Shoulder dystocia (SD) represents a significant complication during delivery, posing substantial risks. Despite its challenging predictability, assessing individual risk is crucial for informed counseling on optimal delivery methods. The objective of this study was to develop and validate a model prediction system for SD using fetal ultrasound and maternal data.

Study Design: Data was retrospectively obtained from deliveries in Meir Hospital between 2014 and 2023.The inclusion criteria were singleton pregnancies and vaginal deliveries. The features included in the tested models were those that had a small percentage of null values in the SD cases. In cases of null values in normally distributed features, we completed the data with mean values. The final model parameters included maternal age, BMI, obstetric history, maternal height, gestational or pre-gestational diabetes, gestational age at delivery, clinical and sonographic estimated fetal weight, fetal gender, and mode of delivery (vaginal or operative vaginal). To address imbalanced data, we used repeated random sampling of the negative cases. The training and test sets were split in a 70:30 ratio and standardized.

Several classifiers, including logistic regression, decision tree, random forest, support vector machine, XGBoost, and CatBoost, were evaluated using cross-validation and area under the ROC Curve (AUC). We chose the model based on the highest mean AUC. The analysis was conducted in Python using Pandas, Scikit-learn, Numpy, and visualization libraries.

Results: A total of 51,628 deliveries were analyzed, including 94 SD cases. SD patients had higher rates of diabetes (13% vs. 4.8%) and obesity (23% vs. 5%) compared to non-SD patients, and higher mean neonatal birthweight (3751 g vs. 3287 g). The highest mean AUC was achieved using the CatBoost model, which demonstrated high discriminatory ability in predicting SD (AUC = 0.83).

Conclusion: The SD prediction model presented in this study serves as a valuable adjunct for clinical decision-making regarding the appropriate mode of delivery.



544 | Do Maternal Attributes Including Clinical Risk and Antenatal Services Predict Postpartum Care by 6 Months?

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4:00 PM - 6:00 PM

Objective: Adequate postpartum care (PPC) is critical to overall maternal health, however rates of PPC utilization in the United States are suboptimal. To better understand factors related PPC engagement, we sought to broadly examine maternal attributes including clinical risk, antenatal services, labor and delivery outcomes, and their association with 6-month PPC.

Study Design: Retrospective cohort analysis of patients delivering in a hospital system 2013-2022 with at least 1 documented prenatal care (PNC) visit. We identified PPC visits by examining electronic medical record (EMR) data for ICD codes for any PPC engagement within 6 months across all specialty departments, and traditional PPC defined by ICD codes Z39 and V24. Patient socio-demographics, antenatal clinical diagnoses, measures of PNC service utilization, and maternal/neonatal outcomes were examined by PPC engagement using chi-square or ANOVA. Multivariable logistic regression was performed including all variables $p < 0.05$ in bivariate tests. Adjusted odds ratios (aOR) and 95% CI are presented in Table 1.

Results: Among 60,933 deliveries, 90.3% and 78.3% had any PPC and traditional PPC, respectively. PPC engagement at 6 months varied by many patient attributes. Following multivariable adjustment, significantly reduced odds of any PPC and traditional PPC were observed among patients with the following attributes: multiparous, smoking, single relationship status, public insurance, gestational diabetes (GDM), and substance use disorder (SUD). In contrast, significantly increased likelihood of PPC was demonstrated among patients with planned or intrapartum cesarean, preterm birth, chronic hypertension (cHTN), depres-

sion or anxiety, influenza vaccination, and higher number of PNC visits.

Conclusion: Although the overall rate of PPC is high in this diverse cohort, patients with disparity-related risk demonstrate significantly lower rates of PPC. These data can inform targeted antenatal and delivery admission encounter interventions to optimize PPC with the goal of improving maternal health.

Table 1. Patient characteristics and association with PPC at 6 months, N=60,933

	Any PPC encounter				Traditional PPC encounter (Z39 or V24 ICD code)			
	No	Yes			No	Yes		
Sociodemographics	5926 (9.7)	55007 (90.3)	p-value	aOR (95% CI)	13244 (21.7)	47689 (78.3)	p-value	aOR (95% CI)
Age ≥35	1431 (24.2)	14093 (25.6)	0.01	**1.11 (1.03-1.20)**	3176 (24.0)	12348 (25.9)	<0.0001	1.05 (0.99-1.11)
Race ethnicity			<0.0001				<0.0001	
Hispanic	1662 (28.1)	13369 (24.3)		0.96 (0.88-1.06)	4070 (30.7)	10961 (23.0)		**0.81 (0.75-0.86)**
Black, non-Hispanic	1186 (20.0)	9954 (18.1)		1.02 (0.92-1.12)	2740 (20.7)	8400 (17.6)		0.94 (0.88-1.01)
White non-Hispanic	2346 (39.6)	26574 (48.3)		REF	4985 (37.6)	23935 (50.2)		REF
Asian, non-Hispanic	283 (4.8)	3034 (5.5)		1.11 (0.95-1.30)	632 (4.8)	2685 (5.6)		1.02 (0.91-1.13)
Other	449 (7.6)	2076 (3.8)		**0.66 (0.57-0.75)**	817 (6.2)	1708 (3.6)		**0.68 (0.61-0.76)**
Multiparous*	3766 (63.6)	31145 (56.6)	<0.0001	**0.79 (0.73-0.85)**	8302 (62.7)	26609 (55.8)	<0.0001	**0.83 (0.79-0.88)**
Smoking	677 (11.4)	3829 (7.0)	<0.0001	**0.74 (0.66-0.83)**	1548 (11.7)	2958 (6.2)	<0.0001	**0.66 (0.60-0.71)**
Single, divorced, widowed	2671 (45.1)	20025 (36.4)	<0.0001	**0.83 (0.78-0.90)**	6101 (46.1)	16595 (34.8)	<0.0001	**0.86 (0.82-0.91)**
BMI at delivery ≥30*	3448 (58.7)	33007 (60.2)	0.02	0.99 (0.92-1.05)	7886 (59.9)	28570 (60.1)	0.70	
Non-English language	921 (15.5)	6343 (11.5)	<0.0001	0.92 (0.84-1.02)	2168 (16.4)	5096 (10.7)	<0.0001	**0.82 (0.77-0.89)**
Public insurance	3386 (57.1)	23735 (43.2)	<0.0001	**0.76 (0.70-0.83)**	7778 (58.7)	19343 (40.6)	<0.0001	**0.70 (0.66-0.74)**
Maternal clinical diagnoses								
GDM	1345 (22.7)	6547 (11.9)	<0.0001	**0.39 (0.35-0.42)**	2468 (18.6)	5424 (11.4)	<0.0001	**0.48 (0.45-0.51)**
Pregestational diabetes	283 (4.8)	2210 (4.0)	0.005	0.85 (0.72-1.002)	702 (5.3)	1791 (3.8)	<0.0001	**0.66 (0.59-0.75)**
HDP	869 (14.7)	10735 (19.5)	<0.0001	**1.35 (1.23-1.48)**	2372 (17.9)	9232 (19.4)	0.0002	1.05 (0.96-1.12)
cHTN	346 (5.8)	5269 (9.6)	<0.0001	**1.57 (1.37-1.79)**	1082 (8.2)	4524 (9.5)	<0.0001	**1.25 (1.15-1.37)**
Depression or anxiety	1119 (18.9)	13803 (25.1)	<0.0001	**1.31 (1.21-1.42)**	3008 (22.7)	11914 (25.0)	<0.0001	**1.14 (1.08-1.21)**
SUD**	615 (10.4)	3722 (6.8)	<0.0001	**0.81 (0.72-0.92)**	1443 (10.9)	2894 (6.1)	<0.0001	**0.60 (0.73-0.67)**
Multiple gestation	148 (2.5)	1417 (2.6)	0.72		319 (2.4)	1246 (2.6)	0.19	
Prenatal care services								
Fetal anatomy ultrasound	4857 (83.7)	50832 (92.4)	<0.0001	0.97 (0.88-1.07)	11458 (86.5)	44331 (93.0)	<0.0001	**1.10 (1.02-1.19)**
Social work encounter	747 (12.6)	7209 (13.1)	0.28		1995 (15.1)	5961 (12.5)	<0.0001	**0.84 (0.79-0.90)**
Influenza vaccination	1873 (31.6)	29318 (53.3)	<0.0001	**1.32 (1.24-1.42)**	5508 (41.6)	25683 (53.9)	<0.0001	**1.09 (1.04-1.14)**
Number of PNC visits - median (IQR)	4.0 (1.0-9.0)	12.0 (9.0-14.0)	<0.0001	**1.37 (1.35-1.38)**	7.0 (2.0-12.0)	12.0 (10.0-15.0)	<0.0001	**1.28 (1.27-1.29)**
GA at 1st PNC visit - median (IQR)*	109.0 (80.0-203.0)	72.0 (59.0-95.0)	<0.0001	**1.003 (1.003-1.004)**	90.0 (69.0-165.0)	71.0 (59.0-92.0)	<0.0001	**1.004 (1.003-1.004)**
Labor and delivery, maternal/neonatal outcomes								
Induction	1697 (28.6)	17092 (31.1)	<0.0001	0.95 (0.88-1.03)	3885 (29.3)	14904 (31.3)	<0.0001	0.97 (0.92-1.02)
Mode of delivery			<0.0001				<0.0001	
Vaginal	4096 (69.8)	36148 (66.1)		REF	8874 (67.7)	31370 (66.2)		REF
Planned cesarean	1304 (22.2)	12211 (22.3)		**1.33 (1.20-1.47)**	3107 (23.7)	10408 (22.0)		**1.13 (1.06-1.19)**
Intrapartum cesarean	468 (8.0)	6310 (11.5)		**1.29 (1.14-1.47)**	1135 (8.7)	5643 (11.9)		**1.23 (1.13-1.33)**
Length of stay 72+ hrs	2353 (39.7)	23050 (41.9)	0.001	1.06 (0.97-1.16)	5593 (42.2)	19810 (41.5)	0.15	
Maternal ICU	12 (0.2)	191 (0.4)	0.07		53 (0.4)	150 (0.3)	0.13	
Preterm birth *	621 (10.6)	5328 (9.7)	0.04	**1.89 (1.68-2.12)**	1493 (11.4)	4456 (9.4)	<0.0001	**1.72 (1.58-1.87)**
NICU	1172 (19.8)	10071 (18.3)	0.006	1.00 (0.91-1.09)	2631 (19.9)	8612 (18.1)	<0.0001	1.03 (0.96-1.09)
SGA <10th percentile*	686 (11.7)	5593 (10.2)	0.0004	0.94 (0.85-1.04)	1487 (11.4)	4792 (10.1)	<0.0001	0.98 (0.91-1.06)
Fetal growth restriction	637 (10.8)	5847 (10.6)	0.78		1427 (10.8)	5057 (10.6)	0.57	
Macrosomia (≥4000g)*	471 (8.0)	4679 (8.5)	0.15		1032 (7.8)	4118 (8.6)	0.002	**0.89 (0.82-0.97)**
Fetal demise	44 (0.7)	360 (0.7)	0.43		173 (1.3)	231 (0.5)	<0.0001	0.95 (0.82-1.48)
Neonatal demise	18 (0.3)	227 (0.4)	0.21		75 (0.6)	170 (0.4)	0.0007	**1.47 (1.02-2.13)**

* missing values: parity (n=913), BMI (n=248), GA 1st PNC (n=213), macrosomia (n=52), PTB (n=229), SGA (n=463).
** ICD (substance use disorder or dependence) defined by: alcohol, cannabis, cocaine, hallucinogens, inhalants, opioids, sedatives.

545 | Patient-Reported Unmet Health-Related Social Needs in Patients with and Without Gestational Diabetes

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4:00 PM - 6:00 PM

Objective: Gestational diabetes (GDM) is a common pregnancy complication associated with social determinants of health (SDOH) including economic stability, social and community context and neighborhood environment. Little is known regarding the impact of patient-level manifestations of SDOH, termed unmet health-related social needs (HRSNs), on GDM. We sought to characterize the impact of patient-reported HRSNs on GDM.

Study Design: Retrospective cohort study of pregnant patients that completed a validated electronic screening tool at least one time for HRSNs during pregnancy in a regional health-care system from 5/2020 to 3/2024. Patients with pre-existing diabetes or multiple gestation were excluded. HRSNs were compared between patients with and without GDM by ICD-10 codes at delivery. Generalized estimating equations were generated to determine adjusted odds ratios (aOR) for the association between HRSNs and GDM, adjusting for patient characteristics known to be associated with GDM.

Results: 2,024 patients met inclusion criteria, of whom 174 (8.6%) had GDM. The GDM cohort was more likely to be older, Black or Asian, multiparous, and to have obesity. Compared to patients without GDM, patients with GDM were more likely to have food insecurity (8.6% vs. 3%) and transportation barriers (13.8% vs. 8.1). 77 patients with GDM (44.3%, p = 0.03) had ≥ 1 HRSN in any domain. In logistic regression models controlling for patient characteristics, transportation barriers (aOR 4.3, 95% CI 2.18-8.50), food insecurity (aOR 1.95, 95% CI 1.14-3.34), and ≥ 3 HRSN domains (aOR 1.93, 95% CI 1.19-3.13) were significantly associated with GDM (Table 1). Other HRSNs represented in the cohort (Figure 1) were not significantly associated with risk of GDM (Table 1).

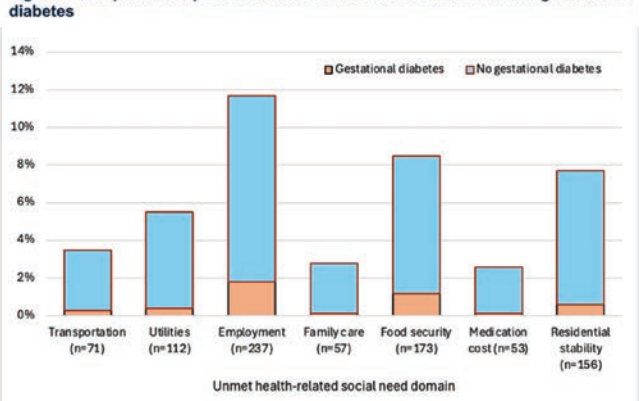
Conclusion: Multiple HRSNs are risk factors for GDM, and the effect size of transportation barriers was on par with that of obesity. Further research is needed to understand the impact of these HRSNs on the development of GDM so appropriate primary prevention tools on a patient- and community-level can be developed to optimize birth outcomes.

Table 1 - Patient characteristics and odds of gestational diabetes among those with health-related social needs

	GDM N=174	No GDM N=1850	Adjusted Odds Ratio* (95% CI)
Advanced maternal age	99 (57.2%)	875 (47.9%)	1.53 (1.07-2.18)^
Race			
Non-Hispanic White	71 (40.8%)	974 (52.6%)	(Reference)
Non-Hispanic Black	28 (16.1%)	181 (9.8%)	1.68 (0.99-2.84)^
Hispanic (any race)	11 (6.3%)	171 (9.2%)	0.64 (0.31-1.33)^
Non-Hispanic Asian	37 (21.3%)	147 (7.9%)	4.87 (3.05-7.77)^
Other Non-Hispanic Race	27 (15.5%)	377 (20.4%)	0.88 (0.53-1.45)^
Nulliparous	77 (44.3%)	1023 (55.3%)	0.69 (0.48-0.98)^
Obesity	75 (45.7%)	388 (22.7%)	3.44 (2.39-4.96)^
Health-related Social Need			
Transportation barriers	15 (8.6%)	56 (3.0%)	4.37 (2.26-8.77)
Food insecurity	24 (13.8%)	149 (8.1%)	2.16 (1.27-3.67)
Utilities	161 (92.5%)	1751 (94.6%)	1.45 (0.75-2.82)
Unemployment	147 (84.5%)	1640 (88.6%)	1.45 (0.88-2.41)
Family care	7 (4.0%)	50 (2.7%)	1.36 (0.58-3.19)
Paying for medication	8 (4.6%)	45 (2.4%)	2.59 (0.89-5.68)
Residential stability	14 (8.0%)	142 (7.7%)	1.27 (0.67-2.39)
Number of Health-related Social Needs			
0	97 (55.7%)	1186 (64.1%)	-
≥1	77 (44.3%)	664 (35.9%)	1.40 (0.97-2.01)
≥2	47 (27.0%)	381 (20.6%)	1.29 (0.86-1.96)
≥3	32 (18.4%)	209 (11.3%)	1.89 (1.14-3.00)

*=model adjusted for advanced maternal age, race/ethnicity, obesity, and nulliparity
^= aOR from model including transportation barriers and
GDM, gestational diabetes mellitus

Figure 1 - Proportion of patients with health-related social needs and gestational diabetes



546 | Influence of Preconception and Pregnancy Exposure to Marijuana on Adverse Perinatal Outcomes

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4:00 PM - 6:00 PM

Objective: Marijuana consumption during pregnancy has been associated with adverse perinatal outcomes. However, whether exposure during the preconception period also poses a risk is unknown.

Study Design: Retrospective cohort utilizing data from PRAMS Phase 8 Core Questionnaire and the Marijuana & Prescription Drug Supplement from 2017-2021. The association between marijuana use 3 months prior to pregnancy, during pregnancy, and during both periods and pregnancy outcomes were observed. The primary outcome was fetal growth restriction (FGR) < 10%ile. Other outcomes examined were severe FGR, preterm birth <37 weeks, low birth weight, infant mortality, and NICU admission. Generalized linear modeling estimated the associations while adjusting for coexisting risks of maternal race, tobacco use, education status, obesity, and parity.

Results: Of 17,882 postpartum individuals surveyed, 88.7% reported no marijuana consumption, 5.4% reported use prior to pregnancy only, 0.1% during pregnancy only, and 5.9% preconception and during pregnancy. Marijuana consumption prior to and during pregnancy was associated with a 30% increased risk of FGR and severe FGR, even after accounting for tobacco use and other risk factors (Table 2). The rate of infant mortality also increased but was not statistically significant. Cessation of marijuana use after the preconception period was not associated with an increased risk of adverse perinatal outcomes.

Conclusion: Marijuana use before and during pregnancy is associated with increased risk of adverse perinatal outcomes, even after adjusting for confounding risks. However, exposure during only the pregestational period was not. This highlights the importance of counseling patients regarding the risks of marijuana use during pregnancy and the importance of cessation

Table 1. Maternal Characteristics Stratified by Marijuana Consumption

	Gestational Period when Marijuana was Consumed			
	No Marijuana Consumption *n=12,681*	**3 Months Prior to Pregnancy Only** *n=780*	**3 Months Prior + During Pregnancy** *n=831*	**P-Value**
Demographic Characteristics				
Age (years)				<0.001
<20	527; 4.2%	72; 9.2%	75; 9%	
20-34	9,627; 75.9%	618; 79.2%	689; 8.1%	
≥35	2,526; 19.9%	90; 11.5%	67; 8.1%	
Race/Ethnicity				<0.001
American Indian or Alaskan Native	1,218; 9.7%	105; 13.6%	208; 25.2%	
Hispanic	2,075; 16.5%	100; 12.9%	81; 9.8%	
Non-Hispanic Black	1,154; 9.2%	105; 13.6%	83; 10.1%	
Non-Hispanic White	6,697; 53.3%	415; 53.6%	407; 49.3%	
Other	1,421; 11.3%	50; 6.5%	47; 5.7%	
Social and Socioeconomic Factors				
Unmarried	4,712; 37.2%	474; 60.9%	656; 79.5%	<0.001
Education				<0.001
≤High school graduate, GED	4,317; 34.3%	330; 42.5%	519; 63.1%	
Some college, Associate's	3,432; 27.3%	261; 33.6%	237; 28.8%	
Bachelor's degree or greater	4,841; 38.5%	186; 23.9%	66; 8%	
Insurance				<0.001
Medicaid	4,682; 37.2%	401; 51.9%	580; 71.5%	
Private	6,550; 52.1%	327; 42.4%	180; 22.2%	
Self-pay	526; 4.2%	7; 0.9%	7; 0.9%	
Other[1]	816; 6.5%	37; 4.8%	44; 5.4%	
Cigarette Smoker	1,402; 11.1%	222; 28.7%	409; 49.8%	<0.001
Pregnancy Characteristics				
Primiparous	4,691; 37.1%	413; 53.1%	350; 42.1%	<0.001
Pre-Pregnancy Body Mass Index				<0.001
Underweight <18.5	294; 2.3%	25; 3.2%	42; 5.1%	
Normal (18.5-24.9)	4,876; 38.5%	306; 39.2%	317; 38.2%	
Overweight (25.0-29.0)	3,475; 27.4%	174; 22.3%	199; 24%	
Obese (≥30)	4,036; 31.9%	275; 35.3%	273; 32.9%	
Initiation of Prenatal Care				<0.001
No Prenatal Care	231; 2%	11; 1.6%	40; 5.5%	
1st Trimester	9,634; 81.6%	553; 77.8%	484; 66.4%	
2nd Trimester	1,527; 12.9%	119; 16.7%	158; 21.7%	
3rd Trimester	416; 3.5%	28; 3.9%	47; 6.5%	

[1]Other insurance includes Tricare and SCHIP/CHIP

Table 2: Pregnancy Outcomes Stratified by Marijuana Consumption

	Gestational Period when Marijuana was Consumed			
	No Marijuana Consumption *n=12,166*	**3 Months Prior to Pregnancy Only** *n=740*	**3 Months Prior + During Pregnancy** *n=805*	**P-Value**
FGR, < 10th %ile	1,673; 13.8%	104; 14.1%	193; 24%	<0.001
RR (95% CI)	REF	1.01 (0.8-1.22)	1.73 (1.52-1.97)	
adjRR[2] (95%CI)	REF	0.82 (0.68-0.99)	1.3 (1.12-1.49)	
Severe FGR, < 2 SD[3]	428; 3.5%	30; 4.1%	60; 7.5%	<0.001
RR (95% CI)	REF	1.17(0.82-1.67)	2.09 (1.61-2.71)	
adjRR (95%CI)	REF	0.86 (0.6-1.24)	1.37 (1.04-1.82)	
Preterm Birth, <37w	2,055;16.2%	142; 18.2%	183; 22.02%	<0.001
RR (95% CI)	REF	1.14 (0.98-1.33)	1.34 (1.17-1.53)	
adjRR (95%CI)	REF	1.01 (0.86-1.18)	1.16 (1.0 -1.34)	
Low Birth Weight	1,370;10.8%	100; 12.82%	141; 16.97%	<0.001
RR (95% CI)	REF	1.23 (1.02-1.48)	1.55 (1.32-1.82)	
adjRR (95%CI)	REF	1.03 (0.85-1.25)	1.26 (1.06-1.5)	
Infant Mortality[4]	99; 0.79%	10; 1.29%	11; 1.34%	0.193
RR (95% CI)	REF	1.78 (0.96-3.30)	1.66 (0.9-3.1)	
adjRR (95%CI)	REF	1.65 (0.87-3.14)	1.6 (0.82-3.1)	
NICU Admission	92; 8.84%	4; 6.45%	14; 17.95%	0.021
RR (95% CI)	REF	0.72 (0.27-1.89)	2.03 (1.22-3.39)	
adjRR (95%CI)	REF	0.64 (0.24-1.7)	1.53 (0.88-2.69)	

[2]Adjusted relative risks include adjustment for maternal race, tobacco use, high school diploma/GED or less, obesity, and parity

[3]SD = standard deviation below the mean

[4]Infant Mortality is defined as infant death during the 2 to 6-month period after birth in which PRAMS is administered

547 | Temporal Trends in Gonorrhea and Chlamydia Infections During Pregnancy: 2013-2023

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4:00 PM - 6:00 PM

Objective: Gonorrhea (GC) and chlamydia (CT) infection during pregnancy is increasing nationally. We evaluated the incidence of GC and/or CT infection in pregnancy as well as risk factors for infection over the past 11 years at single center.

Study Design: Retrospective study of all pregnant patients who delivered between 2013-2023 at large urban tertiary care center in Alabama. The primary outcome was the incidence of infection with GC, CT, or both (GC/CT co-infection) identified during pregnancy by nucleic acid amplification testing; secondary outcomes included rates of treatment, time to treatment, and reinfection rates. Outcomes were compared across the study period with linear regression to assess trends. We secondarily compared baseline characteristics between individuals with and without GC and/or CT infection using multivariable logistic regression. Tests of heterogeneity (interaction p-values) were conducted by year to assess different effects in these risk factors over the study period.

Results: Over the study period, 40,139 patients were analyzed (no exclusions) - 1.8% had GC, 6.6% CT, and 0.8% both. Rates of infection (GC, CT, and both) significantly decreased over time (Figure, all $p < 0.001$). Rates of treatment were high (range 58.4%-71.7%), reinfection low (6.2%-12.9%), and did not demonstrate trends across the study period ($p > 0.05$). Of note, time to treatment significantly decreased over the study period from a median of 5 days (IQR 0-10) to 2 days (0-4) ($p < 0.001$). Multiple risk factors were associated with infection in multivariable analyses (Table). However, over time, there were only increasing risks of infection based on non-White/Black/Hispanic race/ethnicity (p-interaction = 0.02) and government insurance (p-interaction = 0.003).

Conclusion: Contrary to national reports in pregnant individuals, at our urban institution, we describe decreasing rates of GC and/or CT infection. Risk factors in our population are consistent with the literature. Further larger studies to confirm or refute our findings, and identify risk factors in populations with rising infection rates should be performed.

Figure: Rates of Gonorrhea (yellow), Chlamydia (blue), and co-infection with both GC/CT (purple) annually in pregnant individuals from 2013-2023 in a single center in Alabama

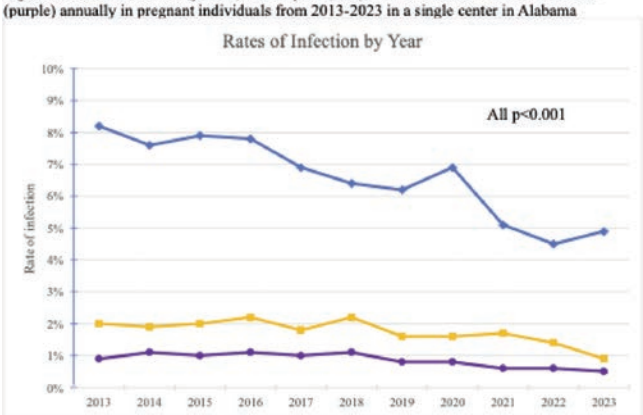

Table: Comparison of baseline characteristics and risk factors for GC/CT infection (data presented as % unless specified)

	GC/CT Positive (n=3011)	GC/CT Negative (n=37128)	aOR (95% CI)
Age years mean ± SD	22.9 ± 4.7	28.3 ± 5.9	0.87 (0.87-0.88)
Race/ethnicity			
Black, non-Hispanic	80.4	43.5	3.98 (3.44-4.61)
White, non-Hispanic	7.5	35.6	Ref
Hispanic	10.5	17.7	1.68 (1.40-2.01)
Other	1.7	3.3	2.89 (2.09-4.00)
BMI, kg/m^2 mean ± SD	32.8 ± 16.6	34.0 ± 12.3	0.99 (0.99-1.00)
Relationship status			
Single	90.7	56.1	2.08 (1.80-2.39)
Married	9.3	43.9	Ref
Diabetes mellitus	1.6	4.2	1.73 (1.28-2.34)
Hypertension	7.5	13.5	1.19 (1.02-1.39)
Payor status			
Private	10.0	38.6	Ref
Government/Self Pay	90.0	61.4	1.99 (1.74-2.27)
Gestation			
Singleton	98.0	96.7	Ref
Multiple	2.0	3.3	0.75 (0.57-0.99)

GC/CT: gonorrhea/chlamydia; SD: standard deviation; BMI: body mass index; kg: kilograms; m^2: meters squared; Ref: reference
* Adjusted for age, race, body mass index, marital status, diabetes mellitus, chronic hypertension, insurance status, syphilis infection, multiple gestation

548 | Association of Perinatal Inflammation and Breastfeeding Intensity

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4:00 PM - 6:00 PM

Objective: Higher systemic inflammation has been associated with lower rates of breastfeeding, but this has not been measured across multiple perinatal timepoints. We aimed to identify whether elevated inflammatory cytokines in blood during pregnancy and postpartum were associated with lower breastfeeding intensity.

Study Design: The Stress, Pregnancy, and Health (SPAH) observational study included 605 participants enrolled mid-gestation with singleton pregnancies. Participants completed surveys and antecubital blood draws between 20-27 and after 32 weeks gestation. Clinical outcomes were abstracted from the medical record. A sub-group of SPAH participants additionally completed surveys at 1 week, 6 weeks, 3 months, and 6 months postpartum as well as an additional blood draw at 6 weeks. Breastfeeding intensity was self-reported at all 4 surveys, and cytokines IL-1RA, IL-6, IL-10, and TNF-α, and C-reactive protein were measured in serum. Inflammation markers were log-transformed for normality and z-scored, and z-scores were summed into composites. Stepwise regression identified key covariates, which were retained in multiple regression models.

Results: 155 individuals were included in the analysis. As indicated by the stepwise regression, we retained marital status, SES, and any diabetes in prenatal models and gestational weeks at delivery, any diabetes, and hypertensive disorders of pregnancy, last BMI measured during pregnancy, and resource composite score in postpartum models. Adjusted models indicated that lower circulating inflammatory markers during pregnancy were associated with higher breastfeeding intensity across week 6, month 3, and month 6 time points. The postpartum inflammatory composite was associated with breastfeeding intensity at point of blood draw (6 weeks).

Conclusion: Lower prenatal inflammatory markers were associated with higher rates of breastfeeding in the postpartum period, but postpartum inflammatory markers were not. Inflammation in pregnancy may influence lactogenesis and breastfeeding initiation, differentiating breastfeeding outcomes in the postpartum period.

Table 1. Participant characteristics (n=155)

	M (SD) / N (%)
Age	34.4 (5.04)
Married	132 (85.2%)
Resource Composite	0.03 (0.73)
Pre-pregnancy BMI	32.5 (6.79)
Any diabetes (Yes)	24 (15.6%)
Hypertensive disorders of pregnancy (Yes)	21 (13.6%)
Gestational age (weeks)	
<37 weeks	13 (8.4%)
>37 weeks	139 (89.7%)
41 weeks	3 (1.9%)

Resource composite is the mean of z-scores of IPR, total savings, and how long they could maintain current cost of living if they lost income. Hypertensive disorders of pregnancy includes those with pre-eclampsia, gestational hypertension, and chronic hypertension. N=1 missing for any diabetes and hypertensive disorders of pregnancy.

Table 2. Unadjusted and adjusted relationships between prenatal and postpartum composite measures of inflammation and breastfeeding intensity at all timepoints.

	Unadjusted				Adjusted			
	Prenatal (n=155)		Postpartum (n=155)		Prenatal (n=154)		Postpartum (n=151)	
	β (95CI%)	p	β (95CI%)	p	β (95CI%)	p	β (95CI%)	p
BF intensity Week 1	-0.09 (-0.15, -0.03)	**<0.01**	-0.08 (-0.14, -0.02)	**0.01**	-0.05 (-0.12, 0.01)	0.09	-0.04 (-0.11, 0.03)	0.31
BF intensity Week 6	-0.09 (-0.16, -0.03)	**<0.01**	-0.10 (-0.17, -0.03)	**<0.01**	-0.09 (-0.16, -0.02)	**0.02**	-0.09 (-0.17, -0.00)	**0.04**
BF intensity Month 3	-0.13 (-0.21, -0.06)	**<0.01**	-0.11 (-0.19, -0.03)	**0.01**	-0.08 (-0.17, 0.00)	**0.05**	-0.06 (-0.15, 0.03)	0.21
BF intensity Month 6	-0.14 (-0.22, -0.06)	**<0.01**	-0.08 (-0.17, -0.01)	**0.07**	-0.11 (-0.19, -0.02)	**0.02**	-0.02 (-0.12, 0.09)	0.73

Adjusted for marital status, resource composite score, and any diabetes in prenatal models and for gestational age at delivery (weeks), any diabetes, last BMI measured during pregnancy, hypertensive disorders of pregnancy, and resource composite score in postpartum models.

549 | Physiologic Treatment of Mild Chronic Hypertension and Pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: Among patients with hypertension (HTN) in pregnancy, emerging research suggests that improved blood pressure (BP) control can be achieved if the antihypertensive drug used accounts for the underlying maternal hemodynamic physiology. We evaluated whether physiologic treatment of mild chronic HTN is associated with a reduction in adverse pregnancy outcomes.

Study Design: We conducted a secondary analysis of CHAP, an open-label, multicenter, randomized trial of antihypertensive treatment (vs. none) for pregnant patients with mild chronic HTN. Patients with BPs≥160/105 were excluded from CHAP trial. Eligible participants for this analysis had either hyperdynamic– a pulse pressure (PP)≥65, or vasoconstrictive– diastolic BP≥100 physiology. Three groups were compared based on treatment of BP at randomization: 1) Physiologic- hyperdynamic receiving Labetalol or vasoconstrictive receiving Nifedipine; 2) Non-physiologic- hyperdynamic receiving Nifedipine or vasoconstrictive receiving Labetalol, and 3) control- not on medications. The primary outcome was a composite of superimposed preeclampsia with severe features, preterm birth before 35 weeks' gestation, placental abruption, or fetal or neonatal death. Adjusted odds ratios (aORs) and 95% CIs were estimated with logistic regression.

Results: Of 2408 in CHAP, 542 (23.3%) participants met physiologic classification criteria and were analyzed: 136 (25.1%) had physiologic treatment, 125 (23.0%) had non-physiologic treatment, with 281 (51.8%) untreated controls. The primary outcome did not differ among those who received physiologic treatment (44.9%), non-physiologic (45.6%), or control (48.4%) with aOR (CIs) for physiologic vs control 0.85 (0.56-1.30), non-physiologic vs control 0.90 (0.59-1.39), and physiologic vs non-physiologic 0.95 (0.58-1.56).

Conclusion: Physiologic treatment of mild chronic HTN was not associated with a significant reduction in primary composite adverse outcome. Most patients did not meet criteria for physiologic classification. Further research using different thresholds to account for dynamic physiology over a greater BP range is needed.

Table 1: Baseline Characteristics of patients who received physiologic (vs. non-physiologic) treatment of mild chronic hypertension with pregnancy outcomes

Characteristic	Physiologic Treatment (n=136)	Non-physiologic Treatment (n=125)	Control (n=281)	p-value
Age (years)	31.7 ± 6.2	32.2 ± 5.9	32.5 ± 5.9	0.55
Race or ethnic group – no (%)				
Non-Hispanic White	34 (25.0)	33 (26.4)	69 (24.6)	0.88
Non-Hispanic Black	77 (56.6)	65 (52.0)	151 (53.7)	
Hispanic	20 (14.7)	22 (17.6)	52 (18.5)	
Other	5 (3.7)	5 (4.0)	9 (3.2)	
Insurance type				
Government	89 (65.4)	69 (55.2)	160 (56.9)	0.14
Private	37 (27.2)	43 (34.4)	98 (34.9)	
None	7 (5.1)	12 (9.6)	18 (6.4)	
Missing Data	3 (2.2)	1 (0.8)	5 (1.8)	
Type of CHTN				
Newly diagnosed	29 (21.3)	30 (24.0)	65 (23.1)	0.70
Diagnosed and receiving medications	72 (52.93)	68 (54.4)	156 (55.5)	
Diagnosed and not receiving medications	35 (25.7)	27 (21.6)	60 (21.4)	
Previous pregnancy	122 (89.7)	99 (79.2)	236 (84.0)	**0.02**
Body Mass Index				
Mean	39.9 ± 9.1	39.6 ± 10.2	38.8 ± 10.3	0.82
<30	20 (14.7)	21 (16.8)	50 (17.8)	0.92
30-40	48 (35.3)	45 (36.0)	119 (42.3)	
≥40	65 (47.8)	59 (47.2)	108 (38.4)	
Missing Data	3 (2.2)	0 (0)	4 (1.4)	
Gestational age <14 weeks	54 (39.7)	55 (44.0)	127 (45.2)	0.48
Comorbidities				
Diabetes mellitus	26 (19.1)	14 (11.2)	47 (16.7)	0.08
Current smoker	12 (8.8)	10 (8.0)	21 (7.5)	0.81
Aspirin use	60 (44.1)	54 (43.2)	128 (45.6)	0.88
Drug Type				
Labetalol	109 (80.1)	55 (44.0)	0 (0)	**<0.01**
Nifedipine	27 (19.9)	70 (56.0)	0 (0)	

Table 2. Primary Outcomes of patients who received physiologic (vs. non-physiologic) treatment of mild chronic hypertension with pregnancy outcomes

Outcome	Physiologic Treatment (n=136)	Non-physiologic Treatment (n=125)	Control (n=281)	aOR (95% CI)		
				Physiologic treatment vs. control	Non-Physiologic treatment vs. control	Physiologic vs. Non physiologic treatment
Primary Outcome: CHAP Composite	61 (44.9)	57 (45.6)	136 (48.4)	0.85 (0.56-1.30)	0.90 (0.59-1.39)	0.95 (0.58-1.56)
Preeclampsia with severe features	34 (25.0)	34 (27.2)	85 (30.3)	0.76 (0.48-1.23)	0.86 (0.53-1.39)	0.89 (0.51-1.57)
Medically indicated preterm birth < 35 weeks	18 (13.2)	23 (18.4)	52 (18.1)	0.67 (0.37-1.20)	1.00 (0.57-1.73)	0.67 (0.34-1.32)
Placental abruption	2 (1.5)	4 (3.2)	6 (2.1)	‖	‖	‖
Severe hypertension	22 (16.2)	19 (15.2)	38 (13.5)	1.22 (0.69-2.18)	1.16 (0.64-2.12)	1.05 (0.54-2.07)
Fetal or Neonatal death	3 (2.2)	4 (3.2)	12 (4.3)	‖	‖	‖

aOR (95% CI), adjusted odds ratio with 95% confidence interval. Covariates included confounders such as race, type of chronic hypertension, current smoker and aspirin use.
‖ Multivariable modeling was not performed if the count was less than 5.

550 | Are Maternal Fever Height and Duration During Labor Associated with the Risk of Hypoxic-Ischemic Encephalopathy?

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4:00 PM - 6:00 PM

Objective: To examine if the height of fever and/or duration between maternal fever onset and delivery modifies the risk of hypoxic-ischemic encephalopathy (HIE).

Study Design: Population-based cohort study of singleton neonates without congenital anomalies born ≥ 35 weeks at 15 Kaiser Permanente Northern California hospitals between January 2012 and July 2019. Maternal fever was defined as at least one temperature ≥38°C before delivery. Maximal maternal temperature and timing of the first maternal fever were extracted from medical records. HIE was defined as the presence of both neonatal encephalopathy and perinatal acidosis (cord pH< 7 or base deficit >10 on any gas within 2 hours after birth). We evaluated the associations between maximal maternal temperature and duration between fever onset to delivery and neonatal outcomes, using Poisson regression adjusting for duration of labor as a spline.

Results: Among 280,347 neonates, exposure to maternal fever occurred in 27,317 (9.8%) and HIE occurred in 490 (0.17%). The incidence of HIE was higher among infants of febrile compared to afebrile mothers (Relative risk - RR 4.4 [95% CI 3.6-5.3]). Both the height (Figure 1) and duration (Figure 2) of fever were associated with an increased risk of HIE. After adjusting for duration of labor, the incidence of HIE increased with each 0.1°C increase in maximal maternal temperature (Incidence rate ratio- IRR 1.09; 95% CI 1.08-1.11) and for each hour between fever onset and delivery (IRR 1.06 95%CI 1.05-1.07).

Conclusion: The higher the maternal fever and the longer the duration between fever onset and delivery, the higher the risk of developing HIE. Novel strategies designed to predict the risk of adverse neonatal outcomes during labor and delivery should account for these factors.

Figure 1. Height of maximal maternal temperature in labor and incidence of hypoxic-ischemic encephalopathy (95% CI).

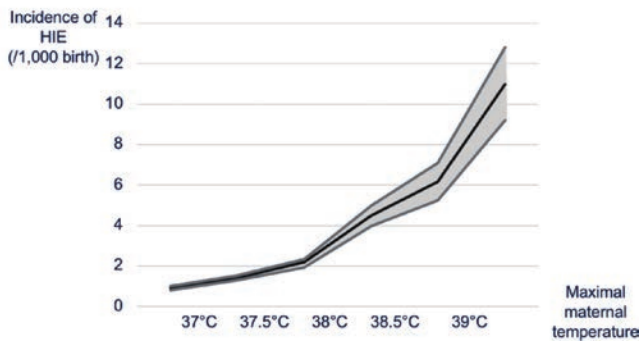
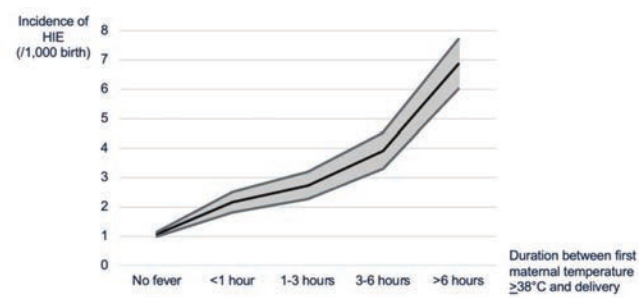


Figure 2. Duration between fever onset and delivery and incidence of hypoxic-ischemic encephalopathy (95% CI).



551 | Obstetric, Maternal and Neonatal Outcomes Associated with Attempted Trial of Labor after Cesarean Delivery

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4:00 PM - 6:00 PM

Objective: To examine the obstetric, maternal, and neonatal outcomes associated with attempted trial of labor after cesarean delivery (TOLAC) in the United States (US).

Study Design: A retrospective analysis of the Centers for Disease Control and Prevention's Natality live birth database (2016-2022). The inclusion criteria consisted of term (37 0/7 - 40 6/7 weeks), singleton pregnancies with a history of cesarean delivery. The study group comprised of individuals who attempted TOLAC, while the comparison group consisted of those undergoing repeat cesarean section without TOLAC. Obstetric, maternal, and neonatal outcomes were compared between the two groups using Pearson's chi-square test. Results were presented as odds ratios (OR) with 95% confidence intervals (CI). Statistical significance was defined as p-value < 0.05.

Results: Of the 7,250,494 live births with previous cesarean sections analyzed, 2,313,494 (31.9%) individuals attempted TOLAC. The prevalence of attempted TOLAC and the ORs based on different maternal and neonatal outcomes are presented in Tables 1 and 2, respectively.

Conclusion: Based on this large contemporary US database, we provide an update on obstetric, maternal, and neonatal outcomes associated with attempted TOLAC. Attempted TOLAC was associated with a higher risk of maternal intensive care unit (ICU) admission, maternal antibiotic use, uterine rupture, immediate neonatal assisted ventilation, and 5-minute APGAR scores < 7. However, attempted TOLAC was associated with lower odds of assisted neonatal ventilation after six hours and neonatal ICU admissions, suggesting that attempted TOLAC has a transient impact on the neonatal status. These findings can be used to help counsel patients on risks of attempting TOLAC.

Table 1. Maternal Outcomes Associated with Attempted TOLAC.

	Elective Cesarean	Attempted TOLAC	OR (95% CI)
Maternal ICU	15,911/4,932,996 (0.3%)	6,440/1,842,731 (0.4%)	1.08 (1.05-1.12)
Maternal Antibiotics	97,308/4,935,096 (2.0%)	59,892/1,843,673 (3.3%)	1.67 (1.65-1.69)
Uterine Rupture	2,702/4,932,996 (0.1%)	2,777/1,842,731 (0.2%)	2.75 (2.61-2.90)

Table 2. Neonatal Outcomes Associated with Attempted TOLAC.

	Elective Cesarean	Attempted TOLAC	OR (95% CI)
Infant Weight < 2500g	326,717/4,170,713 (7.8%)	88,163/1,527,799 (5.8%)	0.72 (0.71-0.73)
Assisted Ventilation (Immediate)	331,244/4,935,096 (6.7%)	152,144/1,843,673 (8.3%)	1.25 (1.24-1.26)
Assisted Ventilation (6 hours)	128,976/4,935,096 (2.6%)	36,455/1,843,673 (2.0%)	0.75 (0.74-0.76)
Neonatal ICU	562,234/4,935,096 (11.4%)	206366/1,843,673 (11.2%)	0.98 (0.97-0.99)
5-Minute APGAR < 7	125,627/4,937,000 (2.5%)	64,719/1,844,474 (3.5%)	1.39 (1.38-1.41)

552 | Does Day of Delivery Matter? Obstetric, Maternal and Neonatal Outcomes in Term, Singleton Weekend Births

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4:00 PM - 6:00 PM

Objective: To determine whether obstetric, maternal, and neonatal outcomes differ between weekend and weekday deliveries in the contemporary United States (US).

Study Design: A retrospective analysis of the Centers for Disease Control and Prevention's Natality live birth database (2016-2022). The inclusion criteria consisted of term (37 0/7 - 40 6/7 weeks), singleton pregnancies. The study group comprised of births occurring on the weekend (Saturday or Sunday) while

the comparison group consisted of those occurring during the weekdays (Monday through Friday). Obstetric, maternal, and neonatal outcomes were compared between the two groups using Pearson's chi-square test. Results were presented as odds ratios (OR) with 95% confidence intervals (CI). Statistical significance was defined as p-value < 0.05.

Results: Of the 22,355,756 live births analyzed, 4,598,349 (20.6%) births occurred on weekends. The prevalence of weekend births and the ORs based on different maternal and neonatal outcomes are presented in Tables 1 and 2, respectively.

Conclusion: Based on this large contemporary US database, weekend births are associated with higher rates of maternal intensive care unit (ICU) admission, 3rd and 4th degree perineal lacerations, maternal antibiotic use, uterine rupture, neonate less than 2500g, assisted ventilation, 5-minute APGAR score < 7, and neonatal ICU admission. However, there was a lower risk of primary cesarean section on weekends than weekdays. This information can be used to guide providers into stratifying higher risk deliveries on weekdays when planning is possible.

Table 1. Maternal Outcomes Associated with Weekend Deliveries.

	Weekday	Weekend	OR (95% CI)
Maternal ICU Admission	24,056/17,741,286 (0.14%)	6,793/4,593,943 (0.15%)	1.09 (1.06 – 1.12)
3rd/4th Degree Perineal Lacerations	132,406/17,741,286 (0.7%)	42,698/4,593,943 (0.9%)	1.25 (1.23 – 1.26)
Maternal Antibiotic Use	255,239/17,748,909 (1.4%)	85156/4,596,094 (1.9%)	1.29 (1.28 – 1.30)
Mode of Delivery			
Vaginal Delivery	11,544,953 (65.0%)	3,475,124 (75.6%)	REF
VBAC	355,853 (2.0%)	113,167 (2.5%)	
Primary Cesarean	3,059,764 (17.2%)	693,358 (15.1%)	0.75 (0.75 - 0.75)
Repeat Cesarean	2,778,281 (15.6%)	311,210 (6.8%)	
Uterine Rupture	5,240/17,741,286 (0.03%)	1,670/4,593,943 (0.04%)	1.23 (1.16 – 1.30)

Table 2. Neonatal Outcomes Associated with Weekend Deliveries.

	Weekday	Weekend	OR (95% CI)
Neonate < 2500g	687,430/14,959,271 (4.6%)	209,463/3,838,123 (5.5%)	1.198 (1.192 - 1.204)
Assisted Ventilation (Immediate)	691,944/17,748,909 (3.9%)	196,558/4,596,094 (4.3%)	1.101 (1.097 – 1.106)
Assisted Ventilation (6 hours)	209,849/17,748,909 (1.2%)	63,939/4,596,094 (1.4%)	1.179 (1.169 – 1.190)
5-Minute APGAR < 7	290,756/17,757,407 (1.6%)	88,190/4,598,349 (1.9%)	1.175 (1.166 – 1.184)
Neonatal ICU	1,139,074/17,748,909 (6.4%)	340,390/4,596,094 (7.4%)	1.166 (1.162 – 1.171)

553 | Burdened by Prevention? Factors Associated with High Burden of Attending Antenatal Fetal Surveillance

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4:00 PM - 6:00 PM

Objective: Antenatal fetal surveillance (AFS) is recommended to screen for acidemia and prevent stillbirth in pregnancies with a maternal or fetal condition that increase these risks. AFS visits are in addition to prenatal care and factors associated with patient's experience of burdens of attending this care is lacking.

Study Design: We performed a cross-sectional survey of patients attending AFS in a maternal fetal medicine ultrasound unit, querying patients regarding their burdens in cost, childcare, employment, and time-related domains. Patients eligible for inclusion were those undergoing any type or frequency of AFS and were English or Spanish speaking. The primary aim was to describe factors associated with experiencing a high burden of AFS visits. Patients were categorized as "high burden" if they agreed with experiencing burden in any domain and "low burden" if they universally disagreed with experiencing burden. Chi square and t-test as appropriate were used to determine associations between demographic and patient characteristics.

Results: Of 186 patients, 82 (44.1%) experienced high burden and 104 (55.9%) were low burden. The high burden group was older (32.4 years vs 28.6 years, p< 0.01) and more likely to attend twice weekly testing (31.7% vs 15.4%, p< 0.01). There was no difference between high and low burden experience groups in gestational age at start of AFS, number of visits scheduled, having children at home, or work outside the home. The high burden group were more likely to have gestational diabetes as the indication for AFS (24.4% vs 9.6%, p< 0.01) though other indications for AFS were similar between high and low burden groups.

Conclusion: Almost half of patients experienced a high burden of recommended AFS, which was associated with a slightly older patient age, twice-weekly frequency of AFS, and a diagnosis of gestational diabetes, which requires daily intensive blood glucose monitoring. Providers should attempt to query patients about burdens to develop a regimen of AFS that balances burden and stillbirth prevention.

	High (N=82)	Low (N=104)	p
Age (mean, SD)	32.4 (25.7-39.2)	28.6 (20.5-36.6)	**<0.01**
Frequency of AFS visits			
Once weekly	56 (68.3)	88 (84.6)	**<0.01**
Twice weekly	26 (31.7)	16 (15.4)	
Gestational age at start of AFS (med, IQR)	32.3 (32.0, 34.1)	32.4 (32.0, 35.0)	0.77
Gestational age at delivery (med, IQR)	38.3 (37.2, 39.3)	39.0 (38.0, 39.5)	0.12
Number of AFS visits scheduled (med, IQR)	7.0 (4.0, 9.0)	7.0 (4.0, 9.0)	0.75
Number of AFS visits attended (med, IQR)	6.0 (4.0, 9.0)	6.0 (4.0, 8.0)	0.94
Other children at home	56 (68.3)	66 (63.5)	0.49
Work outside the home	37 (45.1)	34 (32.7)	0.08
Indication for AFS			
Obesity (class II or III)	49 (59.8)	62 (59.6)	0.98
Hypertension (chronic or gestational)	11 (13.4)	14 (13.5)	0.99
Maternal age > 40 years	14 (17.1)	15 (14.4)	0.62
Gestational diabetes mellitus	20 (24.4)	10 (9.6)	**<0.01**
Fetal growth restriction	8 (9.8)	5 (4.8)	0.19
Multifetal gestation	2 (2.4)	3 (2.9)	0.85
Pregnancy resulting from IVF*	9 (11.0)	5 (4.8)	0.11
Placental or umbilical cord pathology	3 (3.7)	1 (1.0)	0.21
Polyhydramnios	3 (3.7)	6 (5.8)	0.5054
Prior adverse pregnancy outcome	13 (15.9)	8 (7.7)	0.08
Cholestasis	1 (1.2)	1 (1.0)	0.99
Substance use	0	0	---
Other	13 (15.9)	25 (24.0)	0.16

**IVF, in-vitro fertilization*

554 | Predictors of VBAC Success After Two Previous Cesarean Sections

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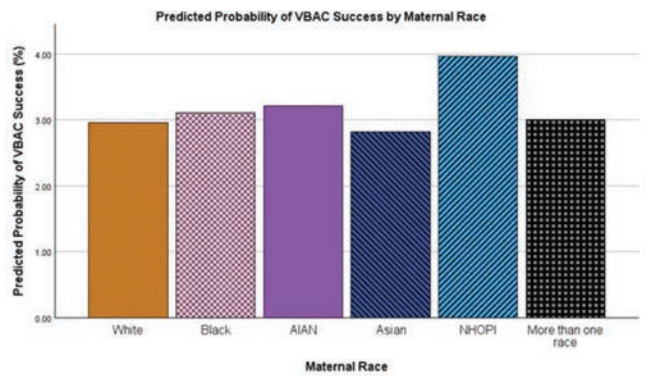
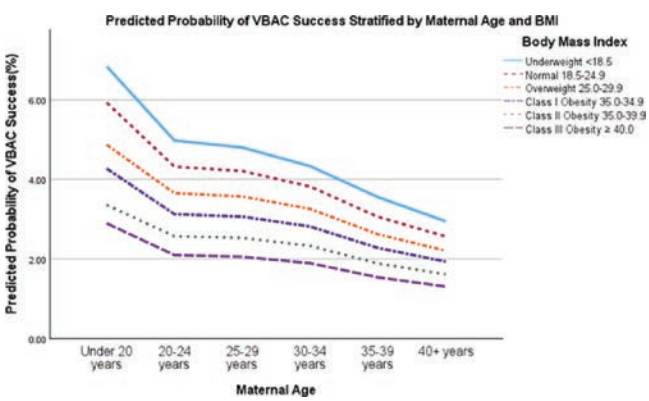
4:00 PM - 6:00 PM

Objective: This study aimed to identify key predictors of a successful vaginal birth after cesarean (VBAC) among women with two previous cesarean sections and no prior spontaneous vaginal deliveries (SVD) using US vital statistics natality birth data, and to determine the uterine rupture rate in this population.

Study Design: A retrospective cohort study used data from the US Vital Statistics natality birth dataset. The analysis included women with two previous cesarean sections and no prior SVD. Descriptive statistics were performed on all variables. Logistic regression was used to identify predictors of VBAC success. Adjusted odds ratios (aOR) and 95% confidence intervals (CI) were calculated, and the uterine rupture rate was determined.
Results: The study included 537,852 women, with an overall VBAC success rate of 3.0%. Native Hawaiian or Other Pacific Islander (NHOPI) women had higher odds of VBAC success compared to White women (aOR = 1.38, CI: 1.09-1.75). Women with Class II (aOR = 0.53, 95% CI: 0.46-0.60) and Class III (aOR = 0.43, 95% CI: 0.38-0.49) obesity had significantly lower odds of VBAC success. Women aged 40+ years exhibited lower odds of VBAC compared to women aged under 20 years (aOR = 0.41, 95% CI: 0.31-0.55). Privately insured had higher odds of VBAC success than those with public insurance (aOR = 1.97, 95% CI: 1.84-2.12). There were 536 cases of uterine rupture identified, corresponding to a rate of 0.10%.
Conclusion: This study highlights predictors associated with VBAC success. The overall VBAC success rate was low at 3.0%, a result potentially limited by using a retrospective dataset with many covariates. The finding that privately insured women had better outcomes than those with public insurance may reflect disparities in access to healthcare resources. The finding of increased risk of failure in the highest BMI and age categories continues to support these variables as independent risk factors for cesarean delivery. The reported uterine rupture rate of 0.10% is lower than previous studies, supporting VBAC as a viable option for delivery mode as part of shared decision making.





555 | Influence of French Labor-management Guidelines on Incidence of Severe Postpartum Hemorrhage: A National Population-Based Study

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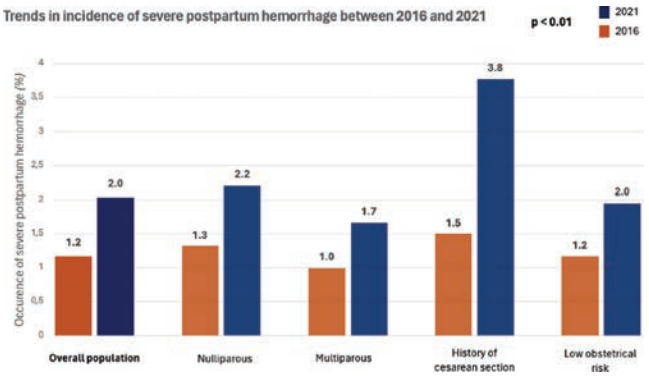
4:00 PM - 6:00 PM
Objective: The 2021 French National Perinatal Survey (FNPS) revealed an increased rate of severe postpartum hemorrhage (PPH) since the previous survey in 2016. This rise might be attributed not only to the evolution of maternal risk factors but also to the publication of the 2017 guidelines that aimed at restricting labor interventions, such as oxytocin administration, for women in spontaneous labor. Our aim was to explore the association between changes in medical practice between 2016 and 2021 and incidence of severe PPH.
Study Design: Women who participated to the 2016 and 2021 FNPS and delivered of a term live-born cephalic singleton after a spontaneous labor were included. We described the evolution of severe PPH rate, oxytocin use, and labor duration. We then assessed the determinants of severe PPH using univariate and multivariable analyses adjusting on maternal characteristics. Finally, we investigated the potential mediation effect of oxytocin use and prolonged labor on the relationship between the year of delivery and the occurrence of severe PPH.
Results: A total of 14,168 women were included, 7,529 in 2016 and 6,639 in 2021. The incidence of severe PPH increased from 1.2% in 2016 to 2.0% in 2021, p< 0.01. The use of oxytocin during labor decreased from 45.0% in 2016 to 30.2% in 2021, p< 0.01. Labor duration were significantly longer in 2021, regardless of parity (p < 0.01) After adjusting for maternal, obstetrical and maternity unit characteristics, giving birth in 2021 (versus 2016) remained associated with an increased risk of severe PPH (OR 1.7 [1.3-2.2]). While oxytocin use did not appear as a mediating factor, prolonged labor mediated only 9% of the observed association between the year of delivery and the risk of severe PPH.
Conclusion: While the French Labor management Guidelines could partially explain the increase in severe PPH rates observed between 2016 and 2021, the decrease in the use of oxytocin does not appear to be associated with this increase.



Determinants of severe postpartum hemorrhage	Severe postpartum hemorrhage		Univariate regression	Multiple logistic regression
	No (n = 13 945)	Yes (n = 223)	OR	OR
Year of delivery (n, (%))				
2016	7 441 (98.8)	88 (1.2)	Reference	Reference
2021	6 504 (98.0)	135 (2.0)	**1.75 [1.3-2.3]**	**1.65 [1.3-2.2]**
Maternal characteristics				
Maternal age (années, (n, (%))				
< 25	1 843 (13.2)	30 (13.5)	Reference	Reference
25 – 29	4 413 (31.7)	66 (29.6)	0.9 [0.6-1.4]	0.93 [0.6-1.5]
30 – 34	4 928 (35.3)	71 (31.8)	0.9 [0.6-1.4]	0.88 [0.6-1.4]
≥ 35	2 761 (19.8)	56 (25.1)	1.3 [0.8-2.0]	1.21 [0.8-2.0]
Body Mass Index (kg/m2, (n, (%))				
< 18.5	1 012 (7.4)	6 (2.8)	0.4 [0.2-0.9]	0.4 [0.2-1.0]
18.5 – 24	8 520 (62.5)	134 (61.8)	Reference	Reference
25 – 29	2 738 (20.1)	48 (22.1)	1.1 [0.8-1.6]	1.0 [0.7-1.4]
30 – 34	963 (7.1)	21 (9.7)	1.4 [0.9-2.2]	1.2 [0.7-2.0]
≥ 35	407 (3.0)	8 (3.7)	1.3 [0.6-2.6]	1.1 [0.5-2.3]
Country of birth (n, (%))				
France	11 293 (81.3)	172 (77.1)	Reference	Reference
Other European country	540 (3.9)	8 (3.6)	1.0 [0.5-2.0]	1.0 [0.5-2.0]
Northern African country	831 (6.0)	18 (8.1)	1.4 [0.9-2.3]	1.3 [0.8-2.1]
Other African country	770 (5.6)	14 (6.3)	1.2 [0.7-2.1]	1.1 [0.6-1.9]
Other	449 (3.2)	11 (4.9)	1.6 [0.9-3.0]	1.5 [0.8-2.9]
Social vulnerability (n, (%))	226 (1.6)	6 (2.7)	1.7 [0.7-3.8]	1.7 [0.7-4.0]
Obstetric characteristics				
Parity (n, (%))				
Nulliparous	5 774 (41.5)	102 (45.7)	Reference	Reference
Multiparous without a prior cesarean delivery	7 167 (51.5)	95 (42.6)	0.8 [0.6-1.0]	0.8 [0.6-1.2]
Multiparous with a prior cesarean delivery	987 (7.1)	26 (11.7)	1.5 [1.0-2.3]	1.3 [0.8-2.0]
Hypertensive disorder during pregnancy (n, (%))	252 (1.8)	3 [1.4]	0.8 [0.2-2.4]	0.7 [0.2-2.1]
Gestational diabetes (n, (%))	1 328 (9.6)	31 [14.1)	**1.6 [1.1-2.3]**	1.4 [0.9-2.0]
Suspicion of macrosomia (n, (%))	601 (4.5)	17 (8.3)	**1.9 [1.1-3.1]**	1.6 [0.9-2.6]
Gestational age at delivery (n, (%))				
37 – 37WG6D	763 (5.5)	4 [1.8]	0.5 [0.2-1.3]	0.47 [0.17-1.32]
38 – 38WG6D	2 040 (14.6)	24 (10.8)	1.0 [0.6-1.7]	1.04 [0.63-1.70]
39 – 39WG6D	4 244 (30.4)	48 (21.5)	Reference	Reference
40 – 40WG6D	4 820 (34.6)	91 (40.8)	**1.7 [1.2-2.4]**	**1.6 [1.2-2.3]**
≥ 41 WG	2 078 (14.9)	56 (25.1)	**2.4 [1.6-3.5]**	**2.3 [1.5-3.4]**
Mode of delivery (n, (%))				
Vaginal delivery	11 083 (79.5)	149 (66.8)	Référence	Référence
Operative vaginal delivery	1 948 (14.0)	45 (20.2)	**1.7 [1.2-2.4]**	**1.5 [1.1-2.2]**
Cesarean delivery	912 (6.5)	29 (13.0)	**2.3 [1.6-3.5]**	**1.8 [1.1-2.8]**
Preventive administration of oxytocin (n, (%))	12 418 (89.6)	193 (89.8)	1.02 [0.7-1.6]	1.10 [0.7-1.8]
Maternity unit characteristics				
Type of maternity unit (n, (%))				
I	3 146 (22.6)	34 (15.3)	Référence	Référence
II	7 294 (52.4)	119 (53.4)	1.5 [1.0-2.2]	**1.5 [1.1-2.3]**
III	3 488 (25.1)	70 (31.4)	**1.9 [1.2-2.8]**	**2.0 [1.2-3.3]**
Number of deliveries per year (n, (%))				
< 2000	7 009 (50.3)	104 (46.7)	1.0 [0.7-1.5]	1.3 [0.9-1.9]
2000 – 2999	2 912 (20.9)	42 (18.8)	Référence	Référence
≥ 3000	4 024 (28.9)	77 (34.5)	1.3 [0.9-1.9]	1.2 [0.8-1.73]

556 | Trajectory Analysis of Prenatal Urinary Tract Dilation and Risk of Postnatal Surgery

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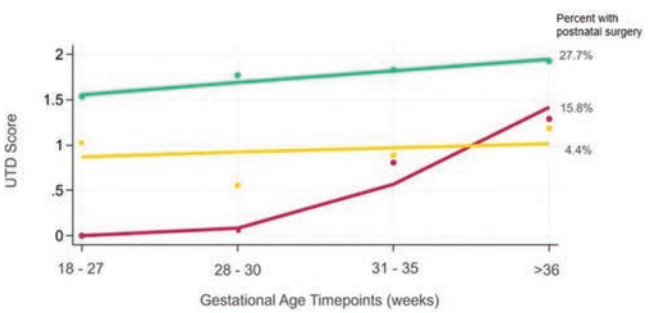
4:00 PM - 6:00 PM

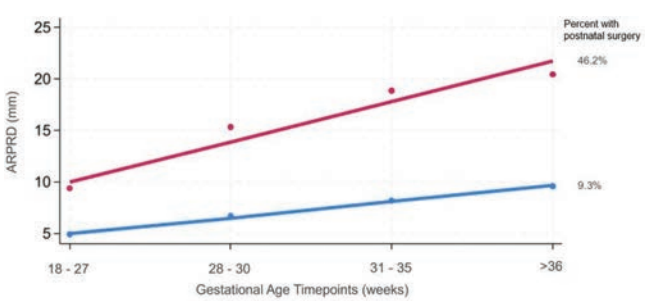
Objective: A prenatal urinary tract dilation (UTD) classification system is associated with postnatal urologic outcomes and assigns a score (UTDA1 or UTDA2-3) depending on anterior-posterior renal pelvis diameter (APRPD) and other markers of renal dysfunction. Postnatal management is dictated by a maximum peri-delivery UTD score and there is limited data assessing the trajectory of UTD across gestation with postnatal outcomes. We aimed to identify trajectories of UTD and describe the association with postnatal surgery.

Study Design: We conducted a retrospective cohort study of infants with congenital UTD, via ICD-10 codes, in visits with pediatric urology at an academic health system and born between 2015-2020 with at least 2 years of follow up. We matched infants to maternal charts and delivery records in the health system. We obtained demographic, obstetric, prenatal ultrasounds, and infant surgical outcomes. We excluded patients without sonographic evidence of UTD prior to delivery as this would not have prompted postnatal follow up, or if there was only a single prenatal ultrasound. Postnatal management followed a standardized algorithm. We performed a trajectory analysis with UTD score and APRPD at multiple gestational ages and assessed their association with postnatal surgery.

Results: There were n = 243 matched dyads and n = 54 were excluded for missing prenatal ultrasound data, leaving n = 189 dyads for analysis. There were no demographic differences between infants with or without postnatal surgery. Three trajectories of UTD score (Figure 1) were identified: stable-high, stable-medium, and escalating groups with postnatal surgery in 27.7% (n = 23/83), 4.4% (n = 3/68), and 15.8% (n = 6/38), respectively, (p< 0.001). Two trajectories for APRPD (Figure 2) were identified with postnatal surgery in 46.2% (n = 18/39) vs 9.3% (n = 14/150, p< 0.001).

Conclusion: UTD score trajectories demonstrated an increased risk of postnatal surgery in stable-high and escalating groups, while a stable-medium risk UTD group conferred a low risk of surgery. ARPRD measures had two trajectories with differing risks of postnatal surgery.





557 | Accuracy of ICD-10 Codes for Placenta Accreta Spectrum: Frequency and Reasons for Miscoding

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4:00 PM - 6:00 PM

Objective: The ICD-10 codes for placenta accreta spectrum (PAS) were introduced in 2015, facilitating improved research and quality tracking of this important source of maternal morbidity. However, the validity of these codes has not been thoroughly evaluated. We aimed to identify the frequency and reasons for PAS miscoding.

Study Design: We conducted a case series analysis of all deliveries associated with an ICD-10 code for PAS in the two large healthcare systems (17 hospitals, including 2 PAS referral centers) in our state between September 2015 and December 2023. Medical records were reviewed by three reviewers to determine whether PAS was present using the FIGO clinical and/or histopathologic criteria. If PAS was excluded, the reason for misapplication of the code was assigned.

Results: There were 394 deliveries associated with ICD-10 codes for PAS during the study period, with most (n = 156, 68%) occurring at a PAS referral center; 40% (95% CI 35-45%) were false positive PAS. Many demographic and delivery factors were associated with a false PAS diagnosis including younger maternal age at delivery, a lower number of prior cesarean deliveries, absence of placenta previa, and delivery without hysterectomy, and later gestational age at delivery (Table). The most common cause (42.9%) for a false positive was hemorrhage due to another etiology not meeting clinical or histopathologic criteria for PAS (Figure). In 22.4% of false positives, there was antenatal suspicion of PAS, but PAS was not seen at delivery. In 22.4% of false positives, the code was erroneously applied.

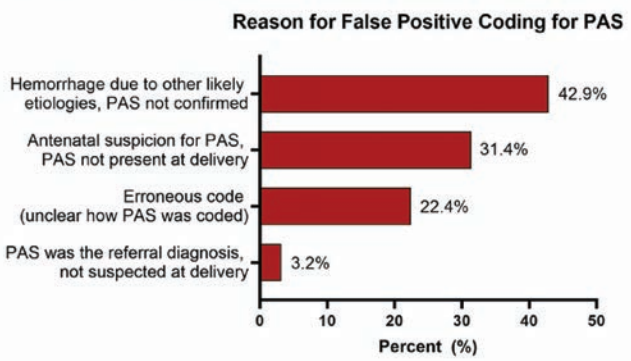
Conclusion: In this study, 40% of cases with an ICD-10 code for PAS did not meet clinical and/or histopathologic criteria for PAS. This underscores the need for improved clinician understanding of the clinical PAS criteria and improved coding practices for PAS. Additionally, studies using ICD-10 to identify cases of PAS should consider the possibility of bias introduced by a significant false positive rate.

Table. Demographic and delivery attributes associated with accuracy of diagnostic code application

Characteristic	Value	False positive (N=156)	True PAS (N=238)	P
Age at delivery (mean ± SD)		32.06 ± 5.8	34.00 ± 4.8	<.001
Gravidity	1	12 (7.7)	6 (2.5)	<.001
	2	44 (28.2)	18 (7.6)	
	3	32 (20.5)	44 (18.5)	
	4 or more	68 (43.6)	170 (71.4)	
Number of prior cesarean deliveries	0	75 (48.1)	20 (8.4)	<.001
	1	43 (27.6)	58 (24.5)	
	2	18 (11.5)	56 (23.6)	
	3	13 (8.3)	59 (24.9)	
	4 or more	7 (4.5)	44 (18.6)	
IVF Pregnancy		8 (5.2)	16 (6.8)	0.521
GA (weeks) at delivery	<26w	5 (3.2)	2 (0.8)	<.001
	26-<32	10 (6.5)	32 (13.4)	
	32-<37	52 (33.5)	170 (71.4)	
	term (37+)	88 (56.8)	34 (14.3)	
GA (weeks) at delivery (mean ± SD)		36.02 ± 3.9	33.96 ± 2.8	<.001
Mode of delivery	SVD, OVD	63 (40.4)	7 (2.9)	<.001
	Cesarean	85 (54.5)	33 (13.9)	
	Cesarean hysterectomy	8 (5.1)	198 (83.2)	
Hysterectomy performed		10 (6.5)	210 (88.2)	<.001
PAS suspected prior to delivery		42 (26.9)	200 (84.0)	<.001
Placenta previa at the time of delivery		35 (22.4)	172 (72.3)	<.001
Blood loss (ML) (mean ± SD)		1039.12 ± 777.5	2127.31 ± 1531.0	<.001

Values reported as frequency (column percent) with p-value from chi-square, or mean ± standard deviation (SD) with p-value from two-sample t-test

Figure. Reasons for False Positive Coding for PAS



Reasons for false positive coding for PAS are mutually exclusive and exhaustive of all identified false positives (n=156)
PAS - Placental Accreta Spectrum

558 | Cardiovascular Disease and Hypertensive Disorders of Pregnancy Increase Severe Maternal Morbidity Risk

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4:00 PM - 6:00 PM

Objective: Cardiovascular disease (CVD) and hypertensive disorder of pregnancy (HDP) both confer risk of severe maternal morbidity (SMM). Our objective was to examine rates of SMM by CVD and HDP type during delivery hospitalization and 90 days postpartum compared to births without CVD.

Study Design: Retrospective cohort study of pregnant patients $\geq$ 18 years of age delivering between 2015 and 2020 in the Premier Database. Patients without CVD were compared to patients with six categories of CVD: congenital, ischemic, aortic, pulmonary hypertension (pHTN), cardiomyopathy, and valvular. Patients with multiple types of CVD were included in the analyses for each

category. The exposure of interest was any SMM during delivery hospitalization and < 90 days postpartum. Patients were stratified by HDP type: gestational hypertension (GHTN), preeclampsia (PEC), and preeclampsia with severe features (sPEC). Adjusted predicted SMM rate (%) was calculated during delivery and within 90 days postpartum by CVD type stratified by HDP type, adjusted for age, payor status, race, ethnicity, hospital characteristics, and OB comorbidities.

Results: Of 4,606,247 deliveries, 22,366 (0.5%) had CVD. The prevalence of HDP in this population was 11.9%. Patients with PEC had higher adjusted predicted SMM rates, independent of CVD. Those with CVD had significantly higher SMM rates across all HDP types. Patients with cardiomyopathy and pHTN who developed sPEC had the highest rates of SMM (26% and 33%) during delivery hospitalization (Figure 1). Acute respiratory distress syndrome (ARDS) and mechanical ventilation were the most common types of SMM during delivery hospitalization, while heart failure/pulmonary edema were the most common < 90 days postpartum (Figure 2).

Conclusion: Patients with CVD and PEC have a substantial increase in risk of SMM. The indications for the high rates of mechanical ventilation and etiologies of ARDS during delivery should be explored further. Heart failure is the most common postpartum morbidity and care should be targeted to improve surveillance and prevention postpartum.

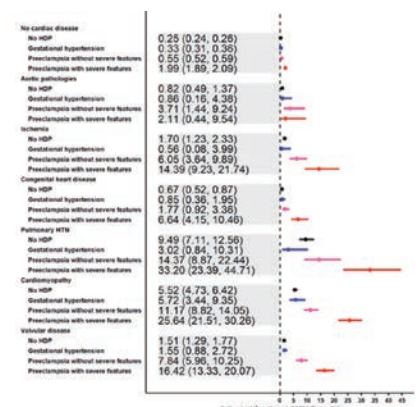

Figure 1. Adjusted predicted severe maternal morbidity rate (%) during delivery hospitalization by cardiovascular disease subtype stratified by hypertensive disorders of pregnancy subtype

Abbreviations: HDP, hypertensive disorders of pregnancy

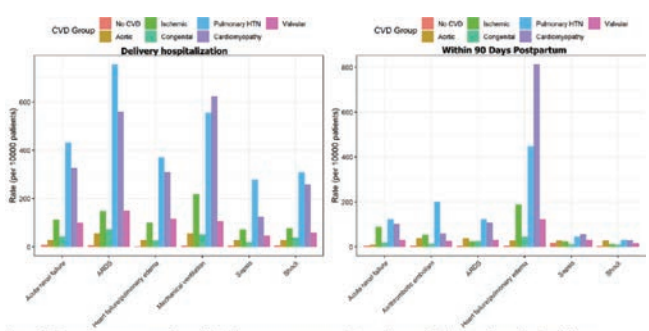

Figure 2. Rates of severe maternal mortality (six most common types) by cardiovascular disease subtype during delivery hospitalization (left) and within 90 days postpartum (right)

Abbreviations: ARDS, acute respiratory distress syndrome

559 | Risk of Hemorrhage and Severe Maternal Morbidity (SMM) with Low-lying Placenta: A Nationwide Analysis

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4:00 PM - 6:00 PM

Objective: To evaluate and compare rates of hemorrhage and the CDC-defined severe maternal morbidity (SMM) associated with persistent low-lying placenta (LLP) and placenta previa (PP) using a national database.

Study Design: We conducted a retrospective analysis using the Nationwide Readmissions Database (NRD) from 2017 through 2019, reflecting the initial 3 years of coding for LLP. Patients with multifetal gestation, ectopic/molar pregnancies, and other placental abnormalities were excluded. Hemorrhage was defined as ante-, intra-, and post-partum hemorrhage. Baseline characteristics and maternal outcomes were compared using chi-square tests for categorical variables and Kruskal-Wallis tests for continuous variables. Multivariable regression analysis was used to evaluate the risk ratios (RR) of adverse outcomes across these groups.

Results: Among 5,644,185 singleton deliveries, 11,755 were diagnosed with LLP & 23,817 with PP. Compared to normal placentation, LLP was associated with a higher prevalence of hemorrhage (21.1% vs. 4.1%, $p < 0.001$), and increased RR of hemorrhage (RR: 5.19; 95% CI: 5.01-5.38), SMM (RR: 2.55, 95% CI: 2.35-2.78), blood transfusion (RR: 3.08; 95% CI: 2.79-3.40), and hysterectomy (RR: 4.69; 95% CI: 2.95-7.45). Additionally, delivery admission with LLP was found to have a longer inpatient stay (3 vs. 2 days, $p < 0.001$) and a higher cost ($21,451 vs. $17,025; $p < 0.001$). Patients with PP had significantly worse outcomes than those with normal placentation as well, with a 5.28-fold RR of SMM, 7.11-fold RR of blood transfusion, and 10.49-fold RR of hemorrhage.

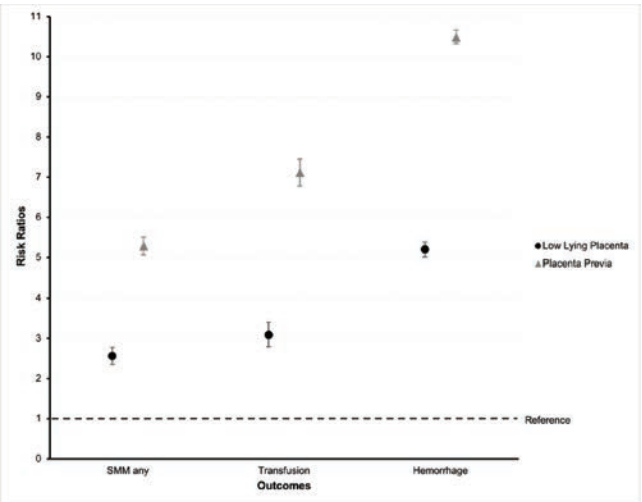
Conclusion: With the institution of distinct coding for LLP in 2017, we were able to distinguish between patients with LLP and PP. While patients with PP are known to have poor maternal outcomes, patients with LLP also have an increased risk of hemorrhage, SMM, and prolonged inpatient care relative to

normal placentation. These findings should be considered during the prenatal counseling and management of patients with LLP.

Table 1. Maternal outcomes in patients with low-lying placenta and placenta previa at delivery

	Normal Placentation N=5,604,372	Low-Lying Placenta N=11,601	p-value (normal vs LLP)	Placenta Previa N=21,601	p-value (normal vs PP)	p-value (LLP vs PP)
Cesarean Delivery, n(%)	1,748,706 (31.2)	6,373 (54.9)	<0.001	21,601 (100.0)	<0.001	<0.001
Hemorrhage, n(%)	226,968 (4.1)	2,444 (21.1)	<0.001	9,228 (42.7)	<0.001	<0.001
SMM any, n(%)	99,055 (1.8)	525 (4.5)	<0.001	2,031 (9.4)	<0.001	<0.001
SMM except transfusion, n(%)	47,299 (0.8)	197 (1.7)	<0.001	637 (2.9)	<0.001	<0.001
Hysterectomy, n(%)	1,842 (0.0)	18 (0.2)	<0.001	271 (1.3)	<0.001	<0.001
Blood Products Transfusion, n(%)	59,649 (1.1)	380 (3.3)	<0.001	1,537 (7.6)	<0.001	<0.001
DIC, n(%)	11,316 (0.2)	60 (0.5)	<0.001	175 (0.8)	<0.001	0.002
Shock, n(%)	2,992 (0.1)	18 (0.2)	<0.001	110 (0.5)	<0.001	<0.001
VTE or PE, n(%)	4,061 (0.1)	26 (0.2)	<0.001	47 (0.2)	<0.001	0.90
Maternal hypotension, n(%)	27,158 (0.5)	101 (0.9)	<0.001	224 (1.0)	<0.001	0.14
Length of stay, days, median (IQR)	2 (2-3)	3 (2-3)	<0.001	3 (3-4)	<0.001	<0.001
Total charges, $, median (IQR)	17025 (11138-26452)	21451 (13601-34092)	<0.001	29644.5 (19313-45284)	<0.001	<0.001

LLP: Low-lying placenta; PP: Placenta previa; SMM: Severe maternal morbidity (CDC-defined); DIC: Disseminated intravascular coagulation; VTE: Venous thromboembolism; PE: Pulmonary embolism.



560 | Association between a Healthy Plant-Based Diet and Adverse Pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: We determined whether a healthy plant-based diet in early pregnancy was associated with adverse pregnancy outcomes (APOs).

Study Design: This is a secondary analysis of data from the prospective Nulliparous Pregnancy Outcomes Study-Monitoring Mothers-to-Be (nuMoM2b) cohort. We calculated Healthy Plant-Based Diet Index (hPDI) scores from a validated food-frequency questionnaire in the first trimester. Healthy plant-based foods (e.g., whole grains, seed oils, vegetables) were assigned positive scores and unhealthy plant foods (e.g., refined grains, sugar sweetened beverages) and animal foods (e.g., meat, dairy) received negative scores. The hPDI was categorized in quartiles from quartile 1 (Q1, least plant-based) to Q4 (most plant-based). The outcomes were: small-for-gestational-age [< 10th percentile, SGA], large-for-gestational-age [≥ 90th percentile, LGA]), hypertensive disorder of pregnancy (HDP), gestational diabetes (GDM), and preterm birth (PTB) < 37 weeks. APOs were evaluated individually. Modified Poisson regression models adjusted for age, income, education, and health insurance. Secondarily, we assessed whether the above associations varied by adequate neighborhood food access, determined using the USDA *Food Atlas)*.

Results: Among 7,981 nulliparous individuals with dietary and outcome data, those who were in the highest quartile of a healthy plant-based diet were at a lower risk of developing HDP (11.0% vs 15.1%; aRR 0.76; 95% CI 0.62 to 0.94) and GDM (3.4% vs 4.1%; aRR 0.64; 95% CI 0.44 to 0.92) compared with those in the lowest quartile. The above associations did not vary by neighborhood food access (interaction p-value = 0.31 for HDP and 0.52 for GDM in adjusted models). A healthy plant-based diet was not associated with SGA, LGA, or PTB (TABLE).

Conclusion: A healthy plant-based diet in early pregnancy was associated with a lower risk of developing HDP and GDM in nulliparous individuals, after accounting for potential socioeconomic confounders. Findings suggest the potential benefits of a plant-based diet in early pregnancy and warrant further study.

TABLE. Association between plant-based diet and adverse pregnancy outcomes

	Frequency (row percentage)		Unadjusted and adjusted analysis	
	No	Yes	Risk Ratio, RR (95% CI)	Adjusted risk ratio, aRR (95% CI)[1]
Hypertensive disorder of pregnancy				
Plant based diet				
Q1	1,665 (84.9)	295 (15.1)	1.00	1.00
Q2	1,789 (85.6)	300 (14.4)	0.95 (0.82, 1.11)	0.97 (0.82, 1.15)
Q3	1,518 (88.1)	206 (11.9)	**0.79 (0.67, 0.94)**	0.82 (0.68, 1.00)
Q4	1,683 (89.0)	207 (11.0)	**0.73 (0.62, 0.86)**	**0.76 (0.62, 0.94)**
Gestational diabetes				
Plant based diet				
Q1	1,895 (95.9)	81 (4.1)	1.00	1.00
Q2	2,006 (95.1)	104 (4.9)	1.20 (0.91, 1.60)	1.09 (0.81, 1.47)
Q3	1,669 (96.0)	69 (4.0)	0.97 (0.71, 1.33)	0.80 (0.57, 1.13)
Q4	1,844 (96.6)	65 (3.4)	0.83 (0.60, 1.14)	**0.64 (0.44, 0.92)**
Small-for-gestational-age				
Plant based diet				
Q1	1,505 (84.6)	274 (15.4)	1.00	1.00
Q2	1,648 (86.5)	257 (13.5)	0.88 (0.75, 1.03)	0.99 (0.83, 1.17)
Q3	1,353 (87.7)	190 (12.3)	**0.80 (0.67, 0.95)**	0.96 (0.79, 1.18)
Q4	1,505 (86.8)	229 (13.2)	0.86 (0.73, 1.01)	1.07 (0.87, 1.31)
Large-for-gestational-age				
Plant based diet				
Q1	1,505 (90.8)	152 (9.2)	1.00	1.00
Q2	1,648 (90.3)	178 (9.7)	1.06 (0.86, 1.31)	1.02 (0.82, 1.27)
Q3	1,353 (88.9)	169 (11.1)	1.21 (0.98, 1.49)	1.12 (0.89, 1.42)
Q4	1,505 (91.4)	141 (8.6)	0.93 (0.75, 1.16)	0.85 (0.66, 1.10)
Preterm birth <37 weeks				
Plant based diet				
Q1	1,774 (90.0)	197 (10.0)	1.00	1.00
Q2	1,930 (91.6)	176 (8.4)	0.84 (0.69, 1.01)	0.91 (0.73, 1.12)
Q3	1,595 (91.6)	147 (8.4)	0.84 (0.69, 1.03)	0.97 (0.77, 1.22)
Q4	1,752 (92.2)	148 (7.8)	**0.78 (0.64, 0.96)**	0.94 (0.74, 1.20)

Modified Poisson regression models adjusted for baseline age, income, education, and health insurance.
Bolded results signify a p-value <0.05. Data provided as n (%)

561 | Effect of Oxytocin Rest on Labor Outcomes and Uterine Contractility During Induction of Labor

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4:00 PM - 6:00 PM

Objective: For patients with inadequate contractions despite high-dose continuous oxytocin (OT), a period of OT rest is often trialed to resensitize uterine smooth muscle to OT; however, the utility of this is unknown. Our aim was to determine the effect of OT rest on labor outcomes and uterine contractility compared to continuous OT during induction of labor (IOL).

Study Design: A secondary analysis of a prospective cohort study of singleton, term pregnancies admitted in labor or for IOL from

January 2020 to July 2022 was performed. Inclusion criteria were nulliparity, IOL, and OT use. All patients had an intrauterine pressure catheter placed within 30 minutes of membrane rupture, regardless of labor progress. OT rest was compared to continuous OT. Primary outcomes were completion of first stage, length of active phase, and length of second stage. We used multivariable logistic regression to adjust for potential confounders. Secondary outcomes were Cesarean delivery and Montevideo units (MVUs) at three time points: active labor (cervix ≥ 6cm), max OT dose, and first stage completion. Subgroup analysis was performed to exclude OT rest for non-reassuring fetal status (NRFS).

Results: Of the 120 patients included, 55 (45.8%) had OT rest and 65 (54.1%) had continuous OT. Indications for OT rest were NRFS (73.7%), protracted labor (12.3%), and other (14.0%). Those with OT rest had significantly lower risk of completing the first stage (aRR 0.81, 95% CI 0.52-0.97). This association persisted when OT rest for NRFS was excluded (aRR 0.52, 95% CI 0.15-0.90). There were no differences in max OT dose (19.1 vs 16.7, p = 0.24), length of active phase, or length of second stage (Table 1). Those with OT rest were more likely to deliver via Cesarean (Table 2). MVUs did not differ between groups at any time (Table 2).

Conclusion: Nulliparous patients who had OT rest for protracted labor were 48% less likely to complete the first stage of labor compared to those who had continuous OT; a higher proportion also delivered via Cesarean. Further research is needed to determine the utility of OT rest after diagnosis of protracted labor.

Table 1. Delivery outcomes between OT rest compared to continuous OT during IOL

	Continuous OT (n=65)	OT rest, all indications (n=55)	p value	RR (95%CI)	aRR‡ (95%CI)
Completion of first stage	61 (93.6%)	41 (74.6%)	0.003	0.79 (0.05-0.96)	0.81 (0.52-0.97)
Length of active phase (hrs)	2.9 (1.1-5.2)	2.8 (0.7-4.8)	0.78	-	-
Length of second stage (hrs)	1.2 (0.5-1.8)	1.0 (0.5-1.9)	0.49	-	-
	Continuous OT (n=65)	OT rest, NRFS excluded (n=13)	p value	RR (95% CI)	aRR‡ (95% CI)
Completion of first stage	61 (93.6%)	6 (46.2%)	< 0.001	0.49 (0.17-0.84)	0.52 (0.15-0.90)
Length of active phase (hrs)	2.9 (1.1-5.2)	4.4 (0.3-12.6)	0.44	-	-
Length of second stage (hrs)	1.2 (0.5-1.8)	1.2 (0.8-1.3)	0.49	-	-

‡adjusted for obesity and fetal growth restriction
NRFS, non-reassuring fetal status

Table 2. Uterine contractility between OT rest compared to continuous OT during IOL

	Continuous OT (n=65)	OT rest (n=55)	p value
Cesarean delivery	7 (10.8%)	18 (32.7%)	0.003
Mean MVUs at active labor	156.8 ± 53.6	148.0 ± 49.7	0.40
Mean MVUs at max OT dose	158.1 ± 61.4	177.7 ± 58.1	0.10
Mean MVUs at completion of first stage	154.1 ± 57.9	140.8 ± 53.3	0.25
	Continuous OT (n=65)	OT rest, NRFS excluded (n=13)	p value
Cesarean delivery	7 (10.8%)	7 (53.9%)	< 0.001
Mean MVUs at active labor	156.8 ± 53.6	164.0 ± 56.8	0.71
Mean MVUs at max OT dose	158.1 ± 61.4	168.4 ± 56.5	0.59
Mean MVUs at completion of first stage	154.1 ± 57.9	147.4 ± 62.9	0.79

MVU, Montevideo unit; NRFS, non-reassuring fetal status

562 | Baby Got #Vbac: A Content Analysis of Trending Videos on Tiktok

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4:00 PM - 6:00 PM

Objective: Obstetric providers may be able to combat disinformation and strengthen patient-provider trust by understanding health information many of their patients consume on social media. We aimed to characterize and evaluate vaginal birth after Cesarean (VBAC) video content presented on TikTok.

Study Design: We used the web-scraping tool Apify to compile the 100 top "#vbac" videos. Unrelated, unavailable, or non-English videos were excluded. Two independent reviewers collected twenty-six descriptive data points for each video; a third arbitrated differences. Medical facts were appraised using VBAC guidelines from American College of Obstetricians and Gynecologists and Society of Maternal Fetal Medicine. Two validated measures were used: a modified 5-point DISCERN scale assessed information quality and Patient Education Materials Assessment Tool (PEMAT) assessed understandability and actionability.

Results: The top 100 videos had approximately 156 million views, 12 million likes, and 317,000 shares. A majority (81.0%) were made by non-healthcare professionals. The most common primary video theme was a personal experience or opinion (36.0%); of these, 13 (36.0%) mentioned distrust of or dismissal by providers. Twenty percent of all videos addressed home birth after Cesarean (HBAC), including 16 promoting HBAC by a single creator. Twenty-four videos presented medical facts; of these, videos by healthcare providers (n = 11) and non-healthcare providers (n = 13) included evidence-based facts 64.0% (n = 7) and 46.0%(n = 5) of the time, respectively. Overall videos exhibited high understandability (PEMAT median 85.5%, SD 15.7%), but low information quality (DISCERN mean 1.5, SD 0.9).

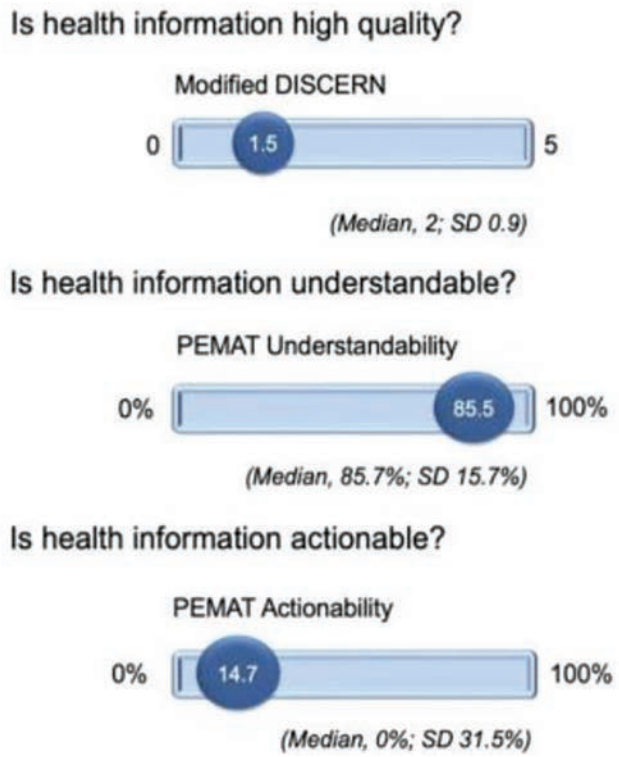
Conclusion: Videos with #vbac had low information quality, a finding consistent with previous work evaluating videos on contraception and abortion. Our study shows that top #vbac videos often lack health information. Of videos that include medical facts, many are incomplete or inaccurate. Obstetric providers can use the findings of this study to engage with patients they know are using TikTok for health education.

Table 1. Select characteristics of top #vbac videos.

A. Video content characteristics	N = 100 (%)
Primary video type	
Personal experience or opinion	36 (36.0%)
Reaction video or response	20 (20.0%)
Vlog	17 (17.0%)
Humor	15 (15.0%)
Educational	12 (12.0%)
Define VBAC or TOLAC	
Yes	3 (3.0%)
No	97 (97.0%)
Provide tips for VBAC	
Yes	13 (13.0%)
No	87 (87.0%)
Mention homebirth or HBAC	
Yes	20 (20.0%)
No	80 (80.0%)
Mention uterine rupture	
Yes	1 (1.0%)
No	99 (99.0%)
Presents medical facts	
Yes	24 (24.0%)
No	76 (76.0%)

B. Health information characteristics	
Video creator	N = 24 (%)
Healthcare provider	11 (45.8%)
Non-healthcare provider	13 (54.2%)
Degree of evidence-based support for facts presented by healthcare professionals	N = 11 (%)
All or mostly unsupported	4 (36.4%)
All or mostly supported	7 (63.6%)
Degree of evidence-based support for facts presented by non-healthcare professionals	N = 13 (%)
All or mostly unsupported	4 (30.8%)
Even mix	3 (23.1%)
All or mostly supported	6 (46.2%)

Figure 1. Average DISCERN and PEMAT scores #vbac video content.



563 | Second Stage of Labor Duration Among Patients with Obesity: How Likely is Vaginal Delivery?

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4:00 PM - 6:00 PM

Objective: ACOG recently revised guidelines defining an abnormally prolonged second stage labor as ≥ 3 hours. We sought to evaluate the difference in vaginal delivery rate for nulliparous patients with obesity and a singleton, term, vertex fetus (NTSV) with a normal (< 3 hour) versus prolonged (≥ 3 hour) second stage of labor.

Study Design: A retrospective cohort study of NTSV patients with obesity who achieved the second stage of labor, delivered at a tertiary care center hospital from 6/1/2023-12/31/2023. Obesity was defined as BMI ≥ 30 kg/m^2 on admission. The primary outcome was vaginal delivery. Secondary outcomes included select maternal and neonatal morbidities. Categorical variables were compared using Chi square and Fisher's exact. Normally distributed continuous variables were assessed using Student's T-test. Multivariable logistic regression was used to adjust for confounders.

Results: Of 348 included patients, 274 (78.7%) had a second stage < 3 hours and 74 (21.3%) had a second stage ≥ 3 hours. Those with a prolonged second stage were older (p = 0.04), more

likely to be admitted for induction of labor (p< 0.01) and utilize oxytocin in the second stage (p = 0.02). After adjusting for confounders, a prolonged second stage was associated with a 22% lower likelihood of vaginal delivery (aRR 0.78, CI 0.41-0.95). Patients with a prolonged second stage were more than 4 times as likely to have an operative vaginal delivery (aRR 4.54, 95% CI 2.97-6.29). 3rd degree lacerations were more likely in a prolonged second stage (aRR 10.25, 95% CI 2.02-41.55); however, the overall frequency was low. There were no other differences in maternal or neonatal morbidities between the groups.

Conclusion: While NTSV patients with obesity and a prolonged second stage of labor had a lower likelihood for vaginal delivery compared to those with a normal second stage duration, both groups had high rates of success. In patients with a prolonged second stage, 40% had an operative vaginal delivery, highlighting the importance of this obstetric skill in preventing the first cesarean section in patients with a protracted labor course.

Table 1: Baseline demographics between NTSV patients with obesity and a normal (<3 hour) or prolonged (≥3 hour) second stage of labor

	Second stage <3h (n=274)	Second stage ≥3h (n=74)	P-value
Age (years)	26.86 (5.6)	28.3 (6.1)	0.04
Body mass index (kg/m^2)	35.7 (5.0)	34.8 (4.0)	0.16
Patient-reported ethnicity			0.43
Non-Hispanic/Latina	86 (31.4)	23 (31.1)	
Hispanic/Latina	182 (66.4)	51 (69.9)	
Other	6 (2.2)	0	
Patient-reported race			0.02
White	108 (39.4)	35 (47.3)	
Black	30 (10.9)	3 (4.0)	
Asian	15 (5.5)	6 (8.1)	
HPI	1 (0.4)	3 (4.0)	
Other	120 (43.8)	27 (36.5)	
Co-morbid conditions			
Hypertension	13 (4.74)	6 (8.11)	0.26
Hypertensive disorder of pregnancy	42 (1533)	18 (24.3)	0.07
Gestational diabetes	33 (12.0)	5 (6.76)	0.20
Pre-gestational diabetes	3 (1.0)	0	-
Autoimmune disorder	4 (1.5)	1 (1.3)	1.00
Thyroid disorder	4	0	-
Substance use disorder	1 (0.4)	1 (1.3)	0.38
Other	16 (5.8)	5 (6.7)	0.78
Gestational age on admission (weeks)	39.23 (2.65)	39.67 (1.18)	0.16
Admission type			<0.01
Spontaneous/Augmented labor	182 (66.7)	36 (48.6)	
Induction	93 (33.3)	38 (51.4)	
Estimated fetal weight on admission (grams)	3298.7 (334.5)	3313.8 (292.6)	0.76
Chorioamnionitis	41 (14.9)	17 (22.9)	0.10
Oxytocin use in 2nd stage	181 (66.1)	59 (79.7)	0.02

*Data presented as N (%) or mean (standard deviation).

Table 2: Relative risk for primary and secondary outcomes between NTSV patients with obesity and a normal (<3 hour) or prolonged (≥3 hour) second stage of labor

	2nd stage <3h (n=274)	2nd stage ≥3h (n=74)	RR	aRR
Vaginal delivery	272 (99.3)	62 (83.8)	0.84 (0.76-0.93)	0.78 (0.41-0.95)
Operative vaginal delivery	25 (9.1)	30 (40.5)	4.44 (2.79-7.07)	4.54 (2.97-6.29)
Maternal morbidity				
3rd degree laceration	2 (0.73)	6 (8.11)	11.10 (2.23-53.90)	10.25 (2.02-41.55)
4th degree laceration	0	0	-	-
PPH	5 (1.82)	2 (2.70)	1.48 (0.29-7.48)	1.79 (0.33-8.55)
Transfusion	3 (1.09)	2 (2.70)	2.46 (0.42-14.50)	2.73 (0.44-14.97)
UAE	0	0	-	-
Ex lap	0	0	-	-
Hysterectomy	0	0	-	-
Endometritis	1 (0.36)	0	-	-
ICU admission	0	0	-	-
5-minute Apgar <7	1 (0.36)	2 (2.70)	7.40 (0.68-80.55)	8.75 (0.76-76.40)
NICU admission	18 (6.57)	5 (6.76)	1.02 (0.39-2.67)	1.06 (0.39-2.67)

*Adjusted for age, labor type, and oxytocin use in second stage of labor. Abbreviations: BMI, body mass index; RR, relative risk; aRR, adjusted relative risk; PPH, postpartum hemorrhage; UAE, uterine artery embolization; ex lap, exploratory laparotomy; ICU, intensive care unit; NICU, neonatal intensive care unit.

564 | Prolonged Second Stage: What is the Likelihood of a Safe, Vaginal Delivery?

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4:00 PM - 6:00 PM

Objective: ACOG has recently revised a clinical practice guideline defining a prolonged second stage labor as ≥3 hours, citing increased risk for adverse maternal and neonatal outcomes and lower likelihood of vaginal delivery at longer second stage durations. We aimed to measure how second stage duration is associated with vaginal delivery rate and adverse maternal and neonatal outcomes.

Study Design: This was a retrospective cohort study of nulliparous, term patients with a singleton, vertex fetus (NTSV) delivered at a tertiary care center hospital from 6/1/2023-12/31/2023. Patients who did not achieve the second stage of labor were excluded. Patients were stratified into three groups based on second stage duration: < 3 hours, ≥3 hours but < 4 hours, or ≥ 4 hours. The association between second stage duration and all outcomes was tested using the Cochran-Armitage test of trend.

Results: 700 patients were included. There was a significant decrease in vaginal delivery rate with increasing duration of the second stage (P-trend < 0.01). In contrast, there was a significant increase in operative vaginal delivery rate with increasing second stage duration (P-trend < 0.01). The rate of neonatal 5-minute Apgar < 7 increased with increasing second stage duration (P-trend 0.04); however, no other significant trends were noted for other markers of maternal morbidity or neonatal ICU admission.

Conclusion: Patients who reached the second stage of labor were significantly less likely to achieve a vaginal delivery as the second stage duration increased. However, the overall vaginal delivery rate remained high, with a significant proportion of operative vaginal deliveries among those with a prolonged second stage.

Table 1: Primary and secondary outcomes by duration of second stage of labor

	2nd stage<3h (n=527)	2nd stage>3h (n=68)	2nd stage >4h (n=105)	P-trend
Vaginal delivery	525 (99.6)	64 (94.1)	92 (87.6)	<0.01
Operative vaginal delivery	69 (13.1)	18 (26.5)	49 (46.6)	<0.01
Maternal Morbidity				
3rd degree laceration	16 (3.0)	1 (1.5)	8 (7.6)	0.09
4th degree laceration	0	1 (1.5)	1 (0.9)	0.10
PPH	11 (2.1)	1 (1.5)	3 (2.8)	0.81
Transfusion	7 (1.3)	0	2 (1.9)	0.98
EMM	3 (0.6)	0	2 (1.9)	0.36
5-minute Apgar <7	2 (0.4)	1 (1.5)	3 (2.8)	0.04
NICU admission	35 (6.6)	4 (5.8)	6 (5.7)	0.78

*Abbreviations: PPH, postpartum hemorrhage; EMM, endometritis; NICU, neonatal ICU

565 | Longitudinal Trends in Symptom and Mood During Pregnancy: a Retrospective Study from Digital Health App

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4:00 PM - 6:00 PM

Objective: Pregnancy symptomatology and mood are routinely captured during prenatal care, however, little data exists on how their trajectories vary throughout pregnancy. The use of mobile pregnancy trackers presents new opportunities to study symptom and mood trajectories throughout pregnancy.

Study Design: Pregnant patients from three clinics enrolled in a pregnancy mobile application between January 2023 and July 2024 and were instructed by their care team to track weekly pregnancy symptoms (100 unique symptoms available to select)

and daily mood rating (1 to 5) in the application. We plot the trajectories of the top five symptom groups and average mood throughout pregnancy using cubic splines. We perform statistical tests for linear and quadratic terms in regression models to describe trends by gestational week.

Results: By July 2024, there were n = 1445 patients using the application. 1073 users reported a total of 24,273 symptoms (average 22.62 symptoms per user) and 1100 reported a total of 29,148 mood measures (average 26.5 moods per user). The top five symptom groups ever reported in our cohort were constitutional, musculoskeletal, gastrointestinal, obstetric, and genitourinary symptoms (Table 1). Each symptom group had a unique trajectory throughout pregnancy (Figure 1). Musculoskeletal symptoms increased linearly ($p < 0.01$) and gastrointestinal symptoms decreased linearly ($p < 0.01$). Constitutional ($p < 0.01$), obstetric ($p < 0.01$), and genitourinary ($p < 0.01$) all had U-shaped curves throughout pregnancy. Average mood also exhibited a slight inverted U-shaped curve ($p < 0.01$), although variation throughout pregnancy was low overall (SD = 0.15).

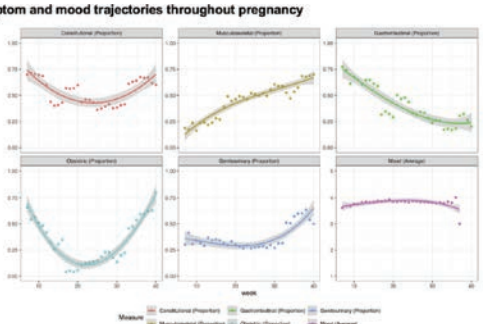
Conclusion: We observed distinct trajectories of symptoms and mood throughout pregnancy. Such information could improve personalized pregnancy care, use evidence-based knowledge to normalize pregnancy experiences, and may be potentially informative for early detection of adverse outcomes.

Table 1: Symptom groups definitions

Group	Number of unique symptoms	Example symptoms*
Constitutional	7	Trouble sleeping, fatigue, sudden weight gain, hot flashes, uncomfortable sleeping positions
Musculoskeletal	14	Lower back pain, leg cramps, leg swelling and pain, aches and pains, numbness of legs and feet
Gastrointestinal	22	Nausea or vomiting, appetite loss or food aversion, abdominal pain, severe nausea or vomiting, constipation
Obstetric	27	Braxton Hicks contractions, pelvic pain, vaginal bleeding, contractions that happen in regular pattern and get closer together over time, change in vaginal discharge
Genitourinary	3	Frequent urination, urinary problems including urinary tract infections (UTI), symptoms of UTI

*Only a selection of the top 5 unique symptoms for each group are shown due to space limitations

Figure 1: Symptom and mood trajectories throughout pregnancy



The proportion of users who experienced that symptom in each week of gestation is presented for the top five symptom groups (y-axis is from 0 to 1). The average weekly mood across users is presented for each week of gestation (y-axis is from 1 to 5, where 1 = Terrible and 5 = Great).

566 | Oral Presentation Conversion to Manuscript Publication Among Obstetrics and Gynecology Subspecialty Meetings

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4:00 PM - 6:00 PM

Objective: We aimed to evaluate the oral presentation to full manuscript conversion rate of Obstetrics and Gynecology subspecialty meetings.

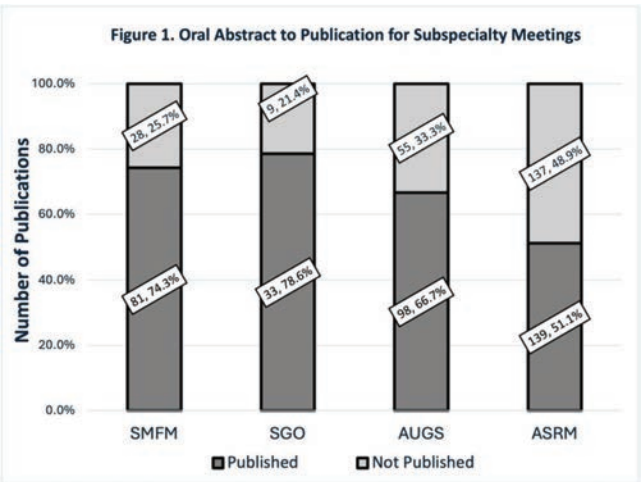
Study Design: We evaluated the 2019 meeting supplements from four subspecialty societies: 1) Society for Maternal-Fetal Medicine (SMFM), 2) Society of Gynecologic Oncology (SGO), 3) American Urogynecologic Society (AUGS), and 4) American Society for Reproductive Medicine (ASRM). Abstracts awarded an oral presentation were included and queried on PubMed using a multimodal method incorporating abstract keywords and first and last author's names to determine publication status. An abstract was classified as a published manuscript if the first author of the meeting abstract was credited in the final publication. The primary outcome was publication status. Secondary outcomes included first author consistency, manuscript journal impact factor, and time to publication. All analyses were performed on STATA IC 15.1 with Chi-square, ANOVA, and Kruskal-Wallis to determine statistical significance at a p-value < 0.05.

Results: There were differences in the proportion of abstracts presented as oral presentations with SMFM 109/1059 (10.3%), SGO 42/629 (6.7%), AUGS 153/704 (21.4%), and ASRM 276/1099 (25.1) (p-value < 0.01, Table 1). SMFM and SGO had a greater proportion of randomized controlled trials and SMFM had the greatest proportion of basic science studies. Among oral presentations, the publication rate was greatest for SGO (78.6%) and SMFM (74.3%), lower in AUGS (66.7%), and lowest in ASRM (51.1%) (p-value < 0.01, Figure 1). Among published manuscripts, SMFM had the highest median impact factor and quickest median time to publication (p-value < 0.01, Table 1). There were no differences noted in first author consistency (Table 1).

Conclusion: We found that the societies with the lowest proportion of oral presentations had the highest publication rate. More importantly, 21-49% of all oral presentations at subspecialty meetings are unpublished suggesting the need to improve the mechanism for or access by which highly regarded research translates to publication.

Table 1. Characteristics of Abstracts from 2019 National Meetings					
	SMFM	SGO	AUGS	ASRM	p-value
Total Number of Abstracts Presented	1059	629	704	1099	-
Presented as Oral, n (%)	109 (10.3)	42 (6.7)	153 (21.4)	276 (25.1)	<0.01
Study Design, n (%)					<0.01
Randomized Trial	37 (33.9)	17 (40.5)	37 (25.2)	34 (12.4)	
Prospective Cohort	18 (16.5)	5 (11.9)	24 (16.3)	76 (27.7)	
Retrospective Cohort	16 (14.7)	12 (28.6)	26 (17.7)	98 (35.8)	
Basic Science	35 (32.1)	0 (0.00)	17 (11.6)	34 (12.4)	
Other	3 (2.8)	8 (19.1)	43 (29.3)	32 (11.7)	
Number of Authors, mean +/- SD	6.1 +/- 2.6	8.0 +/- 2.1	5.4 +/- 2.2	6.0 +/- 2.4	<0.01
First Author Current Highest Degree, n (%)					<0.01
MD/DO	68 (62.4)	29 (69.1)	128 (87.1)	150 (54.4)	
MD/DO + Masters (MS, MPH, MCR, MBA)	10 (9.2)	9 (21.4)	7 (4.8)	12 (4.4)	
MD PhD	11 (10.1)	4 (9.5)	4 (2.7)	22 (8.0)	
PhD	15 (13.8)	0 (0.0)	6 (4.1)	47 (17.0)	
Masters	2 (1.8)	0 (0.0)	0 (0.0)	23 (8.3)	
Bachelors	3 (2.8)	0 (0.0)	2 (1.4)	22 (8.0)	
First Author in USA, n (%)	98 (89.9)	37 (88.1)	106 (72.1)	201 (72.8)	<0.01
Last Author Current Highest Degree, n (%)					<0.01
MD/DO	62 (60.8)	33 (78.6)	138 (95.2)	141 (51.5)	
MD/DO + Masters (MS, MPH, MCR, MBA)	7 (6.9)	2 (4.8)	2 (1.4)	12 (4.4)	
MD PhD	15 (14.7)	6 (14.3)	0 (0.0)	37 (13.5)	
PhD	17 (16.7)	1 (2.4)	4 (2.8)	69 (25.2)	
Masters	0 (0.0)	0 (0.0)	1 (0.7)	11 (4.0)	
Bachelors	1 (1.0)	0 (0.0)	0 (0.0)	4 (1.5)	
Last Author in USA, n (%)	90 (88.2)	37 (88.1)	106 (73.1)	199 (72.6)	<0.01
Published, n (%)	81 (74.3)	33 (78.6)	98 (66.7)	139 (51.1)	<0.01
First Author Consistent, n (%)	71 (87.7)	26 (78.8)	80 (81.6)	111 (78.2)	0.36
Journal Current Impact Factor, median [IQR]	7.2 [3.7,9.8]	6.2 [6.2,7.8]	2.1 [1.8,6.1]	4.4 [2.8,6.7]	<0.01*
Months to Publication, median [IQR]	12 [6,24]	17 [12,30]	17 [11,26]	16 [10,25]	0.03*

*Kruskal-Wallis test used for non-parametric analysis



567 | Practice Patterns in the Administration of Antenatal Corticosteroids in Patients at Risk of Preterm Birth

Moti Gulersen[1]; Frank I. Jackson[2]; Ashley N. Battarbee[3]; Vincenzo Berghella[1]; Matthew J. Blitz[2]
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4:00 PM - 6:00 PM

Objective: Although suboptimal timing of antenatal corticosteroid (ACS) administration in patients at risk of preterm birth (PTB) is well known, studies stratifying timing by GA at administration are limited. We aimed to evaluate whether ACS timing differs by gestational age (GA) of administration in patients at risk of PTB.

Study Design: Multicenter retrospective cohort of all singleton pregnancies exposed to ACS between 22 0/7-36 6/7 weeks of gestation and delivered from 2019-2023. Patients who had neonates that were not actively resuscitated at birth and intrauterine fetal demise were excluded. The primary outcome of time interval from ACS administration to delivery, stratified by < 2, 2-7, and >7 days, was compared among 4 gestational age groups: 22 0/7-25 6/7, 26 0/7-29 6/7, 30 0/7-33 6/7, and 34 0/7-36 6/7 weeks of gestation. The secondary outcome was delivery at term (37 0/7 weeks of gestation or later). Statistical analysis included use of Chi-squared test. Statistical significance was set $P < 0.05$.

Results: Of the 116,803 patients who delivered during the study period, 5,003 (4.3%) received ACS prior to delivery. Primary and secondary outcomes are displayed in the Table.

Conclusion: Data from this large cohort suggest that optimal timing of ACS in patients at risk of PTB is low, regardless of gestational age of ACS administration. The likelihood of optimal timing is significantly decreased in the late preterm period compared to early preterm periods. A significant proportion of patients exposed to ACS in the periviable period deliver at term. These data highlight the importance of developing PTB prediction tools to aid practitioners in optimizing the timing of ACS.

Table. Primary and secondary outcomes compared among the 4 groups.

	ACS administered 22 0/6-25 6/7 weeks (n=246)	ACS administered 26 0/7-29 6/7 weeks (n=676)	ACS administered 30 0/7-33 6/7 weeks (n=1,932)	ACS administered 34 0/7-36 6/7 weeks (n=2,149)	P value
Delivery < 2 days after ACS administration	45 (18.3)	112 (16.6)	525 (27.2)	1,501 (69.8)	<0.001
Delivery 2-7 days after ACS administration	51 (20.7)	140 (20.7)	432 (22.4)	190 (8.8)	
Delivery > 7 days after ACS administration	150 (61.0)	424 (62.7)	975 (50.5)	458 (21.3)	
Delivered ≥ 37 weeks of gestation	57 (23.2)	207 (30.6)	472 (24.4)	422 (19.6)	<0.001

Data are presented as number (percentage)

568 | Should Antenatal Corticosteroids Be Considered in Singletons Undergoing Cerclage at 22 0/7-23 6/7 Weeks' Gestation?

Moti Gulersen[1]; Frank I. Jackson[2]; Rupsa C. Boelig[3]; Eran Bornstein[4]; Vincenzo Berghella[1]; Matthew J. Blitz[2]
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4:00 PM - 6:00 PM

Objective: The American College of Obstetricians and Gynecologists (ACOG) suggests that antenatal corticosteroids (ACS) can be considered as early as 22 0/7 weeks' gestation in patients at increased risk of preterm (PTB) within 7 days of presentation. We aimed to evaluate the likelihood of delivery within 7 days of cerclage placement to determine whether ACS should be considered in this high-risk population.

Study Design: Multicenter retrospective cohort of all singletons undergoing an ultrasound-indicated cerclage (UIC) or physical exam-indicated cerclage (PEIC) between 22 0/7-23 6/7 weeks' gestation and delivered from 01/2018-06/2023. The primary

outcome was delivery < 7 days after cerclage placement. Secondary outcomes included delivery < 14 days after cerclage placement and PTB. We planned to compare baseline characteristics at the time of cerclage placement between those who delivered < 7 days versus 7 days or later after cerclage. Statistical analysis included use of Pearson's chi-square for categorical variables and Wilcoxon rank sum test for continuous variables. Statistical significance was set $P < 0.05$.

Results: Of the 83 patients included, 61 (73.5%) underwent an UIC and 22 (26.5%) underwent a PEIC. There were no patients who delivered < 7 days after cerclage placement; thus, we primarily compared those who delivered < 14 days versus 14 days or later. Three (3.6%) of patients delivered < 14 days after cerclage placement (12, 13, and 13 days). The prevalence of PTB < 37 weeks was 70.0%. Baseline characteristics compared between the two groups are displayed in the Table. Patients who delivered < 14 days after cerclage more commonly had a BMI > 40 kg/m^2 compared to those who delivered later (Table).

Conclusion: Although patients undergoing cerclage at 22 0/7-23 6/7 weeks' gestation are at high risk of PTB, none of the patients in this cohort delivered < 7 day after placement. These data suggest that ACS administration may be deferred in this patient population unless additional indications are present.

Table. Characteristics compared between those who delivered <14 days versus ≥ 14 days after cerclage placement.

	Delivered < 14 days after cerclage placement (n=3)	Delivered ≥ 14 after cerclage placement (n=80)	*P* value
Maternal age (years)	31.3 (2.1)	32.4 (5.3)	0.7
Body mass index (kg/m²)			
<30	0 (0)	6 (7.5)	0.03
30-34.9	0 (0)	0 (0)	
35-39.9	1 (33)	64 (80)	
≥ 40	2 (67)	10 (12.5)	
History of preterm birth	1 (33)	13 (16.2)	0.44
Nulliparity	2 (67)	45 (56.2)	0.72
Race and ethnicity			
Non-Hispanic white	1 (33)	20 (25)	0.74
Non-Hispanic black	1(33)	31 (39)	
Hispanic	0 (0)	11 (14)	
Asian and Pacific Islander	1(33)	7 (8)	
Native American	0 (0)	1 (1)	
Multiracial or other	0 (0)	10 (13)	
Indication for cerclage			
Physical exam-indicated	2 (66)	20 (25)	0.11
Ultrasound-indicated	1 (33)	80 (75)	
Gestational age at cerclage placement (weeks)	22.5 (0.2)	22.7 (0.6)	0.53
Gestational age at delivery (weeks)	24.3 (0.2)	36.7 (3.4)	<0.001

Data are presented as number (percentage) and mean (standard deviation).

569 | The Impact of Peripartum Fever on Long-Term Neurological Morbidity in Offspring

Narkis Hermon[1]; Omri Zamstein[2]; Tamar Wainstock[3]; Eyal Sheiner[3]

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4:00 PM - 6:00 PM

Objective: Peripartum fever, resulting from various infectious and non-infectious causes, can lead to adverse maternal and neonatal outcomes. This study explores the potential long-term neurological effects of peripartum fever on the offspring.

Study Design: A population-based cohort analysis was conducted at a tertiary referral hospital to assess the incidence of neurological conditions in the offspring—encompassing both hospital and community-based diagnoses—based on the presence of peripartum fever. Kaplan-Meier survival curves evaluated the cumulative incidence of morbidity, while Cox proportional hazards models adjusted for confounding factors.

Results: In this study involving 232,476 deliveries, 1,728 (0.7%) were associated with peripartum fever. Compared to the group without fever, those with peripartum fever exhibited significantly higher incidences of hypertensive disorders (9.5% vs. 4.6%), preterm births (15.7% vs. 7.0%), non-reassuring fetal heart rate patterns (17.7% vs. 5.4%), and cesarean deliveries (47.0% vs. 13.8%; Table). Although overall neurological morbidity in the offspring was somewhat higher in the fever group (19.6% vs. 17.4%, p = 0.018), there was no notable difference in the occurrence of autism spectrum disorders (0.3% vs. 0.5%, p = 0.62). Additionally, the Kaplan-Meier analysis revealed no significant difference in the overall neurological morbidity (Log-rank p-value = 0.899; Figure). Following adjustments for maternal age and gestational age at birth, there was no significant association between peripartum fever and long-term neurological outcomes in the offspring (adjusted HR = 0.95, 95% CI 0.85–1.06, p = 0.35; Table).

Conclusion: Peripartum fever is linked to increased rates of obstetric complications; however, it does not significantly impact long-term neurological outcomes in offspring.

Figure. Cumulative Incidence of Total Neurological Morbidity in Offspring Based on Maternal Peripartum Fever Status (Log-Rank p-value = 0.89).

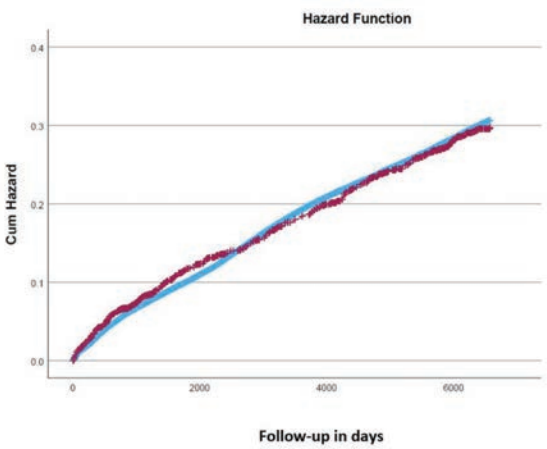

Table. Obstetrical Characteristics and Long-Term Neurological Morbidity in Offspring by Peripartum Fever Status.

	Peripartum fever (n=1,728)	No peripartum fever (n=230,748)	*P*-value
Obstetrical characteristics			
Hypertensive disorders during pregnancy (%)	9.5	4.6	<0.001
Preterm birth (<37 weeks, %)	15.7	7.0	<0.001
Non-reassuring fetal heart rate patterns (%)	17.7	5.4	<0.001
Cesarean delivery (%)	47.0	13.8	<0.001
Offspring neurological morbidity			
Total neurological morbidity	19.6	17.4	0.018
Adjusted HR [a]	0.95 (95% CI 0.85-1.06)	1 (*reference*)	0.349

[a] Accounting for maternal age and gestational age at birth.

570 | Maternal and Neonatal Outcomes: Ampicillin Plus Gentamicin vs. Ampicillin Alone for Intrapartum Fever

Natav Hendin; Yarin Mash; Or Bercovich; Yossi Geron; Mor Ginat Shaked; Eran Hadar; Ohad Houri
Rabin Medical Center, Petach Tikva, HaMerkaz

4:00 PM - 6:00 PM

Objective: To evaluate the effectiveness of ampicillin plus gentamycin versus ampicillin alone in treating women with intrapartum fever.

Study Design: 10-year retrospective study at a single tertiary hospital, including term singleton vaginal deliveries who developed isolated intrapartum fever (≥38°C) without any concurrent evidence of infection. The department's treatment protocol changed in 2016 from ampicillin alone to ampicillin plus gentamicin. Primary outcome was puerperal endometritis. Secondary outcomes included microbiological studies, such as maternal urine or blood cultures, and neonatal outcomes.

Results: A total of 389 women met inclusion criteria and were treated with either ampicillin alone (n = 128, 33%) or ampicillin plus gentamycin (n = 261, 67%). The incidence of endometritis was higher in the ampicillin group compared to the ampicillin plus gentamycin group, although not statistically significant (6.25% vs. 2.30%, P = 0.08). Blood and urine culture positivity rates were similar (6.25% vs. 4.60%, p = 0.47, 2.34% vs. 5.36%, p = 0.20 respectively). Maternal hospitalization was longer for the ampicillin group (3.36 ± 1.1 days vs. 3.03 ± 1.04 days, P< 0.01).

Neonatal intensive care unit (NICU) admission rates were significantly higher in the ampicillin group (36.7% vs. 11.9%, P< 0.01). Conversely, among the neonates admitted to the NICU, the incidence of respiratory pathologies, such as respiratory distress syndrome or transient tachypnea of the newborn, and the need for ventilation were significantly higher in the ampicillin plus gentamycin group (2.1% vs. 25.8%, P< 0.01, 4.3% vs. 38.7 %, p< 0.01 respectively) (Table 1).

Conclusion: Women treated with ampicillin alone for intrapartum fever had higher rates of adverse maternal outcomes compared to those treated with ampicillin plus gentamycin. Although NICU admission rates were higher in the ampicillin group, respiratory diseases were more prevalent in the ampicillin plus gentamycin group.

Figure 1. Flowchart of the study population

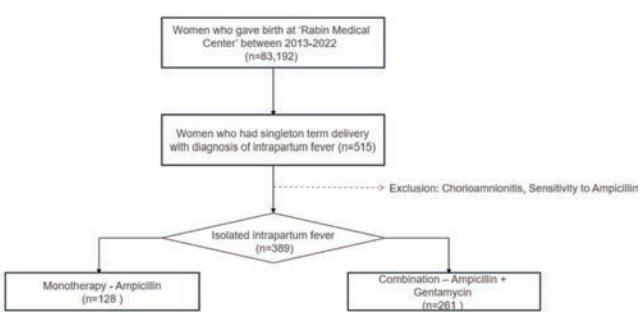

Table 2. Maternal and neonatal outcomes of women included in the study

	Ampicillin (N=128)	Ampicillin + Gentamycin (N=261)	P Value
Maternal Outcomes			
Endometritis	8 (6.25%)	6 (2.30%)	0.08
Blood culture growth	8 (6.25%)	12 (4.60%)	0.47
Urine culture growth	3 (2.34%)	14 (5.36%)	0.20
Hospitalization duration (Days)	3.36 ± 1.1	3.03 ± 1.04	<0.01
Neonatal Outcomes			
NICU	47 (36.7%)	31 (11.9%)	<0.01
RDS/TTN	1/47 (2.1%)	8/31 (25.8%)	<0.01
Need for ventilation	2/47 (4.3%)	12/31 (38.7%)	<0.01
Early sepsis	4/47 (8.5%)	8/31 (25.8%)	1.00
Positive Blood Culture	1/47 (2.1%)	2/31 (6.5 %)	0.56

Data are presented as mean ± SD for continuous variables and as number (%) for categorical variables. NICU, neonatal intensive care unit; RDS, respiratory distress syndrome; TTN, transient tachypnea of the newborn

571 | Neonatal Outcomes After Expedited Delivery Versus Expectant Management for Preeclampsia with Severe Features

Frank I. Jackson; Nathan A. Keller; Sarah H. Abelman; Luis A. Bracero; Matthew J. Blitz
Northwell, New Hyde Park, NY

4:00 PM - 6:00 PM

Objective: To determine if expectant management versus expedited delivery for preeclampsia with severe features (sPEC) improves neonatal outcomes.

Study Design: Retrospective cohort study of pregnancies complicated by sPEC within a large health care system in New York between 2019 and 2023. Patients who delivered < 24 hours after diagnosis (immediate delivery), without receiving two doses of betamethasone were excluded. Deliveries were classified as expectant management (EM) if they occurred > 72 hours after diagnosis and as expedited delivery (ED) if they occurred within 24-72 hours after diagnosis. The primary outcome was severe neonatal morbidity (SNM), a composite neonatal adverse outcome indicator which includes diagnoses and procedures. Secondary outcomes included respiratory distress syndrome (RDS), bronchopulmonary dysplasia (BPD), interventricular hemorrhage (IVH), and sepsis. Analysis was performed separately for deliveries at 28-34 weeks and < 28 weeks due to presumed variation in clinical management strategies. A logistic regression was performed. All statistical analyses were performed in R 4.3.1.

Results: In total, 218 patients were included for analysis: 178 (81.7) delivered between 28 and 34 weeks and 40 (18.3) delivered at < 28 weeks. Overall, the time interval from diagnosis to delivery had a median of 4.0 days [IQR: 2.4-8.0]. There were no significant differences in SNM, RDS, BPD, IVH, or sepsis between the ED and EM groups in either gestational age grouping (Table 1).

Conclusion: Pregnancies complicated by sPEC did not show improvement in SNM, RDS, BPD, IVH, or sepsis whether the delivery was expedited or occurred after expectant management. Significant maternal risks without clear neonatal benefit of expectant management may favor expedited delivery.

Table 1 – Expedited delivery vs. expectant management and neonatal outcomes by gestational age group

	Delivery < 28 weeks (n=40)			Delivery 28-34 weeks (n=178)		
Outcome	Expedited Delivery (n=14)	Expectant Management (n=26)	Odds Ratio (95% CI)	Expedited Delivery (n=60)	Expectant Management (n=118)	Odds Ratio (95% CI)
SNM	8 (57.1)	17 (65.4)	1.42 (0.37-5.42)	39 (65)	78 (66.1)	1.05 (0.54-2.01)
RDS	7 (50)	15 (57.7)	1.36 (0.37–5.13)	22 (36.7)	44 (37.3)	1.03 (0.54-1.97)
BPD	1 (7.1)	4 (15.4)	2.36 (0.13-48.91)	0	0	-
IVH	2 (14.3)	3 (11.5)	0.78 (0.11-6.56)	2 (3.3)	14 (11.9)	2.56 (0.79-11.43)
Sepsis	0	0	-	0	2	-

572 | Racial and Ethnic Disparities in Severe Maternal Morbidity and Icu Admission by Bariatric Surgery Status

Nathan A. Keller; Frank I. Jackson; Sarah H. Abelman; Luke Pierce; Sarika Arora; Alexis Palmer; Luis A. Bracero; Matthew J. Blitz
Northwell, New Hyde Park, NY

4:00 PM - 6:00 PM

Objective: To assess racial and ethnic disparities in severe maternal morbidity (SMM) and ICU admission in patients with and without a history of bariatric surgery.

Study Design: Retrospective cohort study of pregnancies within a large health care system in New York from 2019-2023. The primary exposure was bariatric surgery, which included: gastric sleeve, gastric band, Roux-en-Y gastric bypass, and biliopancreatic diversion with duodenal switch. Race and ethnicity were self-identified from pre-specified categories. The primary outcome was SMM during delivery hospitalization. SMM was defined using the Centers for Disease Control and Prevention (CDC) criteria which includes 21 indicators. A multivariable logistic regression was used to estimate the strength of association between prior bariatric surgery and SMM and ICU admission, adjusting for Obstetric Comorbidity Index (OBCMI) and race and ethnicity group. All statistical analyses were performed in R 4.3.1.

Results: In total, 127,959 pregnancies with delivery outcomes were identified with 493 (0.4%) with and 127,466 (99.6%) without a history of bariatric surgery. SMM occurred in 43 (8.7%) of pregnancies with a history of bariatric surgery and in 5,333 (4.2%) of pregnancies without such a history [unadjusted OR: 2.19, 95% CI 1.58-2.96]. After adjustment for OBCMI and race and ethnicity groups, no significant differences among SMM in patients with a history of bariatric surgery was observed [aOR: 1.37, 95% CI 0.98-1.88]. ICU admission occurred in 12 (2.4%) pregnancies with a history of bariatric surgery and in 797 (0.6%) pregnancies without such a history [aOR: 2.13, 95% CI 1.11-3.71]. All other race and ethnicity groups were at increased risk for SMM compared to Non-Hispanic White patients (Table 1).

Conclusion: A history of bariatric surgery was associated with increased risks of SMM before, but not after, adjustments for OBCMI and race and ethnicity group. ICU admission was significantly increased even after adjustments. Significant differences in SMM were seen by race and ethnicity group.

Table 1 – Incidence of severe maternal morbidity and ICU admission with and without bariatric surgery by race and ethnicity

	Total n=127,959	SMM n (%)	SMM aOR [95% CI]	ICU Admission n (%)	ICU Admission aOR [95% CI]
Bariatric Surgery					
Yes	493	43 (8.7)	1.37 [0.98-1.88]	12 (2.4)	2.13 [1.11-3.71]
No	127,466	5,333 (4.2)	Reference	797 (0.6)	Reference
Race and Ethnicity					
Non-Hispanic White	56,632	1,694 (3.0)	Reference	231 (0.4)	Reference
Non-Hispanic Black	15,925	1,025 (6.4)	1.62 [1.49-1.76]	194 (1.2)	1.81 [1.48-2.21]
Hispanic	24,494	1,222 (5.0)	1.59 [1.47-1.71]	153 (0.6)	1.38 [1.12-1.70]
Asian and Pacific Islander	17,203	735 (4.3)	1.51 [1.38-1.65]	132 (0.8)	2.10 [1.69-2.60]
Native American and Alaska Native	871	43 (4.9)	1.65 [1.19-2.24]	6 (0.7)	1.63 [0.64-3.40]
Multiracial and Other	14,834	657 (4.4)	1.45 [1.32-1.59]	93 (0.6)	1.47 [1.14-1.86]

* Models additionally adjusted for OBCMI

573 | Ultrasonographic Fetal Lung Echotexture Analysis in the Prediction of Neonatal Respiratory Distress Syndrome

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[1]Northwell, New Hyde Park, NY; [2]Northwell, St. Petersburg, FL

4:00 PM - 6:00 PM

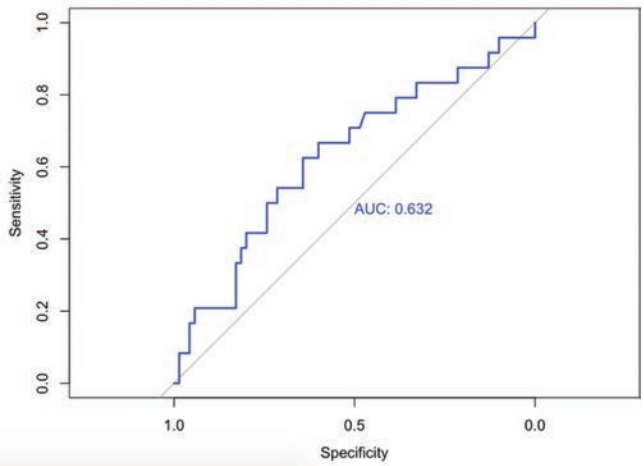
Objective: To determine if ultrasonographic fetal lung echotexture analysis is predictive of neonatal respiratory distress syndrome (RDS).

Study Design: Prospective cohort study of singleton gestations with medically-indicated ultrasound examinations from October 2017 through September 2021. Grayscale transverse fetal lung images were obtained at the level of the four-chamber heart view with GE Voluson E8 and E10 ultrasound machines with convex array transducers. A region of interest was selected in each fetal lung image. Fetal lung heterogeneity index (HI) was determined with MATLAB software using a dithering technique with ultrasound image pixels transformed into a binary map from which a dynamic range value was determined. The fetal lung HI ultrasound occurred $\leq$ 7 days prior to delivery. Pregnancies were categorized by delivery timing: late preterm (34+0 to 36+6 WGA), early term (37+0 to 38+6 WGA), and full-term (39+0 to 40+6 WGA). Pregnancies with delivery occurring > 7 days from HI measurement were excluded from the analysis.

Results: In total, 468 singletons were delivered $\leq$ 7 days from the HI ultrasound examination. Of these, 94 (20.1%), 276 (59.0%), and 98 (20.9%) delivered preterm, early term, and full term, respectively. RDS occurred in 20 (21.3%) of late preterm, 3 (1.0%) of early term, and 1 (1.0%) of full term deliveries. Figure 1 shows the receiver operating characteristic (ROC) curve for fetal lung HI as a predictor of RDS in the preterm delivery cohort. HI was modestly predictive of RDS in the late preterm cohort (AUC: 0.632), but not in the early or full term cohort, potentially from low incidences of RDS in these time frames.

Conclusion: Fetal lung HI had a modest association with RDS in the late preterm time period which is the time of greatest fetal lung HI change and greatest risk of RDS. While fetal lung HI alone may not be a great predictor of RDS, it may be a useful adjunct when combined with other pregnancy risk factors.

Figure 1 – ROC Curve for HI Predicting RDS in Late Preterm Newborns



574 | Risk Factors for Maternal Abruption after the Fetoscopic Laser Surgery for Twin Twin Transfusion Syndrome

Neha Agarwal[1]; Ramesha Papanna[2]; Dejian Lai[3]; Anthony Johnson[4]; Sami Backley[5]; Eric P. Bergh[6]; Edgar A. Hernandez-Andrade[2]; Gustavo Vilchez[7]; Felicia V. LeMoine[5]; Alexandra Garcia[5]; Tania clarete[5]; Elisa Garcia[5]; Ashley Salazar[8]; Jimmy Espinoza[5]

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4:00 PM - 6:00 PM

Objective: To evaluate the risk factors associated with maternal abruption in twin-twin transfusion syndrome (TTTS) after fetoscopic laser surgery (FLS).

Study Design: This retrospective study included TTTS cases that underwent FLS between 2011 and 2024 at a single institution. Maternal demographics and preoperative, intraoperative and postoperative outcomes were collected. Patients were subsequently grouped by abruption status. Placental abruption was diagnosed based on documentation in the medical record. Multiple logistic regression analysis was performed to identify risk factors, adjusted for maternal ethnicity, placental location, gestational age at FLS, amnioinfusion, amnioreduction, number of uterine entries, Solomonization, laser time and kilojoules, chorioamnion separation (CAS) observed on the first postoperative day, and preterm prelabor rupture of membrane (PPROM).

Results: 749 patients were enrolled in the study. Among them, 88 (11.7%) were complicated by maternal abruption. Patients with abruption delivered earlier than those without abruption (29.2 [26.3, 31.5] wks. vs 32 [28.5, 34.2] wks., $p < 0.001$). There were no significant statistical differences in maternal age, race, BMI, smoking status or other demographics or intraoperative variables between groups (Table 1). Rates of CAS (18.1% [16/88] vs. 9.6% [64/661], $p = 0.04$) and PPROM (61.3% [54/93] vs 37% [245/655], $p = 0.001$) were statistically significantly higher among the abruption group than the no abruption group. Multiple logistical regression demonstrated that CAS and PPROM are significant risk factors for placental abruption ([aOR, 2.04; 95% CI 1.01–4.11, $p = 0.04$] and [aOR, 2.16; 95% CI 1.29-3.61, $p = 0.003$], respectively).

Conclusion: CAS and PPROM are significant risk factors for placental abruption. After FLS, patients with CAS and PPROM should be advised of the increased risk for placental abruption.

Table 1. Demographics and intraoperative findings of patients with and without abruption.

Variable	Abruption (n=88)	No abruption (n=661)	P value
Age (years)[1]	29 (24, 32)	29 (24, 33)	0.97
BMI (kg/m²)[1]	28.3 (24.1, 31.8)	26.9 (23.5, 32)	0.48
Current smoker*	7 (7.9%)	32 (4.8%)	0.22
Cervical length (mm)[2]	40.0 (33, 45)	38.2 (30, 44)	0.12
Anterior placenta*	46 (49.4%)	299 (45.2%)	0.25
EFW discordance*	39 (44.3%)	288 (43.5%)	0.48
Sex*			
Male	40 (52%)	325 (53%)	0.95
Female	37 (48%)	289 (49%)	
Quintero Stage at diagnosis*			
Stage I	12 (13.6%)	83 (12.5%)	0.23
Stage II	30 (34%)	172 (26%)	
Stage III	40 (45.4%)	376 (56.8%)	
Stage IV	6 (6.8%)	30 (4.5%)	
Recipient Entry MVP[2]	14 (9, 14)	11 (9.3, 13.3)	0.83
Recipient Closing MVP[2]	7.75 (6.23, 8.97)	7.40 (6.37, 8.50)	0.37
GA at FLS (wks.dys)[2]	20.3 (18.2, 22.1)	20.1 (18.4, 22.2)	0.97
Amnioinfusion*	37 (42%)	317 (47.9%)	0.14
Amnioinfusion (ml)[2]	300 (100, 663)	300 (100, 600)	0.93
Amnioreduction (ml)[2]	1150 (500, 2000)	1240 (700, 2000)	0.57
Transplacental access*	3 (3.4%)	13 (1.9%)	0.18
Laser (KJ)[2]	4.45 (3.08, 6.65)	4.00 (3.06, 5.60)	0.09
Laser time (mins)[2]	3.21 (2.11, 5.10)	2.90 (2.14, 4.02)	0.06
Collagen plug placement*	10 (11.3%)	58 (8.8%)	0.75
Procedure time (mins)[2]	44 (34, 57)	44 (34, 59)	0.51
Solomonization*	84 (95.4%)	600 (90.7%)	0.29

[1] mean ±SD; [2] median (IQR); *n (%) EFW: estimated fetal weight; d: donor; MVP: maximum vertical pocket; GA: gestational age; FLS: fetoscopic laser surgery.

Table 2. Multiple logistic regression analysis to identify variables associated with placental abruption after fetoscopic laser surgery.

Predictor Variables	Crude Odds Ratio (95% CI)	p	Adjusted Odds Ratio (95% CI)	p
Solomonization	1.35 (0.40-04.54)	0.62	0.94 (0.20-4.40)	0.94
GA at surgery	0.99 (0.99-1.00)	0.62	0.99 (0.95-1.01)	0.88
Laser time	1.00 (0.99-1.00)	0.59	1.39 (0.83-2.17)	0.21
Laser (KJ)	0.89 (0.81-0.99)	0.09	0.92 (0.67-1.26)	0.61
Anterior placenta	1.30 (0.83-2.02)	0.25	1.46 (0.88-2.43)	0.13
Amnioinfusion (n)	0.73 (0.47-1.15)	0.18	0.78 (0.47-1.30)	0.36
Amnioreduction (n)	1.41 (0.62-3.16)	0.40	1.42 (0.55-3.70)	0.48
Uterine entries (n)	0.14 (-0.07-0.36)	0.77	2.04 (0.51-8.11)	0.31
African American ethnicity	0.95 (0.44-2.01)	0.89	0.96 (0.45-2.18)	0.92
CAS	2.05 (1.13-3.74)	**0.01**	2.05 (1.01-4.13)	**0.04**
PPROM	2.60 (1.65-4.09)	**0.001**	2.15 (1.29-3.60)	**0.003**

CAS: Chorioamnion separation; PPROM: Preterm prelabor rupture of membrane, GA: gestational age.

575 | Evaluation Of Severity Determination Using Transvaginal Ultrasound In Placenta Accreta Spectrum Scoring (TUPAS)

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4:00 PM - 6:00 PM

Objective: We showed that TUPAS, based on loss of uterine wall interface (LUS), arterial vascularity, and cervical involvement, can determine PAS severity based on blood loss during surgery. This study aims to validate the TUPAS in an external cohort and associate it with surgical outcomes.

Study Design: This is a retrospective cohort study of consecutive patients referred to our center for suspected PAS from 2023-2024. Transvaginal ultrasound evaluated the LUS and cervix per pre-defined protocol (evaluating the placental-uterine/cervical and bladder interface with bladder half full). Patients were managed per usual clinical approach, not based on TUPAS, including c-section with placenta removal, c-hysterectomy, and conservative management. An examiner blinded to patient history and clinical outcomes retrospectively scored images/clips. Cumulative scores of 0-9 were converted to 4 categories as previously published (0: score 0; 1: score 1-3; 2: score 4-6; 3: score 7-9). The primary outcome was calculated estimated blood loss (cEBL) during the primary surgery. Secondary outcomes were surgery type, blood product transfusion, ICU admission and length of hospital stay.

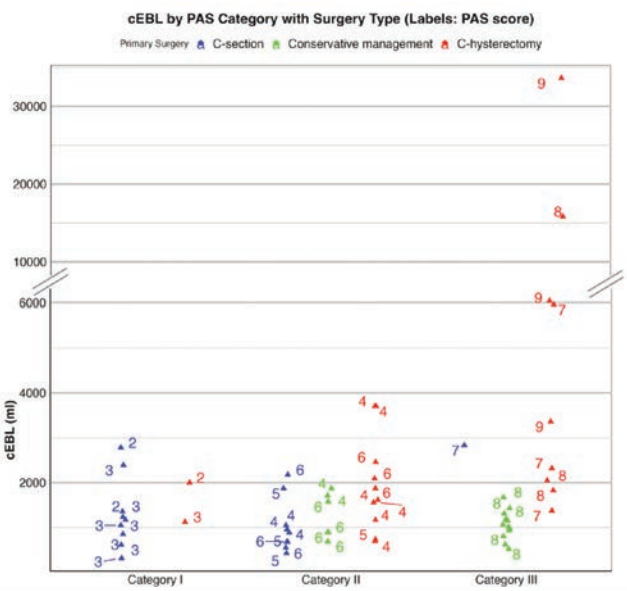
Results: 86 patients were referred: 78 were included in the analysis, 6 had incomplete or no images, 2 had placenta in the upper uterine segment. Maternal demographics and number of c-section deliveries did not differ by category. Surgical management differed by category: all Cat-0 patients and 82% in Cat-1 had c-section with placenta removal (Tab 1). Cystotomy occurred only in Cat-3. From multiple linear regression analysis in log scale, Cat-3($\beta = 0.94$, $p = 0.002$) was associated with greater blood loss than other categories, irrespective of surgery type, on multiple linear regression. C-hysterectomy in Cat-3 was associated with higher cEBL (Fig1.), requiring massive transfusion, and more severe pathology than Cat-2.

Conclusion: Our scoring strongly associated with severity of PAS with blood loss regardless of management approach. Cat 3 represents the most severe cases; referral to a tertiary care center specializing in PAS management should be considered.

Table 1. Selected variables of significant differences among the categories.

Characteristics	Category 0 (PAS 0)	Category 1 (PAS 1-3)	Category 2 (PAS 4-6)	Category 3 (PAS 7-9)	P value
N=78	20 (26%)	11 (14%)	25 (32%)	22 (28%)	
Complete Previa[3]	0 (0%)	5 (45.4%)	22 (88%)	22 (100%)	0.001
GA at delivery[2]	37.2 [34.2–39.4][a]	34.2 [33.6–37.4][a]	34.2 [27.2–38.2][a]	33 [28.2–36.5][c]	<0.001
Cesarean delivery + Placenta removal[3]	20 (100%)	9 (81.8%)	9 (36%)	1* (4.5%)	<0.001
Cesarean delivery with conservative management[3]	0 (0%)	0(0%)	6 (24%)	12 (54.5%)	
Cesarean hysterectomy[3]	0 (0%)	2(18.1%)	10 (40%)	9(40.9%)	
Cystotomy[3]	0 (0%)	0 (0%)	0(0%)	6(27.2%)	<0.001
cEBL (mL)–all methods[2]	738 [604-926][a]	1167 [949-1677][b]	1166 [732-1871][b]	1353 [1028-2250][b]	<0.001
cEBL (mL) in C-hysterectomy[2]	N/A	1561[1342-1781]	1742 [1263-2366]	3359 [2044-6036]	0.07
Massive Transfusion (1st Surgery) >5L cEBL+ ≥8PRBCs >2L + 4PRBCs	0 0	0 1 (7%)	0 1 (4%)	4 (18%) 7 (32%)	0.017 0.004
Placenta pathology No Accreta/PI Removed Accreta Increta Percreta NA/Placenta in-situ	20 (100%) 0 0 0 0 0	9 (81.8%) 1 (9.09%) 1 (9.09%) 0 0	9 (36%) 3 (12%) 12 (48%) 1 (4%) 0	1* (4.5%) 4 (18.1%) 10 (45.4%) 4 (18.1%) 3 (13.6%)	<0.001
Birth weight (grams)[1]	3080 ± 624 [a]	2582 ± 435 [b]	2417 ± 464[b]	2205 ± 387 [b]	<0.001
ICU admission[3]	1 (5%) [a]	2 (18.1%)[a, b]	16 (64%)[b, c]	19 (86.3%)[c]	<0.001
Duration of stay in hospital (days)[2]	3 (2,3) [a]	4 (3,7) [b]	5 (4,7) [b]	9 (7,16) [c]	<0.001
C-section with delayed hysterectomy (cEBL)[2] Primary Surgery (mL) Second Surgery (mL) Combined Surgery (mL)	0 0 0	0 0 0	1235 (893, 1675) 1376 (786, 3088) 3085 (2359, 3949)	1039 (906,1216) 2497 (1552, 2690) 3496 (2491, 3884)	0.55 0.50 0.79

[1]mean ±SD; [2]median [IQR]; [3]n (%). Groups with a different letter (a, b, c or d) are significantly different from each other (P value <0.05 considered significant)
*Intentional removal of placenta, cEBL 2500 ml + 5 U PRBCs transfusion.
GA: gestational age at delivery, cEBL: calculated estimated blood loss using established methods, PI: placenta



576 | Dietary Risk Factors for Excess Weight Gain in Pregnancy

Ngantu Le[1]; Megan L. Lawlor[1]; Jeannie C. Kelly[2]; Sarah K. England[3]; Antonina I. Frolova[4]; Nandini Raghuraman[2]; Peinan Zhao[3]
[1]Washington University in St. Louis, St. Louis, MO; [2]Washington University School of Medicine in St. Louis, St. Louis, MO; [3]Washington University, St. Louis, MO; [4]Washington University School of Medicine, St. Louis, MO

4:00 PM - 6:00 PM

Objective: Excess gestational weight gain (GWG) is associated with adverse pregnancy and metabolic outcomes. Patients are motivated to improve their health during pregnancy but

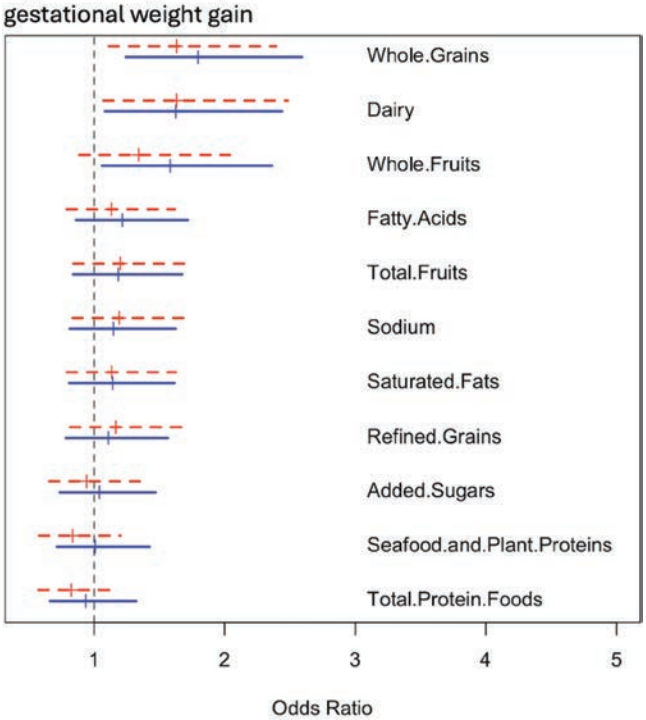
describe a lack of knowledge on dietary recommendations. We investigated dietary components that are most associated with GWG.

Study Design: This is a nested case control study in a cohort of singleton pregnancies who completed the NIH Dietary Health Questionnaire II (DHQ-II) in the third trimester or within 3 months of delivery. Cases were patients with excess GWG greater than the Institute of Medicine (IOM) recommended guidelines. Controls were patients with GWG within the IOM guidelines. Those with GWG below guidelines were excluded. Exposures of interest were Healthy Eating Index-2015 (HEI-2015) score components and other DHQ-II dietary components. These components were compared between cases and controls. Multivariable logistic regression was used to adjust for BMI at first prenatal visit.

Results: 531 patients completed the DHQ-II, among which 312 (58.8%) had excess GWG and 219 (41.2%) had appropriate GWG. There were no significant socioeconomic differences between those with excess and adequate GWG. The average BMI was 29.60±8.07 kg/m^2 among patients with excess GWG and 27.20±7.49 kg/m^2 among patients with appropriate GWG (P = 0.001). Overall HEI-2015 scores were not significantly different between cases and controls. However, a diet composed of low whole grains (aOR 1.75, 95% CI 1.18- 2.60) or high dairy intake (aOR 1.84, 95% CI 1.18- 2.81) was associated with excess GWG.

Conclusion: A diet low in whole grains or high in dairy is associated with excess GWG. Obstetric providers should address specific dietary components when counseling patients about GWG.

Figure: Dietary components associated with excess gestational weight gain



Blue = crude OR and 95% CI
Red = adjusted OR and 95% CI

577 | Predicting Live Birth with the PRC2 Age Index, a Novel Epigenetic Biomarker

Nicola C. Perlman[1]; Andrea Cipriano[2]; Daniel J. Simpson[3]; Xixi D. Plummer[1]; Samantha L. Kruger[1]; Arian Korshid[2]; Janet Hurtado[1]; Ruth B. Lathi[1]; Danielle M. Panelli[1]; Vittorio Sebastiano[2]; Katherine Bianco[1]
[1]Stanford University, Palo Alto, CA; [2]Stanford University, Stanford, CA; [3]Mayo Clinic, Rochester, MN

4:00 PM - 6:00 PM

Objective: Polycomb Repressive Complex 2 (PRC2) is a novel epigenetic biomarker of advanced cellular aging that has not yet been evaluated in pregnancy. PRC2 regions, present in all somatic cells, are associated with CpGs which gain DNA methylation with age. We evaluated whether PRC2 related methylation changes, as a marker of cellular aging, were associated with live birth in a preconception population.

Study Design: This pilot study utilized biobanked samples from patients desiring pregnancy at an academic center. Peripheral blood mononuclear cell DNA was extracted from buffy coat. Using the Illumina Infinium MethylationEPIC BeadChip array, we evaluated CpG methylation at PRC2 sites to generate the "PRC2 Age Index." Mean PRC2 site methylation was reported for each patient. Patients were then grouped by chronologic age (age by birthdate) decade. The primary outcome was successful live birth, defined as pregnancy and delivery of live infant after 24 weeks. Using the PRC2 Age Index, mean methylation was compared between live birth and no live birth within chronologic age decades.

Results: 64 patient samples were analyzed. In the population, 57.2% had a live birth, of which 80% utilized assisted reproductive therapy. Demographics were overall similar between those with and without live birth. As expected, when the PRC2 Age Index was applied, patients in each chronologic age decade gained methylation. There were trends towards increased methylation of the PRC2 Age Index in people with no live birth across all chronologic age decades (Figure 1). Mean methylation was plotted for the live birth versus the no live birth groups (Figure 2).

Conclusion: The PRC2 Age Index correlated increased methylation at PRC2 sites with aging in a preconception population. Although insignificant, the PRC2 age index exhibited trends in increasing mean methylation for people without live birth, suggesting accelerated cellular aging compared to live birth counterparts. Larger studies evaluating the PRC2 Age-Index may contribute to understanding of biological age and outcomes in a reproductive age population.

Figure 1: Relationship between PRC2 region methylation and decade of chronologic age grouped by live birth or no live birth.

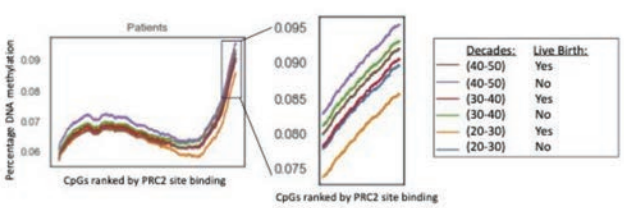
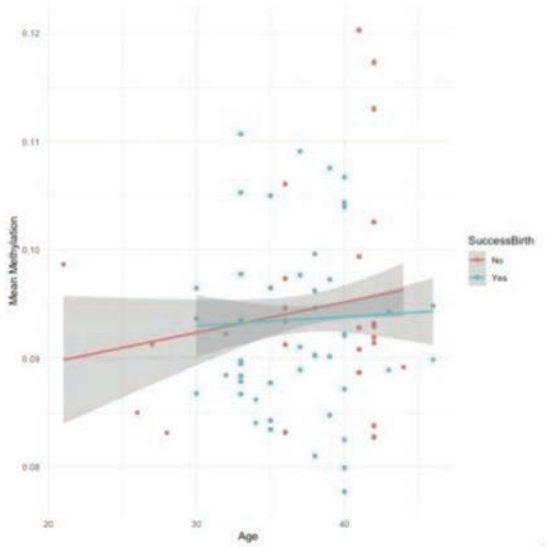


Figure 2: Linear relationship between mean methylation and biologic age using the PRC2 Age Index, grouped by live birth or no live birth.



578 | The Association of Race and Ethnicity with Postpartum Hemorrhage Care Escalation

Nigel Madden; On behalf of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network
Beth Israel Deaconess Medical Center, Boston, MA

4:00 PM - 6:00 PM

Objective: We aimed to evaluate whether there were racial and ethnic disparities in postpartum hemorrhage (PPH) care escalation after cesarean birth in a large, diverse cohort of birthing people.

Study Design: Secondary analysis of a multicenter placebo-controlled randomized trial of prophylactic use of tranexamic acid during cesarean birth. We included participants who self-reported as non-Hispanic White (NHW), non-Hispanic Black (NHB), or Hispanic and who had a PPH (estimated blood loss [EBL] > 1L). Based on a published algorithm for classifying PPH management, the primary outcome was level of PPH care intervention during the delivery admission: Level 0 (no intervention beyond standard third stage oxytocin), Level 1 (uterotonics only), Level 2 (performance of a procedure), and Level 3 (hysterectomy). We created multivariable ordinal regression models to evaluate the independent association between race/ethnicity and receipt of higher levels of anti-hemorrhagic intervention. A secondary analysis stratified these results by PPH severity.

Results: Of 656 individuals who met inclusion criteria, 37% identified as NHW, 27% as NHB, and 36% as Hispanic. A majority received no interventions, with 360 (55%) Level 0, 154 (23%) Level 1, 118 (18%) Level 2, and 24 (4%) Level 3. NHB patients had a lower pre-delivery hemoglobin (10.9 mg/dL NHB vs. 11.7 NHW vs. 11.8 Hispanic, p< 0.01). In adjusted analyses, NHB patients had lower odds of receiving higher levels of PPH care compared to NHW patients (aOR 0.48, 95% CI 0.31-0.75, Table 1). As a proportion of Level 1 interventions, NHB patients received methylergonovine less often (9.0% NHB vs. 29.6% NHW vs. 30.3% Hispanic, p < 0.01). When stratified by severity of PPH, NHB patients had significantly lower odds of receiving higher levels of PPH care at an EBL between 1500-1999mL (aOR 0.32, 95% CI 0.14-0.78, Table 2).

Conclusion: NHB patients with PPH after cesarean birth had 50% lower odds of receiving higher levels of anti-hemorrhagic intervention and this finding persisted at higher EBL. Racial differences in PPH care escalation may underlie disparities in PPH outcomes.

Table 1: Multivariable ordinal regression models for relationship of race and ethnicity with receipt of higher levels[1] of anti-hemorrhagic intervention[2]

	Level 0 (none)	Level 1 (uterotonics)	Level 2 (procedural)	Level 3 (hysterectomy)	aOR (95% CI)[3]
Non-Hispanic White	114 (47.5)	63 (26.3)	55 (22.9)	8 (3.3)	Reference
Non-Hispanic Black	122 (68.5)	29 (16.3)	21 (11.8)	6 (3.4)	**0.48 (0.31-0.75)**
Hispanic	124 (52.1)	62 (26.1)	42 (17.7)	10 (4.2)	1.19 (0.81-1.74)

aOR, adjusted odds ratio; CI, confidence interval
Data expressed as N (%)
1. Based on the algorithm published by: Guan CS, Boyer TM, Darwin KC, et al. Racial disparities in care escalation for postpartum hemorrhage requiring transfusion. *American Journal of Obstetrics & Gynecology MFM*. 2023:100938.
2. Individuals are included in the highest level for which they received an intervention during the delivery admission.
3. Adjusted for delivery hospital, prior cesarean, any hypertension (chronic or new-onset during pregnancy), preoperative hemoglobin, and study treatment assignment

Table 2. Receipt of higher levels of anti-hemorrhagic intervention by race and ethnicity stratified by PPH severity[1]

	NH-White N=240	NH-Black N=178	Hispanic N=238
EBL 1001-1499mL (N=395)	Reference	0.57 (0.32-1.02)	1.08 (0.65-1.79)
EBL 1500-1999mL (N=172)	Reference	**0.32 (0.14-0.78)**	1.11 (0.56-2.19)
EBL ≥2000mL (N=89)	Reference	0.42 (0.14-1.31)	0.59 (0.23-1.51)

PPH, postpartum hemorrhage; NH, Non-Hispanic; EBL, estimated blood loss
Data expressed as adjusted odds ratio (95% confidence interval)
[1]Adjusted for delivery hospital, prior cesarean, any hypertension, preoperative hemoglobin, and study treatment assignment (interaction by level of blood loss, p=0.31)

579 | Obesity and Weight Gain: How are the SMFM Annual Meetings Weighing in?

Nkechinyelum Ogu; Jacqueline C. Hairston
Northwestern University Feinberg School of Medicine, Chicago, IL

4:00 PM - 6:00 PM

Objective: Obesity and weight gain are commonly understood risk factors for adverse pregnancy outcomes and the Society for Maternal-Fetal Medicine (SMFM) Annual Meeting is one of the primary venues for high impact research on this topic. We sought to determine whether scientific presentations regarding obesity were focused on interventions to improve maternal and neonatal outcomes versus identification of risk factors.

Study Design: This is a descriptive study of abstract submissions related to obesity from the 2020 to 2024 SMFM Annual Meetings. Two independent researchers searched abstract titles with the following terms: “obesity”, “obese”, “weight gain”, “habitus”, “overweight”, “body mass index”, and “BMI”. The abstracts were then reviewed to determine if obesity was studied as a risk factor or if a clinical intervention was evaluated for the management of patients with obesity. Abstracts with multiple search terms in the title were only analyzed once and redundancies were eliminated. Only human studies were eligible for inclusion. The categorization of each abstract was compared and if a discrepancy arose a third-party independent researcher provided final designation.

Results: Of the 6,023 abstracts presented at SMFM from 2020 to 2024, 254 (4.2%) were regarding obesity and weight gain and

met criteria for inclusion. There were no abstracts with "habitus" or "overweight" in the title. 38 (15%) abstracts focused on interventions related to obesity and weight gain. 216 (85%) abstracts concentrated on obesity as a risk factor. 16 (6.3%) abstracts were oral presentations, of which eight featured interventions. Abstract categorization by year was assessed (Table 1).

Conclusion: Obesity is a well-studied risk factor in perinatal outcomes, yet studies of interventions that aim to mitigate obesity-related morbidity represent a minority of presented science on this topic. Further studies directed towards interventions and protocols to improve care surrounding obesity and weight gain are needed.

Table 1: Abstract Categorization from 2020-2024

	Year										
	2020 n = 59		2021 n = 52		2022 n = 51		2023 n = 50		2024 n = 42		
Abstract Categorization	Oral	Poster	Oral	Poster	Oral	Poster	Oral	Poster	Oral	Poster	Total
Intervention	1	10			1	4	2	4	3	3	28
Risk Factor	2	46			1	45	0	44	3	33	174
Total	3	56	0	0	2	49	2	48	6	36	202

580 | The Association Between Group B Streptococcus Colonization and Long Term Infectious Morbidity of the Offspring

Noa Leybovitz Haleluya[1]; Tamar Wainstock[2]; Eyal Sheiner[2]
[1]Soroka Medical Center, Meitar, HaDarom; [2]Department of Obstetrics and Gynecology, Soroka University Medical Center, Ben-Gurion University of the Negev, Beer-Sheva, Israel., Beer Sheva, HaDarom

4:00 PM - 6:00 PM

Objective: Group B *Streptococcus* (GBS) colonizes the gastrointestinal and genital tracts of pregnant women. Determining colonization state near delivery time is an important determinant of infections in infants. Positive GBS carrier state is associated with short-term infant morbidity and mortality. However, long-term effects were not thoroughly studied. We aimed to study the association between positive test for GBS colonization near delivery and long-term infectious morbidity of offspring.

Study Design: A population based cohort analysis was performed comparing infectious related pediatric morbidity among offspring to mothers with positive GBS status and negative or unknown GBS status. The analysis included all singletons born between the years 2002- 2021 at a single tertiary regional medical center. Infants with congenital malformations, multiple gestations, and cesarean deliveries were excluded from the analysis. Infectious related morbidities included hospitalizations or medical visits involving a pre-defined set of ICD-9 codes, as recorded in computerized files. A Kaplan-Meier survival curve was constructed to compare the cumulative infectious morbidity, and a Cox proportional hazards model was used to adjust for confounders.

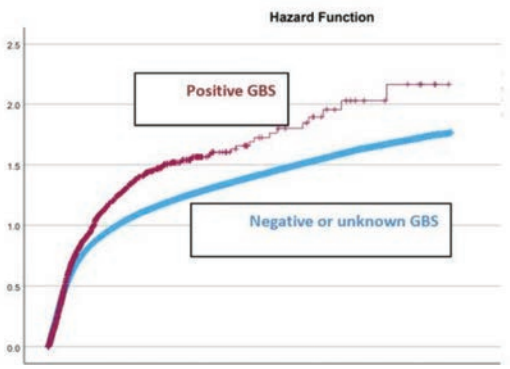
Results: The study population included 146103 singletons. Positive GBS carrier state was recorded in 2225 (1.5%) patients. The cumulative incidence of long-term infectious morbidity was higher among the offspring in the group of positive GBS (Figure; Log-rank $p < 0.001$). The association remained significant and independent while adjusting for gestational age, maternal age, maternal hypertension and diabetes and ethnicity (Table, Adjusted HR = 1.15, 95%CI 1.09-1.22, $p < 0.001$).

Conclusion: GBS colonization in genital tract near delivery is independently associated with an increased risk for long-term pediatric infectious morbidity of the offspring. Our results highlight the importance of GBS screening in pregnancy. In addition, we suggest using GBS status as a possible predictor for long-term pediatric morbidities which may require special surveillance in this group of children.

Table – Cox proportional hazards model for the association between GBS status and total infectious morbidity in the offspring.

Cox variable controlled for	Adjusted HR (95% CI)	P value
GBS status	1.15 (1.09-1.22)	<0.001
Maternal age	0.99 (0.99-1.00)	<0.001
Hypertension	1.06 (1.03-1.10)	<0.001
Gestational age in weeks	1.00 (1.00-1.01)	0.046
Maternal diabetes	1.13 (1.09-1.17)	<0.001
Ethnicity	0.99 (0.96-1.00)	0.071

Figure- A Kaplan-Meier cumulative hazard function of infectious morbidity in both groups



581 | Group B Streptococcus Vaginal Colonization and Long Term Respiratory Morbidity of the Offspring

Noa Leybovitz Haleluya[1]; Tamar Wainstock[2]; Eyal Sheiner[2]
[1]Soroka Medical Center, Meitar, HaDarom; [2]Department of Obstetrics and Gynecology, Soroka University Medical Center, Ben-Gurion University of the Negev, Beer-Sheva, Israel., Beer Sheva, HaDarom

4:00 PM - 6:00 PM

Objective: Group B *Streptococcus* (GBS) colonize the gastrointestinal and the genital tract. Vertical transmission primarily occurs following rupture of membranes or during passage through the birth canal. Early-onset neonatal GBS infection manifests as sepsis, pneumonia, or meningitis, while late-onset GBS disease most often presents as bacteremia. Both are associated with short-term morbidity and mortality. However, the long-term effects are not well established. We aimed to study the association between GBS colonization near and long-term childhood respiratory morbidity of offspring.

Study Design: A retrospective population based cohort analysis was performed, in which respiratory pediatric morbidity was compared between offspring to mothers with positive GBS and offspring to mothers with negative or unknown GBS status. The analysis included all singletons born between the years 2002-2021 at a tertiary medical center. Infants with congenital malformations, multiple gestations and cesarean deliveries were excluded from the analysis. Data for the diagnosis of respiratory morbidity was extracted from community-based clinics and hospitalization records. A Kaplan-Meier survival curve was

constructed to compare the long- term cumulative respiratory morbidity, and a Cox proportional hazards model was used to adjust for confounders

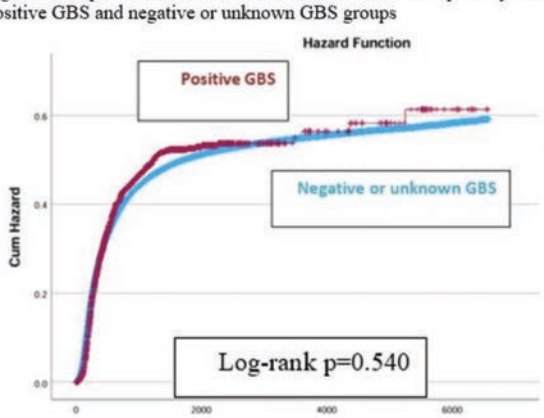
Results: The study population included 146103 singletons. Positive GBS carrier state was recorded in 2225 (1.5%) patients. The cumulative incidence of long-term respiratory morbidity was comparable between both groups (Figure, Log-rank p = 0.540). Selected respiratory morbidities groups are presented in the Table. Using a Cox proportional hazard model, no significant association was noted between GBS colonizationand the risk for long-term pediatric respiratory morbidity, while adjusting for gestational age, maternal age, ethnicity, maternal hypertension and diabetes (Adjusted HR = 1.00, 95%CI 0.93-1.08, $p = 0.920$).

Conclusion: GBS colonization in maternal genital tract is not independently associated with a risk for long-term pediatric respiratory morbidity of the offspring

Table - Respiratory morbidity in the offspring in positive GBS and negative or unknown GBS groups

respiratory Disease	Positive GBS (n=2225)	No GBS (n=143878)	OR (95% CI)	P value
Asthma	31.7% (706)	36.2% (52140)	0.82 (0.75-0.89)	<0.001
Fibrosis	0% (0)	0.1% (103)	0.99 (0.98-0.99)	0.207
Pneumonitis	0 % (1)	0.1% (134)	0.99 (0.98-0.99)	0.150
Pleural disease	0.1% (3)	0.1% (170)	1.14 (0.36-3.58	0.820
Obstructive sleep apnea	1.2% (27)	1.7% (2494)	0.70 (0.48-1.02)	0.062
Bronchiectasis	0 % (0)	0% (67)	0.99 (0.98-0.99)	0.309
Other respiratory morbidity	0% (1)	0.1% (196)	0.33 (0.05-2.35)	0.244

Figure- A Kaplan-Meier cumulative hazard function of respiratory morbidity in positive GBS and negative or unknown GBS groups



582 | Basal Insulin Type and Neonatal Outcomes: a Secondary Analysis of the Mompod Trial

Noelia Zork[1]; Qi Yan[1]; Gladys (Sandy) A. Ramos[2]; Celeste Durnwald[3]; Mark B. Landon[4]; On behalf of the MOMPOD consortium

[1]Columbia University Irving Medical Center, New York, NY; [2]University of California, San Diego, San Diego, CA; [3]Hospital of University of Pennsylvania, Philadelphia, PA; [4]The Ohio State University, Columbus, OH

4:00 PM - 6:00 PM

Objective: A variety of basal insulin types (e.g. intermediate vs long-acting) are available for managing diabetes in pregnancy, however, the optimal choice of basal insulin remains uncertain in those with Type 2 diabetes (T2D) and diabetes diagnosed in early pregnancy (eDM). We aimed to compare neonatal outcomes according to basal insulin type.

Study Design: A secondary analysis of a randomized trial comparing the addition of metformin versus placebo in insulin treated pre-existing T2D or eDM at < 23 weeks. Included were those using either intermediate or long-acting insulin at randomization, though specific insulin types were not recorded. The primary outcome was a composite of newborn complications (Table 2). Categorical variables were compared between those on intermediate versus long-acting insulin using Chi-square or Fisher's exact test, and continuous variables using t-test or Wilcoxon rank sum test. Logistic regression estimated the association between the basal insulin type and the composite outcome. Adjustments were made for confounding.

Results: A total of 812 participants were included in the analysis, 485 (59.7%) treated with intermediate and 327 (40.2%) with long-acting insulin. There were several demographic differences between the groups (Table 1). The primary neonatal composite outcome was less common among participants treated with intermediate insulin (65.8% vs 72.8%, p = 0.035); however, after adjusting for confounders, there was no significant association (Table 2). There were no associations between basal insulin type and the individual components of the composite outcome. A post hoc power analysis confirmed that the study had sufficient power to detect a 10% difference in the primary outcome.

Conclusion: In participants with T2DM and eDM, while basal insulin choice varied by maternal characteristics there was no significant difference in neonatal outcomes. Consistent with a shared decision making model, providers and patients can be reassured that their choice of basal insulin can be based on preference and/or insurance coverage without concerns for adverse nor varying neonatal outcomes.

Table 1. Demographics and Clinical Characteristics of Participants in the Study

Variable	Intermediate Insulin (n=485)	Long-acting insulin (n=327)	P value*
Age, mean, SD:	33.20±5.57	32.38±5.60	0.042
Race, n (%):			**<0.001**
American Indian/Alaska native	1 (0.21)	3 (0.92)	
Black/African American	107 (22.06)	138 (42.2)	
Native Hawaiian/PI	4 (0.82)	0 (0)	
White	196 (40.41)	141 (43.12)	
Asian	17 (3.51)	6 (1.83)	
>2 races	6 (1.24)	4 (1.22)	
Not reported/declined	154 (31.75)	35 (10.7)	
Hispanic, n (%):			**<0.001**
No	186 (38.35)	205 (62.72)	
Yes	299 (61.65)	122 (37.28)	
Insurance Type, n (%):			0.223
Government	96 (19.83)	65 (20)	
Private	2 (0.41)	1 (0.31)	
Military	347 (71.69)	246 (75.69)	
None	39 (8.06)	13 (4)	
Parity (delivery>20wks), n (n range)	2 (1-3)	2 (1-3)	0.288
Diabetes Characteristics, n (%):			**0.013**
T2DM prior to pregnancy	358 (73.82)	266 (81.34)	
Diagnosed during pregnancy <20w6d	127 (26.18)	61(18.66)	
Chronic hypertension requiring meds, n (%):	92 (19.06)	100 (30.58)	**<0.001**
Smoking, n (%):	22 (4.58)	38 (11.62)	**<0.001**
Pre-pregnancy BMI, n (%):	34.75(30.31-40.46)	35.83(30.39-42.12)	0.257
Intake HbA1c, % (range):	7(6-8.9)	7.7(6.4-9.5)	**0.002**

BMI: Body mass index

*P values of <0.05 were considered significant

Table 2. Neonatal Outcomes in Participants with Intermediate Insulin versus Long-acting Insulin

Variable	Intermediate Insulin (Total n=485), n (%)	Long-acting insulin (Total n=327) n (%)	Adjusted* P-value	Adjusted* OR (95% CI)
Composite neonatal outcome:	319 (65.79)	238 (72.79)	0.4544	0.83 (0.52, 1.34)
RDS	103 (58.19)	79 (52.32)	0.8757	1.04 (0.62, 1.76)
Glucose <40mg/dL or need for IV treatment	173 (38.09)	137 (45.82)	0.2954	0.79 (0.50, 1.23)
Hyperbilirubinemia requiring phototherapy	86 (19.33)	93 (31.84)	0.1381	1.50 (0.88, 2.57)
NICU admission	172 (38.55)	145 (49.83)	0.3462	0.80 (0.50, 1.28)
Preterm delivery <37wks	134 (29.71)	123 (41.42)	0.2237	1.35 (0.83, 2.18)
LGA	122 (27.11)	77 (26.1)	0.4685	0.82 (0.48, 1.40)
SGA	19 (4.22)	20 (6.78)	0.3062	1.62 (0.64, 4.10)
Shoulder dystocia	16 (3.56)	8 (2.72)	0.3798	0.60 (0.17, 1.85)
Birth injury	6 (1.32)	3 (1)	0.2051	3.18 (0.50, 18.46)
Stillbirth	3 (0.66)	4 (1.35)	0.752	1.57 (0.08, 26.12)
Neonatal death	1 (0.21)	3 (0.96)	0.7819	1.50 (0.09, 57.09)

RDS: Respiratory distress syndrome; NICU: Neonatal intensive care unit; LGA: Large for gestational age; SGA: small for gestational age

*Adjusted by study site, metformin exposure, maternal age, race, Hispanic ethnicity, hypertension requiring medication, smoking, diabetes characteristics, and intake Hba1c.

583 | The Triple Threat of Socioeconomic Insecurity: Housing, Financial, and Food Insecurity Association with Postpartum Depression

Noor Ali; Emily A. DeFranco
Department of Obstetrics and Gynecology, University of Kentucky, Lexington, KY

4:00 PM - 6:00 PM

Objective: Examine the influence of housing, financial, and food insecurity on postpartum depression.

Study Design: Using data from the Pregnancy Risk Assessment Monitoring System (PRAMS) Core and Standard Questionnaire from 2016 to 2021 linked to US birth certificate data, a retrospective cohort study was performed to quantify the relative risk of the exposures of housing, financial, and/or food insecurity on the outcome of postpartum depression. Pre-pregnancy depression was determined by anyone who reported depression in the three months before pregnancy. Postpartum depression was quantified by a previously created variable by PRAMS titled "Postpartum Depression Indicator." Participant surveys occurred at 2-6 months postpartum. Generalized linear modeling (GLM) estimated adjusted relative risk (adjRR) and 95% CIs while accounting for the confounding influences of maternal race, marital status, education, and WIC utilization.

Results: 221,381 Postpartum patients completed the Pregnancy Risk Assessment Monitoring System (PRAMS) Core and Standard Questionnaire. Of those surveyed, 11,482 (5.2%), 373 (3.2%), and 4,302 (3.0%) reported financial, food, and housing insecurity, respectively, and 15,768 (7.1%) had any of the three. The prevalence of reported depression was 15.8% before pregnancy and 14.4% postpartum. Each exposure was associated with a significantly higher risk of pre-pregnancy and postpartum depression, even after adjusting for race, marital status, education, and WIC usage (see table). The highest individual risks for depression were observed with food insecurity, with greater than 2-fold increased risk for depression before pregnancy and postpartum.

Conclusion: The physical and social environments of birthing people can impact their psychological state. Postpartum depression can influence the bond between the mother-infant dyad, potentially contributing to adverse psychosocial outcomes. Public health initiatives should focus on improving access to financial, food, and housing resources for reproductive-age people to mitigate postpartum depression effects.

Table 1: Demographic characteristics of the study population

	No Housing, Food, or Financial Insecurity n= 205,613 (92.9%)	Housing Insecurity n= 4,302 (3.0%)	Food Insecurity n= 373 (3.7%)	Financial Insecurity n= 11,482 (5.2%)	Housing, Food, or Financial Insecurity n= 15,768 (7.12%)
Demographic Characteristics					
Maternal Age , years					
19 & Younger	8,465 (4.3%)	359 (8.7%)	26 (7.00%)	680 (6.1%)	1,032 (6.7%)
20-29	89,534 (45.8%)	2,430 (58.9%)	214 (57.4%)	6,207 (55.4%)	8,644 (56.5%)
30-39	90,528 (46.3%)	1,255 (30.4%)	125 (33.5%)	3,938 (35.1%)	5,177 (33.8%)
40 & Older	6,989 (3.6%)	79 (1.9%)	8 (2.1%)	380 (3.4%)	460 (3.0%)
Race					
American Indian	6,675 (3.4%)	304 (7.4%)	5 (1.4%)	529 (4.8%)	819 (5.4%)
Asian	13,583 (7.0%)	44 (1.1%)	1 (0.3%)	477 (4.3%)	518 (3.4%)
Hispanic	34,249 (17.2%)	607 (14.3%)	29 (7.8%)	2,706 (24.2 %)	3,296 (21.4%)
Non-Hispanic Black	35,068 (18.1%)	1,653 (40.4%)	46 (12.6%)	2,633 (23.8%)	4,210 (27.4%)
Non- Hispanic White	117,102 (60.4%)	1,491 (36.4%)	283 (77.8%)	5,930 (53.7%)	7,519 (49.8%)
Social & Socioeconomic Factors					
Education Status					
< High School Diploma	23,249 (11.4%)	1,076 (25.4%)	56 (15.1%)	1,896 (16.7%)	2,958 (19.0%)
High School Diploma	47,386 (23.3%)	1,687 (39.7%	164 (44.3%	4,181 (36.8%)	5,867 (37.7%)
Some College	56,725 (27.8%)	1,273 (30.0%)	130 (35.1%)	3,977 (35.0%)	5,244 (33.7%)
Completed College	76,395 (37.5%)	209 (4.9%)	20 (5.4%)	1,299 (11.4%)	1,511 (10.0%)
Married	125,796 (61.2%)	799 (18.6%)	79 (21.5%)	5,159 (45.0%)	5,973 (38.0%)
Household Income					
$0 TO $16,000	36,198 (93.2 %)	2,318 (9.4%)	185 (16.4%)	221 1.0%)	2,656 (6.8%)
$16,001 TO $20,000	9,900 (66.4%)	434 (4.3%)	44 (9.3%)	4,707 (31.6%)	5,019 (33.6%)
$20,001 TO $24,000	7,630 (71.3%)	247 (3.3%)	34 (8.8%)	2,961 (26.7 %)	3,076 (28.7%)
$24,001 TO $28,000	6,539 (81.6%)	150 (2.7%)	20 (5.6%)	1,326 (16.6%)	1,473 (18.4%)
$28,001 TO $32,000	8,582 (89.7%)	130 (2.00%)	16 (3.7%)	855 (8.9%)	988 (10.3%)
$32,001 TO $40,000	11,331 (94.5%)	120 (1.5%)	14 (2.5%)	536 (4.5%)	658 (5.5%)
$40,001 TO $48,000	8,523 (97.0%)	59 (1.0%)	9 (2.1%)	201 (2.3%)	265 (3.0%)
Breastfeeding	8,160 (82.6%)	144 (74.2%)	0 (0.0%)	421 (80.8%)	555 (79.1%)
WIC during Pregnancy	70,248 (34.7%)	1,455 (34.5%)	124 (33.7%)	4,389 (38.9%)	9,659 (62.3%)
Depression in the 3 months before pregnancy	30,607 (15.0%)	1,872 (44.0%)	213 (57.7%)	2,224 (19.6%)	4,118 (26.4%)

Table 2: Postpartum Depression Rates

Characteristics	Housing Insecurity	Food Insecurity	Financial Insecurity*	Housing, Food, & Financial Insecurity
	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
Depression before Pregnancy				
RR (95% CI)	2.90 (2.79, 3.00)	3.67 (3.32, 4.05)	1.25 (1.20, 1.30)	1.75 (1.70, 1.80)
adjRR (95% CI)**	2.06 (1.98, 2.14)	2.31 (2.08, 2.57)	1.07 (1.03, 1.11)	1.43 (1.38, 1.47)
Postpartum Depression				
RR (95% CI)	2.29 (2.19, 2.40)	3.37 (2.89, 3.93)	1.25 (1.20, 1.30)	1.56 (1.51, 1.61)
adjRR (95% CI)**	1.70 (1.62, 1.78)	2.42 (2.05, 2.85)	1.08 (1.04, 1.13)	1.29 (1.24, 1.33)

*Financial Insecurity was determined by the 2021 Poverty Guidelines created by the Office of the Assistant Secretary for Planning and Evaluation
**adjusted RRs include adjustment for race, marital status, education, and WIC usage

584 | Outcomes Among Patients in a Remote Postpartum Blood Pressure Monitoring Program: Does Medication Choice Matter?

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4:00 PM - 6:00 PM

Objective: Participants in postpartum self-measured blood pressure (SMBP) programs can have antihypertension medications initiated remotely, thereby preventing severe hypertension (HTN) and reducing HTN-related readmissions, emergency department (ED) presentations, and severe maternal morbidity (SMM). Nifedipine and labetalol are commonly prescribed first-line HTN medications, although outcomes related to their use may differ. We aimed to compare outcomes between participants in a postpartum remote SMBP program who were prescribed nifedipine versus labetalol after hospital discharge.

Study Design: Postpartum patients with HTN at our tertiary care hospital are offered enrollment in our remote 6-week SMBP program, during which antihypertensives are prescribed for BP >140/90 mmHg. For this analysis, participants were stratified by antihypertensive prescribed (nifedipine versus labetalol). Patients who were prescribed a different medication or who were prescribed both medications were excluded. The primary outcome

was a composite of postpartum readmission or ED presentation for HTN within 30 days of delivery hospitalization. Secondary outcomes included HTN-related SMM. A generalized linear model was used to estimate relative risks (RR) after adjustment for differences in medical conditions.

Results: Among 2003 remote SMBP participants, 446 (22.3%) were prescribed either labetalol alone (n = 104; 23%) or nifedipine alone (n = 342; 77%) after hospital discharge. Differences between groups were identified in type of HTN diagnosis (Table 1). After controlling for these differences, the rate of the composite outcome of HTN-related postpartum readmission or ED presentation was similar between those who received labetalol (n = 23 (22.1%)) or nifedipine (n = 65 (19.1%); adjusted relative risk = 1.26 (0.81, 1.94) (Table 2). There were no differences between groups for secondary outcomes.

Conclusion: In our remote SMBP program for postpartum patients with HTN, there was no difference in risk of HTN-related healthcare utilization between those prescribed labetalol alone or nifedipine alone for persistent HTN after hospital discharge.

Table 1: Demographics

Variable	Labetalol alone (n=104)	Nifedipine alone (N= 342)	P value
Age	32.5 (29, 36)	32.0 (27, 36)	0.08
Primary insurance type			.51
Private	61 (58.7)	187 (54.7)	
Medicaid/Medicare	42 (40.4)	153 (44.7)	
None	1 (0.96)	2 (0.58)	
Race			
White only	67 (64.4)	193 (56.9)	0.33
Black only	21 (20.2)	68 (20.0)	
Other race/mixed race	14 (13.5)	73 (21.5)	
Unknown	2 (1.9)	8 (2.3)	
Ethnicity			0.28
Hispanic	23 (22.6)	100 (29.2)	
Non-Hispanic	80 (77.5)	240 (70.2)	
Unknown	1 (1.0)	2 (0.6)	
HDP diagnosis prior to delivery			
Gestational hypertension	22 (21.2)	98 (28.7)	0.16
Preeclampsia with severe features	23 (22.1)	103 (30.1)	0.14
Preeclampsia without severe features	16 (15.4)	57 (16.7)	0.87
Chronic hypertension with superimposed Preeclampsia	15 (14.4)	23 (6.7)	**0.03**
Eclampsia	0 (0.0)	1 (0.3)	1.0
Chronic hypertension alone	25 (24.0)	33 (9.7)	**0.0004**
Gestational age (weeks) at delivery	37.6 (36.4, 38.6)	37.6 (35.4, 39.1)	0.79
Mode of delivery			1.0
Vaginal	45 (43.3)	150 (43.8)	
c-section	59 (56.7)	192 (56.1)	
ICU admission after delivery	3 (2.9)	3 (0.9)	0.14
Postpartum day of discharge	3 (2, 4)	3 (2, 4)	0.27

Data presented as n (%) or median (interquartile range) unless otherwise noted

Table 2: Outcomes

	Labetalol alone (n=104)	Nifedipine alone (N= 342)	P value	Relative Risk (95% Confidence Interval)	Adjusted RR (95% CI) *
Primary Outcome					
ED visit or Hospitalization for hypertension	23 (22.1)	65 (19.1)	0.57	1.15 (0.76, 1.76)	1.26 (0.81, 1.94)
Secondary Outcomes					
ED visit due to hypertension	22 (21.2)	62 (18.3)	0.57	1.16 (0.75, 1.79)	1.27 (0.82, 1.99)
Hospitalization due to hypertension	13 (12.5)	37 (11.0)	0.72	1.15 (0.63, 2.07)	1.23 (0.67, 2.26)
Severe maternal morbidity** (any)	13 (12.5)	47 (13.7)	0.87	0.91 (0.51, 1.61)	0.98 (0.54, 1.76)

Data presented at n (%)
*adjusted for diagnosis of chronic hypertension with superimposed preeclampsia and chronic hypertension alone
**Includes any of the following HTN-related condition: stroke, seizure/eclampsia, acute fatty liver of pregnancy, posterior reversible encephalopathy syndrome, pulmonary edema, heart failure, HELLP syndrome, placental abruption, postpartum hemorrhage, acute kidney injury, transaminitis

585 | Association Between Treatment Modalities for Gestational Diabetes Mellitus and Risk of Attention-Deficit/Hyperactivity Disorder in Offspring

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4:00 PM - 6:00 PM

Objective: The association between gestational diabetes mellitus (GDM) and long-term neurodevelopmental disorders (NDD), particularly attention-deficit/hyperactivity disorder (ADHD), remains a topic of debate. We aimed to explore the association between GDM, either dietary controlled (GDMA1) or pharmacologic treated (GDMA2) and the risk of ADHD in the offspring.

Study Design: Retrospective population-based study included all deliveries in "Clalit" HMO hospitals from 2012 to 2020. Women with unknown diabetic status during pregnancy or with pregestational diabetes were excluded from the study. Offspring were followed through electronic medical records starting at age 4 years.

Results: Among 15,074 children exposed to maternal GDM (13,566 GDMA1, 1,508 GDMA2) and 187,112 children born to mothers with normal glycemic index (control group), 13,446 were diagnosed with ADHD, median age was 6.5 years with interquartile range (IQR) 2.15 years. The incidence of ADHD was significantly higher in the GDM groups compared to 6.6% in the control group; 7.4% (pV< 0.001) in the GDMA1 group, and 8.5% (pV< 0.001) in the GDMA2 group. The adjusted odds ratios (aOR) for ADHD were 1.30 (95% CI: 1.06-1.57, p = 0.008) for children exposed to GDMA2 and 1.09 (95% CI: 1.01-1.16, p = 0.02) for those exposed to GDMA1, compared to unexposed children. Additionally, gestational hypertension during pregnancy was identified as a significant risk factor for ADHD, with an aOR of 1.19 (95% CI: 1.003-1.39, p = 0.04).

Conclusion: Maternal GDM significantly increases the risk of ADHD in exposed offspring. The need for pharmacologic intervention to control gestational diabetes further amplifies this risk.

586 | False Positive Prenatal Diagnosis of Placenta Accreta Spectrum: Factors Associated with Overdiagnosis and Perinatal Outcomes

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4:00 PM - 6:00 PM

Objective: Accurate prenatal prediction of placenta accreta spectrum (PAS) is known to improve maternal and neonatal outcomes. However, when striving to increase sensitivity of prenatal sonographic identification of PAS, the risk of overdiagnosis also

increases. We aim to identify factors associated with false positive prenatal diagnosis of PAS and the impact on perinatal outcomes.
Study Design: All delivery encounters at a single academic institution from 2013-2023 were queried for ICD-10 codes for PAS. Cases (n = 775) were then manually reviewed and those with any degree of prenatal suspicion for PAS but no evidence of PAS at the time of delivery were included (n = 181). For each case, two variables were created by a consensus of 4 clinical experts: prenatal suspicion (low - true negative; or high - false positive diagnosis), determined by prenatal ultrasound reports and documentation of delivery planning, and *a priori* risk for PAS (low or high) based on clinical risk factors (i.e prior uterine surgeries and placenta previa). Other patient attributes and perinatal outcomes were identified through the EMR. Bivariate analyses comparing low *vs* high prenatal suspicion and patient attributes were conducted. Multivariate logistic regression was performed on significantly different outcome measure - preterm birth (PTB) - adjusting for covariates significant at $p< 0.05$.
Results: Of the 181cases, 73 (40.3%) were coded as high prenatal suspicion. Advanced maternal age, race, multiparity, higher gestational age at initial prenatal visit and ultrasound, high *a priori* risk and placenta previa were associated with high prenatal suspicion for PAS. High prenatal suspicion was an independent risk factor for PTB after adjusting for *a priori* risk and placenta previa (aOR 4.6, 95% 2.1-10.2, $p< 0.0001$).
Conclusion: False positive PAS diagnosis (prenatal high suspicion) results in 4.6 times increased risk of iatrogenic preterm birth compared to those with low suspicion. New tools are urgently needed to accurately prenatally rule out PAS to decrease the risk of iatrogenic adverse neonatal outcomes.

Table 1. Association between degree of prenatal suspicion for PAS and patient attributes.

	Low suspicion n=108 (59.7%)	High suspicion n=73 (40.3%)	*p* value
Race/Ethnicity, n (%)			**0.024**
Hispanic	31 (28.7)	22 (30.1)	
Non-Hispanic black	18 (16.7)	26 (35.6)	
Non-Hispanic white	47 (43.5)	20 (27.4)	
Asian	8 (7.4)	2 (2.7)	
Other	4 (3.7)	3 (4.1)	
Age at delivery > 35, n (%)	39 (36.1)	40 (54.8)	**0.013**
Multiparity, n (%)	79 (73.1)	62 (86.1)	**0.049**
Smoking in pregnancy, n (%)	12 (11.1)	7 (9.5)	0.74
Marital status - single, n (%)	35 (32.4)	29 (39.7)	0.31
BMI > 40 (at delivery), n (%)	11 (10.2)	12 (16.4)	0.23
Non-commercial insurance, n (%)	47 (43.5)	34 (46.6)	0.68
Primary language other than English, n (%)	17 (15.7)	8 (10.9)	0.36
GA at the initial prenatal visit, mean weeks (+/-SD)	14 (+/-8)	20.2 (+/-11.3)	**0.0009**
GA at the earliest ultrasound, mean weeks (+/-SD)	13.6 (+/-7.8)	16.3 (+/-9.4)	**0.045**
cHTN, n (%)	11 (10.2)	4 (5.5)	0.26
HDP (gHTN, PE, Eclampsia, HELLP), n (%)	17 (10.2)	9 (12.3)	0.52
GDM, n (%)	8 (7.4)	9 (12.3)	0.26
Pregestational diabetes, n (%)	5 (4.6)	4 (5.4)	0.79
IVF, n (%)	8 (7.4)	10 (13.7)	0.16
***A priori* risk, n (%)**	22 (20.4)	44 (60.3)	**<0.0001**
Placenta previa, n (%)	22 (20.4)	33 (45.2)	**0.0004**
FGR, n (%)	14 (13.0)	11 (15.0)	0.68
Preterm birth (<37 wks), n (%)	16 (14.8)	35 (47.9)	**<0.0001**

BMI, body mass index; GA, gestational age; cHTN, chronic hypertension; HDP, hypertensive disorders of pregnancy; gHTN, gestational hypertension; PE, preeclampsia; GDM, gestational diabetes; IVF, in vitro fertilization; FGR, fetal growth restriction; NICU, neonatal intensive care unit.

Table 2. Association between preterm birth and patient attributes.

Variables	Preterm birth No n=127 (71.3%)	Preterm birth Yes n=51 (28.7%)	*p value*
High degree of suspicion, n (%)	38 (29.9)	35 (68.6)	**<0.0001**
Race/Ethnicity, n (%)			0.55
Hispanic	35 (27.5)	18 (35.3)	
Black	29 (22.8)	14 (27.5)	
White	50 (39.4)	16 (31.4)	
Asian	8 (6.3)	1 (2.0)	
Other	5 (3.9)	2 (3.9)	
Age >35, n (%)	54 (42.5)	23 (45.1)	0.75
Multiparous status, n (%)	97 (76.4)	42 (82.4)	0.48
Smoking in pregnancy, n (%)	14 (11.0)	5 (9.8)	0.81
Marital status - single, n (%)	45 (35.4)	19 (37.3)	0.82
BMI > 40 kg/m^2, n (%)	16 (12.6)	6 (11.8)	0.89
Non-commercial insurance, n (%)	56 (44.1)	24 (47.1)	0.72
Primary language other than English, n (%)	17 (13.4)	8 (15.7)	0.69
High *a priori* risk, n (%)	42 (33.1)	24 (47.1)	0.08
GA at initial prenatal visit, mean weeks (+/-SD)	17.7 (+/-9.7)	19.4 (+/-11)	0.08
GA at initial ultrasound, mean weeks (+/- SD)	13.8 (+/-8.1)	16.2 (+/-9.1)	0.09
cHTN, n (%)	10 (7.9)	5 (9.8)	0.67
HDP, n (%)	18 (14.2)	8 (15.7)	0.8
GDM, n (%)	10 (7.9)	7 (13.7)	0.23
Pregestational diabetes, n (%)	4 (3.1)	5 (9.8)	0.067
IVF conception, n (%)	15 (11.8)	3 (5.9)	0.23
Placenta previa, n (%)	26 (20.5)	28 (54.9)	**<0.0001**
FGR, n (%)	14 (11.0)	11 (21.6)	0.07

BMI, body mass index; GA, gestational age; cHTN, chronic hypertension; HDP, hypertensive disorders of pregnancy; gHTN, gestational hypertension; PE, preeclampsia; GDM, gestational diabetes; IVF, in vitro fertilization; FGR, fetal growth restriction.

587 | Can B-type Natriuretic Peptide (BNP) help Differentiate Gestational Hypertension and Preeclampsia from Chronic Hypertension?

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4:00 PM - 6:00 PM
Objective: B-type natriuretic peptide (BNP) is a cardiac biomarker that is synthesized and secreted from the cardiac ventricles in response to volume expansion and pressure overload. The primary objective was to determine if BNP value could help differentiate gestational hypertension, preeclampsia without severe features and preeclampsia with severe features from chronic hypertension (CHTN). Given the acuity of gestational hypertension (GHTN) and preeclampsia (PEC) versus the chronic nature of preexisting CHTN, we hypothesized that a higher BNP value will be associated with GHTN and PEC compared to CHTN.
Study Design: This was a retrospective cross-sectional study involving 391 patients evaluated for hypertension in pregnancy from January 2022 to February 2023 in an urban teaching hospital. CHTN, GHTN and PEC were defined according to ACOG. Those patients with superimposed preeclampsia were excluded. Demographic characteristics, BNP value, hypertension diagnosis and delivery information were collected for all patients. BNP value was collected on the labor and delivery unit at the time of initial evaluation for hypertensive disease.

Results: The study population consisted of 391 patients. There were 326 patients in the GHTN/PEC group (149 with GHTN, 54 with PEC w/oSF & 123 with PEC w/SF) and 65 in the CHTN group. There was no significant difference in patient demographics between the two groups. The mean BNP level for the GHTN/PEC group was 22.0 pg/mL, whereas the mean BNP level for the CHTN group was 11.2 pg/mL, which was significantly different (p = 0.0004) (Figure 1 & Table 1).

Conclusion: This study demonstrates that BNP levels are significantly higher in patients with GHTN/PEC compared to those with CHTN. Therefore, BNP may be a useful test in helping to differentiate between CHTN and GHTN/PEC at the time of initial diagnosis.This is important given the differences in management and delivery implications for each disease.

Figure 1. BNP level and hypertensive groups

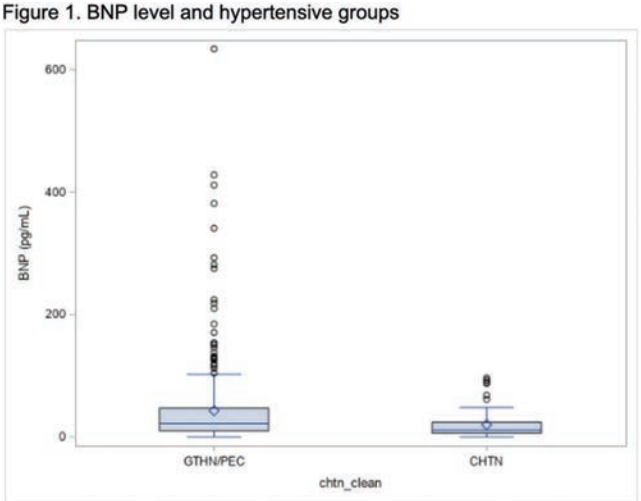

Table 1. BNP level and hypertensive groups

Characteristic	ALL (n=391)	CHTN (n=65)	GHTN/PEC (n=326)	P value
BNP level (pg/mL) – median (IQR)	19.3 (10.0, 40.9)	11.2 (9.9, 24.0)	22.0 (10.0, 47.3)	0.0004
BNP level (pg/mL) – range	(0.0, 633.8)	(0.0, 96.2)	(0.0, 633.8)	

588 | Evaluating the Impact of Labor Induction on Autism Spectrum Disorder Risk

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4:00 PM - 6:00 PM

Objective: Significant effort has been dedicated in recent years to uncovering the environmental factors, particularly perinatal exposures, that contribute to the development of autism spectrum disorder (ASD). However, the overall picture remains incomplete, with many suggested associations lacking consistency. Given the frequent use of labor inductions for medical reasons as well as patient preference, we aimed to investigate their relationship with ASD development, considering synergistic factors that may influence ASD onset.

Study Design: A population-based cohort study was conducted, focusing on singleton births. The study aimed to compare the occurrence of ASD in children, considering both hospital and community-based diagnoses, in relation to whether labor was induced (using mechanical cervical ripening or prostaglandins, with or without oxytocin) or began spontaneously. A Kaplan-Meier survival curve was employed to assess the cumulative ASD incidence, and a Cox proportional hazards model was used to account for confounders.

Results: Among 115,081 births, 13,071 (11.4%) were labor induced, with the remainder beginning spontaneously. Pregnancy complications, such as gestational diabetes mellitus, preeclampsia or eclampsia, and non-reassuring fetal heart rate patterns, were significantly more common in the labor induction group (p< 0.001 for all). Conversely, preterm births were more prevalent in the spontaneous labor onset group (7.1% vs. 5.3%, p< 0.001; Table). During follow-up, 767 children were diagnosed with ASD: 1.0% in the labor induction group and 0.6% in the spontaneous labor onset group (p< 0.001). The Kaplan-Meier analysis showed a significantly higher cumulative hazard for ASD diagnosis in the labor induction group (log-rank p-value < 0.001; Figure). However, after adjusting for maternal, delivery, and fetal factors such as age, cesarean delivery, ethnicity, and gestational conditions, no significant association was found between labor induction and ASD risk (adjusted HR = 1.21, 95% CI 0.99–1.47, p = 0.063).

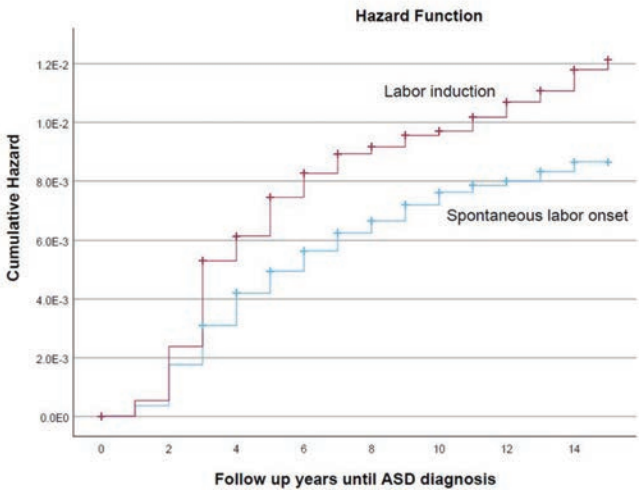
Conclusion: Labor induction does not appear to be associated with an increased risk of ASD.

Table. Comparison of Obstetrical Characteristics and ASD Risk Based on Labor Induction vs. Spontaneous Labor Onset.

	Labor induction (*n*=13,071, 11.4%)	Spontaneous labor onset (*n*=102,010, 88.6%)	*P*-value
	Obstetrical characteristics		
Maternal age (mean ± SD)	28.1 ± 5.7	28.2 ± 5.7	0.006
Gestational diabetes mellitus (%)	9.0	3.4	<0.001
Preeclampsia or eclampsia (%)	8.1	2.7	<0.001
Preterm birth (<37 weeks, %)	5.3	7.1	<0.001
Non-reassuring fetal heart rate patterns (%)	10.3	5.8	<0.001
Cesarean delivery (%)	13.4	15.4	<0.001
	Autism spectrum disorder		
ASD (cases, %)	125 (1.0)	642 (0.6)	<0.001
Adjusted HR [a],	1.21 (95% CI 0.99-1.47)	1 (*reference*)	0.063

[a] Adjusted for maternal age, gender, preterm birth, cesarean delivery, ethnicity, preeclampsia or eclampsia, gestational age, maternal age, gestational diabetes mellitus, epidural analgesia, and non-reassuring fetal heart rate tracing.

Figure. Cumulative incidence of ASD Diagnosis Based on Labor Induction vs. Spontaneous Labor Onset (log-rank p-value <0.001).



589 | Gender as a Determinant of Neurological Sequelae in Twin Gestations

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Objective: Evidence suggests that biological and genetic differences between genders may influence the prevalence and severity of various perinatal and chronic health outcomes. To further investigate these discrepancies, we conducted a detailed evaluation of the long-term neurological outcomes in male and female offspring from twin gestations.

Study Design: A population-based sibling analysis was conducted at a tertiary referral center, focusing on twin births of male-female dyads. The study aimed to compare the occurrence of neurological-related morbidity throughout childhood, considering both community and hospital-based diagnoses, in relation to offspring gender. A Kaplan-Meier survival curve was utilized to evaluate the cumulative incidence of neurological morbidity, while a Cox proportional hazards model was applied to control for confounding variables.

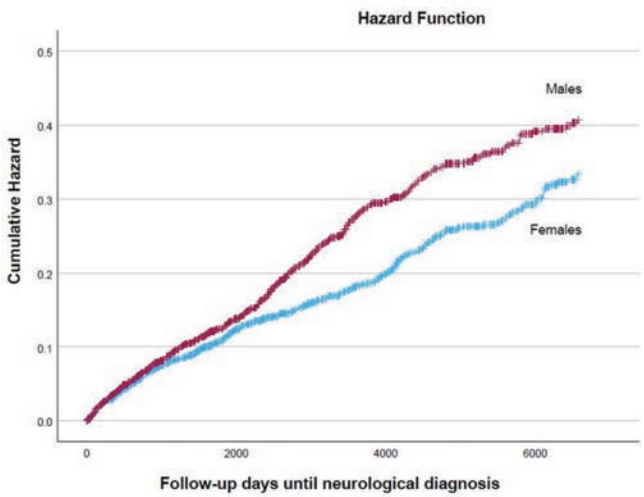
Results: The analysis of 1,471 twin pairs revealed gender differences in neurological and psychiatric conditions (Table). Males exhibited higher rates of ADHD (8.3% vs. 3.5%, p< 0.001) and total neurological-related morbidity (21.5% vs. 17.4%, p = 0.006). Notably, sleep disorders were only reported in males (0.3%, p = 0.02), and developmental disorders were also more prevalent among males compared to females (4.3% vs. 2.5%, p = 0.008). The Kaplan-Meier analysis demonstrated an increased cumulative neurological morbidity among male offspring (log-rank p-value = 0.004; Figure). In a Cox regression hazards model, which accounted for mode of delivery and small-for-gestational-age neonates, male gender remained independently associated with long-term neurological sequelae (aHR = 1.28, 95% CI 1.08-1.51, p = 0.004).

Conclusion: Male offspring from twin gestations are notably more prone to experiencing long-term neurological morbidity.

Table. Long-term neurological morbidity, by offspring gender, among twin gestation.

	Males (n=1,438)	Females (n=1,471)	*p*-value
Autism Spectrum Disorder (%)	13 (0.9)	7 (0.5)	0.183
Muscular Dystrophy (%)	3 (0.2)	3 (0.2)	0.98
Eating Disorders (%)	8 (0.6)	13 (0.9)	0.38
Sleep Disorders (%)	5 (0.3)	0 (0)	0.02
Movement Disorders (%)	46 (3.2)	51 (3.5)	0.76
Cerebral Palsy (%)	7 (0.5)	6 (0.4)	0.79
Psychiatric Disorders (%)	54 (3.8)	40 (2.7)	0.117
Attention Deficit Hyperactivity Disorder (ADHD) (%)	119 (8.3)	51 (3.5)	<0.001
Developmental Disorders (%)	62 (4.3)	37 (2.5)	0.008
Degenerative and Demyelinating Disorders (%)	81 (5.6)	105 (7.1)	0.11
Total Neurological-Related Morbidity (%)	**309 (21.5)**	**256 (17.4)**	**0.006**

Figure. Cumulative Incidence of Neurological-Related Morbidity by Offspring Gender (log-rank p-value = 0.004).



590 | Labor Progression in Women with or without Premature Rupture of Membranes

Or Bercovich[1]; Daniela Chen[2]; Natav Hendin[1]; Shay Sukenik[3]; Eran Hadar[1]; Ohad Houri[1]

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4:00 PM - 6:00 PM

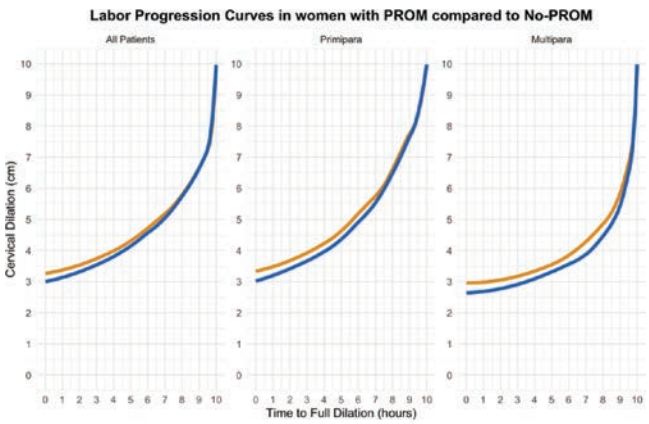
Objective: To compare labor progression in women with premature rupture of membranes (PROM) versus those without PROM.

Study Design: Retrospective study conducted at a tertiary university medical center between July 2012 and September 2020. Women carrying singleton pregnancies who underwent vaginal delivery at or beyond 37 weeks of gestation were included. Exclusion criteria included multiple gestations, non-vertex presentations, and cesarean deliveries. The cohort was divided into two groups: PROM and No-PROM. Interval-censored regression estimated median labor duration at each centimeter of

cervical dilatation. Multivariate analyses adjusted for maternal age, chronic hypertension, thrombophilia, and gestational age were conducted.

Results: 26,438 women were included, with 6,626 (25.1%) in the PROM group and 19,812 (74.9%) in the No-PROM group. In primiparous women, first stage of labor (3-10cm) was significantly shorter in the PROM compared to the No PROM group, with medians of 5.00 (95th percentile 12.79) versus 5.48 hours (95th percentile 13.91; P< 0.001). Similarly, in multiparous women, the median times were 2.70 (95th percentile 8.68) versus 3.16 hours (95th percentile 10.06; P< 0.001). The active phase (6-10 cm) did not significantly differ in primiparous women with medians of 2.76 (95th percentile 8.53) versus 2.84 hours (95th percentile 9.01; P = 0.394). However, multiparous women with PROM had a shorter active phase with medians of 1.02 (95th percentile 4.16) versus 1.16 hours (95th percentile 4.82; P = 0.002).

Conclusion: Labor progression from 3 cm to full dilatation was significantly shorter in women with PROM compared to those without PROM, regardless of parity. Active phase duration was statistically significantly shorter in multiparous women with PROM, albeit the median difference of 8 minutes is not clinically significant.



Labor duration in women with PROM compared to No-PROM

Comparison*	PROM	No-PROM	Adjusted_P_Value**
3cm to 10cm – Primipara	5.00 (12.79)	5.48 (13.91)	<0.001
3cm to 10cm – Multipara	2.70 (8.68)	3.16 (10.06)	<0.001
3cm to 10cm – All	3.94 (12.39)	4.27 (13.26)	<0.001
6cm to 10cm – Primipara	2.76 (8.53)	2.84 (9.01)	0.394
6cm to 10cm – Multipara	1.02 (4.16)	1.16 (4.82)	0.002
6cm to 10cm – All	1.97 (8.43)	1.87 (8.21)	0.018

PROM premature rupture of membranes
*Median (95th percentile)
**Results are adjusted for maternal age, chronic hypertension (ChrHTN), thrombophilia, and gestational age.

591 | Labor Progression in Women with SGA versus AGA Newborns

Or Bercovich[1]; Daniela Chen[2]; Natav Hendin[1]; Shay Sukenik[3]; Eran Hadar[1]; Ohad Houri[1]
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4:00 PM - 6:00 PM

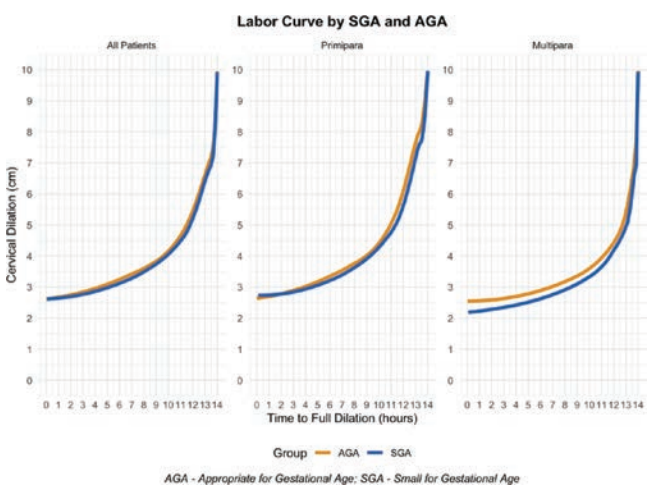
Objective: To compare labor progression in women with small for gestational age (SGA) newborns versus those with appropriate for gestational age (AGA) newborns.

Study Design: Retrospective study at a tertiary university medical center from July 2012 to September 2020. Women with singleton pregnancies at or beyond 37 weeks of gestation were included. Exclusion criteria were multiple gestations, non-vertex presentations, previous multiple cesarean deliveries, and neonates with congenital anomalies, 5-minute Apgar < 7, or admission to the intensive care unit. The cohort was divided into SGA (birth weight < 10th percentile) and AGA (birth weight 10-90th percentile) newborns.

Interval-censored regression estimated median labor durations at each centimeter of cervical dilatation. Multivariate analyses adjusted for maternal age, BMI, and gestational age.

Results: 23,629 women were included, with 2,283 (9.66%) in the SGA group and 21,346 (90.33%) in the AGA group. In both primiparous and multiparous women, the duration of the first stage of labor (3-10cm dilatation) was not significantly different between the SGA and AGA groups, with medians of 4.45 (95th percentile 13.31) vs. 4.65 hours (95th percentile 12.27; P = 0.54) in primiparous women and 2.49 (95th percentile 9.73) vs. 2.72 hours (95th percentile 9.34; P = 0.88) in multiparous women, respectively. The active phase of labor (6-10cm dilatation) was shorter in primiparous women with SGA compared to AGA, with a median of 1.92 (95th percentile 7.61) vs. 2.22 hours (95th percentile 7.58; P< 0.01). However, no significant difference was observed in multiparous women, with medians of 0.64 hours (95th percentile 4.08) vs. 0.84 hours (95th percentile 4.45; P = 0.95) in the SGA and AGA groups, respectively.

Conclusion: Women with SGA and AGA newborns have a similar duration of labor overall. Although active phase of labor was statistically significantly shorter in primiparous women with SGA, the difference of 18 minutes is of limited clinical significance.



Labor Progression Curves in women with SGA compared to SGA newborns

Comparison*	SGA	AGA	Adjusted_P_Value*
3cm to 10cm – Primipara	4.45 (13.31)	4.65 (12.27)	0.550
3cm to 10cm – Multipara	2.49 (9.73)	2.72 (9.34)	0.881
3cm to 10cm – All	4.16 (14.08)	4.19 (12.94)	0.600
6cm to 10cm – Primipara	1.92 (7.61)	2.22 (7.58)	0.005
6cm to 10cm – Multipara	0.64 (4.08)	0.84 (4.45)	0.954
6cm to 10cm – All	1.86 (8.36)	1.89 (8.25)	0.818

AGA appropriate for gestational age; SGA Small for gestational aga
*Median (95th percentile)
**Results are adjusted for maternal age, body mass index and gestational age at delivery

592 | Fetal Head Circumference Underestimation of Neonatal Head Circumference: Results from a Prospective Multicenter Study

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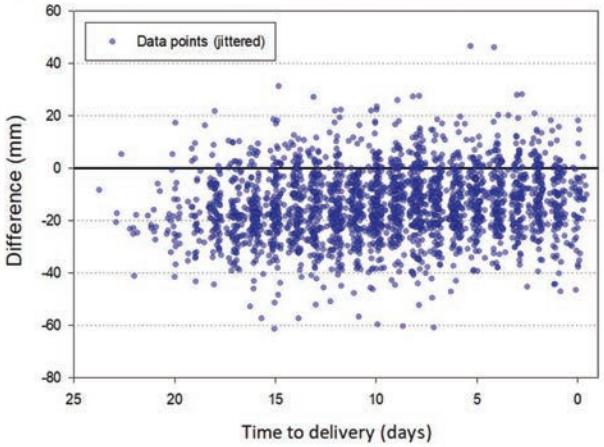
Objective: Being able to prospectively predict difficult labor, and the need for operative vaginal delivery or cesarean delivery, is of great value in contemporary obstetric practice, in particular for nulliparous patients. Increasing fetal head circumference (FHC) has been the focus of predictors in this regard, but this assumes that prenatal ultrasound assessment of FHC is an accurate surrogate marker for neonatal head circumference (NHC).

Study Design: We evaluated the accuracy of prenatal FHC measurement for predicting NHC in a secondary analysis of a prospective multicenter study of nulliparous term labor. 2,336 pregnancies with an ultrasound examination at 39 weeks' gestation were included, in which FHC was measured in triplicate and averaged. NHC was measured at birth by a standard Holtain measuring tape, placed 2cm above the ears around the occipitofrontal circumference. Linear regression was used to compare differences in FHC and NHC, adjusting for time to delivery (TTD) in days. An alternative approach without adjustment for TTD, FHC and NHC were compared using the 90th centiles from the INTERGROWTH-21st study for FHC and NHC.

Results: The median [IQR] gestational age at ultrasound examination was 39.3 weeks [39.0 - 39.6], and FHC was 337mm [329-345]. The median [IQR] gestational age at delivery was 40.7 weeks [40.3–41.3], and NHC was 350mm [340-360]. Regression analysis indicated that FHC underestimated NHC by 10.5mm on average (difference = -10.5–0.37 * TTD, see Figure 1). Centile-based comparisons found that 17% of FHC measurements were above the 90th centile, compared to 30% of NHC values above the 90th centile.

Conclusion: Late pregnancy ultrasound measurement of FHC underestimates neonatal head circumference by approximately 1cm at term, and a centile-based comparison did not compensate for this difference. This systematic error may have important implications and should be taken into account in the interpretation of fetal head circumference.

Figure 1. Difference between FHC and NHC according to Time to Delivery (days)



593 | Suboptimal Fetal Lung Growth After Fetal Endoluminal Tracheal Occlusion in Congenital Diaphragmatic Hernia: Clinical Characteristics

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4:00 PM - 6:00 PM

Objective: Suboptimal fetal lung growth (SFLG) affects cases that undergo Fetoscopic endoluminal tracheal occlusion(FETO) in severe left-sided congenital diaphragmatic hernia (L-CDH).We describe the demographic and clinical characteristics of SFLG and optimal fetal lung growth (OFLG) after FETO

Study Design: Singleton pregnancies with isolated L-CDH, defined as observed-to-expected lung-to-head ratio (O/E LHR) < 25% and normal chromosomes, underwent FETO under an IRB- and FDA-approved clinical trial protocol (NCT02596802) at the UTHealth Houston Fetal Center from 2015-2024. The FETO balloon insertion was scheduled at 27-30 weeks' gestation (wGA), and balloon removal at 34-35-wGA.Observed-to-expected total fetal lung volume (O/E TFLV) was measured by MRI before and 3 weeks after FETO, and percent changes from pre- to post-FETO MRIs were calculated.Descriptive, analytical statistics and (ROC)

curve analysis associating metrics with neonatal survival and the need for extracorporeal life support (ECLS) were performed via R interface(jamovi.org).

Results: 19 pregnant women were enrolled, 4 children died, 2 cases did not undergo the post-FETO-MRI, 2 cases died before surgical repair.Area under the ROC curve(AUC) of O/E TFLV for the prediction of survival and not need for ECLS were 0.974, and 0.729, respectively.The best cut-off for identification of SFLG was an increase of < 12.8% of O/E TFLV 21 days post-FETO with a sensitivity of 92.3% and specificity of 100% to predict childhood mortality at hospital discharge.An increase of ≥ 12.8 % of TFLV(OFLG) had a sensitivity of 90% and specificity of 57.1% to predict children that do not require ECLS. Demographic and maternal characteristics were not different between SFLG and OFLG(Table 1). SFLG had lower O/E TFLV and O/E LHR three weeks post-FETO, and was associated with a lower frequency of surviving hospital discharge than OFLG(Table 2).

Conclusion: SFLG, characterized by decreased lung volume, is associated with a lower survival than optimal fetal lung growth.

Table 1. Demographic and clinical characteristics according to the percent increase in observed-to-expected total lung volume(O/E TLFV) after fetoscopic endoluminal tracheal occlusion (FETO)

Demographic and Clinical Characteristics	Optimal Fetal Lung Growth (≥ 12.8% O/E TFLV) (n=12)	Suboptimal Fetal Lung Growth (>12.8% O/E TFLV) (n-5)	P value
Maternal age, years	25 (21–43)	32 (22–41)	0.43
Nulliparity, %	33.3 (4/12)	40.0 (2/5)	1.0
Maternal body mass index, kg/m^2	27.4 (20.4–47.3)	27.6 (21.2–43.5)	0.68
Male sex, %	33.3 (4/12)	60.0 (3/5)	0.60
Ethnicity, %			1.0
Caucasian	66.7 (8/12)	50.0 (3/6)	
Hispanic	8.3 (1/12)	16.7 (1/6)	
Other	25.0 (3/12)	33.3 (2/6)	
Gestational age at 1st MRI, weeks	25.4 (21.1–28.7)	24.3 (20.1–25.1)	0.07
Gestational age at FETO, weeks	27.9 (27.0–29.7)	27.7 (27.3–29.0)	0.43
Gestational age at 2nd MRI, weeks	30.7 (29.4–33.0)	30.9 (30.4–32.6)	0.55
Interval between 1st and 2nd MRI, days	15.0 (13.0–20.3)	15.0 (14.0–29.0)	0.38
Interval between FETO and 2nd MRI, days	18.5 (5.0–31.0)	15.0 (1.0–29.0)	0.55
Gestational age at FETO balloon removal, weeks	33.9 (32.0–34.6)	34.0 (32.9–35.3)	0.49
FETO-to-FETO balloon removal interval, days	40.0 (28.0–51.0)	42 (22.0–55.0)	0.90
Gestational age at delivery, weeks	35.2 (32.0–39.4)	34.7 (32.3–38.0)	0.46
FETO-to-delivery interval, weeks	45.5 (34.0–86.0)	43.0 (28.0–75.0)	0.30
PPROM, %	41.7 (5/12)	20 (1/5)	0.60
Birthweight, g	2430 (2010–3250)	2090(1530–2900)	0.13
Vaginal delivery, %	33.3 (4/12)	20 (1/5)	1.0

Results listed as percentage (proportion), and median (minimum-maximum). MRI, magnetic resonance imaging; PPROM, preterm pre-labor rupture of membranes.

Table 2. Clinical characteristics according to the percent increase in observed-to-expected total lung volume (O/E TLFV) after fetoscopic endoluminal tracheal occlusion (FETO)

Clinical Characteristics	Optimal Fetal Lung Growth [≥ 12.8 % O/E TFLV] (n=12)	Suboptimal Fetal Lung Growth [< 12.8% O/E TFLV] (n=5)	P value
Observed-to-expected lung-to-head ratio at 1st MRI	23.0 (17.9–27.0)	21.0(15.0–24.0)	0.09
Observed-to-expected lung-to-head ratio <25% at 1st MRI	83.3 (10/12)	100 (5/5)	1.0
Observed -to-expected of total fetal lung volume 1st MRI	22.9 (7.0–43.0)	21.4 (10.5–29.4)	0.96
Liver herniation at 1st MRI	24.9 (7.7–44.0)	25.8 (11.4–44.0)	0.93
Observed-to-expected lung-to-head ratio at 2nd MRI	41.8 (22.0- 51.0)	26.9 (20.6–40.2)	0.001
Observed-to-expected total fetal lung volume at 2nd MRI	53.5 (34.1–108.0)	21.0 (16.8–28.7)	0.001
Liver herniation at 2nd MRI	29.8 (11.5–70.8)	23.0 (5.8–48.0)	0.42
Diaphragm defect Type			0.23
C	50.0 (6/12)	0 (0/4)	
D	50.0 (6/12)	100 (4/4)	
Pre-FETO O/E TFLV <32% and liver herniation >21%	50.0 (6/12)	80 (4/5)	0.34
Need for inhaled nitric oxide	8.3 (1/12)	50 (2/4)	0.14
Need for extracorporeal life support (ECLS)	25.0 (3/12)	80 (4/5)	0.10
Chronic ventilation assistance and tracheostomy	33.3 (4/12)	0 (0/4)	0.52
Survival at discharge	100 (12/12)	25.0 (1/4)	<0.01

Results are listed as percentage (proportion) and median (minimum-maximum). MRI, magnetic resonance imaging;

594 | Sleepiness in Pregnancy and Adverse Perinatal Outcomes

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4:00 PM - 6:00 PM

Objective: Sleep disorders in pregnancy have been associated with adverse perinatal outcomes (APO) including hypertensive disorders of pregnancy (HDP), preterm birth (PTB), and gestational diabetes mellitus (GDM), yet prospective studies that use validated tools to assess sleepiness in pregnancy are limited. We aimed to assess the association of sleepiness in pregnancy with APOs.

Study Design: In this secondary analysis of data from a large, diverse observational cohort of nulliparous individuals conducted at eight US medical centers, those with self-reported sleep data were included. Sleepiness was evaluated in early (6-13 weeks) and mid pregnancy (22-29 weeks) via the Epworth Sleepiness Scale, a validated tool to assess daytime sleep propensity, the ability to fall or stay asleep. Those with scores ≤10 were categorized as having no sleepiness (referent), 11-15 moderate sleepiness, and 16-24 severe sleepiness. The outcomes were HDP, GDM, PTB, and small-for-gestational-age birth < 10%ile (SGA). Multivariable logistic regression analysis was performed to evaluate the associations of moderate and severe sleepiness with each APO. A sensitivity analysis that included "high risk for sleep disordered

breathing (SDB)," measured by an adapted Berlin Questionnaire for Sleep Apnea, as a covariate in the multivariable model was performed.

Results: Of 6,806 eligible participants who completed sleep questionnaires at both time points, the average sleepiness score in early and mid pregnancy was 7.8 (SD 4.1) and 6.5 (SD 4.0) respectively. In early pregnancy, 20.0% and 4.3% of people experienced moderate and severe sleepiness, respectively; in mid pregnancy 14.4% and 2.5% experienced moderate and severe sleepiness. Severe sleepiness in mid-pregnancy was associated with GDM (aOR 1.78, 95% CI 1.01-3.12) and SGA (aOR 1.35, 95% CI 1.06-1.71) (Table). Findings were similar when accounting for SDB.

Conclusion: Severe sleepiness during pregnancy, a symptom reflective of sleep quality, length, and often SDB, is associated with GDM and SGA suggesting a potential relationship with maternal glucose metabolism and placental function.

Table. Association of sleepiness and adverse perinatal outcomes

	Total	Moderate Sleepiness	Severe Sleepiness
		Early pregnancy (6-13 weeks)	
	N=6, 806	N= 1,361 (20.0%)	N= 293 (4.3%)
HDP		0.92 (0.75, 1.13)	0.94 (0.55, 1.61)
GDM		1.16 (0.74,1.82)	1.24 (0.70, 2.21)
PTB		0.80 (0.68, 0.94)	1.17 (0.77, 1.78)
SGA		0.99 (0.84, 1.18)	0.79 (0.57, 1.11)
		Mid pregnancy (22-29 weeks)	
		N= 980 (14.4%)	N= 170 (2.5%)
HDP		0.80 (0.68, 0.95)	0.95 (0.69, 1.33)
GDM		1.18 (0.80, 1.73)	**1.78 (1.01, 3.12)**
PTB		0.92 (0.73, 1.15)	1.30 (0.76, 2.20)
SGA		0.92 (0.73, 1.16)	**1.35 (1.06, 1.71)**

Data presented as % and adjusted odds ratio (95% confidence interval)

HDP- Hypertensive disorders of pregnancy, GDM- Gestational diabetes, PTB-preterm birth (<37w), SGA- Small for gestational age status (<10%ile), aOR- adjusted odds ratio, CI- confidence interval

1. Moderate sleepiness scores were defined as a score of 11-15; Severe sleepiness score were defined as 16-24.
2. Multivariable models were adjusted for early pregnancy maternal age, race/ethnicity as a social construct, insurance, body mass index, and current smoking within the prior 3 months.
3. The 95% confidence intervals are based on robust standard errors, which are clustered at the study sites.
4. The sample exlcuded those with chronic hypertension and pregestational diabtes.

595 | Association of Sleepiness in Pregnancy with Cardiovascular Health 2-7 years after first birth

Rachel L. Friedlander[1]; Xiaoning Huang[2]; Sadiya S. Khan[3]; Phyllis Zee[3]; Philip Greenland[4]; Natalie A. Bello[5]; Janet Catov[6]; Bethany B. Gibbs[7]; William A. Grobman[8]; David M. Haas[9]; Lisa D. Levine[10]; C. Noel Bairey Merz[11]; Eliza C. Miller[12]; Uma M. Reddy[13]; Lynn M. Yee[3]

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4:00 PM - 6:00 PM

Objective: Excessive daytime sleepiness has been associated with cardiovascular disease in non-pregnant populations. This study examined the association of sleepiness during pregnancy and cardiovascular health (CVH) scores 2-7 years after first birth.

Study Design: In this secondary analysis of longitudinal data from a large, diverse cohort of nulliparas conducted at eight US medical centers, individuals were followed 2-7 years after their first birth. The Epworth Sleepiness Scale, a validated tool to assess daytime sleep propensity (i.e. the likelihood of falling or staying asleep), was used to evaluate sleepiness in early (6-13 weeks) and mid- pregnancy (22-29 weeks). Individuals with scores ≤10 were categorized as having no sleepiness (referent), 11-15 as moderate sleepiness, and 16-24 severe sleepiness. The primary outcome was CVH quantified by the American Heart Association's Life's Essential 8 (LE8) score, which is a validated surrogate of cardiovascular disease risk, with lower scores representing worse CVH. The LE8 score includes diet, physical activity, nicotine exposure, sleep, body mass index, blood pressure, blood glucose, and lipids, and ranges from 0 (worst) to 100 (best). Separate multivariable linear regression models were performed for early and mid-pregnancy adjusting for maternal age, insurance type, smoking status, and study site.

Results: Of 2,193 participants, moderate and severe sleepiness was reported in 20.3% and 4.1%, respectively, in early pregnancy and in 14.2% and 2.2%, respectively, in mid-pregnancy. Severe sleepiness in mid-pregnancy was associated with lower mean LE8 score (76.9 [SD 13.8] vs. 80.4 [SD 12.9]) 2-7 years after first birth (aβ -3.63 95% CI [-6.90, -0.36]). In contrast, moderate and severe sleepiness in early pregnancy were not associated with LE8 score.

Conclusion: Severe sleepiness in mid-pregnancy may be a previously unidentified risk factor for poorer CVH indices 2-7 years after first birth.

Table. Association of sleepiness during pregnancy and cardiovascular health 2-7 years after birth

LE8 score[1]	No Sleepiness	Moderate Sleepiness[2]	Severe Sleepiness[2]
		Early pregnancy (6-13 weeks)	
	N=1,658	N=445 (20.3%)	N=90 (4.1%)
LE8 score	80.5 (12.9)	80.1 (13.1)	79.3 (12.7)
aβ (95% CI)[3]		-0.44 (-1.64, 0.76)	-1.05 (-3.51, 1.41)
		Mid pregnancy (22-29 weeks)	
		N=311 (14.2%)	N=48 (2.2%)
LE8 score	80.4 (12.9)	80.7 (12.4)	76.9 (13.8)
aβ (95% CI)[3]		-0.28 (-1.66, 1.10)	**-3.63 (-6.90, -0.36)**

Data presented as mean LE8 scores (standard deviation), beta coefficients (95% confidence interval); LE8, American Heart Association Life's Essential 8 score

1. Mean and standard deviation American Heart Association Life's Essential 8 score for cardiovascular health, which includes diet, physical activity, nicotine exposure, sleep, body mass index, blood pressure, blood glucose, and lipids.
2. Moderate sleepiness scores were defined as a score of 11-15; Severe sleepiness score were defined as 16-24.
3. Multivariable linear regression models were adjusted for baseline maternal age, insurance status, smoking status, and study site.

596 | Time to Treatment Initiation of Piperacillin-Tazobactam Compared to Ampicillin-Gentamicin for the Treatment of Intraamniotic Infection

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4:00 PM - 6:00 PM

Objective: Both the traditional regimen of ampicillin-gentamicin and the new regimen of piperacillin-tazobactam, have been proven to successfully treat intraamniotic infection (IAI). We sought to evaluate the time from diagnosis to initiation of antibiotics in the setting of IAI when comparing the recommended traditional regimen of ampicillin (2g IV q6h) and gentamicin (5mg/kg IV q24h), to the alternative regimen of piperacillin-tazobactam (4.5 g IV q8h).

Study Design: Retrospective cohort study of women with suspected IAI as defined by the ACOG at [3] 34 weeks of gestation, with singleton gestation, who received either regimen at a university hospital from November 2022 to May 2024. The primary outcome was time to treatment initiation (TTI). This was defined by an analysis of both provider and nursing input into an electronic medical record system, from time of medication order placement to administration initiation. Mann-Whitney analysis was used to study the difference in time to treatment.

Results: We included 394 patients of which 199 received piperacillin-tazobactam, and 195 received ampicillin-gentamicin. Most patients (57.8%) were diagnosed with suspected IAI based on maternal fever and fetal tachycardia. Median TTI was 21 minutes (interquartile-range 28 minutes) for the piperacillin-tazobactam group, and 68 minutes (interquartile-range 51.2) for the ampicillin-gentamicin group (p-value < 0.01). There was no significant difference in the rate of postpartum fever, ICU admission, or postpartum readmissions (Table 1). Regarding neonatal outcomes, there were no clinically significant differences in early onset sepsis (EOS) score, rate of NICU admission or cord gas pH (Table 2).

Conclusion: Interestingly, the TTI of the complete antibiotic regimen from time of diagnosis is over twice as long with ampicillin-gentamicin than piperacillin-tazobactam, likely due to the weight-based dosing rather than fixed dosing regimen and ease of medication availability for administration to nursing staff.

Table 1. Maternal Outcomes

	Ampicillin/ Gentamicin (n=195)	Piperacillin-Tazobactam (n=199)	p-value
Postpartum Fever – n (%)			
No Fever	176 (90.2%)	176 (88.4%)	0.20
Within 1 Hour of Delivery	5 (2.6%)	13 (6.5%)	
More than 1 Hour After Delivery	14 (7.2%)	10 (5.0%)	
ICU Admission – n (%)	0 (0%)	1 (0.5%)	1
Postpartum Readmission – n (%)	16 (8.2%)	13 (6.5%)	1
Reason for Readmission – n (%)			
Wound Infection	3 (1.5%)	2 (1.0%)	0.21
Endometritis	1 (<0.1%)	1 (<0.1%)	
Other (Non-Infectious)	12 (6.2%)	9 (0.05%)	

Table 2. Neonatal Outcomes

	Ampicillin/ Gentamicin (n=195)	Piperacillin-Tazobactam (n=199)	p-value
Early Onset Sepsis Score – median (IQR)	1.1 (1.3)	0.9 (1.2)	0.19
Cord Gas pH – median (IQR)	7.27 (0.11)	7.24 (0.11)	0.01
NICU Admission – n (%)	59 (30.3%)	59 (29.6%)	1
Neonate requiring antibiotics – n (%)	41 (21.0%)	40 (20.1%)	1
Length of NICU Stay (days) – median (IQR)	2 (1)	2 (1)	0.10
Neonate Readmission within 7 days – n (%)	11 (5.6%)	11 (5.5%)	0.96
Reason for Readmission – n (%)			
Fever	5 (2.6%)	6 (3.0%)	0.19
Other (Non-Infectious)	6 (3.1%)	5 (2.5%)	

597 | A Comparison of Newborn Birthweights Between Opioid Use Disorders Treated with Methadone vs Buprenorphine

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4:00 PM - 6:00 PM

Objective: To determine effects of in-utero exposure to medications for opioid use disorder (MOUD) on birthweight (BW) and birthweight classification comparing methadone to buprenorphine.

Study Design: This is a retrospective study of patients (N = 362) on MOUD who delivered at a single institution between

Jan 2017 and Dec 2023. Patients were divided into comparison groups based on type of MOUD: buprenorphine or methadone. Demographics and clinical outcomes including gestational age at delivery and BW were extracted from medical records. BW was categorized using Fenton 2013 Growth Charts with small for gestational age (SGA) newborns defined as a BW less than 10%ile for gestational age. Univariate and multivariable statistical analyses were done across groups with a statistical significance considered at $p < 0.05$.

Results: During the study period there were 362 patients, 105 (29%) utilizing methadone and 257 (71%) utilizing buprenorphine. Groups were similar when comparing parity, maternal age, ethnicity, preterm delivery rate, mode of delivery, and concurrent psychiatric diagnosis. BW was greater in the buprenorphine group (3020±615 g) compared to methadone group (2810±586 g; $p = 0.003$); however, there was a similar incidence of SGA newborns, 14.5% for buprenorphine vs 12.5% for methadone ($p = 0.61$). Dosing did not affect incidence of SGA infants [Table 1]. In regression modeling, there were no independent predictors of a SGA newborn, although chronic hypertension approached significance (OR 4.30: 95% CI 0.903 to 20.485; $p = 0.066$) [Table 2].

Conclusion: When using buprenorphine or methadone for MOUD, reassurance can be provided to patients that the incidence of SGA newborns is similar, even when accounting for medical comorbidities.

Table 1. Buprenorphine and Methadone Dosing and its Effect on Small for Gestational Size Infants

	Mean	Median	Range	Dosing Mean Rank	Dosing Mean Rank	P
Dosing at Beginning of Pregnancy				161.09	160.99	
Methadone (mg)	72	70	0 - 170	SGA (n=46)	Non-SGA (n=275)	0.99
Buprenorphine (mg)	10.8	8	0 - 48			
Dosing at Delivery				165.57	178.23	
Methadone (mg)	105.8	100	0 - 270	SGA (n=48)	Non-SGA (n=304)	0.42
Buprenorphine (mg)	11.6	11	0 - 30			

Table 2. Logistic Regression in Prediction of a SGA Newborn

Variable	Odds Ratio	95% CI	P
AMA (>35y)	1.18	0.537 to 2.618	0.673
Buprenorphine MOUD	1.09	0.494 to 2.416	0.827
White Race	4.25	0.498 to 36.176	0.185
BMI >30	0.87	0.388 to 1.976	0.750
Chronic Hypertension	4.30	0.903 to 20.485	0.066
Gestational Diabetes	0.36	0.045 to 2.861	0.335
Psychiatric Diagnosis	0.75	0.354 to 1.625	0.477

598 | Patient Outcomes: Preterm Prelabor Rupture of Membranes Before 34 weeks with Late Preterm Delivery

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4:00 PM - 6:00 PM

Objective: Preterm prelabor rupture of membranes (PPROM) affects 3% of births in the United States and is a significant cause neonatal morbidity and mortality. Guidelines recommend offering expectant management of delivery when appropriate. The objective of this study was to evaluate neonatal and maternal outcomes by gestational week of delivery for patients with PPROM before 34 weeks and delivery at 34 weeks or greater.

Study Design: This was a historical cohort study of patients delivered for PPROM at a single institution between January 2015 and October 2023. The study group included patients who had PPROM with a singleton gestation and non-anomalous fetus. Maternal and neonatal outcomes were compared by gestational week of delivery.

Results: In the cohort, 72 patients had PPROM before 34 weeks with delivery at 34 weeks or greater. Maternal and neonatal outcomes are outlined in the table. Those who delivered at 34 weeks were more likely to have a vaginal delivery after spontaneous preterm labor, compared to those that delivered at 35 weeks, who were more likely to have a vaginal delivery after induction of labor ($p = 0.039$). Neonates delivered at 35 weeks were less likely to have hyperbilirubinemia ($p = 0.019$) and less likely to be admitted to the neonatal intensive care unit ($p < 0.001$) than those delivered at 34 weeks. Outcomes of cesarean delivery, chorioamnionitis, postpartum endometritis, postpartum hemorrhage, 5-minute APGAR < 7, neonatal hypoglycemia, neonatal sepsis, respiratory distress or tachypnea, and neonatal resuscitation were not significantly different between groups. There were no differences in maternal death, neonatal death, necrotizing enterocolitis, intraventricular hemorrhage, and fetal demise.

Conclusion: For those with PPROM before 34 weeks and delivery at 34 weeks or greater, those that delivered at 34 weeks were more likely to have spontaneous preterm labor, neonatal intensive care unit admission, and neonatal hyperbilirubinemia than those delivered at 35 weeks. This data supports counseling patients for expectant management to 35 weeks or more when appropriate.

Table. Maternal and Neonatal Outcomes

Gestational Week of Delivery	34 Weeks n=43	35 Weeks n=28	36 Weeks n=1	P value
Maternal Outcomes				
Most Likely Outcome of Delivery	Spontaneous labor → vaginal delivery 18 (41.9%)	Induction of labor → vaginal delivery 17 (60.7%)		0.039*
Cesarean Delivery	13 (30.2%)	11 (39.3%)	1 (100%)	0.284
Chorioamnionitis	4 (9.3%)	1 (3.6%)	0	0.626
Postpartum Endometritis	1 (2.3%)	2 (7.1%)	0	0.576
Postpartum Hemorrhage	3 (7.0%)	0	0	0.304
Neonatal Outcomes				
5-Minute APGAR <7	6 (14.0%)	0	0	0.152
Neonatal Hypoglycemia	3 (7.0%)	7 (25.0%)	0	0.092
Neonatal Sepsis	6 (14.0%)	1 (3.6%)	0	0.334
Respiratory Distress Syndrome/Transient Tachypnea of the Newborn	12 (27.9%)	5 (17.9%)	0	0.476
Neonatal Hyperbilirubinemia	33 (76.7%)	12 (42.9%)	0	0.019*
Neonatal Resuscitation	18 (41.9%)	9 (32.1%)	0	0.524
Neonatal Intensive Care Unit Admission	42 (97.7%)	9 (32.1%)	0	<0.001*

599 | Inpatient versus Outpatient Management of Preterm Prelabor Rupture of Membranes: A Systematic Review and Meta-Analysis

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4:00 PM - 6:00 PM

Objective: The management of preterm prelabor rupture of membranes (PPROM) varies across healthcare settings with limited data on the safety of outpatient management. The aim of this study was to compare neonatal sepsis and other maternal and perinatal outcomes by outpatient vs inpatient management of PPROM.

Study Design: We performed a systematic review in October 2023 of Cochrane Central, Embase, PubMed and Web of Science databases for studies comparing outpatient and inpatient management of PPROM. We included studies of pregnancies complicated by PPROM < 37 weeks' gestational age (GA) published in full text English. Primary outcome was neonatal sepsis; secondary outcomes included neonatal intensive care unit (NICU) admission, NICU length of stay (LOS), intrauterine fetal demise (IUFD), neonatal death, pregnancy latency, chorioamnionitis, and maternal LOS. A random-effects model was used to calculate pooled odds ratios (OR) or mean differences (MD) and 95% confidence intervals (CI) for all outcomes.

Results: Out of the 485 studies identified, 10 were included. These studies comprised a total of 2,286 patients, with 1,040 undergoing outpatient and 1,246 inpatient management. Included studies involved pregnancies from 20 to 35 weeks' GA. Neonatal sepsis was assessed in all studies, and no significant statistical differences were found between the groups (pooled OR 0.92, 95% CI 0.63-1.35, Figure 1). The latency period was longer (pooled MD 7.73; 95% CI 0.56-14.90; Figure 2) and there was less chorioamnionitis (pooled OR 0.54; 95% CI 0.41-0.72) in the outpatient setting. Regarding neonatal outcomes, the outpatient group had lower odds of NICU admission (pooled OR 0.57; 95% CI 0.36-0.90) and a shorter NICU LOS (pooled MD -9.43 days; 95% CI -13.02 to -5.84). There were no significant differences in maternal LOS, IUFD, and neonatal death.

Conclusion: Outpatient management of PPROM was associated with a longer latency period, lower odds of chorioamnionitis, NICU admission, and shorter NICU length of stay, without an increase in rates of neonatal sepsis.

Figure 1. Fetal Outcomes

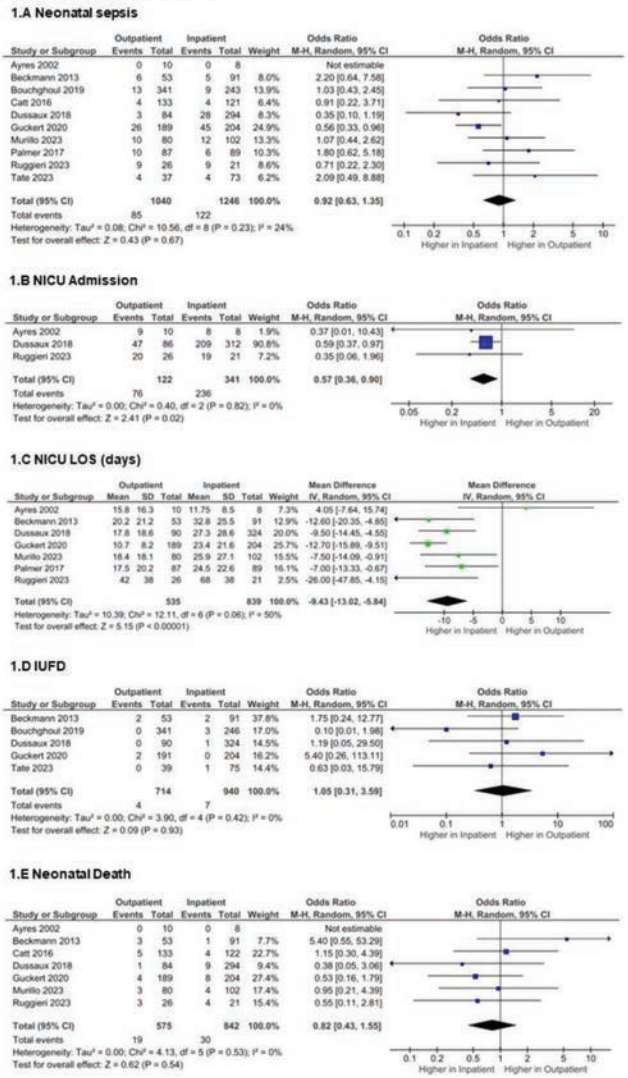
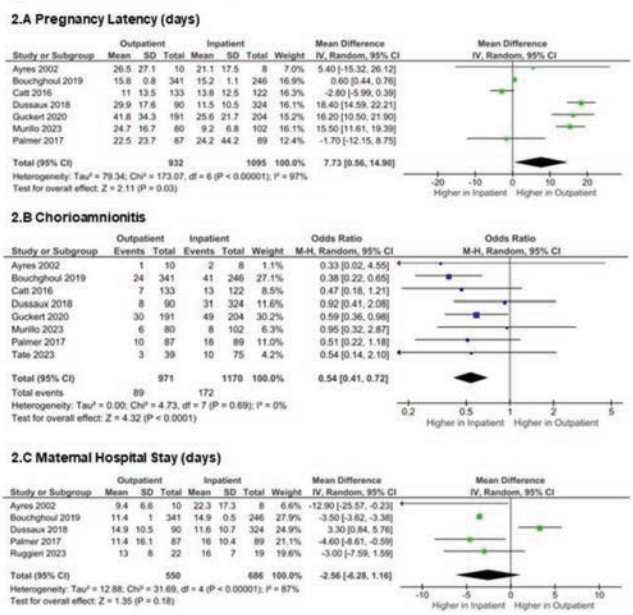


Figure 2. Maternal Outcomes



600 | Prepregnancy or Delivery BMI? Identifying the Better Predictor of Adverse Outcomes

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4:00 PM - 6:00 PM

Objective: Prepregnancy BMI (preBMI) represents baseline health status before pregnancy and is used to guide counseling and management to prevent adverse perinatal outcomes. However, preBMI is often unavailable or unreliable due to recollection bias. Delivery BMI (delBMI) encompasses the cumulative effects of preBMI and gestational weight gain (GWG). We sought to compare the ability of preBMI and delBMI to predict adverse maternal and neonatal outcomes.

Study Design: This was a secondary analysis of a prospective cohort study of all individuals with a singleton gestation who presented for induction or spontaneous labor at ≥ 37 weeks' gestation at a single institution from 2010-2014. Only individuals with a measured weight in the chart during the year prior to pregnancy were included in this analysis, allowing for accurate calculation of preBMI. Receiver operating characteristic (ROC) curves were used to compare the abilities of preBMI and delBMI to predict labor, maternal, and neonatal adverse outcomes.

Results: Among 8,580 patients in the original cohort, 2,964 had a prepregnancy weight recorded and were included in this study. In isolation, delBMI and preBMI were poor predictors of adverse outcomes. However, delBMI was a better predictor than preBMI of labor outcomes including primary cesarean section (Figure 1), labor > 24 hours, prolonged second stage of labor, and shoulder dystocia (Table 1). DelBMI was also a better predictor of hypertensive disorders of pregnancy (HDP), while preBMI was a better predictor of gestational diabetes (GDM) (Table 1). There was no difference in the ability of delBMI and preBMI to predict neonatal outcomes, including composite adverse neonatal outcome, fetal acidemia, NICU admission, and neonatal hypoglycemia (Table 1).

Conclusion: PreBMI and delBMI are individually poor predictors of adverse pregnancy outcomes. However, delBMI is a better predictor of adverse labor outcomes and HDP, while preBMI is a better predictor for GDM. Comprehensive risk assessment may need to reflect maternal weight throughout pregnancy, incorporating preBMI, delBMI and GWG as a dynamic measure.

Figure 1. ROC for Primary Cesarean Delivery by BMI

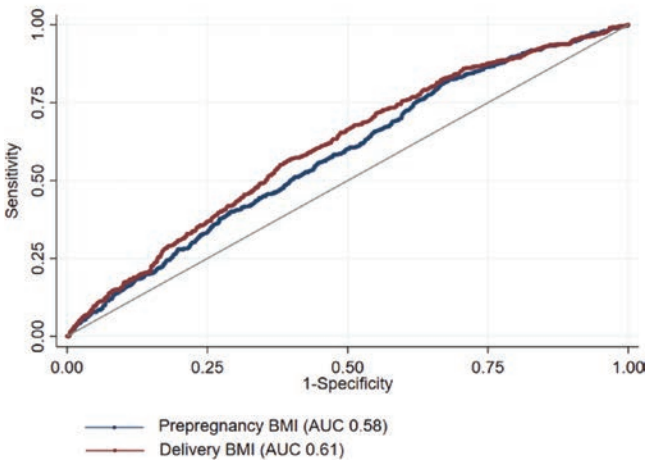

Table 1. Comparison of Area Under the Curve for Prepregnancy and Delivery BMI

	AUC Prepregnancy BMI	AUC Delivery BMI	P-value
Labor Outcomes			
Primary Cesarean Delivery	0.58 (0.55-0.60)	**0.61 (0.58-0.63)**	<0.001
Labor > 24 hours	0.60 (0.57-0.63)	**0.63 (0.60-0.66)**	<0.001
Prolonged 2nd Stage of Labor	0.54 (0.49-0.59)	**0.57 (0.52-0.61)**	0.03
Shoulder Dystocia	0.56 (0.50-0.62)	**0.59 (0.53-0.64)**	0.04
Postpartum Hemorrhage (EBL ≥ 1000 mL)	0.61 (0.48-0.74)	0.63 (0.51-0.74)	0.64
Maternal Outcomes			
Hypertensive Disorders of Pregnancy*	0.60 (0.57-0.63)	**0.63 (0.60-0.66)**	<0.001
Gestational Diabetes	**0.61 (0.56-0.66)**	0.55 (0.50-0.61)	<0.001
Neonatal Outcomes			
Composite Neonatal Morbidity **	0.54 (0.49-0.58)	0.53 (0.49-0.58)	0.43
NICU Admission	0.53 (0.50-0.57)	0.54 (0.51-0.57)	0.50
Fetal Acidemia (umbilical artery pH<7.1)	0.54 (0.47-0.61)	0.54 (0.47-0.62)	0.7
Neonatal hypoglycemia	0.63 (0.50-0.76)	0.60 (0.46-0.74)	0.16

*Excluded individuals with any chronic hypertension
**Included hypoxic ischemic encephalopathy, intubation, death, respiratory distress, seizure

601 | Confirmation of the Physiological Principles of the Sequential Laser Technique for Twin-Twin Transfusion Syndrome

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4:00 PM - 6:00 PM

Objective: To assess changes in middle cerebral artery peak systolic velocity (MCA-PSV) after sequential vs selective laser surgery for twin-twin transfusion syndrome (TTTS).

Study Design: This is a post hoc analysis of data from the Sequential Trial, a randomized controlled trial (RCT) that compared laser techniques for TTTS patients between 18-26 weeks of gestation. Patients received either the original (selective) or a modified selective (sequential) laser surgery, in which arteriovenous (AV) anastomoses with unidirectional blood flow from donor to recipient are laser-ablated first, followed by ablation of AV anastomoses from recipient to donor that should allow for a net intraoperative blood transfer from the hypervolemic recipient to the hypovolemic donor twin. We compared the difference (Delta) in donor MCA-PSV multiples of the median (MoM) (postoperative minus preoperative) by surgical technique.

Because anemia is associated with a higher MCA-PSV, a negative Delta is consistent with an increased blood volume.

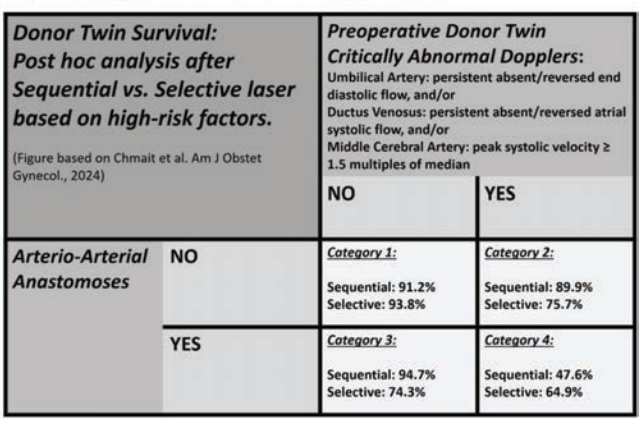
Results: In the 606 study patients, the mean (SD) Delta MCA-PSV MoM for the donor twin was -0.067 (0.301) (P< .0001) for the sequential and -0.017 (0.288) (P = .4186) for the selective techniques, with P< .0001 for the technique comparison. Based on donor critical abnormal Dopplers (CAD) and arterioarterial (AA) anastomoses, 4 risk Categories with donor survival rates were established (Figure). Mean (SD) Deltas for the sequential vs selective procedures are shown by Category in the Table. Linear regression for Delta, controlling for the risk groups, yielded a coefficient for the sequential vs selective techniques of -0.079 (0.024 SE), P = .0009.

Conclusion: Overall, patients receiving the sequential vs the selective technique had a greater drop in the mean donor MCA-PSV MoM, suggesting that the sequential technique facilitated an intraoperative net blood transfusion to the donor. This benefit was apparent in all risk groups except Category 4, which had poor donor survival. Further study is needed to understand and optimize outcomes of Category 4 patients.

Table. Mean (standard deviation) of the Delta MCA-PSV MoM (postoperative minus preoperative) for those undergoing the sequential vs selective procedures by risk group. CAD: critical abnormal Dopplers; AA: arterioarterial anastomosis. A negative value for Delta is consistent with an intraoperative net blood transfusion to the donor.

Risk Group	Sequential Procedure	Selective Procedure	*P*-value
Category 1 (n=341) no CAD or AA	-0.039 (0.266)	0.017 (0.250)	.0083
Category 2 (n=133) CAD no AA	-0.188 (0.335)	-0.020 (0.317)	.0013
Category 3 (n=68) no CAD with AA	-0.043 (0.263)	0.113 (0.308)	.0220
Category 4 (n=64) both CAD and AA	0.048 (0.345)	-0.010 (0.394)	.4438

Figure: Donor twin survival according to Category as established in the Sequential Trial (Chmait et al. Am J Obstet Gynecol., 2024).



602 | Twin-Twin Transfusion Syndrome with Intermittent (Stage I) versus Persistent (Stage III) Umbilical Artery Doppler Abnormalities

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4:00 PM - 6:00 PM

Objective: Per Quintero staging for twin-twin transfusion syndrome (TTTS), umbilical artery (UA) Doppler with *intermittent* absent or reversed end diastolic flow (A/REDF) is classified as Stage I, and UA with *persistent* A/REDF is classified as Stage III. We compared laser outcomes in Stage I patients with UA normal vs Stage I with *intermittent* A/REDF vs Stage III with *persistent* A/REDF.

Study Design: Cases of monochorionic diamniotic twins with TTTS Quintero stages I and III treated with laser (2006-2023) were reviewed and 3 groups analyzed: Stage I with no Doppler abnormalities (Stage-I-normal), Stage I with donor *intermittent* A/REDF of the UA (Stage-I-intermittent), and Stage III with donor *persistent* A/REDF of the UA (Stage-III). The outcome was donor twin intrauterine fetal demise (IUFD).

Results: Of 349 study patients, 101 were classified as Stage-I-normal, 36 were Stage-I-intermittent, and 212 were Stage III. Arterio-arterial (AA) communications were most common in Stage-I-intermittent: 27.7% vs 69.4% vs 42.5%, *P*< .0001. The rate of donor IUFD was lowest in Stage-I-normal compared to Stage-I-intermittent and Stage-III: 3.0% vs 25.0% vs 29.2%, *P*< .0001. At-least-one survivorship did not differ among the 3 groups (Table 1); dual survivorship was highest for Stage-1-normal and differed from both Stage-I-intermittent and Stage-III in pairwise comparisons. In a multivariable logistic regression model, Stage-I-intermittent patients were 7 times more likely to have donor twin IUFD (OR 7.23 [1.69-30.82], *P* = .0075), as were Stage-III patients (7.24 [2.06-25.47], *P* = .0020), compared to Stage-I-normal patients. (Table 2) In this same model, patients with AA were 3.6 times more likely to have donor IUFD (OR 3.59 [1.95-6.61]; *P*< .0001).

Conclusion: TTTS stage I patients with *intermittent* A/REDF UA findings were at increased risk of donor IUFD after laser surgery. It is unknown whether laser surgery or expectant management is the optimal approach for this subset of patients. The role of AA anastomoses in TTTS needs further investigation.

Table 1. Patient characteristics by study population. Continuous variables are presented as mean (standard deviation)

	Stage 1 No doppler abnormality (n=101)	Stage 1 Intermittent A/REDF of UA (n=36)	Stage 3 Donor-involved with persistent A/REDF of UA (n=212)	*P*-value
Patient characteristics				
IUGR donor	58 (57.4%)	23 (63.9%)	177 (83.5%)	< .0001
GA at procedure (weeks)	21.9 ± 1.9	21.0 ± 2.2	19.5 ± 2.2	< .0001
Number of AA anastomoses	0.30 ± 0.50	0.75 ± 0.55	0.45 ± 0.54	< .0001
Laser time (minutes)	n=101 20.7 ± 13.4	n=35 23.9 ± 15.1	n=212 22.9 ± 11.6	.0466
Postoperative variables				
Delivery GA (weeks)	33.3 ± 3.3	32.9 ± 3.8	33.1 ± 4.2	.8735
IUFD donor	3 (3.0%)	9 (25.0%)	62 (29.2%)	< .0001
At-least-1 survivor	100 (99.0%)	34 (94.4%)	200 (94.3%)	.1509
Dual survivors	95 (94.1%)	27 (75.0%)	133 (62.7%)	< .0001

* UA- umbilical artery; A/REDF- absent or reversed flow end diastolic flow; IUGR- intrauterine growth restriction; GA- gestational age, IUFD- intrauterine fetal demise.

Table 2. Odds ratios and 95% confidence intervals for donor IUFD using multiple logistic regression analysis (c=0.81).

Variables	Odds ratio	95% confidence limits	*P*-value
Study Group			
Stage I with normal A/REDF of UA	reference		
Stage I with intermittent A/REDF of UA	7.23	1.69-30.82	.0075
Stage III with persistent A/REDF of UA	7.24	2.06-25.47	.0020
MCA MoM Donor ≥1.5	4.91	1.67-14.46	.0038
IUGR Donor	3.19	1.38-7.28	.0066
Presence of AA anastomoses	3.59	1.95-6.61	< .0001
Multiparity	1.85	1.01-3.39	.0468
GA at procedure	0.79	0.68-0.91	.0018

*EDF- end diastolic flow; UA- umbilical artery; A/REDF- absent or reversed end diastolic flow; MCA PSV MoM- middle cerebral artery peak systolic flow multiple of medians; IUGR- intrauterine growth restriction; AA- arterio-arterial; GA- gestational age

603 | Group B Streptococci Colonization and the Expectant Management of Late Preterm Prelabor Rupture of Membranes

Raneen Abu Shqara[1]; Lior Lowenstein[2]; Maya Frank Wolf[3]
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4:00 PM - 6:00 PM

Objective: The impact of maternal group B streptococci (GBS) colonization on outcomes of expectant management of late premature prelabor rupture of membranes (PPROM) is controversial. We explored maternal and neonatal infectious outcomes in women who presented with PPROM at 34-36.6 weeks according to GBS colonization status.

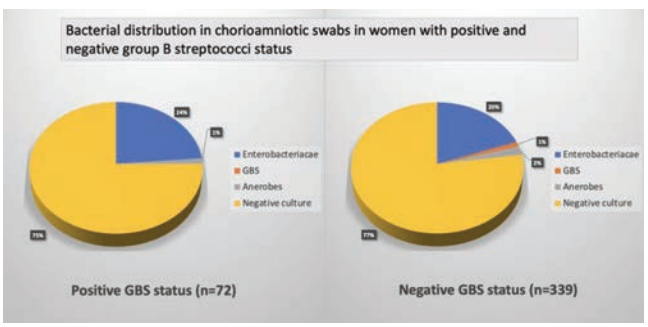
Study Design: This retrospective cohort study included 412 women who presented with late PPROM and were admitted for expectant management. Outcomes were compared according to positive GBS status (n = 73) and negative GBS status (n = 339). The co-primary outcomes were clinical chorioamnionitis and latency duration (ROM-delivery duration). Expectant management consisted of betamethasone administration and 7-day antibiotics regimen. Induction was performed at 37 weeks or earlier if chorioamnionitis or non-reassuring fetal status was suspected. After delivery, chorioamniotic swabs were obtained. The required sample size was calculated to be at least 398, considering a 10% effect size in the rate of women with latency > 48 hours, with a power of 80% and an alpha of 5%.

Results: Gestational age at PPROM was similar between the groups (Table). The rates of intrapartum fever, clinical chorioamnionitis, postpartum fever, latency duration, latency >48 hours, and delivery week were similar. For the positive vs. negative GBS status group, antibiotic administration in the neonatal intensive care unit was more common: 11.1% vs 3.5%, p = 0.013. Rates of neonatal complications such as early onset sepsis, respiratory distress syndrome, invasive ventilation, and meconium aspiration syndrome were similar between the groups. The distributions of pathogens in chorioamniotic swab cultures were similar (p = 0.461) (Figure).

Conclusion: Among women with PPROM at 34-36.6 weeks, we report similar maternal and neonatal adverse outcomes. The increased neonatal antibiotic administration may be attributed to preventive measures related to the positive GBS status. Expectant management of PPROM in women with GBS colonization is reasonable.

Obstetrical and neonatal outcomes in women with PPROM 34-36.5 weeks, according to group B streptococci colonization status.

	Negative GBS status (n=339)	Positive GBS status (n=73)	P-value
PROM week	35.6 (34.0-36.5)	35.5 (34.0-36.5)	0.115
Latency (days)	1.7 (0.5-16.6)	1.7 (0.5-18.9)	0.244
Latency >48 hours	88 (25.9)	15 (20.5)	0.454
Spontaneous labor onset	192 (56.6)	42 (58.3)	0.792
Induction by oxytocin	68 (20.1)	15 (20.8)	0.882
Delivery week	36.1 (34.1-37.2)	36.1 (34.2-37.2)	0.224
Cesarean delivery	67 (19.7)	19 (26.4)	0.209
Intrapartum fever	5 (1.4)	2 (2.8)	0.438
Chorioamnionitis	5 (1.1)	0 (0)	0.591
Postpartum fever	1 (0.3)	0 (0)	>0.99
Maternal hospitalization length (days)	4 (1.6-20.9)	4 (1.8-21.7)	0.694
Umbilical cord pH<7.2	1 (0.3)	1 (1.4)	0.226
Apgar 5<7	1 (0.3)	0 (0)	>0.99
Neonatal intensive care admission	108 (31.9)	32 (44.4)	0.055
Respiratory distress syndrome	12 (3.5)	3 (4.2)	0.797
Invasive ventilation support	15 (4.4)	5 (6.9)	0.367
Antibiotic administration in NICU	12 (3.5)	8 (11.1)	0.013
Neonatal sepsis	0 (0)	1 (1.4)	0.175
NICU hospitalization length (day)	8.5 (1-66)	8 (1-20)	0.289



604 | Comparing Two Prophylactic Antibiotic Protocols for Treating Preterm Pre-Labor Rupture of Membranes

Raneen Abu Shqara[1]; Gabriela Goldinfeld[2]; Lior Lowenstein[3]; Maya Frank Wolf[4]
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4:00 PM - 6:00 PM

Objective: Following our randomized trial, we changed the prophylactic antibiotic protocol for preterm pre-labor rupture of membranes (PPROM) in our department from ampicillin-roxithromycin to cefuroxime-azithromycin. We compared the infectious morbidity of these two regimens.

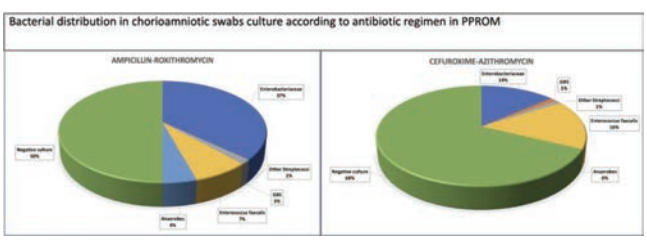
Study Design: This retrospective study included 170 women with PPROM < 37 weeks, managed expectantly with betamethasone and prophylactic antibiotics. According to protocol, chorioamniotic membrane cultures were obtained after delivery. Maternal and neonatal outcomes were compared between 83 women who received ampicillin-roxithromycin (February 2022 - March 2023) and 87 who received cefuroxime-azithromycin (April 2023 - May 2024). A composite maternal postpartum infectious outcome consisted of endometritis, antibiotic treatment and surgical site infection. A composite neonatal adverse outcome consisted of early onset sepsis, admission to the neonatal intensive care unit, antibiotic treatment, sepsis workup and respiratory distress syndrome.

Results: Gestational age at PPROM, parity, group B Streptococcus status and the median latency duration were comparable in the two periods. Among women treated with ampicillin-roxithromycin vs. cefuroxime-azithromycin, a greater proportion had intrapartum fever, clinical chorioamnionitis, cesarean delivery and a postpartum infectious outcome: 9.6% vs 1.1%, p = 0.013; 8.4% vs 1.1%, p = 0.046; 33.7% vs 19.5%, p = 0.036; and 4.8% vs. 0%, p = 0.038, respectively (Table). The composite neonatal adverse outcome did not differ between the groups (p = 0.874). Following the ampicillin-roxithromycin vs. cefuroxime-azithromycin regimen, prevalences were greater of positive chorioamniotic membrane cultures (50.0% vs. 32%, p< 0.001) (Figure) and of ampicillin-resistant Enterobacteriaceae spp. (23% vs. 10%, p = 0.027).

Conclusion: Cefuroxime-azithromycin compared to ampicillin-roxithromycin as a prophylactic for PPROM < 37 weeks showed less maternal peripartum infections, which was supported by the bacteriologic findings.

Maternal outcomes of the two antibiotic protocols

	Cefuroxime-Azithromycin (n=87)	Ampicillin-Roxithromycin (n=83)	P-value
Latency (ROM duration)	4.25±10.75	3.75±6.62	0.717
Spontaneous labor	58 (66.7%)	53 (63.9%)	0.749
Intrapartum fever	1 (1.1%)	8 (9.6%)	0.013
Clinical chorioamnionitis	1 (1.1%)	7 (8.4%)	0.046
Delivery week	35.5 (27-37.1)	35.6 (24-37.1)	0.994
Cesarean delivery	17 (19.5%)	28 (33.7%)	0.036
Pathological findings Acute chorioamnionitis	2 (2.4%)	10 (11.5%)	0.013
Postpartum antibiotics	2 (2.3%)	8 (9.6%)	0.042
Puerperal endometritis	0 (0%)	3 (3.6%)	0.074
Surgical site infection	0 (0%)	1 (1.2%)	0.305
Composite postpartum infection outcome (postpartum antibiotics, puerperal endometritis and surgical site infection)	0 (0%)	4 (4.8%)	0.038
Postpartum hospitalization length (days)	2.1 (1-6)	3 (1-6)	<0.001



605 | Ehr-Integration of an Evidence-Based Calculator for Cesarean Risk During Induction: Impact on Utilization and Outcomes

Rebecca F. Hamm[1]; Mary C. Steele[1]; Allison Dreier[2]; Sameh Saleh[3]; Mika Epps[1]; Madeline Fagen[1]; Mucio K. Delgado[1]; Lisa D. Levine[1]

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4:00 PM - 6:00 PM

Objective: We developed a validated calculator to predict individualized likelihood of cesarean delivery (CD) for patients undergoing induction (IOL) [Levine 2018]. In a prospective cohort, calculator implementation via an external website was associated with reduced maternal morbidity and CD [Hamm 2020]. Here, we aimed to determine if Electronic Health Record (EHR) integration of the CD risk calculator would further improve utilization and clinical outcomes.

Study Design: This prospective cohort evaluated calculator utilization, maternal morbidity, and CD for 6 months PRE (10/2022-4/2023) vs. 6 months POST EHR-release of the CD risk calculator (4/2023-10/2023) in 2 units. Prior to EHR-integration, Site#1 had a 2018 push for calculator website use, while Site#2 had not. EHR-integration recognized eligibility, allowed clinicians to confirm and utilize EHR variables for score automation, visible on electronic display. Patients were calculator eligible if undergoing term IOL with a singleton, intact membranes, and dilation ≤2cm without prior CD. Calculator utilization was measured as a score recorded in the EHR. Analysis was stratified by site and risk of CD based on calculator results (< 20%, 20-39.9%, 40-59.9%, ≥60%).

Results: 2018 patients met eligibility (PRE:998; POST:1010) with more IOLs for fetal indications, earlier gestational age, and higher rates of hypertension in the POST group. Calculator utilization significantly increased POST-EHR implementation (Table). There were no differences PRE to POST in maternal morbidity overall (aRR 1.18 [0.91-1.53]), by site or CD risk strata. There was no difference in CD overall (aRR 1.19 [0.99-1.43). However, an increase in CD was found at Site#2 POST EHR-integration (aRR 1.30 [1.02-1.66]), specifically in the ≥60% CD risk strata.

Conclusion: EHR-integration of a CD risk calculator was associated with substantial increases in utilization. While CD increased at one site PRE to POST, PRE rates were lower than anticipated, and POST rates consistent with institutional data. Care should be taken this calculator is not used to perform CD outside of clinical indications.

Table: Outcomes PRE- and POST-EHR integration of a cesarean delivery (CD) risk calculator.

	Pre n(%)	Post n(%)	p-value	Adjusted relative risk (aRR) [95% Confidence Interval]
CD risk calculator utilization	134/998 (13.4)	789/1020 (77.4)	<0.001	
Maternal morbidity[a,b]	106/998 (10.6)	127/1020 (12.5)	0.20	1.18 [0.91-1.53]
Cesarean delivery[b]				
Overall	209/998 (20.9)	257/1020 (25.2)	0.02	1.19 [0.99-1.43]
Site#1 Overall	92/458 (20.1)	106/499 (21.2)	0.66	1.06 [0.80-1.40]
Site #1 CD Risk <20%	3/148 (2.0)	10/162 (6.2)	0.07	
Site #1 CD Risk 20-39.9%	33/174 (19.0)	35/198 (17.7)	0.75	
Site #1 CD Risk 40-59.9%	39/95 (41.1)	41/104 (39.4)	0.82	
Site #1 CD Risk ≥60%	17/41 (41.5)	20/35 (57.1)	0.17	
Site#2 Overall	117/540 (21.7)	151/521 (29.0)	0.006	1.30 [1.02-1.66]
Site #2 CD Risk <20%	7/143 (4.9)	13/124 (10.5)	0.08	
Site #2 CD Risk 20-39.9%	37/201 (18.4)	45/193 (23.3)	0.23	
Site #2 CD Risk 40-59.9%	46/141 (32.6)	55/148 (37.2)	0.42	
Site #2 CD Risk ≥60%	27/55 (49.1)	38/56 (67.9)	0.045	

[a]≥1 of the following: estimated or quantitative blood loss ≥1000cc, endometritis, blood transfusion, wound infection or separation (requiring intervention), venous thromboembolism, hysterectomy, intensive care unit admission, readmission, and death within 30 days of delivery [b]adjusted for indication for induction and chronic hypertension

606 | Implementation of a Standardized Protocol for Labor Induction: Impact on Obstetric Disparities

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4:00 PM - 6:00 PM

Objective: Prior retrospective data demonstrated that standardization of labor induction (IOL) may reduce racial disparities in cesarean delivery (CD) and morbidity. Here, we aimed to determine the impact of prospectively implementing an IOL protocol on racially disparate outcomes.

Study Design: This was a prespecified secondary analysis of a type I hybrid effectiveness-implementation trial comparing 2 years before (PRE) and 2 years after (POST) implementation of a standardized IOL protocol at 2 sites (2018-2022). The protocol had 8 components and recommended active IOL management, frequent cervical exams, and amniotomy by first exam ≥4cm. All singletons ≥37 weeks with intact membranes requiring cervical ripening were eligible; prior CD was excluded. This analysis included only those with self-recorded race, divided into Black, Indigenous, People of Color (BIPOC) and non-BIPOC. Poisson regression with interaction terms evaluated the protocol's impact on disparities in CD and morbidity. Fidelity to the protocol was defined as adherence to ≥75% of the 8 protocol components.

Results: 8386 were included (PRE = 4167; POST = 4219); 59.3% identified as BIPOC. BIPOC patients differed in delivery site, insurance, BMI, parity, maternal age, diagnosis of diabetes and hypertension, gestational age, and IOL indication, included as confounders. BIPOC patients were more likely to undergo CD in both PRE (aRR 1.36[1.18-1.58]) and POST (aRR 1.55[1.33-1.70]) groups, even when controlling for these differences. Adjusted relative risk of maternal morbidity was greater among BIPOC patients both PRE (aRR 1.25[1.07-1.46]) and POST (aRR 1.34[1.14-1.58]). There was no difference by race in neonatal morbidity in either PRE or POST. There was no differential effect of the protocol by race on CD or morbidity (Table). Protocol fidelity increased PRE to POST for both BIPOC (58.4% to 64.3%, p< 0.001) and non-BIPOC patients (43.6% to 53.1%, p< 0.001; interaction p = 0.15).

Conclusion: Despite increased utilization of a standardized IOL protocol across races, this intervention did not mitigate observed racial disparities in CD or maternal morbidity.

Table: Outcomes compared by patient race among PRE and POST-standardization at 2 sites from 2018-2022.

	PRE-standardization n(%) N=4167				POST-standardization n(%) N=4219				Interaction p[a]
	BIPOC[b]	NON-BIPOC	p-value[c]	aRR[d]	BIPOC[b]	NON-BIPOC	p-value[c]	aRR[d]	
CD[e]	550(22.0)	350(21.0)	0.45	1.36[1.18-1.58]	575(23.3)	347(19.9)	0.009	1.55[1.33-1.70]	0.09
Maternal morbidity[f]	528(21.1)	355(21.3)	0.88	1.25[1.07-1.46]	446 (18.0)	316 (18.1)	0.97	1.34[1.14-1.58]	0.76
Neonatal morbidity[g]	62(2.5)	38(2.3)	0.68	1.14[0.76-1.72]	64(2.6)	63(3.6)	0.06	0.75[0.53-1.07]	0.16

[a]Evaluates the differential impact of the protocol on a given outcome by race; [b] Black, Indigenous, People of Color [c] p-value for unadjusted analyses [d]controlling for delivery site, insurance, BMI, parity, maternal age, diagnosis of diabetes and hypertension, gestational age, and IOL indication [e] cesarean delivery [f]≥1 of the following: estimated or quantitative blood loss ≥1000cc, endometritis, blood transfusion, wound infection or separation (requiring intervention), venous thromboembolism, hysterectomy, intensive care unit admission, readmission, and death within 30 days of delivery [g] ≥1 of the following: severe respiratory distress syndrome or neonatal sepsis

607 | Impact of Health Disparities in Patients with Twin-to-Twin Transfusion Syndrome

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4:00 PM - 6:00 PM

Objective: Social determinants of health impact access to care for patients with complex pregnancies. This study aimed to determine whether patients diagnosed with twin-to-twin transfusion syndrome presented with more progressive disease as measured by Quintero stage (I-IV) at presentation for evaluation for intervention based on their type of insurance coverage.

Study Design: This retrospective cohort study included monochorionic-diamniotic pregnant patients diagnosed with twin-to-twin transfusion syndrome who underwent laser photocoagulation at our fetal center between 11/2011-5/2024. Patients were categorized based on their type of insurance coverage, defined as commercial/private insurance (Private) or The Children's Health Insurance Program/Medicaid/No Insurance (Public). The primary outcome was the Quintero stage (I-IV) at the initial consultation for surgery. Secondary outcomes included gestational age at intervention, selective fetal growth restriction (sFGR), latency from referral to evaluation, location of evaluation, gestational age at delivery, and survival at 30 days. Patients without 30-day outcomes available were excluded.

Results: 484 patients underwent laser photocoagulation for TTTS at our center. Patients with public insurance were more likely to present with a higher Quintero stage than those with private insurance (3 [2,3], 3 [2,3], p = 0.046). The public insurance group was also more likely to be White/Hispanic (45.7% v 19.5%, p< 0.001) or Black/Non-Hispanic (15.7% v 6.6%, p< 0.001), be evaluated as an inpatient (69% v 55%, p = 0.002), have sFGR (47% v 36%, p = 0.014) and have a higher gestational age at intervention (20.7[18.6,22.4] v 19.9[17.9,22.0], p = 0.015). Latency from referral to evaluation and GA at delivery were similar, and we found no difference in survival at 30 days between groups.

Conclusion: Our study shows that social disparities exist in this population, and insurance status may be a surrogate of these inequities. However, long-term patient outcomes are equivalent with prompt, comprehensive care, aligning with the principle of distributive justice and the fair opportunity rule.

Table 1. Demographics and Outcomes by Insurance Type

Demographics and Outcomes	Private Insurance (n=287)	Public Insurance (n=197)	p-value
Race/Ethnicity			
White/Hispanic	56 (19.5)	90 (45.7)	**0.001**
White/Non-Hispanic	201 (70)	73 (37.1)	**0.001**
Black/Hispanic	1 (0.3)	1 (0.5)	1.0
Black/Non-Hispanic	19 (6.6)	31 (15.7)	**0.002**
Asian/Non-Hispanic	8 (2.8)	1 (0.5)	0.09
Unknown/Unknown	2 (0.7)	1 (0.5)	1.0
Inpatient Evaluation	157 (54.7)	135 (68.5)	**0.002**
Latency from referral to evaluation (days)	1 [1,2]	1 [1,2]	0.96
Quintero Stage TTTS	3 [2,3]	3 [2,3]	**0.046**
Gestational Age at Intervention	19.9 [17.9,22.0]	20.7 [18.6,22.4]	**0.015**
Selective Fetal Growth Restriction	104 (36.2)	94 (47.4)	**0.014**
Gestational Age at Delivery	31.2 [28.1,33.7]	30.1 [27.7,33.6]	0.18
Survival at 30 days			
2 Survivors	193 (67.2)	129 (65.5)	0.696
1 Survivor	61 (21.3)	46 (23.4)	0.656
0 Survivors	33 (11.5)	22 (11.2)	1.0

Data presented as n (%) or median [25P , 75P]
Bold = p<0.05

608 | Continuous Glucose Monitor Time in Range: Maternal Outcomes Amongst Pregnant Patients with T2Dm & Gdm

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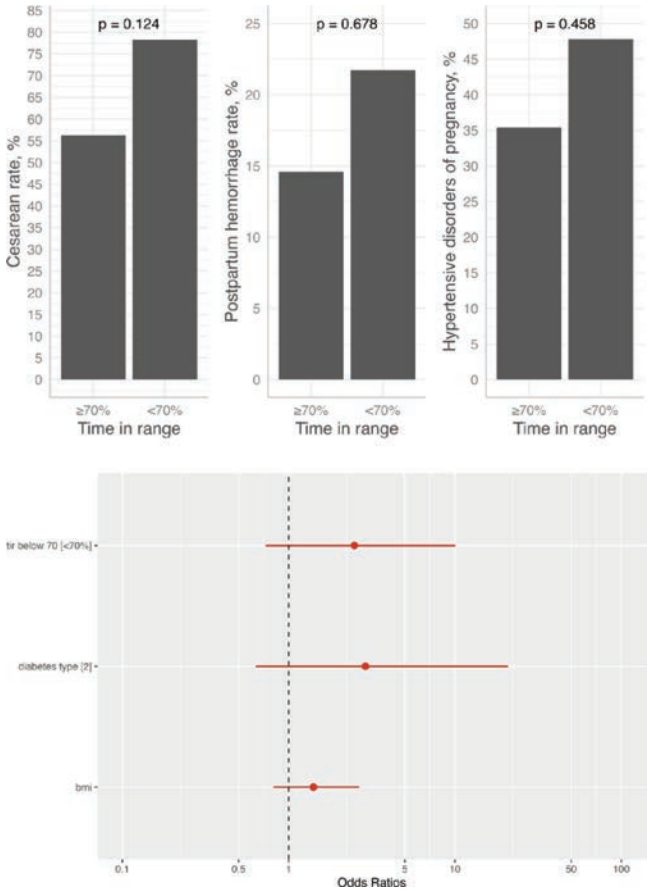
4:00 PM - 6:00 PM

Objective: The Advanced Technologies & Treatments for Diabetes consensus group recommends target time in range (TIR) with a continuous glucose monitor (CGM) of 70% for pregnant patients with type 1 diabetes but concluded that there is inadequate evidence to recommend target TIR for type 2 diabetes (T2DM) or gestational diabetes (GDM). Our objective was to determine the impact of TIR categories on maternal outcomes amongst pregnant patients with T2DM and GDM.
Study Design: This retrospective cohort study included pregnant patients with T2DM or GDM using CGM for at least 30 days at our tertiary center from January 2020 to December 2022. Exclusion criteria were type 1 diabetes, multiple gestation, and unavailable delivery records. Target range for glucose on CGM was 63-140 mg/dL. Mean TIR for duration of CGM use during pregnancy was recorded. Primary outcome was maternal adverse events defined as having a cesarean delivery, postpartum hemorrhage or developing a hypertensive disorder of pregnancy. Maternal outcome in TIR groups were compared with Fisher's Exact test and logistic regression.
Results: 71 patients were included, of whom 48 and 23 had a mean TIR ≥70% and < 70%, respectively. Patients with mean TIR ≥70% had lower rates of cesarean delivery (56.2% vs. 78.3%, P = 0.12), postpartum hemorrhage (14.6% vs. 21.7%, P = 0.68) and hypertensive disorders of pregnancy (35.4% vs. 47.8%, P = 0.46) but the differences did not reach statistical significance (Figure 1). Patients with mean TIR ≥70% had a reduced odds of composite maternal outcome after adjusting for maternal BMI and diabetes type (adjusted OR: 0.40, 95% CI: 0.10-1.37, P = 0.166), but again the difference did not reach statistical significance.
Conclusion: All indicators trend towards better outcomes in pregnant patients with T2DM or GDM with mean TIR ≥70% on CGM compared with those with mean TIR < 70%. However, a larger sample size may be needed to statistically confirm this difference.



609 | Cgm Initial Time in Range & Trajectory: Impact on Neonatal Outcomes in T2Dm and Gdm

Rebecca Horgan[1]; Yara Hage Diab[1]; Lauren A. Forbes[2]; Erkan Kalafat[3]; Theresa Corbine[1]; Margaret Mlynarczyk[1]; George R. Saade[1]; Marwan Ma'Ayeh[1]
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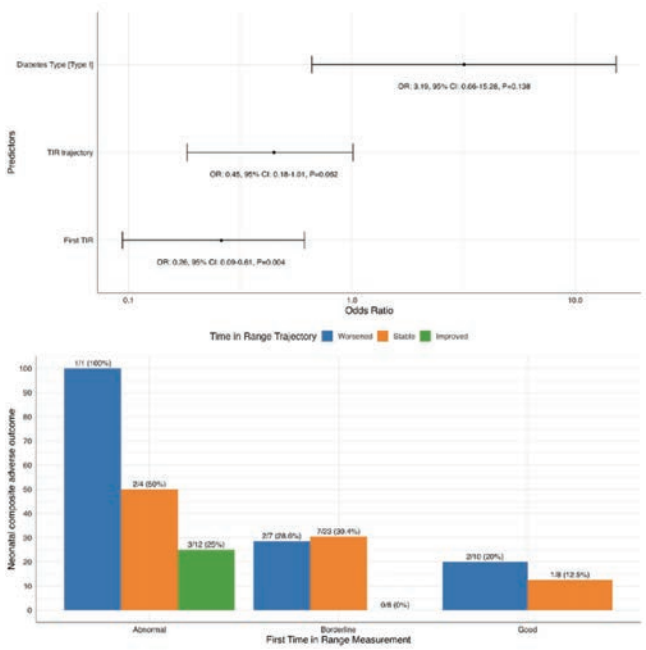
4:00 PM - 6:00 PM

Objective: Continuous glucose monitor (CGM) is increasingly utilized to manage pregnant patients with type 2 diabetes (T2DM) and gestational diabetes (GDM), with target time in range (TIR) the main measure of glucose control. We sought to evaluate the independent contributions of initial TIR versus TIR trajectory during pregnancy on neonatal outcomes.
Study Design: This retrospective cohort study included pregnant patients with T2DM or GDM using CGM for ⩾ 30 days from Jan 2020 to Dec 2022. Exclusion criteria were type 1 diabetes, multiple gestation, and unavailable delivery records. Target glucose values on CGM were defined as 63-140 mg/dL. Initial TIR was defined as mean TIR after 2 weeks of CGM use. The primary composite neonatal outcome was macrosomia, birth trauma, significant hyperbilirubinemia, stillbirth, or neonatal death. TIR values were modeled with mixed effect generalized additive models. TIR groups were formed using sample quartiles (Initial TIR: good, borderline, abnormal; TIR trajectory: worsened, stable and improved).

Results: 71 patients were included in the analysis. Initial TIR was abnormal in 17, borderline in 30, and good in 18, with the primary outcome occurring in 35%, 30%, and 17%, respectively. TIR trajectory worsened in 18, remained stable in 35, and improved in 12, with 28%, 29%, and 25%, respectively having the primary outcome. When initial TIR and trajectory were considered together, the primary outcome rates in patients with abnormal initial TIR were 25%, 50%, and 100% for improved, stable, and worsened TIR trajectory. For borderline initial TIR, rates were 0%, 30.4%, and 28.6%, respectively. For good initial TIR, rates were 12.5% and 20% for stable and worsened TIR. Initial TIR (aOR 0.26, 95% CI: 0.09-0.61) and TIR trajectories (aOR 0.45, 95% CI: 0.18-1.01) were independently associated with adverse outcomes after adjusting for diabetes type.

Conclusion: Pregnant patients with T2DM and GDM should be counseled that poor initial TIR values on CGM is associated with increased risk of adverse neonatal outcomes, and improvement in TIR during pregnancy reduces this risk significantly.



610 | Machine Learning Prediction of NICU Admission at the Point of Care

Reetam Ganguli[1]; Stephen Wagner[2]
[1]Elythea, San Jose, CA; [2]Beth Israel Deaconess Medical Center, Boston, MA

4:00 PM - 6:00 PM

Objective: NICU admissions significantly raise neonatal mortality risk and cost up to $168,000. No universal assessments predict NICU admission risk at the point of care. Literature shows early prenatal risk assessment and education/nutrition intervention reduced NICU admissions by 56% and NICU days by 59%. This study aims to develop an ML model predicting NICU admissions using early prenatal variables and demographic/clinical history.

Study Design: ML models were trained on sociodemographic, medical history, and obstetric variables obtainable at the point of care. Models were trained on years 2018-2020 of the CDC Vital Statistics System and were tested on year 2021. NICU patients from years 2014-2017 (with the exception of year 2015 due to an unavailable data file) were included in training to reduce class imbalance.

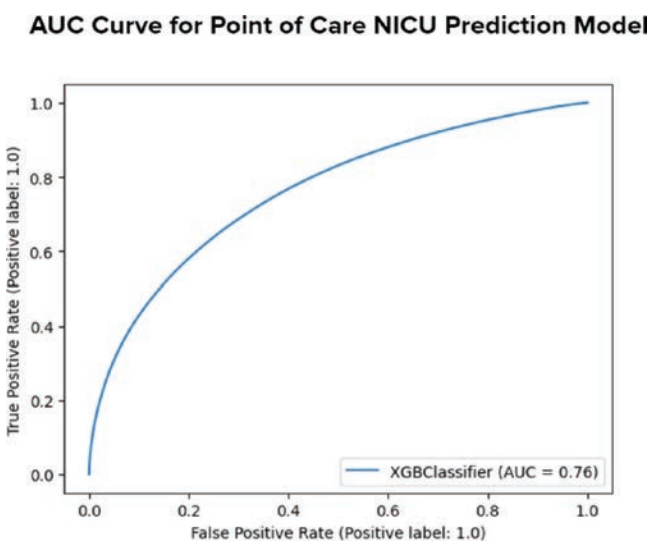
Exclusion criteria: missing NICU data and non-reporting hospitals. The primary outcome was immediate NICU admission post-delivery. Weight scaling algorithms enhanced training for preterm labor patients and NICU patients from prior years up to 2014 were used to improve class imbalance.

Results: 44 clinical variables obtainable in the 1st trimester across 12,127,124 patients were included in the training data. 2,041,555 (16.83%) experienced NICU admissions.

The model was tested on 3,219,217 patients, of which 351,787 (10.93%) had a NICU admission. The developed model had an area under the receiver operating characteristic curve of 0.76, 77% accuracy, sensitivity of 0.60, and F1 score of 0.77 at a standard 50% threshold.

When Youden's J statistic was calculated, the optimal threshold was 45.55%, which yielded 0.66 sensitivity.

Conclusion: Machine learning models can identify nearly 2/3rds of all NICU admissions at the point of care using routinely collected factors. This early identification can potentially allow for targeted interventions to prevent over half of all NICU admissions and lead to cost savings for health plans.



611 | Predicting Severe Hemorrhage in Operative Cesarean Deliveries Using Machine Learning

Reetam Ganguli[1]; Julia Sroda Agudogo[2]; Stephen Wagner[2]
[1]Elythea, San Jose, CA; [2]Beth Israel Deaconess Medical Center, Boston, MA

4:00 PM - 6:00 PM

Objective: Maternal hemorrhage necessitating transfusion is a significant complication in cesarean deliveries. This study aims to develop machine learning (ML) classifiers to predict hemorrhage necessitating transfusion in mothers undergoing cesarean delivery.

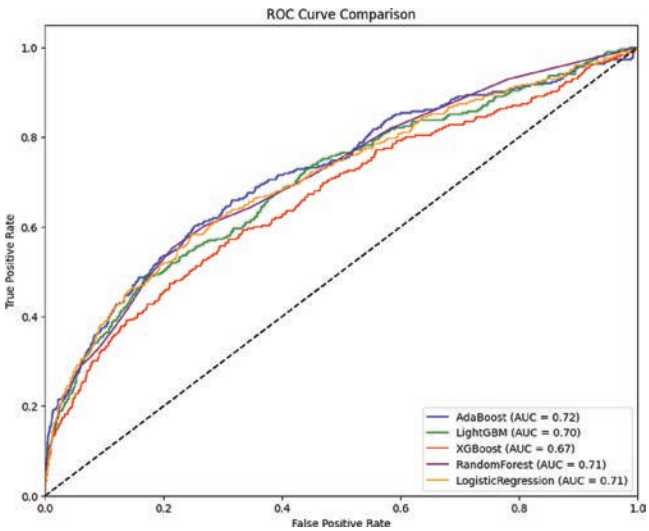
Study Design: AdaBoost, LightGBM, XGBoost, RandomForest, and Logistic Regression mdoels were developed. The models were trained and tested on data from the American College

of Surgeons National Surgical Quality Improvement Program database from years 2009 to 2021. Included patients underwent any cesarean delivery identified by specific Current Procedural Terminology (CPT) codes: 59510, 59514, 59515, 59618, 59620, and 59622 with complete data for the outcome. Cases with missing data on the primary outcome were excluded. Training data included preoperative blood biomarkers, clinical history, and sociodemographic information. All models were evaluated using 5-fold cross-validation to ensure robustness. The training data included preoperative clinical and sociodemographic variables for a large cohort of obstetric patients. The primary outcome was severe hemorrhage requiring transfusion.

Results: Of the total 43,713 patients, 1,425 (3.3%) experienced the outcome of maternal transfusion. AdaBoost and RandomForest models demonstrated the highest accuracy and AUC ROC scores among the evaluated models. Specifically, the AdaBoost model achieved an AUC ROC of 0.72 (95% CI: 0.72-0.72) and an accuracy of 96.52% (95% CI: 96.34%-96.71%). The RandomForest model showed similar performance with an AUC ROC of 0.71 (95% CI: 0.71-0.71) and an accuracy of 96.59% (95% CI: 96.45%-96.73%).

Conclusion: AdaBoost and RandomForest models show the highest potential for predicting severe hemorrhage requiring transfusion in operative cesarean deliveries. These models can assist in early identification and intervention, potentially improving patient outcomes.

Model	AUC ROC (95% CI)	Accuracy (95% CI)
AdaBoost	0.72 (0.72-0.72)	96.52% (96.34%-96.71%)
LightGBM	0.70 (0.70-0.70)	96.60% (96.46%-96.75%)
XGBoost	0.67 (0.67-0.67)	96.43% (96.27%-96.60%)
RandomForest	0.71 (0.71-0.71)	96.59% (96.45%-96.73%)
LogisticRegression	0.71 (0.71-0.71)	96.49% (96.33%-96.64%)



612 | Cost-Effectiveness of Manual Rotation in the Setting of Persistent Occiput Posterior Position

Riane Bradbury-Huang[1]; Aaron B. Caughey[2]
[1]Barnard College of Columbia University, Portland, OR; [2]Oregon Health & Science University, Portland, OR

4:00 PM - 6:00 PM

Objective: Persistent occiput posterior position during the second stage of labor occurs in approximately 5% of annual pregnancies. This fetal position is associated with longer labors, higher cesarean rates, and increased perinatal complications. Manual rotation of the fetal occiput can resolve the malposition in a subset of pregnancies. We examined the outcomes and costs of manual rotation versus expectant management in the setting of persistent occiput posterior position in the second stage of labor.

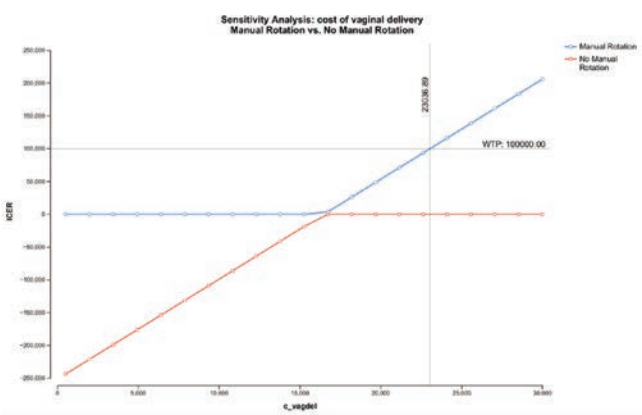
Study Design: We developed a decision-analytic model using TreeAge to compare outcomes between manual rotation versus expectant management for a theoretical cohort of 70,400 individuals, the annual number of nulliparous patients with persistent fetal OP position. Outcomes included cesarean delivery, post-op infection, instrumental delivery, severe perineal laceration, postpartum hemorrhage, and maternal death in addition to costs and quality-adjusted life years (QALYs). The willingness-to-pay (WTP) threshold was set at $100,000/QALY. We conducted literature searches to find inputs for the model, and conducted sensitivity analyses to discover and vary the drivers of the model in order to study its strengths.

Results: Within the theoretical cohort of 70,400 pregnancies, manual rotation prevented 24,119 cesarean sections, 1,206 post-op infections, 7,040 instances of postpartum hemorrhage, and 3 maternal deaths. However, it also resulted in an increased 10,353 instrumental deliveries and 4,796 severe perineal lacerations due to the reduction of cesareans. The manual rotation strategy was dominant to expectant management, resulting in more QALYs for lower costs. Sensitivity analyses demonstrated that manual rotation remained cost-effective until the cost of vaginal delivery was above $23,037.

Conclusion: We found manual rotation led to better outcomes and lower costs for nulliparous patients with persistent fetal OP position compared to expectant management. Further study of the impact of manual rotation and how it can be more widely trained and adopted is important for future research.

Table 1. Outcomes prevented in a theoretical cohort of 70,400 persistent OP nulliparous pregnancies assigned to either manual rotation or expectant management.

Outcome	Manual Rotation	Expectant Management	Difference
Cesarean Section	11,714	35,833	-24,119
Post-op Infection	586	1,792	-1,206
Maternal Death	3	6	-3
Instrumental Delivery	28,638	18,285	+10,353
Severe Tearing	21,853	17,057	+4,796
Postpartum Hemorrhage	16,262	23,302	-7,040
Cost (USD)	$1,500,809,728	$1,606,415,682	-$105,605,954
Effectiveness (QALYs)	1,852,514	1,850,932	+1,582



613 | Cerebrospinal Fluid Analysis in Fetuses with Myelomeningocele

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4:00 PM - 6:00 PM

Objective: Fetuses with myelomeningocele (MMC) often present with ventriculomegaly (VMG). If severe, the pressure exerted on the brain parenchyma may potentially cause axonal demyelination and lead to neurological deficits. Previously, using flow cytometry, we observed heterogeneity in cellular populations in fetal cerebrospinal fluid (CSF) obtained immediately prior to beginning fetal surgery. We hypothesized that differences in proportional microglia and neuronal progenitor cells in fetal CSF correlate with neurological deficits observed in children with MMC and may reflect the degree of brain tissue injury.

Study Design: Retrospective study of CSF from 9 fetuses who underwent a laparotomy-assisted fetoscopic MMC repair. Before surgery, fetal MRI and ultrasound scans were performed. Ventricular atrial width measurements, anatomical level of the lesion, and presence/absence of clubfeet were recorded. At birth, motor function was evaluated. Fetal CSF was collected from the MMC sac immediately prior to starting the fetoscopic MMC repair and subjected to single-cell RNA-sequencing (scRNA-seq; n = 9, 25.1[23.7-25.9] weeks gestation) to quantify proportional cell counts. Proportions of cellular populations were compared between cases with different neurological characteristics and outcomes.

Results: A total of 18 distinct CSF cellular subpopulations were identified (Figures 1A, 1B). Significantly fewer macrophages were found in the CSF from fetuses with VMG compared to those with no VMG (Figure 1, C). Cases with an anatomical lesion higher than L2 had fewer immature neurons as compared to those where the lesion was < L2 (Figure 1, D). When club foot was present at the time of the surgery there were more trophoblast-like cells than in those without club foot. Infants with impaired MF at birth, and those with club foot, showed significantly less proportional microglia cells than their counterparts (Figure 2).

Conclusion: In fetuses with MMC there are changes in the CSF cellular footprint that can be observed at midgestation and which may be associated with specific neurologic findings present at birth.

Figure 1. Comparison of the proportional fetal CSF cells and neurological characteristics

A-B, Fetal CSF from MMC repair cases were subject to scRNA-seq. A total of 20,228 cells were annotated based on marker gene expression (A) Proportional cell counts were analyzed in fetal CSF specimens, neuronal subtypes, and macrophage cells (B).

C, Ventriculomegaly (VMG) was defined as an atrial width >=10mm.

D, Anatomical level of the lesion was determined by ultrasound. High anatomical lesion level was defined as L2 or higher.

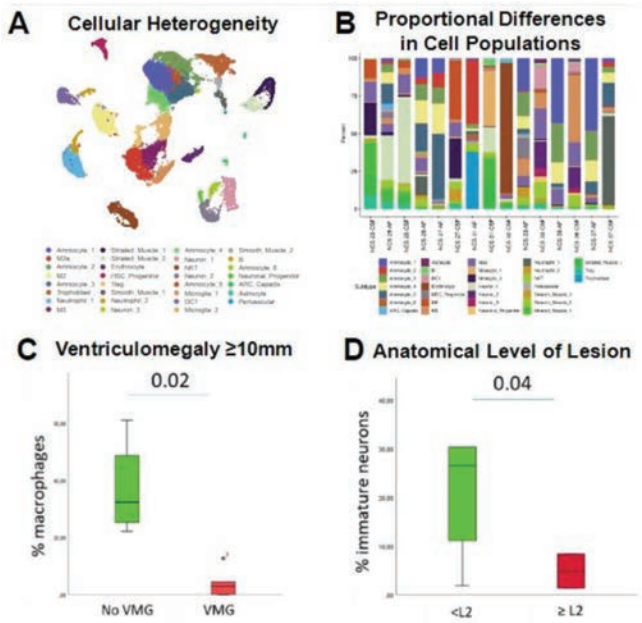
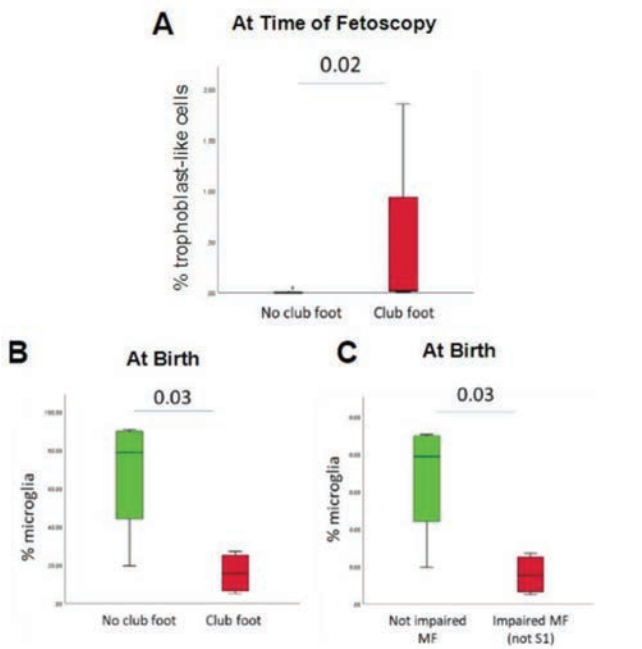


Figure 2. Comparison of the percentage of fetal CSF cell subtypes and neurological outcomes

A. Club foot versus no club foot at the time of the prenatal MMC repair
B. Club foot versus no club foot at birth
C. Children without motor function impairment (MF) at S1 versus those with impaired MF above S1 at birth



614 | Predicting Severe Blood Loss Before Cesarean Hysterectomy (CH): A Novel Method Focusing on Bladder Vascularity

Rosa Drummond; Mevlut Bucak; MaryEllen Mangione; Ozhan M. Turan
University of Maryland Medical Center, Baltimore, MD

4:00 PM - 6:00 PM

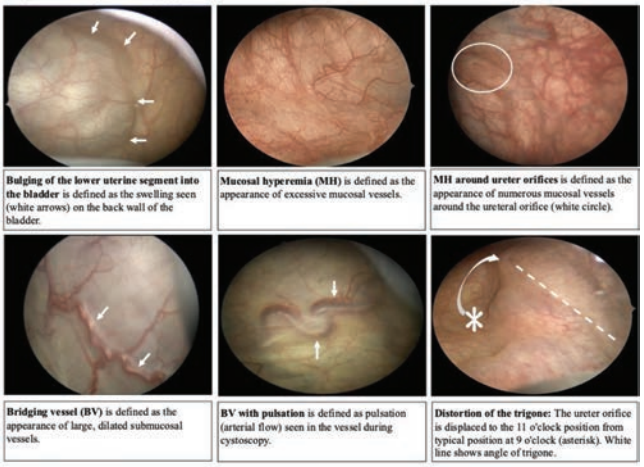
Objective: Placenta accreta spectrum (PAS) grade 3b&c pose the highest risk for severe blood loss (SBL) during CH, primarily due to bladder dissection. Interventions like interval hysterectomy, conservative management and aortic occlusion (REBOA) are proposed to reduce SBL but come with complications. Current preoperative assessments are unreliable in identifying SBL cases. We hypothesize that cystoscopic (C) evaluation can accurately predict SBL.

Study Design: PAS cases had preoperative ultrasound, MRI, and postoperative pathological grading. Standardized cystoscopy and bilateral stents were used in non-urgent cases. Quantitative blood loss (QBL), surgical complications, and transfusions were recorded. Same surgeon, standardized techniques, and blinded evaluation of C recordings were inclusion criteria (Figure 1). Odds ratio (OR) for cystoscopy variables were calculated using postoperative grading. The Cystoscopy Index (CI) was calculated from OR sums. Postoperative grades 3b&c were high grade (HG); 1, 2, and 3a were low grade (LG). Primary outcome was CI prediction of SBL > 2000ml. Secondary outcomes included surgical complications and REBOA placement. C results were analyzed using descriptive statistics, correlation, and ROC curve.

Results: Of 66 cases, 31 were HG and 35 LG. Postoperative grading identified more HG cases than preoperative ($p = 0.002$), with grade 3b being the most common (38%). Bridging vessels (BV) and distortion of the trigone (DT) were the strongest predictors of HG (odds ratios 3.5 and 5.1, $p = 0.01$). CI correlated with QBL ($p = 0.036$). ROC analysis calculated CI ≥ 2.8 is the predictor for HG cases (AUC:0.68, $p = 0.009$). CI ≥ 2.8 was identified in 82% (14/17) of cases with SBL and required >4U RBC transfusion ($p = 0.01$ and 0.03) (Table 1). DT was significantly related to cystotomy ($p = 0.007$). Two HG cases required REBOA and had CI ≥ 2.8.

Conclusion: Preoperative cystoscopy and CI can identify cases resulting in SBL, unavoidable cystotomy, and REBOA. High CI can guide discussions about alternatives like interval hysterectomy or REBOA. This tool aids in randomizing patients for conservative management.

Figure 1. Cystoscopy variables



	CI <2.8 (n=35)	CI ≥ 2.8 (n=31)	p value
Maternal age (median, IQR)	34.5 (4)	35 (7)	NS
BMI (median, IQR)	35 (9)	35 (9)	NS
GA at delivery (median, IQR)	35 (1)	35 (2)	NS
>3 c-sections (n, %)	10 (29%)	9 (29%)	NS
Placenta previa (n, %)	21 (92%)	30 (97%)	NS
Postoperative grading (n, %) Low grade High grade	 21 (60%) 9 (26%)	 22 (71%) 14 (45%)	0.015
SBL (n, %)	3 (9%)	14 (45%)	0.01
Transfusion of ≥ 4 units RBC (n, %)	0 (0%)	6 (19%)	0.028
Cystotomy (n, %)	8 (23%)	11 (35%)	NS
REBOA (n, %)	0 (0%)	2 (6%)	

Table 1. Distribution of maternal demographics and surgical outcomes based on cystoscopy index (CI.)
BMI = body mass index, GA = gestational age, IQR = interquartile range, NS = not significant, RBC = red blood cells, REBOA = resuscitative endovascular balloon occlusion of the aorta, SBL = severe blood loss.

615 | Association Between Nt-Probnp and Persistent Postpartum Hypertension Among Individuals with Hypertensive Disorders of Pregnancy

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4:00 PM - 6:00 PM

Objective: Natriuretic peptide (NP) concentrations are increased in hypertensive disorders of pregnancy (HDP), but the association of NP levels with postpartum outcomes among hypertensive individuals has not been well explored. Our objective was to evaluate the association of N-terminal pro B-type natriuretic peptide (NT-proBNP) concentration at delivery with persistent postpartum hypertension (HTN) and blood pressure (BP) trajectory in the first two weeks postpartum among individuals with HDP.

Study Design: This cohort study included individuals with new-onset HDP (gestational hypertension, preeclampsia) who participated in a remote BP monitoring program and an obstetric biobank. NT-proBNP was measured from maternal plasma at delivery. Postpartum BP data were collected from delivery hospitalization, six-week remote BP program, and outpatient visits. Outcomes were compared between low-NT-proBNP (< 150 pg/mL) and high-NT-proBNP (≥150 pg/mL) groups, with cut-off of 150 pg/mL based on previously published reference intervals

in pregnancy. We used repeated BP measures to fit mixed-effects linear regression models using restricted cubic splines. Persistent HTN was defined as BP ≥140/90 mmHg or antihypertensive medication.

Results: Of 111 individuals with HDP, 31 (28%) had low NT-proBNP, and 80 (72%) had high NT-proBNP. Those with high NT-proBNP had higher maximum DBP during the delivery hospitalization (101 vs. 94 mmHg, p = 0.01), higher maximum SBP during remote monitoring (145 vs. 139 mmHg, p = 0.049), and higher likelihood of being on antihypertensives at any time postpartum (49% vs. 23%, p = 0.01) compared with those with low NT-proBNP. High NT-proBNP was associated with persistent HTN at six weeks postpartum (40% vs. 19%, p = 0.04) compared with low NT-proBNP. The high-NT-proBNP group had a significantly different SBP trajectory from the low-NT-proBNP group over the first two weeks postpartum (p = 0.04 for SBP, p = 0.13 for DBP).

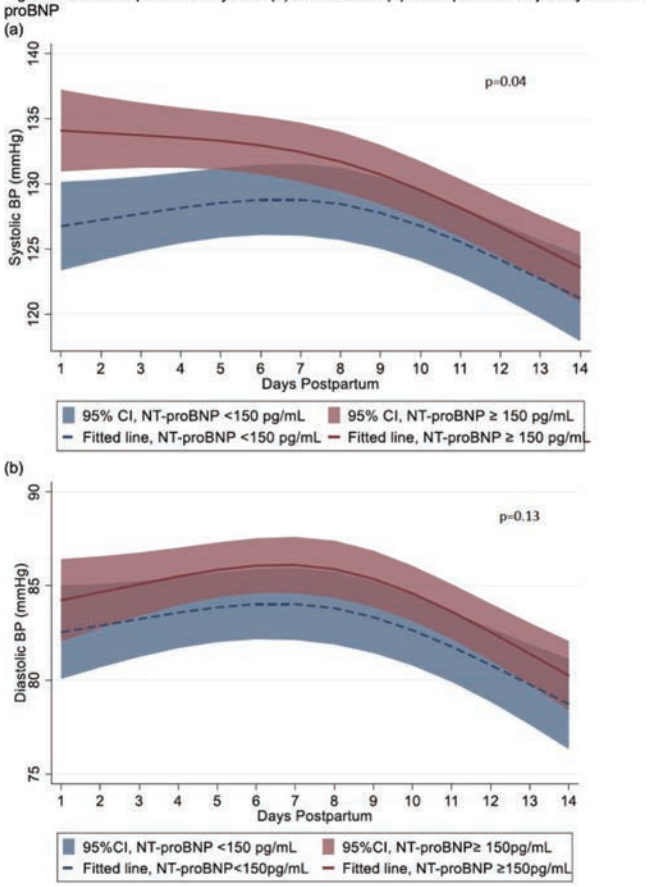
Conclusion: Individuals with elevated NT-proBNP may be at increased risk for ongoing HTN in the postpartum period and could warrant closer monitoring after delivery.

Table. Clinical outcomes by NT-proBNP level

	Low NT-proBNP (n=31)	High NT-proBNP (n=80)	p value
Stage 2 HTN or antihypertensive medication at 6 weeks postpartum	6 (19%)	32 (40%)	0.04
Maximum postpartum SBP from delivery hospitalization	147±11	153±19	0.10
Maximum postpartum DBP from delivery hospitalization	94±11	101±13	0.01
Median number of home BP values	23[19,27]	20[13,27]	0.26
Maximum SBP from home BP monitoring	139±11	145±14	0.049
Maximum DBP from home BP monitoring	92±8	96±10	0.10
Any severe-range BP	10 (32%)	38 (48%)	0.15
SBP at 6 weeks postpartum	119±10	122±12	0.14
DBP at 6 weeks postpartum	78±8	78±8	0.97
Antihypertensive medication at any point between delivery and 6 weeks postpartum	7 (23%)	39 (49%)	0.01
Antihypertensive medication at 6 weeks postpartum	4 (13%)	25 (31%)	0.048
Stage 1 or greater HTN or antihypertensive medication at 6 weeks postpartum	18 (58%)	53 (66%)	0.42
Weight change from admission to postpartum visit (kg)	-10±3	-10±12	0.74

Low NT-proBNP defined as less than 150 pg/mL, high NT-proBNP greater than or equal to 150 pg/mL
Data are mean±SD, median[IQR], or n(%)
BNP, B-type natriuretic peptide; SBP, systolic blood pressure; DBP, diastolic blood pressure; BP, blood pressure; HTN, hypertension
Stage 1 or greater HTN defined as SBP≥130 mmHg or DBP≥80 mmHg, stage 2 HTN defined as SBP≥140 mmHg or DBP≥90 mmHg

Figure. Relationship between systolic (a) and diastolic (b) blood pressure trajectory and NT-proBNP



616 | Preeclampsia Compared to Gestational Hypertension Increases Short-Term Renal Disease Morbidity

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4:00 PM - 6:00 PM

Objective: Despite the physiologic differences, gestational hypertension and preeclampsia without severe features are managed similarly. We hypothesize that the presence of proteinuria in preeclampsia increases the risk of short-term renal disease morbidity.

Study Design: Using the Healthcare Cost and Utilization Project Nationwide Readmissions Database, we performed a retrospective cohort study of hospital delivery discharges in the United States from 2010 to 2020. We used ICD 9 and 10 codes to identify deliveries complicated by hypertensive disease in pregnancy, as well as hospital readmissions within the calendar year of delivery for renal disease, including acute and chronic kidney disease. Chronic hypertension and superimposed preeclampsia were excluded to avoid the possibility of baseline renal disease due to preexisting hypertension. Associations were derived from Cox proportional hazard models expressed in the confounder-adjusted hazard ratio (HR) with a 95% confidence interval (CI).

Results: There were 3,425,221 deliveries complicated by gestational hypertension, preeclampsia without severe features, or severe preeclampsia. Renal disease hospitalization rates for gestational hypertension, preeclampsia without severe features, and severe preeclampsia were 247, 408, and 648 per 100,000 delivery hospitalizations, respectively. Compared to those with gestational hypertension, preeclampsia without severe features was associated with increased risks of acute renal disease (HR 1.49, 95% CI 1.31-1.68); risks for chronic renal disease were even higher (HR 2.31, 95% CI 1.70-3.13). Patients with severe preeclampsia were at substantially increased risk of renal disease hospitalizations.

Conclusion: Preeclampsia has a 1.5- fold and severe preeclampsia a 2.4-fold increase in renal disease morbidity compared to gestational hypertension. These findings highlight the different prognoses between gestational hypertension, non-severe preeclampsia, and severe preeclampsia. Patients who have preeclampsia may warrant closer surveillance for long-term kidney disease.

Table
Hazard ratios for renal disease readmission based on type of preeclampsia compared to gestational hypertension (reference) within one calendar year in the United States, 2010-2020

Renal disease hospitalizations	Adjusted hazard ratio (95%CI)	
	Preeclampsia without severe features	Severe Preeclampsia
Any renal disease	1.55 (1.41-1.71)	2.44 (2.23-2.68)
Any acute renal disorder	1.49 (1.31-1.68)	2.57 (2.30-2.87)
Acute kidney failure	1.66 (1.43-1.94)	3.28 (2.87-3.75)
Acute tubulointerstitial nephritis	1.29 (1.05-1.57)	1.45 (1.19-1.78)
Any chronic renal disorder	2.31 (1.70-3.13)	6.03 (4.54-8.01)
Chronic kidney disease	2.54 (1.80-3.59)	8.03 (5.94-10.86)
Hypertensive kidney disease	3.07 (2.07-4.57)	8.55 (6.05-12.07)
Chronic tubulointerstitial nephritis	0.47 (0.09-2.44)	0.34 (0.06-2.06)
Glomerular and proteinuria disease	2.63 (1.75-3.97)	5.03 (3.37-7.50)

Hazard ratios were adjusted for year of delivery, maternal age, insurance status, income quartile, hospital bed size, hospital type, and hospital teaching status in a weighted Cox-proportional regression model

617 | Disparities in Fetal Autopsy and Placental Histopathology following Stillbirth in the United States

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[1]Charles R. Drew University of Medicine and Science, College of Medicine, Inglewood, CA; [2]Stanford University, Palo Alto, CA

4:00 PM - 6:00 PM

Objective: Efforts to eliminate well-known disparities in stillbirth require an improved understanding of the causes of death. Clinical guidelines recommend fetal autopsy and placental histopathology following a stillbirth, but many stillbirths do not receive these evaluations and remain unexplained. We sought to examine whether rates of fetal autopsy and placental histopathology following a stillbirth differ among racial/ethnic and education groups.

Study Design: We conducted a population-based study using the U.S. CDC national fetal death files between 2020-2022. We included singleton births ≥20 weeks' gestation with complete information on study variables. The study outcomes were fetal autopsy and placental histopathology, categorized as none or yes: completed or planned. Birth parent race, ethnicity, and education were self-reported and categorized by the CDC. We performed multivariable logistic regression models to evaluate differences in the outcomes among racial/ethnic and education groups. Covariates included age, late or no prenatal care, prior live birth, and gestational age.

Results: In this study of 43,954 stillbirths, 18% received a fetal autopsy and 67% had placental histopathology performed (Table 1). Among racial/ethnic groups, Non-Hispanic (NH) Black people had higher rates of fetal autopsy (aOR 1.34, 95% CI: 1.26-1.42) but lower rates of placental histopathology (aOR 0.87, 95% CI: 0.82-0.92) than NH White people (Table 2). NH American Indian or Alaska Native and NH Asian people also had significantly lower rates of placental histopathology. Among education groups, increasing level of education was associated with increasing rate of both fetal autopsy and placental histopathology.

Conclusion: Utilization of fetal autopsy and placental histopathology was lower than expected across all groups, with differences among racial/ethnic and education groups. Further research is needed to understand structural barriers, patient preferences, and causes of disparities in clinical evaluation following stillbirth.

Table 1: Characteristics of the Study Population, Stillbirths in the U.S., 2020-2022 (N = 43,954)

Characteristics	Fetal Autopsy		Placental Histopathology	
	Yes N=8,029 (18.3)	No N=35,925 (81.7)	Yes N=29,698 (67.6)	No N=14,256 (32.4)
Race/Ethnicity				
NH AA/Black	2,320 (20.5)	9,011(79.5)	7,384 (65.2)	3,947 (34.8)
NH AI/AN	67 (14.7)	388 (85.3)	281 (61.8)	174 (38.2)
NH Asian	370 (20.0)	1,482 (80.0)	1,265 (68.3)	587 (31.7)
Hispanic	1,625 (16.8)	8,022 (83.2)	6,371 (66.0)	3,276 (34.0)
NH NHOPI	29 (12.9)	195 (87.1)	157 (70.1)	67 (29.9)
NH Multiracial	148 (17.8)	684 (82.2)	572 (68.8)	260 (31.3)
NH White	3,470 (17.7)	16,143 (82.3)	13,668 (69.7)	5,945 (30.3)
Education Level				
<High school degree	996 (15.9)	5,285 (84.1)	4,002 (63.7)	2,279 (36.3)
High school degree	2,652 (17.2)	12,810 (82.8)	10,195 (65.9)	5,267 (34.1)
Some college	2,115 (18.2)	9,519 (81.8)	8,004 (68.8)	3,630 (31.2)
Bachelors degree	1,397 (20.1)	5,544 (79.9)	4,877 (70.3)	2,064 (29.7)
Graduate degree	869 (23.9)	2,767 (76.1)	2,620 (72.1)	1,016 (27.9)
Age				
<20 y	452 (18.5)	1,986 (81.5)	1,632 (66.9)	806 (33.1)
20-34 y	5,937 (18.9)	25,555 (81.1)	21,450 (68.1)	10,042 (31.9)
35-54 y	1,640 (16.4)	8,384 (83.6)	6,616 (66.0)	3,408 (34.0)
Prenatal Care Initiation				
Not late prenatal care	6,079 (18.9)	26,019 (81.1)	22,140 (69.0)	9,958 (31.0)
Late or no prenatal	1,950 (16.4)	9,906 (83.6)	7,558 (63.7)	4,298 (36.3)
Parity				
No prior livebirth	3,695 (21.0)	13,863 (79.0)	11,968 (68.2)	5,590 (31.8)
Prior livebirth	4,334 (16.4)	22,062 (83.6)	17,730 (67.2)	8,666 (32.8)
Gestational Age				
20-27 wk	3,274 (15.3)	18,151 (84.7)	13,891 (64.8)	7,534 (35.2)
28-36 wk	2,947 (20.0)	11,784 (80.0)	10,255 (69.6)	4,476 (30.4)
≥37 wk	1,808 (23.2)	5,990 (76.8)	5,552 (71.2)	2,246 (28.8)

Cells display: n (row % for outcomes)
AA, African American; AI/AN, American Indian or Alaska Native; NHOPI: Native Hawaiian or Other Pacific Islander; NH, non-Hispanic

Table 2: Differences in Fetal Autopsy and Placental Histopathology by Race/Ethnicity and Education Level, U.S., 2020-2022 (N = 43,954)

	Fetal Autopsy		Placental Histopathology	
	Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)	Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
Race/Ethnicity				
NH AA/Black	1.20 (1.13-1.27)	1.34 (1.26-1.42)	0.81 (0.77-0.85)	0.87 (0.82-0.92)
NH AI/AN	0.80 (0.62-1.04)	0.90 (0.69- 1.18)	0.70 (0.58-0.85)	0.76 (0.62-0.92)
NH Asian	1.16 (1.03-1.31)	1.09 (0.96- 1.23)	0.94 (0.85-1.04)	0.92 (0.83-1.03)
Hispanic	0.94 (0.88-1.00)	1.04 (0.97-1.11)	0.85 (0.80-0.89)	0.92 (0.87-0.97)
NH NHOPI	0.69 (0.47-1.02)	0.79 (0.53-1.17)	1.02 (0.76-1.36)	1.13 (0.85-1.51)
NH Multiracial	1.01 (0.84-1.21)	1.05 (0.87-1.26)	0.96 (0.82-1.11)	0.98 (0.84-1.14)
NH White	Reference	Reference	Reference	Reference
Education Level				
<High school degree	Reference	Reference	Reference	Reference
High school degree	1.10 (1.01-1.19)	1.04 (0.96-1.13)	1.10 (1.04-1.17)	1.09 (1.02-1.16)
Some college	1.18 (1.09-1.28)	1.13 (1.03-1.23)	1.26 (1.18-1.34)	1.23 (1.15-1.31)
Bachelors degree	1.34 (1.22-1.46)	1.29 (1.17-1.43)	1.35 (1.25-1.45)	1.28 (1.19-1.39)
Graduate degree	1.67 (1.50-1.85)	1.62 (1.45-1.81)	1.47 (1.34-1.60)	1.40 (1.27-1.54)

AA, African American; AI/AN, American Indian or Alaska Native; NHOPI: Native Hawaiian or Other Pacific Islander; NH, non-Hispanic

618 | Gender Representation in Mfm Fellowship Leadership: a Cross-Sectional Analysis

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4:00 PM - 6:00 PM

Objective: Women hold far fewer leadership positions in academic medicine than men. The purpose of this study was to describe the gender breakdown of maternal fetal medicine(MFM) fellowship program directors(PD) and to evaluate the association between gender and academic rank in this cohort.

Study Design: After IRB exemption, an inclusive list of active MFM fellowship programs was collected. Using online search tools, PD gender identity (extrapolated from written pronouns in online profiles), PD academic rank, number of years since PD fellowship graduation, and number and gender identity of current fellows were collected for each program. Data were analyzed using descriptive statistics and bivariate analyses.

Results: Biographical information was available for 104 of 106(98.1%) MFM fellowship PDs and 387 fellows representing 88 programs. Of the fellowship PDs, 63(61%) were women. On average, male directors had spent significantly more years out of fellowship than their female counterparts (21.0 yrs vs 15.1 yrs, p = 0.004) and were more likely to be full professors (54% vs. 30%, p = 0.03). However, when stratifying by number of years in practice (< 10 years, 10-19 years, 20+ years), no difference in academic rank was seen between men and women within groups (Figure). Of fellows, 87(22.5%) were men. The proportion of male PDs was significantly higher than the proportion of male fellows (39% vs. 23%, p = 0.0008). There was no association between fellow gender identity and the gender identity of their respective PDs (Table).

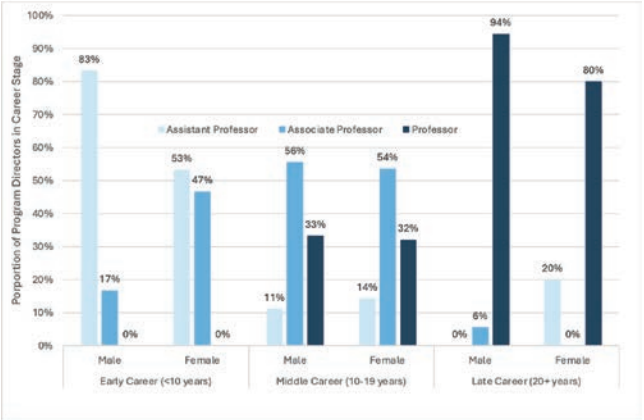
Conclusion: Even in OBGYN—one of the few predominantly female specialties—gender disparities still exist in medical education leadership. In MFM, males are overrepresented in fellowship leadership compared to the gender distribution of current fellows. Our data suggest that this finding, and the difference in academic rank between male and female PDs, is related to males having been in practice for longer. As the specialty continues to evolve, attention must be paid to ensure that medical education leadership is reflective of the trainees it serves.

Table. Sample Characteristics.

PD Demographics*			
	Male n(%)	**Female n(%)**	**P-value**
PD rank			
Assistant	6(14.6%)	15(23.8%)	0.374
Associate	8(19.5%)	25(39.7%)	0.603
Professor	22 (53.7%)	19(30.2%)	**0.028**
Unknown	5(12.2%)	4(6.3%)	
Fellow Demographics**			
	Male fellow n(%)	**Female fellow n(%)**	
PD gender identity			
Male PD	32(36.8%)	118(39.3%)	0.760
Female PD	54(62.1%)	180(60.0%)	0.824
Unknown	1(1.2%)	2(0.7%)	

*PD biographical information available for 104 of 106 programs.
** Fellow biographical information available for fellows in 88 of 106 programs.

Figure. Academic Rank vs. Gender Identity: Stratification by Years in Practice



619 | Postpartum Mental Health Following Unplanned Modes of Delivery: Understanding Birth Trauma

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4:00 PM - 6:00 PM

Objective: Birth trauma is an increasingly recognized and prevalent problem, yet the relationship between potentially traumatic birth events (such as unplanned mode of delivery) and postpartum mental health conditions is understudied. We evaluated associations between unplanned delivery modes and new onset postpartum mental health conditions.

Study Design: This was a retrospective cohort study of singleton live births between 2008-2022 from the MarketScan Commercial Database. We excluded births with mental health conditions diagnosed during pregnancy, discontinuous insurance enrollment, preterm birth (< 37 weeks), contraindications to labor, and planned cesareans. The exposure was spontaneous vaginal delivery (SVD), successful operative vaginal delivery (OVD) with vacuum or forceps, unplanned cesarean without OVD attempt, or cesarean after failed OVD. The outcome was a mental health condition (depression, anxiety, post-traumatic stress disorder (PTSD), or other serious psychiatric conditions) diagnosed between delivery and 6 months postpartum. Multivariable logistic regression models were conducted to assess associations between mode of delivery and any postpartum mental health condition, adjusting for confounders. Secondarily, models were replicated to evaluate each individual mental health condition as an outcome.

Results: A total of 829,917 births were included. Compared with SVD, postpartum mental health conditions were increased after unplanned cesarean without OVD [adjusted odds ratio (aOR) 1.15, 95% confidence interval (CI) 1.13-1.18] and after unplanned cesarean with failed OVD (aOR 1.20, 95% CI 1.03-1.38, Table 1). Prevalence of PTSD was significantly increased in all modes of delivery compared to SVD, most notably for failed OVD (aOR 1.60 95% CI 1.09-2.26, Figure 1).

Conclusion: Postpartum mental health conditions were increased among people with unplanned cesarean births, most notably PTSD in those with failed OVD. Screening for PTSD

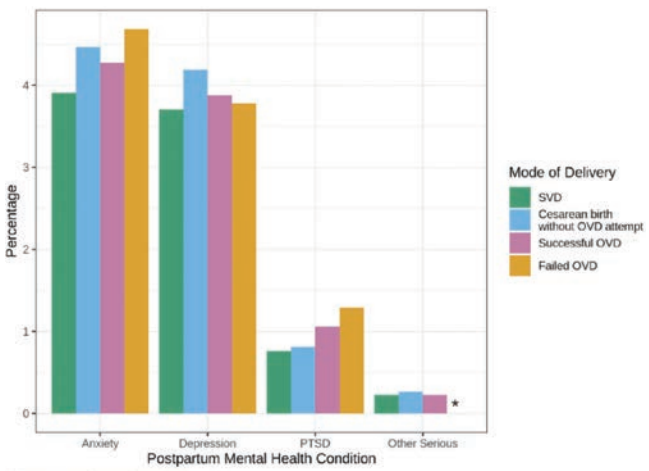
should be considered, especially for people who have failed OVD attempts that result in cesarean birth.

Table 1. Postpartum mental health conditions by mode of delivery among term, singleton, livebirths in a commercial claims database who were eligible for labor in the United States between 2008 and 2022, N=829,917)

	Spontaneous vaginal birth (Reference)	Unplanned cesarean with no OVD[a] attempt		Successful OVD		Cesarean after failed OVD	
	N = 661,655 N (%)	N = 138,203 N (%)	aOR[a] (95% CI)[c]	N = 27,732 N (%)	aOR (95% CI)[c]	N = 2,327 N (%)	aOR (95% CI)[c]
Any Mental Health Condition	46,724 (7.1%)	11,053 (8.0%)	1.15* (1.13, 1.18)	2,126 (7.7%)	1.02 (0.97, 1.07)	198 (8.5%)	1.20* (1.03, 1.38)
Depression	24,504 (3.7%)	5,790 (4.2%)	1.14* (1.11, 1.17)	1,075 (3.9%)	1.00 (0.94, 1.07)	88 (3.8%)	1.00 (0.80, 1.23)
Anxiety	25,855 (3.9%)	6,170 (4.5%)	1.16* (1.13, 1.20)	1,186 (4.3%)	1.01 (0.95, 1.07)	109 (4.7%)	1.19 (0.97, 1.43)
PTSD[a]	5,035 (0.8%)	1,122 (0.8%)	1.11* (1.04, 1.18)	294 (1.1%)	1.14* (1.01, 1.29)	30 (1.3%)	1.60* (1.09, 2.26)
Other Serious Mental Health Condition	1,493 (0.2%)	367 (0.3%)	1.15* (1.02, 1.28)	63 (0.2%)	1.02 (0.78, 1.30)	<12	-

[a] Abbreviations: OVD = Operative Vaginal Delivery, aOR = Adjusted Odds ratio. PTSD = Post-Traumatic Stress Disorder.
[b] Models adjusted for maternal age, region, delivery year, BMI ≥ 40, substance use, gestational age at delivery, chronic hypertension, pre-pregnancy or gestational diabetes, and severe unexpected newborn complication
[c] p value < 0.05 = *

Figure 1. Among term, singleton, livebirths in a commercial claims database who were eligible for labor in the United States between 2008 and 2022, N=829,917)



* Percentage not shown due to cell sizes <12

620 | Expectant Management versus. Prompt Laser Therapy for Stage II Twin-Twin-Transfusion-Syndrome before 18 weeks

Sami Backley[1]; Eric P. Bergh[2]; Saul Snowise[3]; Anthony Johnson[4]; Jimmy Espinoza[1]; Nick Juckel[3]; Ashley Salazar[5]; Ramesha Papanna[6]; Clifton O. Brock[3]

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4:00 PM - 6:00 PM

Objective: In some reports, fetoscopy before 18 weeks (wks) gestational age (GA) is associated with a greater risk of poor perinatal outcomes. We assessed efficacy of expectant management (EM) followed by fetoscopic placental laser ablation (FLA) at 18 wks versus prompt intervention (PI) in patients with early-Stage II twin-to-twin transfusion syndrome (TTTS).

Study Design: This is a secondary analysis of prospectively collected data from monochorionic diamniotic (MCDA) pregnancies with Stage 2 TTTS prior to 18 wks GA at two fetal centers. We compared outcomes between patients that had FLA promptly after evaluation (PI) to those where expectant management (EM), with twice-weekly surveillance and intent to perform FLA at 18 wks GA, was undertaken. For the EM group, we assessed incidence of early FLA (i.e., < 18 wks) for progressive polyhydramnios or worsening severity of disease (i.e., upstaging). Ultrasound characteristics, GA of delivery, incidence and timing of preterm prelabor rupture of membranes (PPROM) and survival were compared between groups.

Results: Stage 2 TTTS prior to 18 wks was confirmed in 54 MCDA pregnancies with 18 (33.3%) in the EM group and 36 (66.7%) in the PI group. In the EM group, 12 patients had FLA at 18 weeks, while 6 had early FLA (Figure). The PI group presented 3.5 days later than the EM group ($p = 0.02$), while time between evaluation and PLA was greater in the EM group (6 vs. 1 days, $p < 0.01$). Ultrasound characteristics between the groups were similar (Table). Rates of PPROM were similar between groups. However, the GA of PPROM trended later in the EM group (24.8 vs. 19.6 wks, $p = 0.08$) while the FLA to PPROM interval trended longer (6.7 v. 3.3 days, $p = 0.31$). GA at delivery was similar between groups. Dual survival rates were 88.9% and 75.0% ($p = 0.30$) in the EM and PI groups respectively. In the EM group, dual survival occurred in all upstaged cases.

Conclusion: Expectant management for early Stage II TTTS was noninferior to prompt intervention. The timing of PPROM, when it occurs, may be more favorable with EM, however further study is required to assess this possibility.

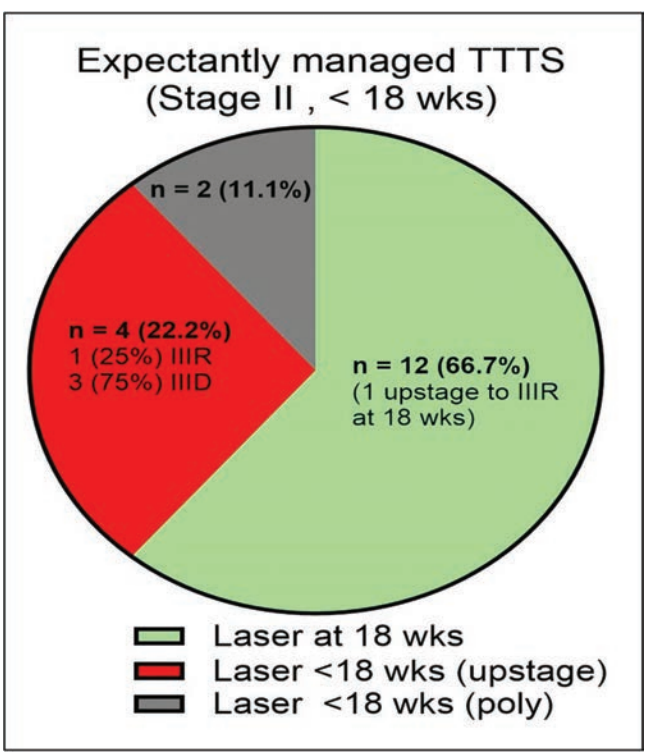

Table: Characteristics of patients that had fetoscopic laser surgery for Stage II TTTS (< 18 wks)

Characteristic	Expectant Management (n = 18)	Prompt Intervention (n = 36)	p-value
Maternal Age	30.1 ± 4.3	29.1 ± 6.2	0.52
BMI	28.6 ± 6.2	27.2 ± 7.8	0.51
GA at presentation (wks)	16.7 ± 0.7	17.2 ± 0.5	0.02
GA of surgery (wks)	17.8 ± 0.4	17.2 ± 0.5	<.0001
Interval: presentation to surgery (days)	6.0 (4.0 - 10.0)	1.0 (0.0 - 1.0)	<0.01
Placentation			
Anterior	11 (61.1%)	18 (50.0%)	0.44
Posterior	7 (38.9%)	18 (50.0%)	
Donor MVP	1.3 (0.8 - 1.9)	0.7 (0.2 - 1.1)	<0.01
Recipient MVP	8.1 (7.1 - 8.7)	8.9 (8.4 - 10.1)	<0.01
sFGR	3 (16.7%)	6 (16.7%)	1.00
TAPS	0 (0%)	0 (0%)	1.00
PPROM	8 (44.4%)	14 (38.9%)	0.69*
Gestational age of PPROM (wks)	24.8 (21.5 - 31.2)	19.6 (18.1 - 29.1)	0.08
Interval Procedure to PPROM	6.7 (3.4 - 13.2)	3.3 (0.3 - 12.8)	0.31
Gestational age of delivery (wks)	30.5 ± 4.1	29.9 ± 4.8	0.87
Interval Procedure to delivery (wks)	12.4 (11.3 - 15.7)	14.1 (10.9 - 15.5)	0.68
Interval PPROM to delivery (wks)	3.1 (0.3 - 8.4)	1.7 (0.1 - 9.9)	0.76
Donor Survival	16 (88.9%)	27 (75.0%)	0.30*
Recipient Survival	17 (94.4%)	32 (88.9%)	0.65*
Dual Survival	16 (88.9%)	27 (75.0%)	0.30*

Data expressed as: n (%), median (1st quartile - 3rd quartile), mean (± standard deviation).
p-values for continuous variables were derived from the student's t test and Mann-Whitney U test for normally and non-normally distributes variables respectively. p-values for discrete variables were derived from the Chi-squared test and Fisher's exact test.
Abbreviations: BMI - body mass index, PPROM - preterm prelabor rupture of membranes, sFGR - selective fetal growth restriction, TAPS - twin anemia polycythemia sequence, TTTS - twin to twin transfusion
* - Denotes use of Fisher's exact test

621 | Diagnosis of Vasa Previa: Is It Time to Sweep?

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4:00 PM - 6:00 PM

Objective: Undiagnosed vasa previa (VP) has devastating consequences due to fetal hemorrhage. Despite the evidence, there is a lack of screening guidelines. Utilizing the universal cervical length (CL) screening protocol at our center, the objective of the study was to identify and characterize the vasa previa distance from the internal os using color Doppler (CD) sweep on transvaginal ultrasound.

Study Design: This was a retrospective cohort study of singleton pregnancies that underwent universal transvaginal CL screening with CD, transvaginal sweep between 2016-2024. VP cases were identified from an ultrasound database query. The images/clips were analyzed using the following screening methods: 1) midline still image with CD, 2) CD sweep over the cervix, and 3) CD sweep to the lateral lower uterine segment (Fig 1A). Quantitative assessment was performed for vessel type (artery, vein or both), Doppler flow (cm/sec), and distance from the internal os (cm) for each image.

Results: 139 of 67,369 pregnancies with transvaginal CL had VP in the diagnostic field. 98 (0.14%) VP were diagnosed of which: 47 (45%) were Type 1, 33 (34%) were Type 2 and 21 (21%) were Type 3. Midline CD view alone diagnosed 32 (33%) of cases. CD flow over the cervix diagnosed an additional 39 (40%) cases. CD flow in the lateral lower uterine segment provided diagnosis of 27 (27%) additional cases. The incidence of resolving placenta previa and velamentous cord insertion were similar in all groups. VP type 3 was more likely to be diagnosed on lateral sweep ($p = 0.02$). The distance between the cervical os and the fetal vessel was further away in cases diagnosed on lateral sweep compared to midline view and midline CD sweep of internal cervical os (Fig 1B).

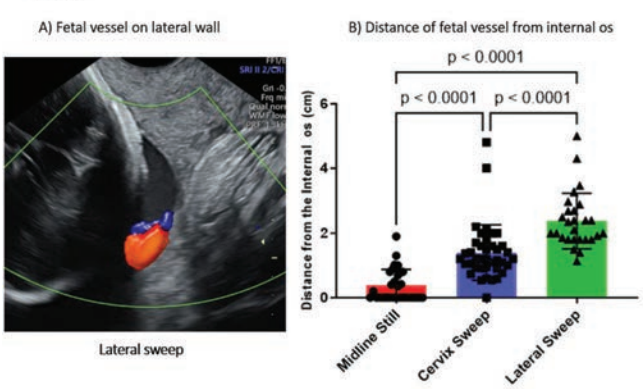
Conclusion: Color Doppler sweep of the cervix and lateral lower uterine segment identifies a higher proportion of vasa previa prenatally. Fetal vessels lateral to the cervix constitute 1 in 5 of vasa previa cases. Guidelines to standardize the screening for vasa previa to include lateral aspects of the cervix should be considered.

Table 1: Ultrasound parameters on the three ultrasound screening methods.

	Midline color	Sweep over cervix only	Lateral sweep	*p*-Value
VP type				**0.02**
1	22 (68.8%)	14 (35.9%)	8 (29.6%)	
2	7 (21.8%)	16 (41%)	10 (37%)	
3	3 (9.4%)	9 (23.1%)	9 (33.4%)	
GA at ultrasound (weeks)	25.20 ± 5.1	26.14 ± 5.13	23.50 ± 4.4	0.15
Cervical length at diagnosis (mm)	37.00 ± 5.3	38.95 ± 6.3	39.89 ± 6.5	0.20
Fetal vessel				1.0
Artery	11 (34.3%)	14 (35.9%)	11 (40.7%)	
Vein	8 (25%)	9 (23.1%)	5 (18.6%)	
Both artery and vein	13 (40.7%)	16 (41%)	11 (40.7%)	
Resolved placenta previa	23 (71.8%)	26 (66.7%)	13 (48.1%)	0.14
Velamentous cord insertion	22 (68.8%)	11 (28.2%)	14 (51.9%)	0.003
Distance of fetal vessel from cervical os (cm)	0.39 ± 0.5	1.40 ± 0.9	2.38 ± 0.9	**<0.001**
PRF of first can (cm/s)	11.31 ± 5.2	12.15 ± 8.0	10.96 ± 4.6	0.74

Data expressed as: n (%), mean (± standard deviation).
p-values for continuous variables were derived from the student's t test and Mann-Whitney U test for normally and non-normally distributes variables respectively. p-values for discrete variables were derived from the Chi-squared test and Fisher's exact test.
Abbreviations: VP (vasa previa), GA (gestational age)

Figure:



622 | Comorbid Anemia is Associated with Worsened Pregnancy Outcomes for Patients with Cardiac Disease in Pregnancy

Sara I. Jones[1]; Chun Xu[2]; Tracy Truong[3]; Sarah C. Snow[3]; Cary C. Ward[3]; Marie-Louise Meng[3]; Jerome J. Federspiel[3]
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4:00 PM - 6:00 PM

Objective: Our aim was to assess whether pregnant patients with comorbid anemia in the setting of cardiac disease experience an increased risk of severe maternal morbidity (SMM) and other adverse pregnancy outcomes.

Study Design: This was a retrospective cohort study using the 2016-2021 National Readmissions Database of all patients with cardiac disease who delivered a singleton infant between 24 and 41 weeks. Patients with cardiac disease as identified by diagnosis codes were included and categorized based on modified World Health Organization (mWHO) criteria, which due to coding limitations was dichotomized as mWHO I or II disease (I-II) versus mWHO II/III, III or IV (II/III+) disease. Logistic regression was used to assess the association between anemia and adverse pregnancy outcomes. A subgroup analysis of patients with iron-deficiency anemia was conducted. Models were adjusted for age, ZIP code, median household income, primary payer, hospital size, hospital teaching status, delivery mode, and comorbid conditions.

Results: Cardiac disease was identified in 61,542 patients in our cohort (47,767 (77.6%) with mWHO I-II disease and 13,775 (22.4%) with mWHO II/III+ disease). Of these patients, 16,122 (26.2%) had anemia. Comorbid anemia was associated with higher odds of SMM/mortality in both mWHO I-II (aOR 4.65, 95% CI 4.16, 5.18) and mWHO II/III+ (aOR 2.25, 95% CI 2.05, 2.47) patients. Comorbid anemia was also associated with blood product transfusion, non-transfusion SMM/mortality, preterm birth, and cesarean delivery (Figure). This relationship persisted for the subgroup of patients with iron-deficiency anemia, with an increased odds of SMM in the setting of anemia seen for patients with both mWHO I-II (aOR 3.68, 95% CI 2.95, 4.58) and mWHO II/III+ (aOR 2.14, 95% CI 1.77, 2.58) (Table).

Conclusion: Comorbid anemia, including iron-deficiency anemia, adversely impacts pregnancy outcomes in pregnant patients with cardiovascular disease. Identifying and treating this modifiable risk factor offers an opportunity to reduce morbidity in this high-risk population.

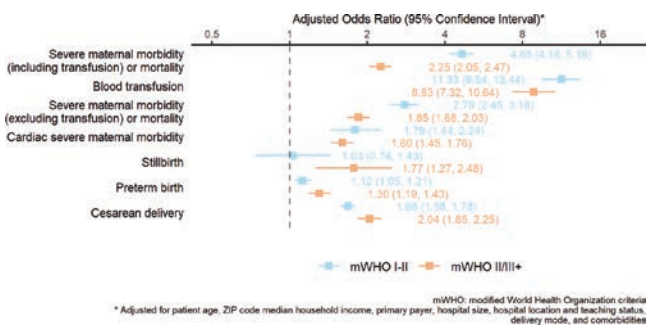


Table: Association between anemia and pregnancy outcomes by WHO cardiac risk categories among patients with iron-deficiency anemia.

Outcomes	Interaction p-value	WHO cardiac risk	Adjusted[a] OR (95% CI)	P-value
SMM (including transfusion) or Mortality	<0.001	Class I or II	3.68 (2.95, 4.58)	<0.001
		Class II/III, III, or IV	2.14 (1.77, 2.58)	<0.001
Blood products transfusion	0.979	--	9.22 (7.48, 11.36)	<0.001
Non-transfusion SMM or Mortality	0.647	--	1.89 (1.60, 2.22)	<0.001
Composite cardiac SMM	0.836	--	1.60 (1.32, 1.95)	<0.001
Stillbirth	0.336	--	0.86 (0.45, 1.64)	0.639
Preterm birth	0.567	--	1.42 (1.25, 1.60)	<0.001
Cesarean delivery	0.044	Class I or II	1.24 (1.09, 1.42)	0.002
		Class II/III, III, or IV	1.63 (1.32, 2.03)	<0.001

[a] Adjusted for age, ZIP code median household income, primary payer, hospital size, hospital teaching status, delivery mode, gestational diabetes, HIV/AIDs, pre-existing diabetes, previous cesarean birth, pulmonary hypertension, asthma, bleeding disorder, BMI at delivery ≥40, pre-existing cardiac disease, and chronic hypertension

623 | Stigmatizing Language and the Association with Patient-Related Factors in Pregnant Individuals with Diabetes

Anwei Gwan; Isai Ortiz; Renee Mahr; Anna Ayers Looby; Sanjana Molleti; Jessica Makori; Bukky Akingbola; Sereen K. Nashif; Katelyn M. Tessier; J'Mag Karbeah; Sarah A. Wernimont
University of Minnesota, Minneapolis, MN

4:00 PM - 6:00 PM

Objective: Healthcare providers' biases can negatively influence the quality of care patients receive and exacerbate health disparities. These biases can manifest through verbal and written communication. In this study, we aimed to identify the prevalence of stigmatizing language in clinical notes and to identify the clinician and patient demographic characteristics associated with the use of such language in a population of pregnant individuals with diabetes.

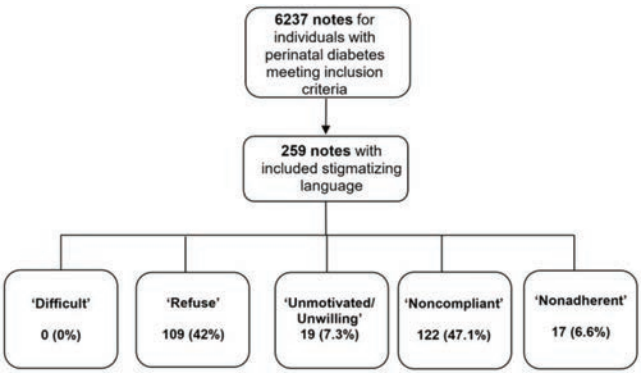
Study Design: We conducted a retrospective cohort study from 2018-2019 of individuals with singleton, non-anomalous pregnancies diagnosed with pre-existing or gestational diabetes using an academic-community obstetric outcomes database. Using a Natural Language Processing (NLP) algorithm, we identified pre-specified stigmatizing terms in electronic health record clinic notes (Fig. 1). We then compared the characteristics of patients with and without documented stigmatizing language in their medical records.

Results: Out of 1433 individuals, 128 (9%) had stigmatizing language in their medical records during their pregnancy, comprising 259 unique notes and a median of 2.0 (range 1.0-12.0) notes per patient. The most frequently used terms were "noncompliant" (47%) and "refused" (42%). Physicians (48%), nurses (22%), and mid-level providers (12%) were the primary providers who used this language. When adjusting for diabetes type, providers were 70% less likely to use stigmatizing language when describing white individuals compared to their black and other race counterparts (aOR 0.26, 95% CI 0.17-0.39; p< 0.001). Additionally, all providers were almost five times more likely to use stigmatizing language when describing patients on public versus private insurance (aOR 4.95, 95% CI 3.26-7.73; p< 0.001) (Table 1).

Conclusion: Non-white birthing individuals and those on public insurance diagnosed with diabetes in pregnancy were significantly more likely to have stigmatizing language documented within their medical records. This documentation may contribute to health inequities for marginalized birthing individuals.

	Individuals with stigmatizing language (N=128)	Individuals with no stigmatizing language (N=1305)	Unadjusted OR [95% CI]	Unadjusted *p*-value	Adjusted[1] OR [95% CI]	Adjusted[1] *p*-value
Race, n (%)						
White	39 (4.8%)	766 (95.2%)	0.29 [0.19, 0.43]	<0.001	0.26 [0.17, 0.39]	<0.001
Non-White	79 (15.0%)	447 (85.0%)				
Insurance type, n (%)						
Uninsured	5 (7.9%)	58 (92.1%)	2.17 [0.72, .33]	0.123	2.14 [0.7, 5.34]	0.135
Public	92 (16.4%)	468 (83.6%)	4.94 [3.27, 7.65]	<0.001	4.95 [3.26, 7.7]	<0.001
Private	31 (3.8%)	779 (96.2%)				

[1] logistic regression models were adjusted for DM type.



624 | Impact of Stigmatizing Language on Perinatal Health Outcomes of Birthing Individuals with Diabetes

Anwei Gwan; Isai Ortiz; Renee Mahr; Anna Ayers Looby; Sanjana Molleti; Jessica Makori; Bukky Akingbola; Sereen K. Nashif; Katelyn M. Tessier; J'Mag Karbeah; Sarah A. Wernimont
University of Minnesota, Minneapolis, MN

4:00 PM - 6:00 PM

Objective: Healthcare providers' biases can influence patients' care and health outcomes. These biases can manifest through verbal and written communication. In this study, we evaluated the impact of stigmatizing language in clinical notes on maternal and neonatal outcomes among individuals with perinatal diabetes.

Study Design: We conducted a retrospective cohort study from 2018-2019 of individuals with singleton, non-anomalous pregnancies diagnosed with pre-existing or gestational diabetes using an academic-community obstetric outcomes database. Using a Natural Language Processing (NLP) algorithm, we identified ADA-specified stigmatizing terms in electronic health record notes. We then compared the characteristics and outcomes of patients with and without documented stigmatizing language in their medical records.

Results: Out of 1433 individuals, 128 (9%) had stigmatizing language documented in their medical records during their pregnancy. Black individuals and those of another race were over three times more likely to have stigmatizing language than white individuals ($p< 0.001$). Individuals described with stigmatizing language had birth one week earlier than their counterparts (median 38w0d vs 39w0d, $p< 0.001$). HgbA1c before birth was comparable between cohorts (median 5.9 vs. 5.5). Both groups had similar rates of glucose documented in the two weeks before birth, and those without stigmatizing language had more abnormal blood glucose levels recorded than those with stigmatizing language (73% vs 47%, $p< 0.001$). After adjusting for diabetes type and gestational age at delivery, no differences were seen between individuals with and without stigmatizing language in hypertensive disorders of pregnancy, NICU admission, or LGA infants.

Conclusion: The presence of stigmatizing language documented in medical records was used more often in Black and other minoritized racial groups than white individuals and was not clearly associated with markers of worse glucose control. No differences in clinical outcomes were identified, suggesting stigmatizing language may be used biasedly.

	Individuals with stigmatizing language (N=128)	Individuals with no stigmatizing language (N=1305)	*p*-value[1]
Race			<0.001
White	253 (31.4%)	552 (68.6%)	
Black	124 (53.2%)	109 (46.8%)	
Other	94 (32.1%)	199 (67.9%)	
Gestational Age at Birth			<0.001
Mean (SD)	37.6 (2.4)	38.3 (2.0)	
Median (Q1, Q3)	38.0 (37.0, 39.0)	39.0 (37.6, 39.4)	
>50% abnormal glucose values, n (%)			<0.001
Number missing	83	871	
Yes	21 (46.7%)	318 (73.3%)	
No	15 (33.3%)	61 (14.1%)	
Unable to access	9 (20.0%)	55 (12.7%)	
Hemoglobin A1C 3 within 3 months of birth			-
Number missing	91	1136	
Mean (SD)	6.5 (1.4)	5.7 (0.8)	
Median (Q1,Q3)	5.9 (5.5, 7.0)	5.5 (5.2, 6.0)	
Hypertension disorders, n (%)			0.479
Pregnancy-related hypertensive disorder	71 (14.0%)	117 (12.6%)	
No pregnancy-related hypertensive disorder	437 (86.0%)	808 (87.4%)	

[1]*p*-value is for the Wilcoxon rank-sum test for continuous variables. Chi-square or Fisher's exact tests were used for categorical variables.

625 | Incidence of Placenta Accreta Spectrum in Pregnancies with Placenta Previa and Prior Dilation and Curettage

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4:00 PM - 6:00 PM

Objective: Risk factors for placenta accreta spectrum (PAS) other than prior cesarean delivery (CD) and placenta previa remain unclear. In those with placenta previa, there is limited data regarding the role of dilation and curettage (D&C) and risk of PAS. We examined whether an association between D&C and PAS in pregnancies with placenta previa exists.

Study Design: Retrospective cohort study of pregnancies with finding of placenta previa on third trimester ultrasound from 2016–2024 and delivery within our hospital system. Pregnancies were divided into group 1: CD≤1 and group 2: CD≥2, and then subclassified according to history of D&C. PAS was diagnosed based on pathology findings. Logistic regression was performed to calculate adjusted relative risk for PAS controlling for gestational age at delivery.

Results: A total of 274 pregnancies with third trimester placenta previa and delivery outcomes at our hospital were reviewed. Characteristics including maternal age, parity, BMI, and IVF were similar within groups (Table 1). The rate of PAS was not different among those with and without D&C in group 1 (26% versus 15%, $p = 0.4$) or group 2 (74% versus 67%, $p = 0.2$). Delivery at < 36 weeks was more frequent in those with D&C among group 1 (69% versus 47%, $p = 0.016$), and not different in group 2 (89% vs 83%, $p = 0.73$). Figure 1 demonstrates PAS pathology in both groups according to history of D&C.

Conclusion: In this cohort of pregnancies with placenta previa, rate of PAS was not changed based on history of D&C. We did note an association with increased placental invasion with history of D&C, although not statistically significant. Interestingly in those with prior CD≤1 and history of D&C, preterm delivery < 36 weeks was 1.5 times more likely than in those without history of D&C. A large trial is needed to evaluate the role of D&C with incidence of PAS and preterm labor.

	Group 1 Cesarean Delivery ≤ 1 N = 172				Group 2 Cesarean Delivery ≥ 2 N = 102			
	With D&C N = 39 (%)	Without D&C N = 133 (%)	Adjusted RR (95% CI)	P-value	With D&C N = 19 (%)	Without D&C N = 83 (%)	Adjusted RR (95% CI)	P-value
Maternal Age ≥ 35	20 (51)	58 (43)		0.4	9 (47)	31 (37)		0.42
BMI ≥ 30	21 (54)	70 (53)		0.89	15 (79)	62 (75)		0.7
IVF	5 (13)	15 (12)		0.79	0	1 (1)		0.63
Myomectomy	2 (5)	6 (5)		0.87	0	1 (1)		0.63
GA at delivery (weeks.days)								
<34	13 (33)	32 (24)			5 (26)	32 (39)		
34.0 – 35.6	14 (36)	31 (23)			12 (63)	37 (45)		
36.0. - 36.6	9 (23)	32 (24)			2 (11)	9 (11)		
≥ 37	3 (8)	38 (29)			0	5 (5)		
GA at delivery < 36 weeks	27 (69)	63 (47)	1.46 (1.11 - 1.93)	0.016	17 (89)	69 (83)	1.08 (0.9 – 1.29)	0.73
PAS	10 (26)	20 (15)	1.35 (0.7 - 2.62)	0.4	14 (74)	56 (67)	1.09 (0.8 – 1.49)	0.2
Accreta	3	11		0.2	3	25		0.16
Increta	6	8		0.3	7	18		0.12
Percreta	1	1		0.6	2	10		0.86
Conservative	0	0			2	3		

Table 1. Description of patient clinical characteristics and rates of PAS among those with and without D&C according to number of prior CD.

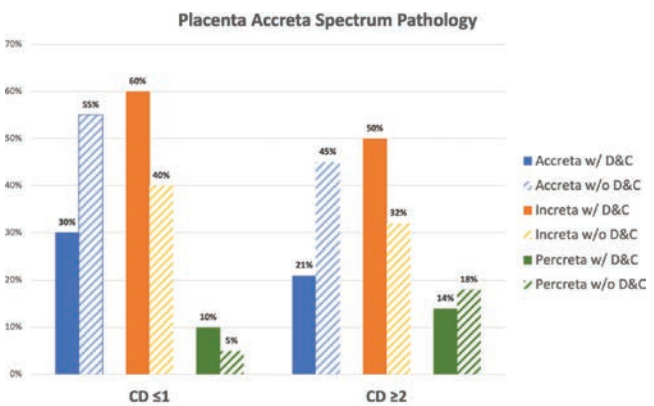

Figure 1. Severity of pathology diagnosed PAS among pregnancies with and without D&C according to number of prior CD.
**5 pregnancies are excluded as they had successful conservative management*

626 | Continuous Glucose Monitoring Profile Metrics in Pregnancies With and Without Adverse Neonatal Outcomes

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4:00 PM - 6:00 PM

Objective: There is controversy concerning the degree of maternal hyperglycemia associated with adverse neonatal outcomes. Continuous glucose monitoring (CGM) is an innovative technology that allows for individualized glycemic profiles. We aimed to determine whether CGM metrics during screening for gestational diabetes (GDM) can identify individuals who experienced adverse neonatal outcomes compared to those who did not.

Study Design: This was a prespecified, secondary analysis of a multi-clinic, randomized controlled trial of individuals being screened for GDM with the use of CGM compared to the 2-step method. Participants assigned to the 2-step method had a blinded CGM (Dexcom G6 Pro) placed at the time of the 1-hour glucose challenge test (GCT). CGM metrics evaluated included the mean glucose, time in range (TIR; 63–140 mg/dL), and time above the target range (TAR; >140mg/dL) expressed as % of all readings. The primary outcome was a composite of neonatal adverse outcomes (CNAO), including shoulder dystocia, birth injury, large for gestational age, need for IV/PO glucose, respiratory distress, and fetal/neonatal death. We compared CGM metrics for those with or without the CNAO.

Results: Of the 814 individuals randomized, 613 (75%) had CGM metrics that were analyzed (N = 331; CGM group, N = 282; 2-step blinded CGM group). Of those 196 (32%) had the CNAO and 417 (68%) did not have CNAO. The CNAO was higher among individuals diagnosed with GDM (28% v 16%; p = 0.003) and those treated with hypoglycemic agents (10% v 5%, p = 0.04). Neonates with the CNAO had a higher mean CGM glucose (108.9 v. 105.0, p = 0.007, Figure), coefficient of variation (17.8 v. 17.1, p = 0.02), and TAR (6.5% v. 3.8%, p = 0.001) compared to those without (Table).

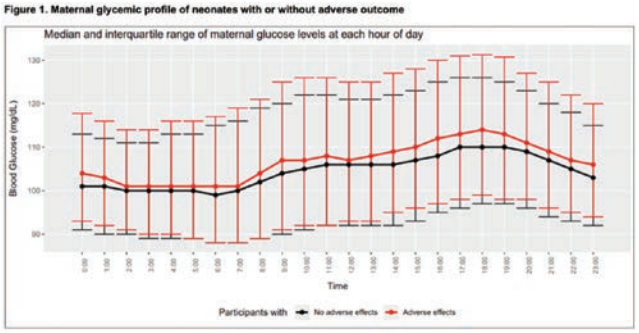
Conclusion: In this secondary analysis, CGM metrics at 24-32 weeks of elevated mean glucose, higher coefficient of variation, and elevated TAR were associated with worse neonatal outcomes. Our findings suggest that further studies are needed to evaluate the role of various CGM metrics in diagnosing maternal hyperglycemia and related adverse outcomes.

Table 1: Demographics and CGM Metrics of Study Population

Characteristics	Composite neonatal adverse outcome present n= 196 (%)	Composite neonatal adverse outcome not present n= 417 (%)	P value
Maternal age (years)	31.0 (26.0, 35.0)	29.0 (24.0, 33.0)	0.009
Race/Ethnicity			0.3
Non-Hispanic White	40 (21)	61 (35)	
Non-Hispanic Black	63 (32)	138 (33)	
Hispanic	61 (31)	142 (35)	
Insurance Status			0.05
Government Assistance	110 (56)	276 (66)	
Nulliparous	61 (31)	131 (31)	0.9
Pre-Pregnancy Body Mass Index (kg/m²)	32.0 (27.9, 39.4)	30.4 (26.4, 35.7)	0.01
Chronic hypertension	19 (9.7)	30 (7.3)	0.3
Clinic Site			0.5
Academic	98 (50)	204 (49)	
Community	95 (49)	213 (51)	
1 hour GCT result	116 (99.0, 135.0)	114.5 (97.0, 135.0)	0.7
1hour GCT ≥135	21 (11)	45 (11)	0.8
Diagnosis of Gestational Diabetes Mellitus	55 (28)	65 (16)	**0.003**
Medication for GDM during pregnancy			**0.041**
Oral	4 (2%)	11 (3%)	
Insulin	15 (8%)	10 (2%)	
Continuous Glucose Monitoring Metrics			
GA at CGM placement	25.6 (24.9, 26.9)	25.4 (24.9, 26.9)	0.5
Days with CGM	9.0 (9.0, 9.0)	9.0 (9.0, 9.0)	0.3
Mean glucose (mg/dL)	108.9 (100.2, 118.2)	105 (97.4, 113.5)	**0.007**
Coefficient of Variation	17.8 (15.5, 20.1)	17.1 (15.1, 19.5)	**0.02**
Time in Range (63-140 mg/dL) (%)	89.9 (82.1, 94.9)	92.4 (86.8, 95.7)	**0.003**
Time Above Range (>140 mg/dL) (%)	6.5 (2.1, 15.1)	3.8 (1.5, 9.2)	**0.001**

Data are presented as number (percentage) or mean (SD: standard deviation) unless otherwise specified
GCT, glucose challenge test, GTT, glucose tolerance test, GDM, gestational diabetes, CGM, continuous glucose monitoring, GA, gestational age

Figure 1. Maternal glycemic profile of neonates with or without adverse outcome



627 | Interval to Cerclage Placement and Delivery Timing in Patients with an Extremely Short Cervix

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4:00 PM - 6:00 PM

Objective: Patients with a very short cervical length < 1cm may benefit from cerclage placement, even in the absence of prior preterm birth. As with exam-indicated cerclages, it is often assumed that rapid cerclage placement improves the benefit of the intervention. This study aimed to determine whether length of time from diagnosis of cervical length < 1cm to cerclage placement affects delivery timing.

Study Design: This was a retrospective cohort study of all patients who received an ultrasound-indicated cerclage due to a transvaginal cervical length measurement of < 1cm during pregnancy, between January 2018 and December 2023, within a large health system in New York. Patients were excluded if they had a history of prior preterm birth. Patients were categorized based on time elapsed between this diagnosis and cerclage placement. The primary outcome evaluated was gestational age at delivery. Outcomes were compared using a linear mixed model regression analysis and were then adjusted for obesity and gestational age at diagnosis of short cervix.

Results: 99 patients were included who had an ultrasound-indicated cerclage placed for a diagnosis of a cervical length < 1cm, with no prior history of preterm birth. The mean wait time for cerclage placement after diagnosis was 2.3 days. 58 (59%) patients received a cerclage the next day, and 41 (41%) waited 2 or more days. The mean cervical length at diagnosis was 5.8mm ± 2.7 mm in the next-day placement group and was 6.9 mm ± 1.7 mm in the later placement group. The mean gestational age at diagnosis of a short cervix was 20.8 ± 1.8 weeks in the next-day placement group and was 20.1 ± 1.7 weeks in the later placement group. The mean gestational age at delivery in the next-day placement group was 35.4 ± 4.1 weeks, and in the later placement group was 34.7 ± 5.8 weeks, with no significant difference detected between the groups ($P = 0.51$).

Conclusion: For patients receiving an ultrasound-indicated cerclage for a short cervix < 1cm, there was no benefit to rapid next-day cerclage placement compared to longer wait times of 2 or more days.

628 | Accuracy of Placenta Accreta Spectrum Administrative Coding and Outcomes Inside and Outside of Referral Centers

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4:00 PM - 6:00 PM

Objective: Since 2015, ICD-10 codes for placenta accreta spectrum (PAS) have been used for research for this life-threatening pregnancy condition. However, this set of diagnostic codes have yet to be validated thoroughly and previous analyses suggest morbidity may be worse in referral centers. We sought to examine the accuracy of PAS ICD-10 codes in and outside of PAS referral centers and to characterize the associated outcomes.

Study Design: We conducted a case series of all ICD-10 diagnostic codes for PAS at two PAS referral centers within two health systems compromised of 17 delivery hospitals, representing the majority of deliveries in our state between September 2015 and December 2023. We performed ICD-10 code validation to assess accuracy of codes and stratified results based on true and false positives. True positive codes were those cases with histopathologic evidence of PAS or FIGO clinical criteria for PAS in the absence of histopathology. We compared composite maternal morbidity with logistic regression adjusted for delivery characteristics (maternal age, prior caesarean, and gestational age) overall, stratified by PAS center.

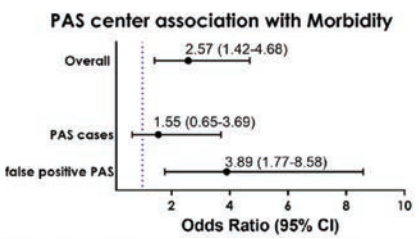
Results: Of 394 deliveries with a PAS diagnostic code, 68% occurred at a PAS referral center. False positive rate of PAS diagnosis was significantly higher at non-referral centers compared to referral centers (74% vs 24%, p< 0.001). All cases of PAS3/Percreta and nearly all cases of PAS2/Increta were managed at referral centers (Table). There was a higher odds of composite maternal morbidity at PAS centres compared to non-referral centres (aOR 2.57; 95% CI 1.42-4.68), but when excluding false positive cases, this association was not seen (aOR 1.55; 95%CI 0.65-3.69, Figure). Absence of PAS3/Percreta at non-referral centers precluded analysis of morbidity by severity.

Conclusion: In contrast to referral centers, the PAS ICD-10 code is most often inaccurate at non-referral centres with three-quarters being misdiagnosed. Among true positive PAS cases, despite a higher PAS severity at referral centers, maternal morbidity was not increased.

Table

Characteristics and Outcomes	PAS Referral Centers N=269	Non-referral Centers N=125	P
False positive PAS code	64 (23.8)	92 (73.6)	<.001
Reason for False positive diagnosis			
Antenatal suspicion, not confirmed at delivery	32 (11.9)	17 (13.6)	0.633
Bleeding due to other possible etiologies	16 (5.9)	51 (40.8)	<.001
Erroneous code	12 (4.5)	23 (18.4)	<.001
Referral diagnosis, not found	4 (1.5)	1 (0.8)	0.571
Pathology diagnosis			
no PAS	64 (23.8)	92 (73.6)	<.001
other	22 (8.2)	14 (11.2)	
PAS 1 or Accreta	59 (21.9)	16 (12.8)	
PAS 2 or Increta	53 (19.7)	3 (2.4)	
(Most severe) PAS 3 or Percreta	71 (26.4)	0 (0.0)	
Route of Delivery			<.001
Vaginal delivery (SVD or OVD)	16 (5.9)	54 (43.2)	
Cesarean Delivery or Cesarean Hysterectomy	253 (94.1)	71 (56.8)	
Hysterectomy performed	190 (70.9)	30 (24.0)	<.001
Hysterectomy performed at delivery	186 (98.4)	25 (83.3)	<.001
PAS suspected prior to delivery	220 (81.8)	22 (17.6)	<.001
Placenta previa at the time of delivery	182 (67.7)	25 (20.0)	<.001
Low-lying placenta at the time of delivery	27 (31.4)	2 (2.0)	<.001
OUTCOMES			
Composite morbidity*	189 (70.3)	40 (32.0)	<.001
Blood loss greater than 2000 mL	110 (40.9)	20 (16.1)	<.001
Blood Loss (mL; Gmean, 95% CI)	1585 (1465-1714)	828 (718- 955)	<.001
Number pRBC given (Median (P25, P75)	1 (0, 3)	0 (0, 2)	0.003
Other blood products			
none	180 (66.9)	111 (88.8)	<.001
FFP	67 (24.9)	11 (8.8)	<.001
fibrinogen	1 (0.4)	0 (0.0)	0.495
platelets	29 (10.8)	6 (4.8)	0.052
other	21 (7.8)	1 (0.8)	0.005
Intra-op complications			
cystotomy	49 (18.2)	5 (4.0)	<.001
ureteral injury	4 (1.5)	2 (1.6)	0.932
bowel injury	1 (0.4)	0 (0.0)	0.495
LOS post op days (Mean ± SD)	4.50 ± 2.2	2.85 ± 1.6	<.001
ICU days (Mean ± SD)	0.44 ± 1.8	0.10 ± 0.4	0.004
Maternal mortality	1 (0.4)	0 (0.0)	0.498

Values reported as frequency (column percent) with p-value from chi-square, or mean ± standard deviation (SD) with p-value from two-sample t-test



Estimates from logistic regression, each model outcome is a composite morbidity defined as: short-term post-operative complication (reoperation, shock, disseminated intravascular coagulation/coagulopathy, acute kidney injury, genitourinary (GU) or gastrointestinal (GI) injury diagnosed post-operatively, deep venous thrombosis or pulmonary embolism, or other), estimated blood loss >= 1500 mL, or a post-operative length of stay > 4 days. Both models adjusted for maternal age (>=/<35), prior cesarean (yes/no), and gestational age at delivery (<26 weeks, 26-<32, 32-<37, term), and true diagnosis, 2nd model includes an interaction between PAS center and true diagnosis

629 | Evaluation of Short-term Perinatal Outcomes with Expanded Gestational Weight Gain Parameters

Savvy Benipal[1]; Susan Dalton[1]; Amanda A. Allshouse[1]; Torri D. Metz[1]; Ann M. Bruno[2]

[1]University of Utah, Salt Lake City, UT; [2]University of Utah Health, Salt Lake City, UT

4:00 PM - 6:00 PM

Objective: Most pregnant patients in the U.S. gain more weight than the Institute of Medicine (IOM) recommends. There is ongoing debate as to whether the weight cutoffs, especially for patients with obesity, optimize outcomes. We aimed to evaluate concordance with IOM gestational weight gain (GWG) guidelines compared with 10 additional pounds (lbs) and perinatal outcomes in a contemporary U.S. cohort.

Study Design: Secondary analysis of a prospective multicenter cohort study of nulliparous, singleton pregnancies (2010-2013). Patients with a pre-pregnancy body mass index (BMI) of 18.5 kg/m^2 or greater, with pregnancy GWG within IOM guidelines or up to 10 lbs above were included. Pregnancies affected by genetic or structural anomalies, pregnancy loss < 20 weeks', or missing key outcome data were excluded. The primary outcomes were a composite maternal morbidity and neonatal morbidity and mortality. We estimated the incidence of maternal and neonatal composites by GWG. Logistic regression modeling compared morbidity composites between individuals within IOM GWG guidelines compared with up to an additional 10 lbs, stratified by BMI category.

Results: Of 4487 pregnancies, 2137 (48%) had GWG within IOM guidelines and 2350 (52%) had up to an additional 10 lbs gained. Additional weight gain was associated with higher pre-pregnancy BMI and age < 35 years. There was a higher odds of composite maternal morbidity (aOR 1.29, 95% CI 1.14-1.47) but not neonatal morbidity (aOR 0.94, 95% CI 0.83-1.08) in those with additional weight gain (Table). Findings were the same when stratified by BMI category among people with normal and overweight BMI but inference was limited among the obesity subgroups with statistical insignificance and wide confidence intervals (Figure).

Conclusion: Expanded GWG (10 lbs above IOM guidelines) was associated with higher odds of short-term adverse maternal outcomes but not neonatal outcomes when compared with GWG within IOM guidelines. Further research is needed to identify GWG targets which optimize both maternal and neonatal health.

Table. Association between expanded gestational weight gain (GWG) of 10 lbs above Institute of Medicine (IOM) guidelines compared with GWG within IOM guidelines and selected outcomes

Outcome	GWG within IOM guidelines (N= 2137)	Expanded GWG (>10 lbs above) (N=2350)	OR (95%CI)	aOR‡ (95%CI)
Maternal morbidity composite+	653 (30.6)	881 (37.5)	1.36 (1.20, 1.54)	1.29 (1.14, 1.47)
Cesarean delivery	476 (22.3)	647 (27.5)	1.33 (1.16, 1.52)	1.27 (1.10, 1.46)
Hypertensive disorders of pregnancy	182 (8.5)	288 (12.3)	1.50 (1.23, 1.82)	1.41 (1.16, 1.73)
Gestational diabetes	78 (3.6)	94 (4.0)	1.10 (0.81, 1.49)	0.94 (0.69, 1.29)
Postpartum hemorrhage	12 (12.2)	24 (20.2)	1.81 (0.85, 3.84)	*
Neonatal morbidity composite†	590 (27.6)	643 (27.4)	0.99 (0.87, 1.13)	0.94 (0.83, 1.08)
NICU (more than 2 day stay)	225 (10.5)	290 (12.3)	1.20 (0.99, 1.44)	1.19 (0.98, 1.45)
Preterm delivery (< 37 weeks)	173 (8.1)	174 (7.4)	0.91 (0.73, 1.13)	0.81 (0.64, 1.01)
Neonatal death	5 (0.2)	2 (0.1)	0.36 (0.07, 1.87)	*
Respiratory distress syndrome	64 (3.0)	54 (2.3)	0.76 (0.53, 1.10)	0.70 (0.47, 1.03)
Small for GA	344 (16.1)	304 (12.9)	0.77 (0.66, 0.92)	0.71 (0.59, 0.85)
Large for GA	38 (1.8)	89 (3.8)	2.17 (1.48, 3.19)	2.07 (1.40, 3.05)
≥ 4500g	5 (0.2)	30 (1.3)	5.51 (2.14, 14.24)	*
Stillbirth	6 (0.3)	9 (0.4)	1.37 (0.49, 3.84)	*

GWG, gestational weight gain; IOM, Institute of Medicine; OR, odds ratio; CI, confidence interval; NICU, neonatal intensive care unit; GA, gestational age

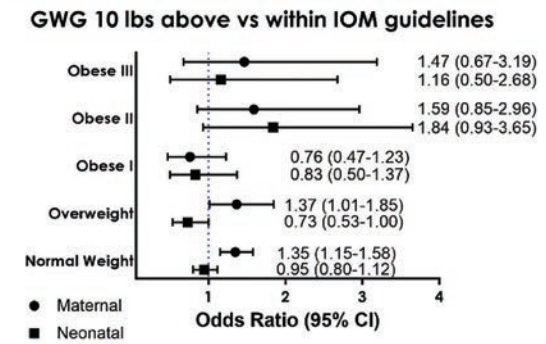
‡Adjusted for body mass index (BMI), maternal age, chronic hypertension, or diabetes, active tobacco, or THC use. Neonatal outcomes adjusted further by gestational diabetes or gestational hypertension, and gestational age at delivery (neonatal composite and preterm birth outcome not adjusted for gestational age).

+Maternal morbidity composite included cesarean delivery, postpartum hemorrhage requiring transfusion, hypertensive disorders of pregnancy, or gestational diabetes.

†Neonatal morbidity composite included stillbirth, preterm delivery, NICU admission for greater than 2 days, neonatal death, respiratory distress syndrome, small for gestational age or larger for gestational age birth weight.

* Adjusted analysis not calculated for fewer than 60 events.

Figure. Odds of maternal and neonatal morbidity and mortality composites with expanded gestational weight gain (10 lbs above Institute of Medicine guidelines) compared with within guidelines, stratified by body mass index (BMI) categories



GWG, gestational weight gain; IOM, Institute of Medicine; CI, confidence interval; BMI, body mass index
Obese I; BMI 30-34.9 kg/m², Obese II; BMI 35-39.9 kg/m², Obese III; BMI 40 kg/m² or greater
Maternal morbidity composite included cesarean delivery, postpartum hemorrhage requiring transfusion, hypertensive disorders of pregnancy, or gestational diabetes.
Neonatal morbidity composite included stillbirth, preterm delivery, NICU admission for greater than 2 days, neonatal death, respiratory distress syndrome, small for gestational age or larger for gestational age birth weight.

630 | Should Tranexamic Acid be Re-dosed for Patients with Postpartum Hemorrhage Based on Blood Volume?

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4:00 PM - 6:00 PM

Objective: The objective of this study is to identify the relationship between blood loss and drug clearance and between blood loss and volume of distribution for tranexamic acid use at delivery to determine the need for scheduling subsequent doses at a fixed rate or based on the magnitude of blood loss.

Study Design: Four pharmacokinetic studies were reviewed, and estimates of drug clearance (CL) and volume of distribution in the central compartment (Vc) and the peripheral compartment (Vp) from prior modeling work were compared with volume of blood loss. Data from 205 individuals was divided into five equal groups based on volume of blood loss, ranging from 160 mL to 10 L. Then the relationships of interest were visualized and described. The data was further described by dividing it into clinically meaningful groups based on blood loss of < 1 L, 1-2 L, 2-3 L, and > 3 L. All data analysis and visualization were performed using R Statistical Software (version 4.2.2, R Core Team (2022), Viena, Austria, https://www.R-project.org/).

Results: Of the 205 individuals studied, 67 experienced blood loss of at least 1 L and ten experienced a blood loss of at least 2 L. Clearance and distribution were both identified to have a minimal relationship with volume of blood lost, with CL having a weak positive trend as shown in Figure 1 (R-squared of 0.44), and Vc and Vp having slightly negative trends (R-squared of 0.055 and 0.20, respectively). Figure 2 shows the trend generated by Vc and blood loss. Data derived from clinically meaningful groups were very similar to that previously described with R-square values for CL, Vc, and Vp equating 0.0061, 0.024, and 0.028, respectively.

Conclusion: No strong correlations were identified among the groups of interest, indicating that blood loss does not greatly affect the pharmacokinetic action of tranexamic acid. Therefore, there may be no need to base TXA redosing frequency on the magnitude of blood loss. Additional data in patients with blood loss >2 L would help to validate these findings.

Figure 1: Drug Clearance versus Blood Loss

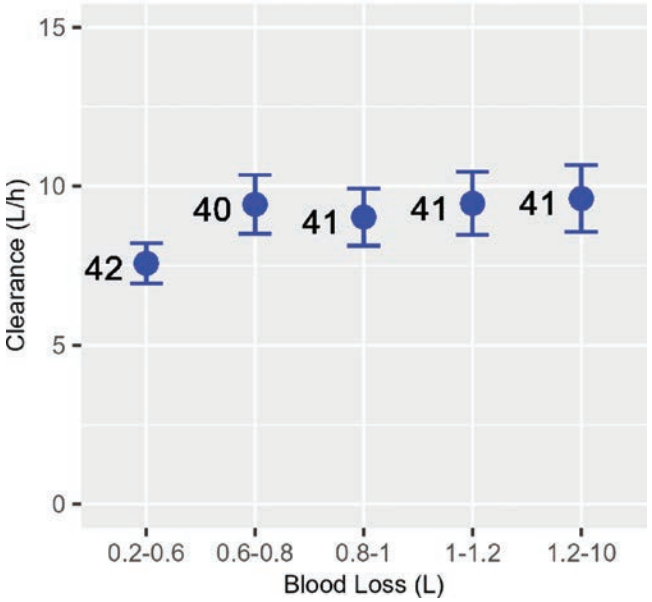
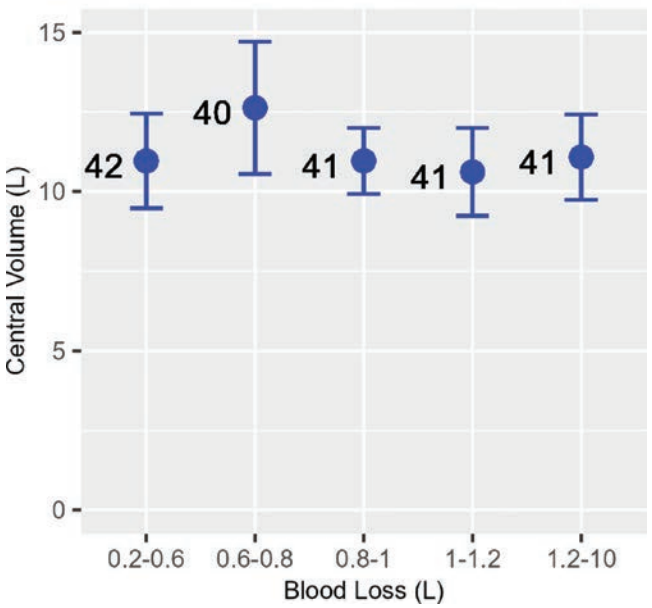


Figure 2: Central Volume versus Blood Loss



631 | The Risk of Hepatitis C Virus Infection on Development of Preeclampsia in Pregnancy

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4:00 PM - 6:00 PM

Objective: To investigate the association between maternal hepatitis C virus (HCV) infection status and the development of preeclampsia during pregnancy.

Study Design: A retrospective cohort study was conducted using a total of 22,846,383 pregnant women who delivered preterm from 2015 to 2021. The primary exposure was HCV infection, while the primary outcome was preeclampsia. The data were obtained from medical records. Chi-squared analyses were performed to evaluate the association between HCV and preeclampsia.

Results: A total of 22, 846, 383 women were included in the study, with 104, 006 (0.46%) identified with HCV infection. Among women who are HCV negative, the prevalence of preeclampsia was 7.00% compared to 7.21% among women who are HCV positive. A significant association was indicated through chi-squared test showing a significant association between HCV and preeclampsia (Chi-squared = 7.4596, Pr = 0.006).

Analysis revealed that HCV infection was associated with an increased risk of preeclampsia (adjusted OR = 1.07, 95% CI: 1.04 - 1.10, P < 0.001). Other factors contributing to the risk of preeclampsia included higher BMI categories and a history of DM or chronic hypertension. Racial disparities were noted, with Black and Asian women having higher odds of preeclampsia compared to Hispanic women.

Conclusion: Maternal HCV infection is associated with an increased risk of developing preeclampsia.

632 | Ultrasound Alone versus Last Menstrual Period for Gestational Age Assignment: Implications for Fetal Growth Restriction

Shae Boguslawski[1]; Elise Turke[2]; Rebekah Pitpitan[2]; Kyra Orton[3]; Majid Shaman[4]; Sun Kwon Kim[4]; Gregory Goyert[4]
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4:00 PM - 6:00 PM

Objective: Accurate pregnancy dating is crucial for evaluating fetal growth and diagnosing fetal growth restriction (FGR). In the first trimester, both the last menstrual period (LMP) and crown-rump length (CRL) are typically used to determine gestational age. Our primary objective was to compare the rates of FGR diagnosed using LMP and CRL with those diagnosed using CRL alone. The secondary objective was to assess the differences in pregnancy outcomes between these two groups.

Study Design: This cohort study utilized an ultrasound database including all singleton pregnancies with a first-trimester ultrasound from 2015 to 2023. We identified two groups of FGR: those dated by LMP and CRL and those dated by CRL alone. FGR was diagnosed based on an estimated fetal weight or fetal abdominal circumference below the 10th percentile. Exclusion criteria included cases without a first-trimester ultrasound (gestational age < 14 weeks 0 days), multiple pregnancies, in vitro fertilization pregnancies, and cases lacking a delivery record.

Results: We identified 1067 pregnancies affected by FGR in our cohort (n = 14116): 733 out of 9251 pregnancy episodes were dated by LMP and CRL, and 334 out of 4865 were dated by CRL alone. The rate of FGR was higher in those dated by LMP and CRL compared to those dated by CRL alone (7.9% vs 6.8%, p<0.001). A higher rate of FGR dated by LMP and CRL resolved by the end of pregnancy compared to FGR dated by CRL alone (28.6% vs 21.0%, p = 0.008). There were no significant differences between the groups in mean gestational age at delivery, mode of delivery, preterm births, severe FGR, abnormal umbilical artery Dopplers, and composite adverse neonatal complications.

Conclusion: Although FGR diagnosed by CRL alone did not show statistically significant differences in pregnancy outcomes, the lower rate of FGR in this group suggests a potential over-diagnosis when using both LMP and CRL. Future research should focus on the impact of modifying gestational age determination methods to potentially reduce the false positive rate of FGR and unnecessary antepartum interventions.

Table. Demographic characteristics and obstetrical outcomes of the study population

Variable	FGR pregnancy episodes dated by LMP + CRL (n = 733)	FGR pregnancy episodes dated by CRL alone (n = 334)	P-values
Maternal characteristics			
Age (year)	29.0 ± 5.5	28.5 ± 5.6	0.163
Gravidity	2.8 ± 1.9	2.9 ± 1.8	0.067
Nulliparity	203 (27.7)	80 (24.0)	0.227
BMI (kg/m^2)	27.9 ± 7.8	28.6 ± 9.0	0.266
Chronic hypertension	61 (8.3)	26 (7.8)	0.766
Gestational hypertension	22 (3.0)	8 (2.4)	0.579
Preeclampsia	35 (4.8)	22 (6.6)	0.222
Pregestational diabetes	31 (4.2)	18 (5.4)	0.401
Gestational diabetes	40 (5.5)	16 (4.8)	0.651
Obstetrical outcomes			
Severe fetal growth restriction	261 (35.6)	131 (39.2)	0.256
Resolved fetal growth restriction	210 (28.6)	70 (21.0)	0.008
Abnormal umbilical artery Dopplers	82 (11.2)	34 (10.2)	0.624
Birth weight (g)*	2477 ± 347	2460 ± 438	0.431
Gestational age at delivery (week)*	37.3 ± 3.5	37.4 ± 3.7	0.576
Preterm birth <37 weeks*	287 (39.2)	142 (42.5)	0.332
Cesarean section*	242 (35.6)	111 (36.8)	0.817
Composite adverse neonatal outcomes	53 (7.2)	27 (8.1)	0.623
NICU admission	85 (11.6)	52 (15.6)	0.072
Fetal/neonatal demise	26 (3.5)	11 (3.3)	0.834

Abbreviations: FGR, fetal growth restriction. LMP, last menstrual period. CRL, crown-rump length. BMI, body mass index. NICU, neonatal intensive care unit.
Data are expressed as number (percentage) or mean ± SD.
*Out of live births
**Including one or more of the following conditions: neonatal sepsis, retinopathy of prematurity, intracranial hemorrhage, chronic lung disease, respiratory distress syndrome, patent ductus arteriosus

633 | Distant, But Connected: Pregnancy App Utilization in Maternity Care Deserts

Shannon Malloy; Katie Noddin; Leslie Saltzman
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4:00 PM - 6:00 PM

Objective: Maternity care deserts (MCDs), or counties with no hospitals or birth centers offering obstetric care and no obstetric providers, account for one-third of all U.S. counties. MCDs are expected to grow with projected obstetric provider shortages. Digital health solutions are positioned as solutions to deliver prenatal education and care for pregnant patients in MCDs. However, little is known about digital health utilization among pregnant patients in MCDs. This analysis explores in-app

behavior, demographics, and maternity care desert status of a pregnancy tracking app's userbase.

Study Design: Deidentified self-reported demographic and app usage data from users who downloaded a popular mobile pregnancy tracking app between 1/1/2022 and 7/31/2024 were assessed. The app provides gestational-age appropriate educational content and encourages symptom logging throughout pregnancy. MCD status was assigned using self-reported ZIP code.

Results: A total of n = 411,617 users qualified for inclusion. Users represented all 50 states. Almost 9% of app users lived in a maternity care desert, over double the proportion of U.S. women aged 18-44 living in MCDs (3.8%). Comparatively, 79% of app users lived in counties with full access (FA) to maternity care, where 89% of women aged 18-44 live. Users in MCDs were more likely to be multiparous, have a high school degree or lower educational attainment, subscribe to public insurance, report financial insecurity, and identify as American Indian or Alaska Native than users in full access counties. Users in MCDs were active in the app for 3.2 months on average, compared to 4.2 months for FA users. Almost all users enrolled in their first trimester of pregnancy. Users in MCDs logged fewer total sessions and had shorter engagement durations than FA users.

Conclusion: These results suggest reproductive-aged women in MCD's are proportionally more likely to download this pregnancy tracking app compared to those in full access counties, and indicate pregnant people in MCDs may be receptive to digital health interventions to support prenatal and reproductive health.

634 | Female versus Male Fetuses—Variation in Fetal Heart Rate Tracing and Adverse Outcomes at Term

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4:00 PM - 6:00 PM

Objective: To compare the fetal heart rate tracing (FHRT) and adverse outcomes among female versus male newborns delivered at term (> 37 weeks). We hypothesized that compared to female, pregnancies with male fetuses will have more frequent FHRT abnormalities and adverse outcomes.

Study Design: The inclusion criteria of the retrospective study were non-anomalous singletons, delivered at > 37 weeks after labor, whose sex at birth was either female or male. The consecutive deliveries occurred over 15 months. Using the guidelines by ACOG (Practice Bulletins 106 and 116), clinicians—blinded to maternal characteristics, gender, and outcomes—interpreted the FHRT for the last 120 min of labor. Composite neonatal and maternal adverse outcomes (CNAO and CMAO) were compared between the groups. Adjusted odds ratio (aOR) and 95% confidence intervals (CI) were calculated.

Results: Of the 5,160 deliveries during the study period, 3,165 (61%) met the inclusion criteria and among them 1,514 (48%) were female and 1,651 (52%), male. Compared to female, the FHRT among male was significantly more likely to have marked variability (P = 0.044), and prolonged deceleration (P = 0.039). The classification of FHRT as categories I, II or III were similar (Table 1). Cesarean delivery for non-reassuring FHRT was more common among male (11.3%) than female newborns (6.9%; aOR 1.67; 95% 1.30-2.14). CNAO for male (2.2%) was significantly higher than female newborns (0.9%; aOR 2.52; 95% CI 1.33-4.77). Apgar score < 7 at 5 min (aOR 3.12, 95% CI 1.26-7.77) was the component of the CNAO that differed significantly. CMAO was also significantly higher for individuals who delivered male (9.3%) vs female (6.3%; aOR 1.45, 95% CI 1.10-1.92) newborns (Table 2).

Conclusion: Among singleton pregnancies delivered at term, male fetuses are significantly more likely to have abnormalities for fetal heart rate, and adverse outcomes to neonatal-maternal dyad. Investigations to elucidate the etiology and intervention trials to mitigate the disparate adverse outcomes are warranted.

Table 1. Fetal heart tracing features present for ≥ 50% of time in the last 60 minutes.

	Female (n=1,514)	Male (n=1,651)	P Value
Fetal Tachycardia	52 (3.4%)	51(3.1%)	0.584
Presence of Accelerations	955 (63.1%)	1,055 (63.9%)	0.631
Heart Rate Variability			
Absent	3 (0.2%)	4(0.2%)	0.792
Minimal	191(12.6%)	207(12.5%)	0.947
Moderate	1,285 (84.9%)	1,384 (83.8%)	0.419
Marked	**4 (0.3%)**	**13 (0.8%)**	**0.044**
Early Decelerations	**47 (3.1%)**	**87 (5.0%)**	**0.003**
Late Decelerations	270 (13.7%)	248 (15.0%)	0.280
Variable Decelerations	611 (40.4%)	665 (40.3%)	0.963
Prolonged Deceleration	**30 (2.0%)**	**52 (3.1%)**	**0.039**
Combinations of Decelerations			
Variable (+) Late Decelerations	723 (47.8%)	795 (48.2%)	0.823
Variable (+) Late (+) Prolonged Decelerations	787 (52.0%)	861 (52.2%)	0.924
Decelerations > 50% of Contractions	458 (30.3%)	538 (32.6%)	0.158
ACOG Classification			
Category I	450 (29.7%)	498 (30.2%)	0.787
Category II	1,046 (69.1%)	1,133 (68.6%)	0.779
Category III	4 (0.3%)	4 (0.2%)	0.902

ACOG, American College of Obstetricians and Gynecologists (using Practice Bulletins # 106 and # 116)

Table 2. Maternal and neonatal outcomes

	Female (n=1,514)	Male (n=1,651)	P Value	OR (95% CI)	aOR[1] (95% CI)
Cesarean Delivery for Arrest	133 (8.8%)	174 (10.5%)	0.096		
Cesarean Delivery for NR-FRHT	**105 (6.9%)**	**186 (11.3%)**	**< 0.001**	**1.70 (1.32-2.18)**	**1.67 (1.30-2.14)**
Umbilical Arterial pH <7.00[2]	6(0.8%)	8 (0.9%)	0.827		
Composite Neonatal Adverse Outcomes	**13 (0.9%)**	**36 (2.2%)**	**0.003**	**2.57 (1.35-4.86)**	**2.52 (1.33-4.77)**
Apgar Score <7 at 5 min.	**6 (0.4%)**	**21 (1.3%)**	**0.007**	**3.23 (1.30-8.04)**	**3.12 (1.26-7.77)**
Neonatal Asphyxia	5 (0.3%)	9 (0.5%)	0.363		
Neonatal Seizure	0 (0%)	3 (0.2%)	0.097		
Bronchopulmonary Dysplasia	0 (0%)	0 (0%)	-		
Intraventricular Hemorrhage	0 (0%)	1 (0.1%)	0.338		
Necrotizing Enterocolitis	0 (0%)	1 (0.1%)	0.338		
Neonatal Sepsis	4 (0.3%)	3 (0.2%)	0.622		
Birth Injury	1 (0.1%)	6 (0.4%)	0.075		
Hypoxic Ischemic Encephalopathy	1 (0.1%)	3 (0.2%)	0.360		
Neonatal Death	1 (0.1%)	0 (0%)	0.296		
Composite Maternal Adverse Outcomes	**95 (6.3%)**	**154 (9.3%)**	**0.001**	**1.48 (1.12-19.5)**	**1.45 (1.10-1.92)**
Estimated Blood Loss ≥ 1,000 mL[3]	**64 (4.2%)**	**103 (6.2%)**	**0.011**	**1.51 (1.09-2.08)**	**1.47 (1.06-2.02)**
Blood Transfusion	38 (2.5%)	55 (3.3%)	0.172		
Endometritis	11 (0.7%)	18 (1.1%)	0.283		
Surgical Site Infection	3 (0.2%)	5 (0.3%)	0.558		
Deep Venous Thrombosis	1 (0.1%)	0 (0%)	0.296		
Intensive Care Unit	3 (0.2%)	8 (0.5%)	0.171		
Maternal Death	0 (0%)	0 (0%)	-		

Data presented as N(%)
OR, odds ratio; CI, confidence intervals; aOR, adjusted odds ratio; NR-FHRT, non-reassuring fetal heart rate tracing
[1]Adjusted for body mass index ≥ 30 kg/m²
[2]Data available for 919 male and 775 female newborns
[3]Data available for 1648 and 1513 individuals, respectively
Bolded if significantly different

635 | Amniocentesis Prior to Physical Exam-Indicated Cerclage Placement and Time to Delivery

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4:00 PM - 6:00 PM

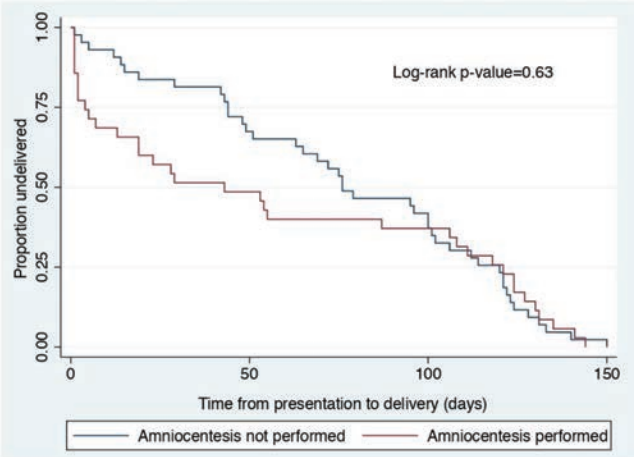
Objective: To assess the association between amniocentesis prior to physical exam-indicated cerclage and latency from presentation to delivery.

Study Design: This is a single center retrospective cohort study of pregnant individuals who presented for a physical exam-indicated cerclage at 16w0d-23w6d gestation from June 2012 through June 2023. The primary exposure was amniocentesis for evaluation of infection prior to attempted cerclage. The primary outcome was the latency from presentation for possible cerclage placement to delivery. Secondary outcomes were a neonatal morbidity composite, delivery < 28 weeks, delivery < 37 weeks, chorioamnionitis or endometritis, and postpartum hemorrhage. Latency from presentation to delivery was assessed by amniocentesis status using Kaplan-Meier curves and the log-rank test. Modified Poisson regression was used to estimate the relative risk for secondary outcomes, adjusting for confounding factors. A sensitivity analysis was performed, including only individuals with successful cerclage placement.

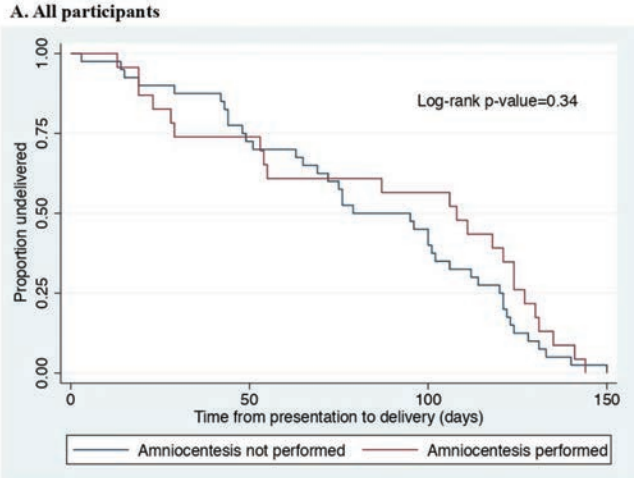
Results: Of the 78 individuals included who presented for exam-indicated cerclage, 35 (44.9%) underwent amniocentesis. Those who underwent amniocentesis were more likely to have mild symptoms at presentation (54.3% vs 18.6%, p< 0.05), but had similar cervical length, dilation, gestational age at presentation, and history of preterm birth. Among those in the amniocentesis group, 12 (34.3%) did not receive a cerclage compared to 3 (7%) who did not receive a cerclage in the no amniocentesis group. There was no significant difference in latency from presentation to delivery between those who underwent amniocentesis and those who did not (Figure 1). In adjusted analysis, there were no significant difference in secondary outcomes between groups (Table 1). The results were similar when limited to those with successful cerclage placement (Figure 1).

Conclusion: We found no association between amniocentesis prior to cerclage and latency from presentation to delivery. Given our modest sample size, these findings await confirmation in a larger study.

Figure 1. Kaplan-Meier Curve for time to delivery by amniocentesis status



A. All participants



B. Participants who underwent cerclage placement

Table 1. Frequency and association between amniocentesis prior to cerclage and secondary outcomes

Neonatal Secondary Outcomes				
	Frequency of outcome, n (%)		Unadjusted relative risk,[2] RR (95% CI)	Adjusted relative risk,[2,3] aRR (95% CI)
	Amniocentesis not performed n=38	Amniocentesis performed n=33		
Neonatal morbidity and mortality composite[3]	22 (57.9)	19 (57.6)	0.99 (0.67-1.48)	0.83 (0.40-1.70)
Perinatal mortality[4,5]	4 (10.3)	14 (42.4)	–	–
Grade 3-4 neonatal intraventricular hemorrhage[5]	2 (5.3)	0 (0)	–	–
Neonatal sepsis[5]	0 (0)	1 (3.0)	–	–
Necrotizing enterocolitis[5]	2 (5.3)	3 (9.09)	–	–
Retinopathy of prematurity[5]	9 (23.7)	3 (9.1)	–	–
Respiratory distress syndrome[5]	19 (50.0)	5 (15.2)	–	–
Delivery <28 weeks (n=78, %)	13 (30.2)	20 (57.1)	1.89 (1.10-3.23)	1.30 (0.58-2.92)
Delivery <37 weeks (n=78, %)	30 (69.8)	23 (65.7)	0.94 (0.69-1.28)	0.74 (0.40-1.40)
Maternal Secondary Outcomes				
	Frequency of outcome, n (%)		Unadjusted relative risk, [2] RR (95% CI)	Adjusted relative risk, [2,3] aRR (95% CI)
	Amniocentesis not performed n=42	Amniocentesis performed n=34		
Diagnosis of chorioamnionitis or endometritis[5]	4 (9.5)	5 (14.7)	–	–
Postpartum hemorrhage[5]	2 (4.8)	3(8.8)	–	–

1. Relative risk estimated using Poisson regression with robust error variance estimators.
2. Model adjusted for variables at time of presentation including gestational age, cervical dilation and presence of mild symptom including pelvic pressure, spotting, vaginal discharge and mild cramping.
3. Neonatal morbidity and mortality composite includes perinatal mortality, grade 3-4 neonatal intraventricular hemorrhage, neonatal sepsis, necrotizing enterocolitis, retinopathy of prematurity and respiratory distress syndrome.
4. For perinatal mortality N=39 for amniocentesis not performed group and N=33 for amniocentesis performed group.
5. Unadjusted and adjusted relative risk not calculated due to small sample size
*Results were similar in sensitivity analysis in which only those who underwent cerclage were included.

636 | Success of Labor Induction in Patients with Class III Obesity

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4:00 PM - 6:00 PM

Objective: Labor induction in patients with class III obesity poses significant challenges and has been associated with higher complication rates. This study evaluates the success rate of labor induction and identifies factors influencing successful vaginal delivery in this population.

Study Design: We conducted a retrospective cohort study using US Vital Statistics Natality Birth Data from 2018 to 2022. The study included patients with class III obesity (BMI ≥ 40) who underwent labor induction. Statistical analyses included descriptive statistics and logistic regression to identify significant predictors of successful induction. Adjusted odds ratios (aOR) were calculated.

Results: Among the 1,053,085 patients with class III obesity who underwent induction of labor, the vaginal delivery was 25.1%.

Compared to White mothers, Black (aOR = 0.79, 95% CI: 0.78-0.80), Asian (aOR = 0.80, 95% CI: 0.76-0.84), and Native Hawaiian or Other Pacific Islander (aOR = 0.76, 95% CI: 0.71-0.81) mothers had lower odds of successful induction.

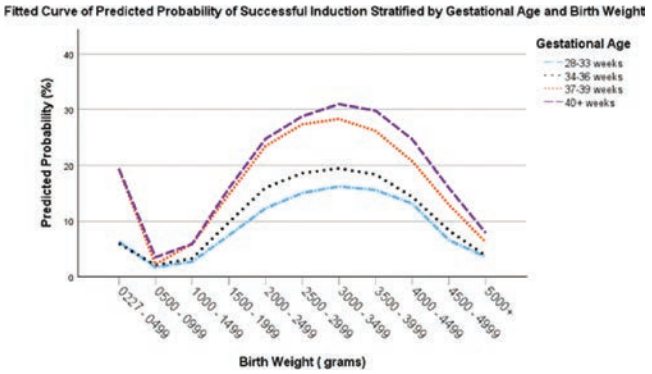
Increasing maternal age was associated with decreased odds of successful induction, particularly in mothers aged 40+ years (aOR = 0.54, 95% CI: 0.52-0.56).

Higher parity was associated with increased odds of success, especially at and after grand multiparity (aOR = 2.50, 95% CI: 2.40-2.60).

Induction success rates were significantly lower at gestational age less than 37 weeks compared to 37 weeks and above (aOR = 0.567, 95% CI: 0.556-0.577). The highest statistically significant success was at 40 weeks (aOR = 1.09, 95% CI: 1.081-1.095) (Figure 1); this is likely not clinically significant given a small change in predictive probability.

At any gestational age, induction success against final birthweight followed a fitted parametric curve with peak at reference group of 3000-3499g. ($p < 0.001$) (Figure 2).

Conclusion: The success rate of labor induction in patients with class III obesity is 25.1%. Identifying predictive factors can aid in better management and counseling. Targeted strategies are needed to improve induction success among diverse racial groups and older maternal age categories.



637 | Preconception Counseling: Understanding the Patient Experience

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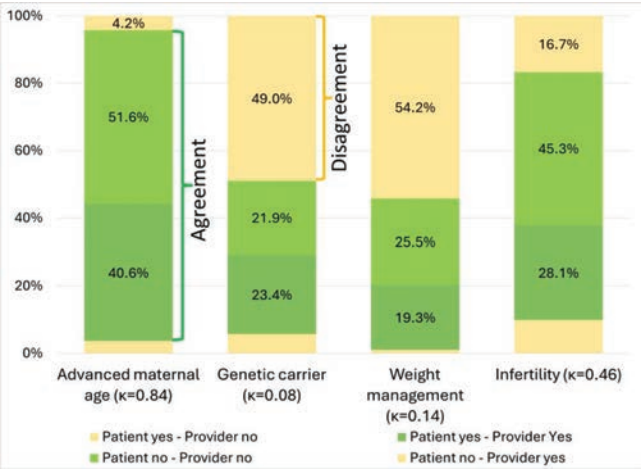
4:00 PM - 6:00 PM

Objective: To characterize health conditions addressed during MFM preconception counseling and to evaluate patient understanding of these with visit satisfaction and provider recommendations regarding future conception.

Study Design: This is a prospective study of patients receiving preconception counseling by MFM specialists at the University of Colorado School of Medicine Clinics (8/20-12/20). Consented patients were asked to complete a 1-week follow-up survey about health conditions discussed at the appointment, conception recommendations, and satisfaction with counseling. Concordance of conditions discussed was defined as the patient identifying ≥80% of the conditions documented by the MFM as having been discussed. SAS was used to perform appropriate statistics.

Results: Of the 192 study participants, most were ≥30 years (77%), married/partnered (94%), and non-Hispanic white (85%). Topics discussed with the highest patient-provider agreement were advanced maternal age (k = 0.84), hypothyroidism (k = 0.80), chronic hypertension (k = 0.70), uterine abnormalities (k = 0.68), and prior poor OB outcomes (k = 0.68). Topics with the lowest agreement were infertility (k = 0.5), genetic carrier (k = 0.08), and weight management (k = 0.14) (Figure 1). Patient satisfaction was high (97%) and similar for all topics except that those with low agreement were less likely to believe that the preconception visit would increase their chances for a healthy pregnancy (7 6.1% vs. 90.0%; p = 0.01).

Conclusion: Patient-provider agreement was lowest for standardized preconception topics (e.g. weight, infertility) indicating that patients were less likely to recall topics they had not intended to discuss. Low agreement in counseling topics also impacted patients' belief that they will have a healthy future pregnancy. Providing patient-centered counseling using shared decision-making is essential to improving preconception care.



638 | Obstetric Antecedent Factors and Therapeutic Hypothermia: Associations with Magnetic Resonance Imaging

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4:00 PM - 6:00 PM

Objective: Magnetic resonance imaging (MRI) abnormalities following neonatal therapeutic hypothermia (THT) for hypoxic ischemic encephalopathy (HIE) are associated with long-term neurocognitive impairment. We compared the obstetric antecedent factors among newborns who underwent THT for HIE and had abnormal versus abnormal MRI findings.

Study Design: Utilizing ICD-10 codes, newborns at a large teaching hospital with clinically diagnosed HIE and who underwent THT were identified. Data was extracted from each chart by an obstetrician. Inclusion criteria for analysis were THT for HIE at $\geq$ 36 weeks on a non-anomalous singleton newborn, who had a brain MRI during admission. The MRI was considered abnormal if the following were noted: basal ganglion injury; white matter/watershed-predominant pattern of injury; or, near total injury. A Chi-square test was done with $P < 0.05$ considered significant.

Results: During the 5 year study period (2019-2023), 136 neonates out of 32,765 live births received THT for moderate to severe HIE (4 per 1,000 births). Among them 117 (86%) met inclusion criteria and 28 (23%) had abnormal MRI findings. Nulliparity ($P = 0.048$) and tobacco use ($P = 0.003$) were more common among mothers of those neonates with abnormal MRIs. Fetal heart tracing (FHRT) categorization within 60 minutes of delivery was not significantly associated with neonatal MRI abnormalities (Table 1). Newborns delivered vaginally had a higher incidence of abnormal MRI ($P = 0.006$) compared to those delivered by cesarean. Apgar scores < 5 at 5 and 10 minutes and umbilical arterial base deficit were similar for the two groups. Small for gestational age neonates were more likely to have abnormal MRI findings ($P = 0.003$; Table 2).

Conclusion: Hypoxic ischemic encephalopathy requiring therapeutic hypothermia occurred in 4 per 1,000 births, and among them maternal tobacco use is a modifiable risk factor for abnormal MRI. Fetal heart tracing, Apgar scores at 5 and 10 min, and umbilical arterial acid-base status did not differentiate between abnormal versus normal MRI, a surrogate for long term sequelae.

Table 1. Fetal heart rate tracing within 60 min of delivery

	Vaginal Delivery (N = 53)	Cesarean Delivery (N = 79)	P
Variability*			
Moderate	41 (77.3)	52 (65.8)	0.154
Minimal	4 (7.5)	14 (17.7)	0.095
Absent	1 (1.8)	5 (6.3)	0.230
Decelerations*	41 (77.3)	56 (70.9)	0.409
Variable decelerations	45 (84.9)	65 (82.9)	0.691
Late decelerations	6 (11.3)	13 (16.5)	0.410
Prolonged decelerations	0	0	-
Bradycardia	0	0	-
Tachycardia	0	0	-
ACOG Category of FHRT*			
I	**1 (1.9)**	**9 (11.4)**	**0.043**
II	43(81.1)	53 (67.1)	0.076
III	2 (3.7)	11 (13.9)	0.055

Data presented as N (%)
ACOG, American College of Obstetricians and Gynecologists
*Interpretation of fetal heart rate tracing, as noted in the chart
Bolded, if significantly different

Table 2. Intrapartum and neonatal outcomes

	Vaginal Delivery (N = 53)	Cesarean Delivery (N = 79)	P
Intrapartum Complication			
Meconium-stained amniotic fluid	21 (39.6)	27 (34.2)	0.524
Chorioamnionitis	13 (24.5)	18 (22.8)	0.817
Cord prolapse	1 (1.9)	5 (6.3)	0.230
Shoulder dystocia	**11 (20.7)**	**0**	**<0.001**
Apgar score < 5			
At 5 min	29 (54.7)	43 (54.4)	0.974
At 10 min*	4/48 (8.3)	14 /68 (20.6)	0.146
Umbilical arterial pH			
< 7.00	16/40 (40.0)	37/65 (56.9)	0.092
< 7.10	27/40 (67.5)	50/65 (76.9)	0.289
Umbilical arterial Base Deficit*			
≥ 12 mmol/L	32/40 (80.0)	36/63 (57.1)	**0.017**
Neonatal growth*			
Small for gestational age (< 10th percentile)	3 (5.6)	2 (2.5)	0.356
Appropriate for gestational age (10-89th percentile)	44 (83.0)	70 (88.6)	0.359
Large for gestational age (≥ 90th percentile)	5 (9.43)	5 (6.3)	0.509
Neonatal Seizure	7/53 (13.2)	12/79 (15.2)	0.750
Abnormal Findings on MRI			
Overall	18/49 (36.7)	10 /68 (14.7)	**0.006**
Among individuals who labored	18/49 (36.7)	9/63 (14.3)	**0.006**

Data presented as N (%)
*Rate based for cohorts with the outcome available
MRI, magnetic resonance imaging (considered abnormal if the following were noted: basal ganglion injury; white matter/watershed-predominant pattern of injury; or, near total injury)
Bolded if significantly different

639 | Risk Factors for Post-Operative Rectus Sheath Hematoma Following Cesarean Delivery: a Case Control Study

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4:00 PM - 6:00 PM

Objective: To identify risk factors for rectus sheath hematoma (RSH) after cesarean delivery.

Study Design: We conducted a case-control study of cesarean deliveries performed at a quaternary academic hospital between January 1, 2013 and December 31, 2023. Cases were patients who developed RSH following cesarean delivery and were identified using the Deep6 natural language processing search engine. Controls were patients without RSH and were matched 1:3 by

age, race, and prior cesarean history. Demographic data, operative details, and perinatal outcomes were abstracted from the medical record and compared between cases and controls using t-test and chi-square as appropriate. Multivariable logistic regression was then performed to identify independent risk factors for RSH.

Results: Of 22,104 cesarean deliveries during the study period, 32 (0.15%) developed postoperative RSH. There were no significant differences between groups in the rates of rectus muscle closure, rectus muscle transection, peritoneal closure, or bladder flap creation (Table 1). Univariate analysis revealed an increased odds of RSH with hypertensive disorders of pregnancy (14.6 vs 34.4%, p = 0.01), placental abruption (0 vs 6.3%, p = 0.01), multiple gestation (3.1 vs 12.5%, p = 0.04), longer duration of cesarean (60.8 vs 78.1 minutes, p = 0.004), anticoagulation during hospitalization (1.0% vs 9.4%, p = 0.02) and post-operative anticoagulation (0 vs 9.4%, p = 0.002) (Table 2). After multivariable adjustment, independent predictors of RSH were anticoagulation during hospitalization (adjusted odds ratio [aOR] 16.3, 95% confidence interval [CI] 1.5–174), multiple gestation (aOR 7.5, 95% CI 1.4–38.3), and cesarean duration > 90 minutes (aOR 8.7, 95% CI 2.8–27.3).

Conclusion: Anticoagulation and prolonged surgical time are independent risk factors for RSH after cesarean delivery. Notably, rectus muscle closure was not associated with RSH.

Table 1: Cesarean Surgical Factors Among Patients With and Without Rectus Sheath Hematoma

	No rectus sheath hematoma (N = 96)	Rectus sheath hematoma (N = 32)	p-value
Cesarean section duration (minutes)[a]	60.8 ± 18.9	78.1 ± 33.5	**0.0004**
Cesarean delivery blood loss (mL)[a]	662.6 ± 229.0	749.8 ± 635	0.95
General anesthesia	2 (2.1%)	2 (6.3%)	0.24
Rectus muscle dissected from overlying fascia	88 (91.7%)	28 (87.5%)	0.48
Rectus muscle transected	7 (7.3%)	0	0.11
Creation of bladder flap	71 (74.0%)	23 (71.9%)	0.82
Peritoneal closure	62 (64.6%)	18 (56.3%)	0.40
Rectus muscle closure	79 (82.3%)	24 (75.0%)	0.37

Variables are presented as n (%) unless otherwise specified
[a]Mean ± SD

Table 2: Demographic and Obstetric Characteristics Among Patients With and Without Rectus Sheath Hematoma

	No rectus sheath hematoma (N = 96)	Rectus sheath hematoma (N = 32)	p-value
Demographics			
Age (y)[a]	35.1 ± 5.6	35.1 ± 5.7	0.99
Body mass index (kg/m^2)[a]	31.1 ± 6.1	31.8 ± 6.1	0.60
Race/ethnicity			
Asian	26 (27.7%)	9 (28.1%)	0.75
Black	12 (12.8%)	4 (12.5%)	
Hispanic	15 (6.0%)	4 (12.5%)	
Indigenous	2 (2.1%)	0 (0)	
White	30 (31.9%)	9 (28.1%)	
Other	9 (9.6%)	6 (18.8%)	
Insurance type			
Private	83 (86.5%)	27 (84.4%)	0.77
Public	12 (12.5%)	5 (15.6%)	
Self-pay	1 (1%)	0	
Medical comorbidities			
Hypertensive disorder of pregnancy[c]	14 (14.6%)	11 (34.4%)	**0.01**
Pre-gestational diabetes	2 (2.1%)	0	0.41
Gestational diabetes	5 (5.2%)	3 (9.4%)	0.40
Autoimmune disease	2 (2.1%)	1 (3.1%)	0.74
Cardiovascular disease	0	0	
Inherited coagulopathy	0	1 (3.1%)	0.08
Receiving anticoagulation (any)	1 (1.0%)	3 (9.4%)	**0.02**
Prior to cesarean	1 (1.0%)	2 (6.3%)	0.09
After cesarean	0	3 (9.4%)	**0.002**
Obstetric characteristics			
Nulliparous	49 (41.0%)	11 (34.4%)	0.10
Gestational age at delivery[a]	38.8 ± 2.1	38.0 ± 2.5	0.06
Neonatal birth weight (g)[a]	3349 ± 600	3086 ± 799	0.05
Multiple gestation	3 (3.1%)	4 (12.5%)	**0.04**
History of prior cesarean	43 (44.8%)	14 (43.8%)	0.92
Any prior abdominal surgery	48 (50%)	15 (46.9%)	0.76
Intrapartum cesarean	30 (31.3%)	7 (21.9%)	0.31
Emergency cesarean	4 (4.2%)	3 (9.4%)	0.26
Labor arrest disorder	14 (14.6%)	2 (6.3%)	0.22
Chorioamnionitis or endometritis	6 (6.3%)	3 (9.4%)	0.55
Placental abruption	0	2 (6.3%)	**0.01**
Pre-delivery platelets[a]	220 ± 62.4	217.0 ± 57.2	0.77
Pre-delivery hemoglobin[a]	12.2 ± 1.1	12.6 ± 1.2	0.13

Variables are presented as n (%) unless otherwise specified
[a]Mean ± SD
[b]Gestational hypertension, preeclampsia, HELLP syndrome, chronic hypertension

640 | Association Between Induction of Labor and Birth Experience: a National Population-Based Study

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4:00 PM - 6:00 PM

Objective: Induction of labor (IOL) is rising in high income countries. The ARRIVE trial, with a selected population due to randomized trials, found increased satisfaction among induced women. However, birth experience in case of IOL should be assessed in real life. Our objective is to assess the association between IOL and birth experience using a national population-based survey

Study Design: Using the French national perinatal survey 2021, we included women with a term singleton cephalic infant and a trial of labor. At 2 months, women answered the question "What kind of memories do you have about your childbirth?". We used univariate and multivariate analyses to assess the association between IOL and birth experience, and weighting to account for missing data. We identified and assessed as potential mediators prolonged labor ≥12 hours and 'birth with intervention or complication' (caesarean and/or operative vaginal delivery and/or PPH and/or OASIS and/or NICU), and estimated the indirect and residual effects using mediation modelling.

Results: Of the 6271 women included in the main analysis, 1800 (28.7 %) underwent IOL. Overall, women with IOL had more often a bad birth experience than women with spontaneous onset of labor (SOL) (16.4% vs 8.8%, p< 0.01), and the association remained significant after adjustment (ORa 1.78 (1.47-2.16)). In case of cervix ripening, the rate of bad birth experience rose to 18.8%. Analyses on a subgroup of women at low maternal risk found similar results. Prolonged labor explained only 6% of the association between IOL and bad experience. Birth with complications or interventions concerned 43.8% of women with IOL and 31.1% with SOL (p< 0.01) and explained 26% of this association.

Conclusion: IOL was associated with a higher risk of bad birth experience than SOL. Only a small part of this association is mediated by medical complications or interventions and prolonged labor. In the context of increase in inductions, our findings underline the importance of considering birth experience in the decision-making and information for women and the need to explore consequences of IOL.

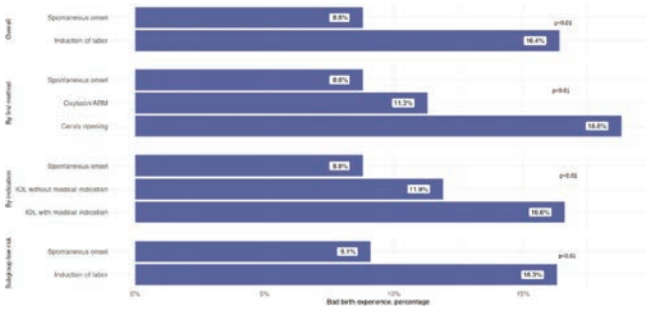

Table 2: Multivariate analysis, to assess the association between IOL and bad birth experience

	Risk of bad experience Adjusted OR
Onset of labor	
Spontaneous onset of labor	*Ref*
Induction of labor	1.78 (1.47 – 2.16)
Age	
< 35 y.o.	*Ref*
>= 35 y.o.	1.04 (0.84 – 1.29)
Parity	
Multiparous	*Ref*
Multiparous with previous cs	1.16 (0.79 – 1.70)
Nulliparous	2.07 (1.70 – 2.52)
Deprivation index [a]	
0	Ref
>=1	1.14(0.85 – 1.53)
Literacy score [b]	
5	Ref
4.01-4.99	1.23 (0.99 – 1.52)
<=4	1.95 (1.58 – 2.42)
Nationality	
France	*Ref*
Other	0.65 (0.46 – 0.91)
Gestational age	
39-40.9 wks	*Ref*
37-38.9 wks	1.03 (0.81 – 1.31)
=> 41 wks	1.28 (0.98 – 1.67)
Composite maternal risk [c]	
Low	Ref
High	1.04 (0.85 – 1.27)
Maternity unit status (N=6265)	
Regional or university hospital	*Ref*
Other public hospital	1.23 (0.96 – 1.56)
Private non-profit hospital	1.05 (0.73 –1.50)
Other private hospital	1.08 (0.80 – 1.45)

Results are expressed as OR with 95% confidence interval. IOL= induction of labor, y.o.= years old, cs= caesarean, wks=weeks, Ref= reference.

[a] The deprivation index considers the following criteria: not living with a partner, receiving RSA, receiving AME state medical aid, or having neither social insurance nor living in their personal dwelling (as owner or leaseholder)

[b] Health literacy measures individuals' motivation and skills for acceding to, understanding, assessing, and using information to make decisions about their health. Health literacy was assessed at 2 months using module 6 (ability to engage with healthcare professionals) of the Health Literacy Questionnaire

[c] composite criterion for maternal risk defined as >= 1 of the following: high medical risk (according to the HAS classification), gestational diabetes, gestational hypertensive disorders

641 | Association of Maternal Hypotension with Abnormal Uterine Artery Dopplers and Small for Gestational Age Neonates

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4:00 PM - 6:00 PM

Objective: To evaluate the association of abnormal uterine artery (UtA) dopplers in patients with persistent hypotension with delivery of a small for gestational age (SGA) neonate. We hypothesize that abnormal blood flow to the uterus may result in smaller neonates.

Study Design: This was a secondary analysis of the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-Be of patients with a singleton gestation at $\geq$ 24 weeks with abnormal UtA dopplers (defined as pulsatility index > 95th percentile for gestational age or presence of a diastolic notch) between 18 weeks 0 days and 23 weeks 6 days gestation. Persistent hypotension was defined as systolic blood pressure < 100 mmHg and/or diastolic blood pressure < 60mmHg at all 3 study visits between 6 weeks 0 days and 29 weeks and 6 days gestation. The primary outcome was delivery of an SGA neonate. Univariable analyses were performed to evaluate demographic and clinical associations with the primary outcome. Multivariable analyses were performed to adjust for potential confounders selected a priori (age, race and ethnicity, insurance status, pre-pregnancy body mass index (BMI), and history of chronic hypertension).

Results: 5,092 patients met inclusion criteria; 137 (2.7%) had persistent hypotension, 4,955 (97.3%) did not. Patients in the hypotension group were less likely to be of White race and Asian ethnicity, and more likely to have public insurance and a lower pre-pregnancy BMI, and less likely to use tobacco within 3 months of pregnancy (Table 1). Patients with persistent hypotension and abnormal UtA dopplers were more likely to deliver an SGA neonate (11.8 vs. 18.2%, p-value 0.025) but this did not persist in multivariable analysis (aOR 1.43, 95% CI 0.91, 2.24). In univariable analysis of secondary outcomes, the hypotension group had a lower median birth weight (3,323 vs. 3,239 grams, p-value 0.01) (Table 2).

Conclusion: In patients with abnormal UtA dopplers, persistent hypotension was not associated with an increased risk of an SGA neonate.

Table 1: Maternal demographics and clinical characteristics

	No persistent hypotension (n=4,955)	Persistent hypotension (n=137)	P-value
Maternal age (years)	28 ± 8	26 ± 10	**<0.001**
Race/Ethnicity			**<0.001**
Non-Hispanic White	3094 (62.4)	58 (42.4)	
Non-Hispanic Black	599 (12.1)	22 (16.1)	
Black	817 (16.5)	34 (24.8)	
Asian	6 (0.11)	0 (0)	
Other	440 (8.9)	22 (16.8)	
Insurance status (n=5,057)			**<0.001**
Public	1361 (27.7)	57 (41.6)	
Private	3511 (71.4)	75 (54.7)	
Other	48 (0.99)	5 (3.65)	
Pre-pregnancy BMI	24.8 ± 7.4	21.8 ± 4.1	**<0.001**
Cigarette use within 3 months of pregnancy (n=2191)	937 (44.0)	39 (6.2)	**0.01**
History of chronic hypertension	95 (1.9)	0 (0.0)	0.10

BMI: body mass index
Data presented as median ±IQR, n (%)

Table 2: Analysis of secondary perinatal outcomes

	No persistent hypotension (n=4,955)	Persistent hypotension (n=137)	P-value
Birthweight (grams)	3323 ± 630	3239 ± 590	**0.01**
Gestational age at delivery (weeks)	39 ± 2	39 ± 2	0.78
Stillbirth	0 (0.0)	0 (0.0)	
Placental abruption	22 (0.4)	0 (0)	0.43
Hypertensive disease of pregnancy	491 (9.0)	7 (5.1)	0.06
Cesarean delivery	1060 (27.4)	24 (22.0)	0.21
Apgar score < 3 at 5 minutes	5 (0.1)	1 (0.7)	0.15
NICU admission	716 (14.5)	15 (10.1)	0.25

Hypertensive disease defined as gestational hypertension, preeclampsia or eclampsia, NICU: neonatal intensive care unit
Data presented as median ±IQR, n (%)

642 | Hybrid Closed-Loop Therapy Versus Standard Therapy for Type 1 Diabetes in Pregnancy: a Meta-Analysis

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4:00 PM - 6:00 PM

Objective: Hybrid closed-loop (HCL) therapy, which integrates an insulin pump with a continuous glucose monitor to automatically adjust basal insulin rates, improves glycemic control in non-pregnant individuals with type 1 diabetes (T1DM). Although it is not yet approved for pregnancy, recent studies suggest potential benefits to HCL in pregnant people with T1DM. This meta-analysis aims to evaluate clinical outcomes associated with HCL vs. standard therapy (ST) during pregnancy.

Study Design: In this meta-analysis, a predefined, systematic, librarian-assisted search of Ovid MEDLINE, Embase, Scopus, Cochrane, ClinicalTrials.gov, and World Health Organization International Clinical Trial Registry Platform initially yielded 295 studies related to HCL in pregnancy. Glycemic metrics (time-in-range, TIR [63-140mg/dL]; time-above-range, TAR; time-below-range, TBR; coefficient of variation, CV; mean glucose; hemoglobin A1c, HbA1c), were compared by trimester in those exposed to HCL vs. ST (i.e. sensor-augmented pump therapy or multiple daily injections). Maternal and neonatal outcomes were secondarily assessed. We calculated standardized mean differences (SMD) and pooled odds ratios (OR) with 95% confidence intervals (CI) using random effects models.

Results: Five studies (3 randomized trials, 1 prospective cohort, 1 case series) published from 2022-24 met eligibility criteria and evaluated 183 pregnancies exposed to HCL vs. 178 exposed to ST. TIR and TAR did not differ by HCL vs. ST in any trimester (Table 1). TBR was lower with HCL use in the 2nd (-1.1% [-2.2%, -0.03%]) and 3rd (-1.4% [-1.9%, -0.8%]) trimesters. CV was also lower with HCL use in the 1st (33.8 vs. 36.1%, SMD -2.6% [95%CI -4.3%, -0.8%]), 2nd (31.6% vs. 33.6%, SMD -2.1% [95%CI -2.9%, -1.3%]), and 3rd (29.1% vs. 30.9%, SMD -1.5% [95%CI -2.2%, -0.8%]) trimesters. Maternal and neonatal outcomes did not differ between groups (Table 2).

Conclusion: Use of HCL for pregnant people with T1DM is associated with lower TBR and glycemic variability, with similar maternal and neonatal outcomes, suggesting a potential safety benefit that warrants further study.

Table 1. Glycemic metrics associated with hybrid closed-loop therapy in pregnancy

Outcome	Hybrid Closed-Loop		Standard Therapy		SMD (95% CI)
	N	Mean[1] (SD)	N	Mean[1] (SD)	
1ST TRIMESTER					
TIR (%)	155	63.8 (10.0)	158	60.6 (9.8)	1.6 (-0.3, 3.5)
TAR (%)	155	32.0 (8.6)	158	34.4 (9.1)	-0.7 (-2.3, 0.9)
TBR (%)	157	3.5 (1.7)	158	4.4 (1.5)	-0.9 (-1.8, 0.1)
CV[2] (%)	139	33.8 (4.2)	143	36.1 (4.8)	**-2.6 (-4.3, -0.8)**
Mean glucose (mg/dL)	156	129.4 (11.3)	156	129.16 (13.5)	1.71 (0.2, 3.2)
HbA1c[2] (%)	112	6.4 (0.4)	116	6.5 (0.5)	-0.07 (-0.2, 0.01)
2nd TRIMESTER					
TIR (%)	182	65.4 (8.8)	178	58.2 (11.3)	5.5 (-0.2, 11.2)
TAR (%)	182	32.2 (10.3)	178	37.2 (8.8)	-3.7 (-10.6, 3.1)
TBR (%)	183	2.4 (1.1)	178	3.3 (1.7)	**-1.1 (-2.2, -0.03)**
CV[2] (%)	166	31.6 (3.8)	175	33.6 (4.5)	**-2.1 (-2.9, -1.3)**
Mean glucose (mg/dL)	180	129.5 (10.4)	178	132.8 (13.1)	0.09 (-7.6, 7.7)
HbA1c[2] (%)	118	6.1 (0.4)	115	6.0 (0.3)	**0.2 (0.1, 0.2)**
3rd TRIMESTER					
TIR (%)	178	71.2 (8.4)	174	66.8 (9.9)	2.6 (-2.9, 8.2)
TAR (%)	178	29.9 (7.5)	174	29.9 (9.2)	1.5 (-5.8, 8.7)
TBR (%)	179	1.8 (1.0)	174	3.2 (1.6)	**-1.5 (-2.2, -0.8)**
CV[2] (%)	163	29.1 (3.4)	159	30.9 (4.0)	**-1.4 (-1.9, -0.8)**
Mean glucose (mg/dL)	178	122.9 (8.9)	174	124.4 (12.4)	3.1 (-4.8, 11.0)
HbA1c[2] (%)	110	6.4 (0.3)	109	6.2 (0.3)	0.2 (-0.1, 0.5)

Abbreviations: SD—standard deviation, SMD—standardized mean difference, CI—confidence interval, TIR—time-in-range (63-140 mg/dL), TAR—time-above-range (>140 mg/dL), TBR—time-below-range (<63 mg/dL), CV—coefficient of variation (i.e. glycemic variability), HbA1c—hemoglobin A1c

[1]Means are weighted based on number of participants in each treatment arm for each study.

[2]Denotes only 4 studies report this outcome.

Table 2. Maternal and neonatal outcomes associated with hybrid closed-loop therapy

Outcome (n, %) or mean (SD)	# Studies	Hybrid Closed-Loop n/N (%) or mean[1] (SD)	Standard Therapy n/N (%) or mean[1] (SD)	Pooled OR or SMD (95% CI)
MATERNAL OUTCOMES				
Cesarean birth	4	111/172 (64.5)	112/171 (65.5)	-0.05 (-0.6, 0.5)
HDP	4	35/169 (20.7)	44/169 (26.0)	-0.2 (-0.9, 0.6)
GWG[2] (kg)	4	12.4 (5.1)	13.3 (5.7)	-1.0 (4.0, 2.1)
NEONATAL OUTCOMES				
Preterm birth (<37 weeks)	4	58/172 (33.7)	43/171 (25.1)	0.4 (-0.3, 1.0)
LGA (BW >90th %ile)	4	93/171 (54.4)	97/170 (57.1)	-0.1 (-0.7, 0.4)
Macrosomia (BW >4000g)	4	39/171 (22.9)	34/170 (20.0)	0.2 (-0.7, 1.1)
Hypoglycemia[3]	4	66/165 (40.1)	58/158 (36.7)	0.2 (-0.5, 0.8)
Hyperbilirubinemia	2	49/163 (30.1)	42/164 (25.6)	0.4 (-0.2, 1.1)
Respiratory distress	3	19/164 (11.6)	19/159 (11.9)	-0.05 (-0.7, 0.6)
NICU admission	4	41/171 (24.0)	40/166 (24.1)	0.04 (-0.5, 0.6)

Abbreviations: OR—odds ratio, SMD—standardized mean difference, CI—confidence interval, HDP—hypertensive disorders of pregnancy, GWG—gestational weight gain, BW—birthweight, LGA—large-for-gestational age neonate, SGA—small-for-gestational age, NICU—neonatal intensive care unit

[1]Means are weighted based on number of participants in each treatment arm for each study.

[2]GWG was reported for 163 pregnant individuals using hybrid-closed loop therapy versus 159 pregnancies managed with standard therapy.

[3]Neonatal hypoglycemia is defined as capillary blood glucose <40mg/dL in the first 24 hours of life.

643 | Clinical Outcomes in Pregnant People with Type 1 Diabetes: Does Age of Diabetes Onset Matter?

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4:00 PM - 6:00 PM

Objective: Metabolic differences exist between childhood- and adult-onset type 1 diabetes mellitus (T1DM), yet how these may be associated with perinatal outcomes is poorly understood. We aimed to evaluate the association of age of onset of T1DM with antenatal glycemic control and perinatal outcomes.

Study Design: In this single-center retrospective cohort study (2018-2023), we compared pregnant people with childhood- (< 18 years of age) vs. adult-onset (≥18 years of age) T1DM who used a continuous glucose monitor (CGM). We assessed maternal (gestational weight gain [GWG], hypertensive disorders of pregnancy [HDP], cesarean birth), neonatal (preterm birth [PTB], large-for-gestational age, neonatal intensive care unit admission, hypoglycemia), and glycemic outcomes (CGM metrics, hemoglobin A1c [HbA1c]; by trimester). Multivariable logistic and linear regression were used to determine adjusted odds ratios (aOR) or β-coefficients (β) and 95% confidence intervals (CI), adjusted for pre-gravid body mass index (BMI).

Results: Of 102 eligible individuals, 61 (60%) had childhood-onset T1DM. Individuals with childhood-onset (vs. adult-onset) T1DM were younger (32 vs. 35 years old, p = 0.01) and had higher pre-gravid BMI (26 vs. 24 kg/m^2, p = 0.01). Although HDP was more frequent among those with childhood-onset T1DM (39% vs. 27%), adjusted odds of all maternal outcomes were similar by age of onset (Table 1). The adjusted odds of PTB (aOR 3.48 [95% CI 1.02, 11.8]) were higher in individuals with childhood-onset, compared to those with adult-onset T1DM, but all other neonatal outcomes were similar. Childhood-onset (vs. adult-onset) T1DM was associated with lower 1st trimester time-in-range (57% vs. 65%, β -7.36 [95% CI 0.63, 14.08]); all other per-trimester glycemic metrics were similar between groups (Table 2).

Conclusion: Childhood-onset, compared to adult-onset, T1DM is associated with higher odds of PTB, but similar glycemic

control in pregnancy aside from lower 1st trimester TIR. These findings may inform risk counseling and surveillance in those with childhood-onset T1DM to mitigate risk of adverse perinatal outcomes.

Table 1. Maternal and neonatal outcomes

Outcomes	Adult-onset T1DM median (IQR) or n (%) N=41	Childhood-onset T1DM median (IQR) or n (%) N=61	Adjusted OR[1] or β-coefficient[1] (95% CI)
MATERNAL OUTCOMES			
GWG (kg)	16.2 (12.2-19.7)	15.7 (11.3-20.0)	-0.27 (-2.88, 2.34)
HDP	11 (26.8)	24 (39.3)	1.52 (0.62, 3.69)
Cesarean birth	17 (41.5)	35 (57.4)	1.69 (0.74, 3.85)
NEONATAL OUTCOMES			
PTB	4 (9.8)	15 (24.6%)	3.48 (1.02, 11.81)
LGA	10 (24.4)	22 (36.1%)	1.91 (0.77, 4.75)
NICU admission	7 (17.1)	15 (25.9%)	1.36 (0.48, 3.89)
Neonatal hypoglycemia[2]	11 (26.8)	27 (46.6%)	2.41 (1.00, 5.83)

[1]Adjusted for pre-gravid body mass index.
[2]Neonatal hypoglycemia was defined as capillary blood glucose < 40mg/dl in the first 24 hours of life.
Abbreviations: T1DM—type 1 diabetes mellitus, IQR–interquartile range, OR—odds ratio, CI–confidence interval, GWG–gestational weight gain, HDP–hypertensive disorders of pregnancy, PTB—preterm birth (< 37+0 weeks), LGA—large-for-gestational age (birthweight >90th percentile), NICU—neonatal intensive care unit

Table 2. Glycemic metrics by trimester

Outcome	Adult-onset T1DM median (IQR)	Childhood-onset T1DM median (IQR)	Adjusted β-coefficient[1] (95% CI)
1ST TRIMESTER	N=26	N=45	
TIR (%)	65.2 (58.0-75.4)	57.0 (49.1-65.4)	7.36 (0.63, 14.08)
TAR (%)	28.2 (16.2-36.0)	36.4 (24.6-46.4)	-7.49 (-15.45, 0.47)
TBR (%)	6.6 (3.0-8.8)	6.7 (2.3-9.6)	-0.10 (-2.85, 2.66)
CV (%)	33.4 (29.1-37.5)	35.2 (32.4-39.0)	-0.97 (-3.97, 2.03)
Mean Glucose (mg/dl)	123.8 (113.3-131.0)	132.3 (116.3-143.8)	-7.94 (-19.36, 3.48)
HbA1c (%)	6.1 (5.5-6.5)	6.3 (5.6-6.6)	-0.14 (-0.61, 0.32)
2nd TRIMESTER	N=29	N=51	
TIR (%)	67.4 (61.6-79.6)	63.8 [56.9-70.4)	2.61 (-3.93, 9.14)
TAR (%)	25.0 (12.7-31.9)	28.2 (19.0-36.7)	-2.35 (-9.90, 5.20)
TBR (%)	7.7 (4.2-9.7)	8.2 (4.0-11.5)	-0.29 (-3.16, 2.57)
CV (%)	31.2 (26.9-34.5)	33.4 (30.5-36.0)	-1.59 (-4.30, 1.12)
Mean Glucose (mg/dl)	119.3 (106.3-125.2)	121.1 (109.4-131.6)	-1.02 (-10.52, 8.48)
HbA1c (%)	5.8 (5.3-6.2)	5.8 (5.4-6.2)	0.07 (-0.22, 0.36)
3rd TRIMESTER	N=29	N=51	
TIR (%)	70.6 (59.7-80.4)	67.4 (61.0-73.7)	2.35 (-3.19, 7.89)
TAR (%)	23.3 (12.2-28.5)	25.8 [15.2-32.9)	-1.70 (-8.02, 4.62)
TBR (%)	6.1 (3.7-7.0)	6.9 (3.0-9.3)	-0.09 (-3.24, 1.55)
CV (%)	29.3 (24.7-33.2)	31.3 (28.5-32.8)	-1.62 (-4.24, 0.99)
Mean Glucose (mg/dl)	116.8 (106.6-121.1)	119.2 (109.8-126.6)	-1.51(-8.70, 5.68)
HbA1c (%)	5.9 (5.6-6.2)	6.0 (5.5-6.6)	-0.06 (-0.35, 0.23)

[1]Adjusted for pre-gravid body mass index.
Abbreviations: T1DM—type 1 diabetes mellitus, IQR–Interquartile range, TIR—time-in-range (63-140 mg/dL), TAR—time-above-range (>140 mg/dL), TBR—time-below-range (<63 mg/dL), CV—coefficient of variation (i.e. glycemic variability), HbA1c—hemoglobin A1c

644 | Diagnostic rate of Pulmonary Embolism during Pregnancy: An update on VQ vs CT

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4:00 PM - 6:00 PM

Objective: Diagnosing pulmonary embolism (PE) during pregnancy can be challenging. We sought to compare PE diagnosis rates during pregnancy based on the original imaging modality of ventilation-perfusion (VQ) scan versus CT angiography (CTA).

Study Design: We performed a retrospective chart review of pregnant participants who underwent either VQ scan or CTA due to clinical suspicion of PE from January 2018- April 2024 at a single academic institution. Patients who underwent imaging for other clinical reasons, postpartum patients, and deliveries at an outside hospital were excluded. Our primary outcome was a scan considered diagnostic by the radiology read. Secondary outcomes included if a second imaging modality was pursued for diagnosis and reasons why initial imaging was non-diagnostic. Chi-squared, Fisher's exact, Student's t and Wilcoxon Rank sum tests were used as appropriate.

Results: 113 patients were included; 80 (71%) were imaged by VQ scan, and 33 (29%) were imaged by CTA. Baseline demographics and major VTE risk factors were similar between groups, including BMI and trimester of pregnancy; most patients were in the third trimester (Table 1). Diagnostic rates were similar between VQ and CTA groups (62.5% v 72.7%, P = 0.29), and 33.3% of patients in each group with non-diagnostic findings underwent further testing to evaluate for PE (Table 2). PE was present in a minority of patients in both cohorts, and most non-diagnostic scans were due to poor timing of dye/opacification of vessels (Table 2).

Conclusion: Despite improvements in technological imaging studies, many studies of both VQ and CTA are non-diagnostic to exclude PE in pregnancy. Causes for non-diagnostic imaging studies should be investigated in the future.

Table 1: Comparison between CT and V/Q scan group

	V/Q Scan (n=80)	CT Scan (n=33)	P – value
Demographic variables			
Age	27.9 ±5.6	27.5±7.2	0.74
Trimester	--	--	0.51*
1st trimester*	4 (5.0%)	3 (9.1%)	
2nd trimester	23 (28.8%)	11 (33.3%)	
3rd trimester	53 (66.3%)	19 (57.6%)	
Multiple gestation	7 (8.8%)	3 (9.1%)	1.0*
Race			0.70*
Black	39 (48.8%)	18 (45.5%)	
Caucasian	40 (50.0%)	17 (51.5%)	
Asian	0 (0%)	0 (0%)	
Other	1 (1.3%)	1 (3.0%)	
BMI	31.7 (27.4, 36.0)	31.5 (25.4, 38)	0.97
Illicit drug use in pregnancy	13(18.5%)	9 (27.3%)	0.19
Tobacco use in pregnancy	9 (11.5%)	8 (24.2%)	0.09
Alcohol use in pregnancy	2 (2.6%)	2 (6.1%)	0.58*
Surgery during pregnancy	8 (10.1%)	3 (9.1%)	1.0*
Asthma	21 (26.3%)	9 (27.3%)	0.91
Chronic hypertension	21 (26.3%)	10 (30.3%)	0.66
Hypertensive disorder of pregnancy	44 (55.0%)	17 (51.1%)	0.86
Pregestational diabetes	6 (7.5%)	4 (12.1%)	0.47*
Gestational diabetes	7 (8.8%)	3 (9.1%)	1.0*
Major VTE risk factors			
Personal history of DVT/PE	11 (13.8%)	4 (12.1%)	1.0*
Clotting disorder	6 (7.5%)	0 (0%)	0.18*
Sickle cell disease	6 (7.5%)	1 (3.0%)	0.67*
Nephrotic range proteinuria	0 (0%)	1 (3.0%)	0.29*
Maternal autoimmune disorder	13 (16.3%)	8 (24.2%)	0.32

*= Fisher's Exact test
Dated reported as number (percentage), median (interquartile range) or mean ± SD, as appropriate

Table 2: Outcomes

	V/Q Scan (n=80)	CT Scan (n=33)	P-value
Scan diagnostic	50 (62.5%)	24 (72.7%)	0.29
Further PE workup after first scan	10 (33.3%)	3 (33.3%)	1.0*
PE present	2 (4%)	4 (16.7%)	0.08
Why was scan non-diagnostic?			
CTA (n=9)			
No reason indicated	0		
Artifact (motion)	4		
Poor timing of dye	5		
Poor opacification of vasculature	6		
Body habitus (larger BMI)	1		
Other	0		
Multiple reasons	4		
VQ scan (n=30)			
Reason not documented	11		
Perfusion only study	2		
Lung abnormality on imaging obscuring diagnosis	8		
Other	9		
Multiple reasons	1		

645 | First-Trimester Fasting Glucose Levels Associated with Abnormal Glucose Challenge and Tolerance Tests Later in Pregnancy

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4:00 PM - 6:00 PM

Objective: Gestational diabetes mellitus (GDM) is diagnosed using an initial glucose challenge test (GCT), and if exceeds 140 mg/dL is followed by an oral glucose tolerance test (OGTT). The definition of pathological first-trimester fasting glucose (FG) is controversial, and its correlation with abnormal GCT and OGTT is not well established. This study aims to evaluate the association between first-trimester FG levels and pathological GCT and OGTT results.

Study Design: We retrospectively analyzed the electronic medical records of a large healthcare provider searching for individuals who delivered between 2012 and 2024. Inclusion criteria were singleton pregnancies and a documented first-trimester FG, excluding those with preexisting diabetes. Only the first documented pregnancy was included. We assessed the cohort's distribution of first-trimester FG values and compared the rates of abnormal GCT and OGTT between those with FG above and below the 95th percentile (two standard deviations). The primary outcome was the incidence of abnormal GCT and OGTT above vs. below the 95th percentile of FG.

Results: The study comprised 202,960 individuals who met the inclusion criteria. The mean first-trimester FG level was 84.6±9.9 mg/dL, and the 95th percentile was 100 mg/dL. Those with an FG≥100 mg/dL were older and had a higher BMI (31.0±5.7 vs. 29.8±5.5 years, p< 0.001 and 28.2±6.7 vs. 25.1±14.9 kg/m^2, p< 0.0001, respectively). Moreover, they had higher pathological rates of GCT and OGTT (19.2% vs. 13.1%, p>0.001, and 6.9% vs. 2.4%, p>0.001, respectively). We observed a positive association between increasing FG levels and pathological GCT and OGTT results **(Fig. 1)**.

Conclusion: First-trimester fasting glucose levels of 100mg/dL or higher are significantly associated with increased rates of pathological glucose challenge test and oral glucose tolerance test. Further consideration should be given to adjusting pregnancy management for these high-risk populations.

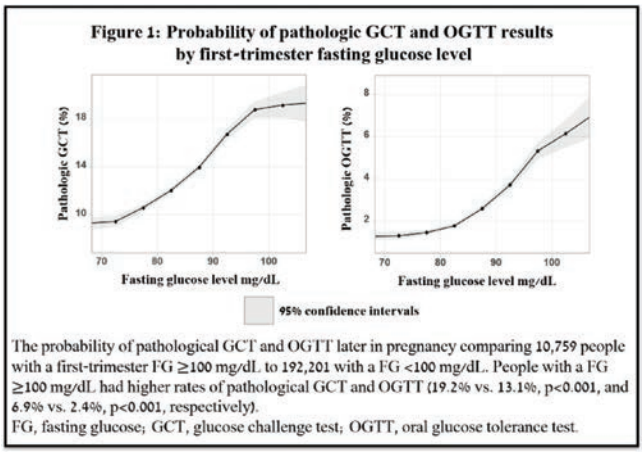

Figure 1: Probability of pathologic GCT and OGTT results by first-trimester fasting glucose level

The probability of pathological GCT and OGTT later in pregnancy comparing 10,759 people with a first-trimester FG ≥100 mg/dL to 192,201 with a FG <100 mg/dL. People with a FG ≥100 mg/dL had higher rates of pathological GCT and OGTT (19.2% vs. 13.1%, p<0.001, and 6.9% vs. 2.4%, p<0.001, respectively).
FG, fasting glucose; GCT, glucose challenge test; OGTT, oral glucose tolerance test.

646 | Fetal Fibronectin for Prediction of Spontaneous Labor at Term

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4:00 PM - 6:00 PM

Objective: Elective induction of labor (IOL) at 39 weeks reduces cesarean delivery; however, many individuals hope to labor spontaneously and be informed participants in IOL decision-making. Fetal fibronectin (fFN) predicts risk of spontaneous preterm delivery. We sought to determine if fFN predicts spontaneous term labor.

Study Design: Prospective observational multicenter study within one healthcare system. Nulliparous patients without a medical indication for IOL prior to 41 weeks were offered enrollment at their 38-week prenatal visit. After informed consent, a provider collected a fFN and performed a cervical exam. The primary outcome was spontaneous onset of labor. The predictor of interest, quantitative fFN value, was dichotomized to positive (≥50 ng/mL) or negative (< 50 ng/mL) based on qualitative standards in the US. Secondary outcomes included time from study visit until delivery admission. Logistic and Cox proportional hazards regression were used; adjusted models controlled for gestational age and Bishop score at study visit.

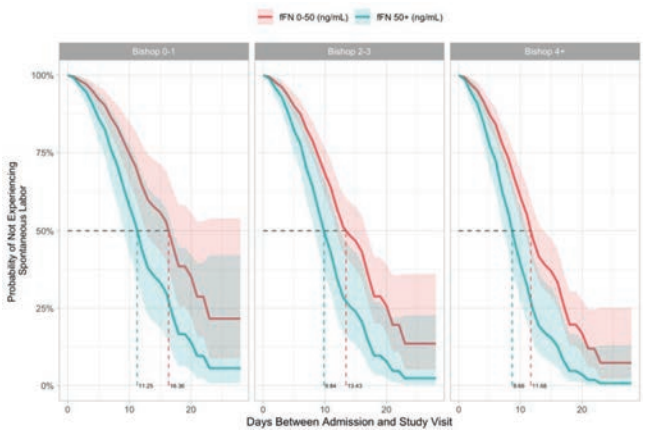
Results: 290 patients consented, of whom 284 were included in the analysis with a mean age of 30.1 years and BMI of 24.9. 59% were White, and 22% delivered by cesarean. 173 (60.9%) went into spontaneous labor and 109 (38.4%) were induced, of which 32 (29.4%) were medically indicated and 67 (61.5%) were elective inductions prior to 41 weeks. Mean quantitative fFN value was 46 ± 109 ng/mL, and mean Bishop score was 3.6 ± 2.2 cm. A positive fFN was associated with an increased odds of spontaneous labor (aOR 2.16, 95% CI 1.04–4.86, Table). All patients with a positive fFN who were not induced prior to 40w6d (medically indicated or elective) entered labor spontaneously. A positive fFN was associated with an increased adjusted hazard of spontaneous labor (aHR 1.88, 95% CI 1.27–2.78, Figure), which

persisted after accounting for potential informative censoring due to non-spontaneous deliveries.

Conclusion: A positive fFN is associated with an increased odds of spontaneous labor after 38 weeks. Our findings may help in counseling patients considering elective IOL after 39 weeks.

Table. *Unadjusted and adjusted odds ratios (OR) for spontaneous labor at term*

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
fFN ≥ 50 vs < 50 (ng/mL)	2.29 (1.11, 5.11)	2.16 (1.04, 4.86)
GA at visit (days)	1.00 (0.87, 1.14)	1.00 (0.87, 1.15)
Bishop Score		
≤ 1	Referent	Referent
2-3	1.44 (0.72, 2.88)	1.44 (0.72, 2.89)
≥ 4	2.11 (1.07, 4.20)	2.05 (1.03, 4.10)



647 | Neonatal Outcomes in Individuals with Periviable Pre-Eclampsia

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University of Rochester, Rochester, NY

4:00 PM - 6:00 PM

Objective: To compare neonatal outcomes in pregnancies complicated by pre-eclampsia versus patients without pre-eclampsia between 22w0d and 25w0d.

Study Design: Retrospective cohort study utilizing the Registry of Obstetrical Determinants of Neonatal Survival (ODNS) of pregnancies with delivery between 22w0d-25w0d. Individuals with preeclampsia were compared to individuals delivered during the same gestational age without preeclampsia. The primary outcome is a composite measure of neonatal outcomes which includes neonatal death (death within 120 days of delivery), seizures, necrotizing enterocolitis requiring surgery, oxygen dependence at discharge or at 120 days of age, Grade III or IV retinopathy of prematurity and Grade III/IV CNS hemorrhage. Multivariate analysis was performed with Pearson Chi-squared tests, fisher's exact test to analyze categorical variables and two tailed test to analyze continuous variables.

Results: A total of 339 pregnancies met inclusion criteria. 18(5.3%) was delivered for severe pre-eclampsia while 321(94.75%) delivered for other indications. Both groups were similar in terms of umbilical pH, estimated gestational age, number of days on a ventilator and number of days spent in the NICU. There was a significant difference in the median birth weight of the pre-eclampsia group compared to the non-pre-eclampsia group (519grams versus 614gram, P = 0.016) In the pre-eclampsia group, 6(33.3%) of neonates were alive at 120 days of birth, compared to 121(37.7%) in the non-pre-eclampsia group(p = 0.806). The composite neonatal outcome was similar between both groups (16(88.%) for preE vs 274(84.8%), p = 0.638).

Conclusion: Infants born in the periviable period secondary to preeclampsia experience similar neonatal outcomes in comparison to other indications for preterm delivery.

	No pre-Eclampsia n(%)	Pre-Eclampsia n(%)	P-Value
Gestational age at delivery in weeks (Median)	24	23.8	0.712
Birth weight in grams (Median)	614	519	0.036
Composite outcome	274(84.8)	16(88.9)	0.638
Neonatal death	200(62.3)	12(66.7)	0.710
Retinopathy of prematurity	44(13.6)	3(6.4)	0.936
Oxygen requirement	43(13.3)	3(16.7)	0.486
Intraventricular hemorrhage	50(15.5)	2(11.1)	0.317
Necrotizing enterocolitis	11(3.4)	0	0.661
Seizures	28(8.7%)	0	0.416
Umbilical cord PH(Median)	7.31	7.26	0.122
Number of days on mechanical Ventilator (Median)	6	4	0.897
Number of days in NICU (Median)	12	14	0.345
Number of days infant survived (Median)	3	8	0.695

648 | Neonatal Survival in Individuals with Periviable Pre-Eclampsia

Tejumola Apata; Sarah Crimmins
University of Rochester, Rochester, NY

4:00 PM - 6:00 PM

Objective: To compare neonatal survival in pregnancies complicated by preeclampsia versus patients without pre-eclampsia(preE) between 22w0d and 24w6d.

Study Design: Retrospective cohort study utilizing the US Vital Statistic Natality Birth Data of pregnancies with delivery between 22w0d-24w6d from 2018 to 2022. Individuals with preeclampsia were compared to individuals delivered during the same gestational age without preeclampsia. The primary outcome is infant survival as documented at the time of birth certificate report . Secondary outcomes include neonatal seizures and assisted ventilation for >6 hours. Multivariate analysis was completed with Pearson Chi-squared tests to analyze categorical variables.

Results: A total of 38,024 met inclusion criteria. 253(0.7%) of pregnancies were affected by PreE while 37,660(99.0%) did not have preE. At the time of the birth certificate report, 201(79.4%) infants survived in the preE group compared to 26,691(70.9%) infants in the non-preE group(P< 0.003, OR 1.6; 95% CI: 1.18-2.20). However, when analyzed by gestational age week by week, neonatal survival rates were similar between the two groups: [22 weeks (18(52.9%) preE vs. 3,832(44.7%) non-preE, P = 0.336), 23 weeks(69(78.4%) preE vs. 8,922(72.1%) non- preE, P = 0.095, and at 24 weeks(114(87.0%) preE vs.13,937(84.4%) non- preE, p = 0.530]. There is a statistically significant difference in number of neonates with seizures (0.4% in the preE group vs 0.2% in the non- preE group P< 0.001) and neonates requiring ventilation for more than 6 hours (33.1% in the preE group versus 32.9% in the non-preE group p< 0.001).

Conclusion: The overall survival of neonates born in the periviable period in pregnancies complicated by preeclampsia

is 79.4%. The chance of survival increases with each week of continued pregnancy in the periviable period. Given the rarity of periviable preeclampsia, the rates of survival are similar to neonates born in the periviable period for other indications.

649 | Deliveries with a Disability Diagnosis and Risk for Adverse Maternal Outcomes in the U.S., 2000-2021

Teresa C. Logue[1]; Fabrizio Zullo[2]; Suneet P. Chauhan[3]; Kartik K. Venkatesh[4]; Timothy Wen[5]
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4:00 PM - 6:00 PM

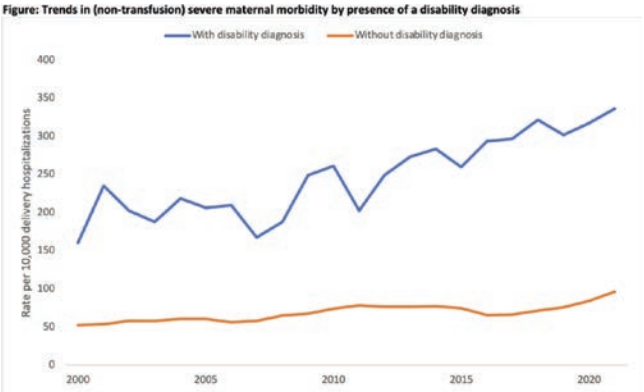
Objective: There is limited data on pregnancy outcomes of people with disabilities. People with disabilities are more likely to have chronic conditions and adverse social determinants of health, which are risk factors for pregnancy complications. We evaluated the association between disability diagnosis and severe maternal morbidity (SMM) and other adverse outcomes.
Study Design: We conducted a serial cross-sectional analysis of delivery hospitalizations with a physical, intellectual or sensory disability diagnosis in the National Inpatient Sample during 2000-2021. Our primary outcome was non-transfusion SMM. Secondary outcomes were transfusion, hypertensive disorders of pregnancy (HDP), preterm delivery (PTD), and maternal death. We described temporal trends in SMM by presence of any disability, reporting average annual percent change (AAPC). We fit logistic regression models to evaluate the association between any disability and our outcomes, adjusting for demographic and obstetric factors and chronic conditions. In subgroup analyses, we evaluated risk for SMM by disability type.
Results: Of 83.7 million total deliveries, 857,876 (1.0%) had a disability diagnosis, with 83.8% of disabilities physical, 6.0% intellectual, and 10.2% sensory. Deliveries with any disability had threefold higher risk of SMM (2.7% vs 0.7%; adjusted OR [aOR] 3.33, 95% CI 3.22, 3.44) as well as higher risk for transfusion (aOR 2.02, 95% CI 1.94, 2.09), HDP (aOR 1.50, 95% CI 1.47, 1.52), PTD (aOR 1.38, 95% CI 1.36, 1.41) and death (unadjusted OR 8.26, 95% CI 6.43, 10.61). Risk for SMM was elevated across all disability types but highest in the setting of physical disability (aOR 3.37, 95% CI 3.25, 3.49). Incidence of SMM among deliveries with any disability increased from 2000 to 2021 (AAPC 3.1%, 95% CI 2.4%, 3.8%).
Conclusion: Pregnant people with disabilities have threefold higher risk of SMM, even after adjusting for social risk factors and chronic disease. This risk persists across all disability types and is increasing over time. Future research is needed to develop interventions to improve pregnancy outcomes in this population.

Table: Unadjusted and adjusted odds for adverse maternal outcomes with a disability diagnosis

	Any disability diagnosis (n=857,876)	No disability diagnosis (n=82,795,931)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)
Adverse outcomes				
Severe maternal morbidity	22,762 (2.7%)	565,792 (0.7%)	3.96 (3.83, 4.10)	3.33 (3.22, 3.44)
Sensitivity analysis of SMM by disability type:				
Physical disability			*3.94 (3.81, 4.09)*	*3.37 (3.25, 3.49)*
Intellectual disability			*3.43 (3.01, 3.90)*	*2.79 (2.45, 3.18)*
Sensory disability			*4.35 (3.99, 4.74)*	*3.03 (2.78, 3.31)*
Blood transfusion	16,940 (2.0%)	757,202 (0.9%)	2.18 (2.10, 2.26)	2.02 (1.94, 2.09)
Hypertensive disorders of pregnancy	117,159 (13.7%)	6,932,913 (8.4%)	1.73 (1.70, 1.76)	1.50 (1.47, 1.52)
Preterm delivery	75,606 (8.8%)	5,175,062 (6.3%)	1.45 (1.42, 1.48)	1.38 (1.36, 1.41)
Maternal death	360 (0.04%)	4,212 (0.01%)	8.26 (6.43, 10.61)	-

Estimates in the table demonstrate likelihood of adverse outcomes in the presence compared to the absence of a disability diagnosis. All adjusted models include maternal age category, race, payer, presence of obstetrical factors (including multiple gestation) and presence of chronic medical conditions (including obesity, pregestational diabetes, chronic hypertension and smoking.) Adjusted analyses were not performed for maternal death given the small numerators involved.

Figure: Trends in (non-transfusion) severe maternal morbidity by presence of a disability diagnosis



The rate of non-transfusion severe maternal morbidity among patients with a disability diagnosis increased from 161 to 336 per 10,000 delivery hospitalizations over 2000-2021 (AAPC 3.1%, 95% CI 2.4%, 3.8%) compared to 53 to 97 per 10,000 delivery hospitalizations among patients without a disability diagnosis (AAPC 2.7%, 95% CI 1.2%, 4.2%).

650 | Patient-Directed Discharge During Antepartum Hospitalization and Risk for Adverse Outcomes at Delivery

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4:00 PM - 6:00 PM

Objective: Antepartum (AP) hospitalizations are typically unplanned and often cause social stress. Patients with social and mental health risk factors may be more likely to leave the hospital via patient-directed discharge (PDD). We evaluated predictors of PDD at AP hospitalization and the effect of AP PDD on risk for adverse outcomes at delivery.
Study Design: We conducted a serial cross-sectional analysis of October-December delivery hospitalizations with an AP admission in the preceding 9 months included in the National Readmissions Database during 2016-2021. Our primary exposure was PDD (versus routine discharge) at first AP hospitalization. Using the chi-square test, we evaluated the association between demographic and clinical factors and AP PDD. Using survey-adjusted logistic regression, we evaluated the association between AP PDD and the following adverse outcomes at delivery: non-transfusion severe maternal morbidity (SMM), transfusion, hypertensive disorders (HDP), preterm delivery (PTD) and stillbirth.
Results: We identified 152,748 AP hospitalizations with delivery follow-up in NRD during 2016-2021, with 3.3% of AP discharges

categorized as PDD. Compared to routine discharge, AP PDD was associated with higher likelihood of any mental health condition (38.4% vs 27.0%; p< 0.01), any substance use disorder (44.4% vs 14.1%, p < 0.01), lowest income quartile (45.2% vs 36.0%; p< 0.01), and Medicaid insurance (78.8% vs 57.9%; p < 0.01). At delivery, history of AP PDD was associated with increased risk for SMM (adjusted OR [aOR] 1.42, 95% CI 1.16, 1.73), transfusion (aOR 1.63, 95% CI 1.32, 2.02), HDP (aOR 1.44, 95% CI 1.28, 1.61), PTD (aOR 1.45, 95% CI 1.29, 1.63) and stillbirth (aOR 1.80, 95% CI 1.39, 2.33).

Conclusion: About 3% of antepartum patients will self-discharge. Patient-directed discharge is more common in patients with adverse social determinants of health and mental health conditions. PDD is associated with higher risk of adverse delivery outcomes. Screening for PDD risk factors during antepartum admission and providing interventions to at-risk patients may reduce adverse delivery outcomes.

Figure: Percent of antepartum patient-directed discharges associated with any mental condition, any substance use disorder, lowest income quartile and Medicaid insurance:

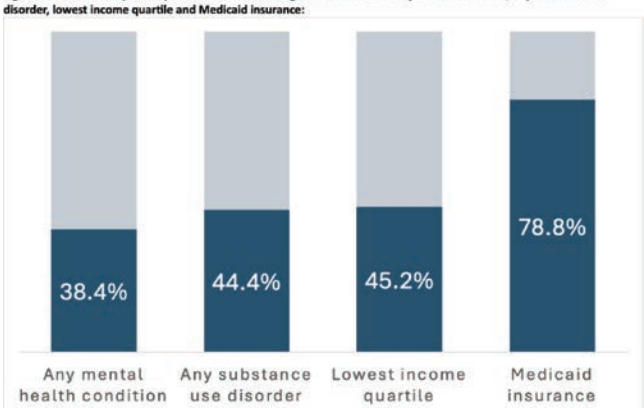

Table: Unadjusted and adjusted odds for adverse delivery outcomes following antepartum patient-directed discharge (PDD)

	Patient-directed discharge at antepartum hospitalization (n=5,077)	Routine discharge at antepartum hospitalization (n=147,671)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)
Adverse maternal outcomes				
Severe maternal morbidity	203 (4.0%)	3784 (2.6%)	1.59 (1.30, 1.93)	1.42 (1.16, 1.73)
Blood transfusion	204 (4.0%)	3619 (2.5%)	1.67 (1.36, 2.05)	1.63 (1.32, 2.02)
Hypertensive disorders of pregnancy	1218 (24.0%)	27188 (18.4%)	1.40 (1.25, 1.56)	1.44 (1.28, 1.61)
Preterm delivery	758 (14.9%)	15585 (10.6%)	1.49 (1.33, 1.67)	1.45 (1.29, 1.63)
Stillbirth	135 (2.7%)	1983 (1.3%)	2.00 (1.56, 2.57)	1.80 (1.39, 2.33)

Estimates in the table demonstrate odds in the presence of patient-directed discharge compared to provider-directed discharge at antepartum hospitalization. All adjusted models include maternal age category, payer, presence of obstetrical factors (including multiple gestation) and presence of chronic medical comorbidities (including obesity, pregestational diabetes, chronic hypertension and smoking.)

651 | Environmental Protection Agency (EPA) National Walkability Index: Does it Effect Weight Gain in Gdm Pregnancies?

Thomas Owens[1]; Erica Glaser[2]; Johanna Suskin[3]; Guillaume Stoffels[4]; Mia A. Heiligenstein[5]; Olivia Grubman[6]; Xiteng Yan[2]; Zainab Al-Ibraheemi[1]; Lois Brustman[1]

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4:00 PM - 6:00 PM

Objective: An important factor in the management of gestational diabetes (GDM) is exercise. The primary aim of this study was to assess neighborhood walkability and weight gain from time of diagnosis of GDM, and total weight gain of the pregnancy.

Study Design: This is a retrospective cohort study of pregnant patients that were diagnosed with GDM at an academic center between 2018-2023. Patients' addresses at the time of their gestation were correlated with the EPA National Walkability Index. The categories of walkability index included: least walkable(score 1-5), below average(6-10), above average(11-15), and most walkable(16-20). Descriptive statistics and restricted cubic spline plot were used. Multivariate analysis was conducted adjusting for median income, age, BMI, gravidity, parity, race, and hypertension.

Results: 1231 patients were identified. There were 81 patients(6.6%) in the least walkable group, 225 patients(18.3%) in the below average walkable group, 428 patients(34.8%) in the above average walkable group, and 497 patients(40.4%) in the most walkable group.The above-average walkable group(scores 10.51 to 15.25) was defined as the reference group, as it included the median walkability score. In multivariable analysis, the total weight gain of patients in the least walkable group was, on average, 5.42 pounds greater compared to the reference group(p< 0.0001)(table 1). The relationship between walkability score and total weight gain was approximately linear(Fig. 1). In the adjusted linear trend analysis, each unit increase in walkability score was associated with a 0.40-pound decrease in total weight gain (p< 0.0001)(table 1). Additionally, each unit increase in walkability score was associated with a 0.25-pound decrease from time of GDM diagnosis(p< 0.0001).

Conclusion: This study suggests that patients with GDM who live in a lower walkability area are more likely to gain weight during their pregnancy. Therefore, it's important when providers are counseling patients with GDM to stress the relationship of exercise to weight gain and how that may impact blood glucose control.

		Unadjusted		Adjusted	
(Table 1) Outcome	**Walkability score**	**Odds ratio or Absolute change (95% CI)**	**P value**	**Odds ratio or Absolute change (95% CI)**	**P value**
Total weight gain§§					
	1-5.75	5.00 (2.32, 7.68)	0.0003	5.42 (2.73, 8.12)	<0.0001
	5.76-10.50	1.63 (-0.19, 3.45)	0.08	1.68 (-0.14, 3.49)	0.07
	10.51-15.25 (ref)	1.00	--	1.00	--
	15.26-20	-1.36 (-2.82, 0.10)	0.07	-1.45 (-2.89, -0.01)	0.049
	Linear trend	-0.38 (-0.55, -0.21)	<0.0001	-0.40 (-0.56, -0.24)	<0.0001
Weight gain since GDM diagnosis§§					
	1-5.75	3.92 (2.07, 5.77)	<0.0001	3.93 (2.04, 5.82)	<0.0001
	5.76-10.50	1.36 (0.10, 2.61))	0.03	1.51 (0.24, 2.79))	0.02
	10.51-15.25 (ref)	1.00	--	1.00	--
	15.26-20	-0.44 (-1.45, 0.56)	0.39	-0.42 (-1.44, 0.59)	0.41
	Linear trend	-0.24 (-0.36, -0.13)	<0.0001	-0.25 (-0.37, -0.14)	<0.0001

§ Binary outcomes were analyzed using both univariable (unadjusted) and multivariable (adjusted) logistic regression models. The effect of the walkability score was quantified using odds ratios. For the linear trend, the odds ratio was calculated for a one-point increase in the walkability score.
§§ Continuous outcomes were analyzed using both univariable (unadjusted) and multivariable (adjusted) linear regression models. The effect of the walkability score was quantified as the absolute change in the outcome variable. For the linear trend, the absolute change was calculated for each one-point increase in the walkability score.
In all multivariable models, adjustment variables included median income, age, BMI, gravidity, parity, race and HTN.
† Neonatal adverse outcome included NICU admission, LGA, APGAR score at 5 minutes < 7, and neonatal hypoglycemia

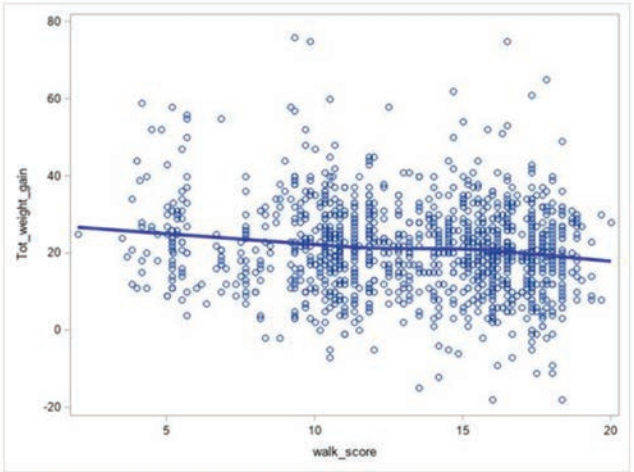


Figure 1 Relationship between walkability and total weight gain

652 | Environmental Protection Agency (EPA) National Walkability Index and its Impact on the Severity of Gdm

Thomas Owens[1]; Johanna Suskin[2]; Erica Glaser[3]; Guillaume Stoffels[4]; Mia A. Heiligenstein[5]; Olivia Grubman[6]; Xiteng Yan[3]; Zainab Al-Ibraheemi[1]; Lois Brustman[1]
[1]Icahn School of Medicine at Mount Sinai West, New York, NY; [2]Mount Sinai West, New York City, NY; [3]Mount Sinai West, New York, NY; [4]Icahn School of Medicine at Mount Sinai, New York, NY; [5]Mount Sinai West, Astoria, NY; [6]Westchester Medical Center, Westchester, NY

4:00 PM - 6:00 PM

Objective: An important factor in the management of gestational diabetes (GDM) is exercise. The aim of this study is to assess neighborhood walkability and need for hypoglycemic agents (HA) in patients with GDM.

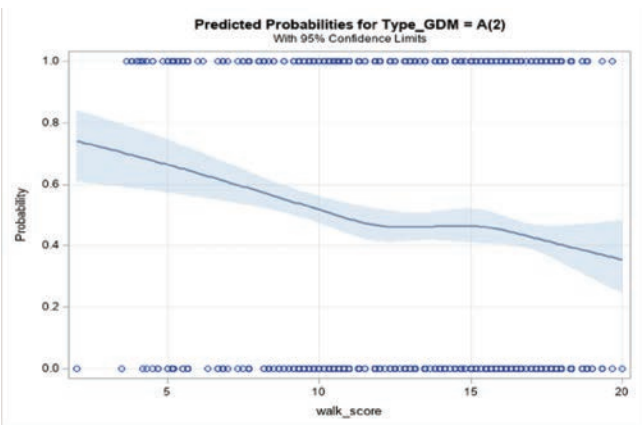
Study Design: A retrospective cohort study of pregnant patients that were diagnosed with GDM at an academic center between 2018-2023. Patients' addresses at the time of their gestation were correlated with the Environmental Protection Agency (EPA) National walkability index. The categories of EPA walkability index included:least walkable (score 1-5), below average (6-10), above average (11-15), and most walkable (16-20). A2GDM was defined as patients requiring HA. Secondary analysis included a neonatal composite outcome consisting of neonatal hypoglycemia(NH), large for gestational age(LGA), NICU admission, and APGAR score< 7. Descriptive statistics and restricted cubic spline plot (RP) were used. Multivariate analysis was conducted adjusting for median income, age, BMI, gravidity, parity, race, and hypertension.

Results: 1231 patients identified. There were 81 patients(6.6%) in the least walkable group, 225 patients(18.3%) in the below average walkable group, 428 patients(34.8%) in the above average walkable group, and 497 patients(40.4%) in the most walkable group. In multivariable analysis patients in the least walkable and below-average walkable groups had a significantly higher likelihood of having A2GDM(least walkable: p = 0.004; below average walkable: p = 0.02 (Table 1)). A RP showed that the relationship between walkability score and the probability of A2GDM was linear(Fig. 1).When walkability score was treated as continuous, each one-unit increase in walkability score was significantly associated with a 6% decrease in the odds of A2GDM(p = 0.0001). Neonatal composite did not differ between the groups(p = 0.30).

Conclusion: Patients who live in a higher walkability area are less likely to need medication. Thus, providers counseling patients with GDM should stress the importance of exercise in the control of blood glucose and its relationship to the severity and subsequent management.

(Table 1) Outcome	Walkability score	Unadjusted Odds ratio or Absolute change (95% CI)	Unadjusted P value	Adjusted Odds ratio or Absolute change (95% CI)	Adjusted P value
A2 vs. A1 GDM§					
	1-5.75	2.43 (1.47, 4.03)	0.0005	2.21 (1.29, 3.76)	0.004
	5.76-10.50	1.49 (1.08, 2.06)	0.02	1.52 (1.08, 2.14)	0.02
	10.51-15.25 (ref)	1.00	--	1.00	--
	15.26-20	0.83 (0.64, 1.07)	0.16	0.86 (0.65, 1.13)	0.27
	Linear trend	0.94 (0.91, 0.96)	<0.0001	0.94 (0.91, 0.97)	0.0001
Neonatal hypoglycemia§					
	1-5.75	1.05 (0.58, 1.92)	0.86	0.99 (0.53, 1.83)	0.96
	5.76-10.50	0.87 (0.57, 1.33)	0.52	0.85 (0.55, 1.31)	0.47
	10.51-15.25 (ref)	1.00	--	1.00	--
	15.26-20	1.15 (0.83, 1.59)	0.41	1.18 (0.85, 1.64)	0.41
	Linear trend	1.01 (0.98, 1.05)	0.53	1.02 (0.98, 1.06)	0.32
Adverse neonatal outcome§†					
	1-5.75	1.28 (0.77, 2.13)	0.34	1.27 (0.74, 2.16)	0.39
	5.76-10.50	0.96 (0.67, 1.37)	0.80	0.94 (0.65, 1.37)	0.76
	10.51-15.25 (ref)	1.00	--	1.00	--
	15.26-20	1.26 (0.95, 1.68)	0.10	1.36 (1.02, 1.82)	0.04
	Linear trend	1.01 (0.98, 1.04)	0.58	1.02 (0.99, 1.05)	0.30

§ Binary outcomes were analyzed using both univariable (unadjusted) and multivariable (adjusted) logistic regression models. The effect of the walkability score was quantified using odds ratios. For the linear trend, the odds ratio was calculated for a one-point increase in the walkability score.
§§ Continuous outcomes were analyzed using both univariable (unadjusted) and multivariable (adjusted) linear regression models. The effect of the walkability score was quantified as the absolute change in the outcome variable. For the linear trend, the absolute change was calculated for each one-point increase in the walkability score.
In all multivariable models, adjustment variables included median income, age, BMI, gravidity, parity, race and HTN.
† Neonatal adverse outcome included NICU admission, LGA, APGAR score at 5 minutes < 7, and neonatal hypoglycemia.



653 | Does Early Administration of IV Iron During Pregnancy Improve Maternal Morbidity?

Tina M. Bui; Guillermo Valenzuela; Kristina Roloff; Mary Tsaturian; Phoebe Jen
Arrowhead Regional Medical Center, Colton, CA

4:00 PM - 6:00 PM

Objective: Anemia in pregnancy is a significant contributor to maternal morbidity, including increased risks of blood transfusion, longer hospital stays, depression, preterm birth, and low birth weight. Oral (PO) iron has been traditionally recommended for its simplicity and cost-effectiveness but often suffers from poor adherence and gastrointestinal side effects. This study aims to investigate whether early administration of IV iron can improve hemoglobin (Hgb) levels prior to delivery and decrease the need for blood transfusion.

Study Design: Patients with a ferritin level < 30 ng/mL were recruited. Exclusion criteria included age < 18, multifetal gestations, thalassemia or sickle cell disease, and chronic kidney or

liver disease. After obtaining consent, patients were randomly assigned to either the PO or IV iron groups. The PO iron group received Ferrous sulfate 325 mg every other day, while the IV iron group received Venofer 200 mg every other day until the iron deficit was corrected. Hgb and ferritin levels were assessed before treatment and four weeks after treatment initiation. Patients also completed an anemia symptom questionnaire at enrollment and at the 4-week mark. Statistical comparisons were conducted using two-tailed T-tests with significance set at $P < 0.05$.

Results: The IV iron group showed a significant increase in Hgb and ferritin levels compared to the PO iron group four weeks after treatment, with P-values of 0.002 and 0.0001, respectively. The blood transfusion rate was 3.7% in the PO iron group and 0% in the IV iron group.

Conclusion: Our findings demonstrate a significant improvement in ferritin levels among patients treated with IV iron compared to those receiving PO iron therapy. Additionally, the absence of blood transfusions in the IV iron group highlights its potential in reducing alloimmunization and blood transfusion reactions, suggesting that early administration of IV iron during pregnancy can improve maternal health outcomes.

	PO iron	IV iron	P-value
Age	27.61 (5.92)	25.41 (5.07)	0.062
GA at enrollment	23w4d (7.01)	24w6d (7.32)	0.379
BMI	30.33 (7.56)	30.29 (6.73)	0.979
Change in Hemoglobin 4 wks after treatment	-0.389 (1.80)	0.616 (1.31)	**0.002**
Change in Ferritin 4 wks after treatment	1.89 (15.28)	27.90 (38.45)	**0.0001**
Change in Symptoms 4 wks after treatment	-2.24 (8.00)	-4.36 (9.03)	0.219
Number of reported side effects	2.27 (2.42)	2.57 (2.72)	0.582
GA at delivery	38.55 (0.93)	38.76 (1.75)	0.604
Pre-Delivery Hgb	11.80 (1.24)	12.07 (1.10)	0.419
Post-Delivery Hgb	9.95 (1.60)	10.49 (1.18)	0.155
QBL	436.38 (292.10)	341.29 (226.65)	0.185
Rate of blood transfusion	2 (3.7%)	0 (0%)	
Birthweight	3211.30 (345.92)	3173.00 (454.74)	0.740
Change in EPDS after treatment	-1.67 (2.95)	-1.73 (4.62)	0.959

Table 1: **Comparative Analysis of Characteristics Between PO and IV Iron Treatments** Data are expressed as mean (standard deviation) or number (percentage). Significant p-values are indicated in bold.

654 | Perceived Racism and Placentally Mediated Adverse Pregnancy Outcomes

Joy McNeal; Sarah Heerboth; Ashlyn Tolbert; Johanna Quist-Nelson; Rebecca Fry; Tracy A. Manuck
University of North Carolina, Chapel Hill, NC

4:00 PM - 6:00 PM

Objective: Racism is consistently implicated in obstetric disparities and is associated with hypertension (HTN) among non-pregnant individuals. We sought to quantify the extent to which racism, including its characteristics (domains, timing), is associated with placentally-mediated pregnancy complications (plac-comps).

Study Design: Primary analysis of a prospective cohort. Participants identifying as Black, White, and/or Hispanic, with singleton, non-anomalous gestations were recruited < 22 weeks, 2017-2022, and completed the validated Perceived Racism Scale at enrollment to assess any-time (at any time during life) and recent (within the last year) racism in 11 public/personal, 3 public/observed experience, and 7 employment domains. The primary outcome was a diagnosis of plac-comps (HTN disorders of pregnancy, birthweight < 10% for GA and sex, ± placental abruption).

Results: 414 individuals (47% Black, 42% White, 11% Hispanic) were included; 93 (22.4%) had plac-comps. Surveys were completed at a mean of 17.3 (IQR 16.1-20.0) wks. Clinical factors are shown in Table 1. Compared to those without plac-comps, those with plac-comps were more likely to experience racism at any time (65% vs. 47%, $p = 0.02$) and racism across a greater number of domains any-time (8.1 v. 5.6, $p = 0.002$) and recently (mean 4.6 v. 2.6, $p< 0.001$). Differences were most pronounced in public/personal domains, as those with plac-comps had higher any-time perceived racism in 7 of 11 public/personal domains and higher recent perceived racism in 7 of 11 public/personal domains (all $p< 0.05$), Figure. In regressions, each additional any-time racism domain conferred a 9% increased odds of plac-comps (aOR 1.09, 95% CI 1.03-1.15). Similarly, each additional recent racism domain conferred a 8% increased odds of plac-comps (aOR 1.08, 95% CI 1.03-1.13).

Conclusion: Among pregnant individuals at high-risk for adverse pregnancy outcomes, racism is present across multiple facets of daily life. Perceived racism was associated with an increased risk of adverse placental outcomes, irrespective of the timing of the exposure.

Table. Demographic and obstetric characteristics by those with and without racism reported in a high total number of domains at any time during life (≥ 7 of 20 evaluated domains, ≥ 75th centile for cohort). Data are presented as n(%) unless otherwise noted.

Characteristic	High # (≥7) of total racism domains at any time n=112	Lower # (<7) of total racism domains at any time n=302	P
Mom age, mean years ± SD	31.8 ± 5.2	31.4 ± 5.1	0.47
Black race	100 (89)	94 (31)	<0.001
More than one race	13 (11.6)	20 (6.6)	0.10
Public insurance	67 (60)	126 (42)	0.001
Pre-pregnancy BMI, mean kg/m² ± SD	32.7 ± 9.6	30.0 ± 8.9	0.008
Chronic hypertension	27 (24)	44 (15)	0.02
Pre-gestational diabetes mellitus	4 (4)	16 (5)	0.47
Prior spontaneous preterm birth <35 weeks' gestation	85 (76)	186 (62)	0.007
≥ 1 prior term delivery	64 (57)	202 (67)	0.07
Earliest prior delivery, mean weeks	26.1 ± 9.5	30.6 ± 8.5	<0.001

Figure 1. Proportion of participants reporting life-long racism by domain and specific scenario. Numbers in each box represent the percentage of individuals reporting racism at any time during their life, for the overall cohort and for those with and without placental complications. Data are shown in 'heat map' fashion, with darker colors representing larger %, as per legend below.

*Statistically significant comparisons (between those with and without plac-comps) are noted with bolded box outlines. *p<0.05; **p<0.001*

Domain	Racism Scenario	All participants N=414	NO Plac-comps n=321	Plac-comps n=93
Public / personal domain	Called insulting names	58	56	67
	Encountered legal restrictions	13	12	14
	Difficulty getting loan	16	10	32 **
	Denied med care or hospitalization	7	4	15 **
	Received extra attention from police	34	30	44 *
	Was refused rental housing	15	11	25 *
	Got worse seats in public places	8	6	11
	Was followed / watched while shopping	57	50	75 **
	Was talked down to	56	50	71 **
	Had house vandalized	6	6	8
	Ignored in restaurants	49	44	62 *
Public / observed domain	Surprised at your intelligence	60	58	68
	Know people in trouble	42	40	48
	Not desired for serious relationship	31	27	44
Job / employ-ment domain	Assigned undesirable jobs	35	34	37
	Recipient of jokes or harassment	34	31	44
	Ignored / not taken seriously	31	28	40
	Lost out on / skipped over for promotion	39	37	44
	Opinions not asked for	35	32	41
	Less dignity & respect	43	39	54
	Watched more closely	41	35	53 *

655 | Objective Quantification of Sleep Throughout Pregnancy, Preterm Birth, and Delivery Gestational Age

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4:00 PM - 6:00 PM

Objective: Sleep quality and quantity (evaluated using traditional duration/stage measures and novel metrics including the sleep regularity index, a parameter assessing sleep pattern regularity and consistency) are associated with health outcomes. We sought to determine which sleep parameters are associated with PTB.

Study Design: Primary analysis of a prospective cohort enriched for those at high *a priori* risk of PTB. Participants identifying as Black, White, and/or Hispanic, with singleton, non-anomalous gestations were recruited < 14 weeks, 2017-2022. Participants were provided FitBit wristband activity trackers at enrollment and instructed to maintain their usual activity. Those with ≥7 nights of sleep monitoring (verified by FitBit recorded heart rate) were included. The primary outcomes were delivery gestational age and PTB < 35 weeks. We evaluated individual sleep parameters and a composite 'poor sleep' score based on previously established metrics of sleep health. The poor sleep score was calculated by adding +1 point for (1) mean total min/asleep < 360 min/night; (2) mean % time in REM < 20%; (3) mean sleep efficiency (time asleep/time in bed) < 85%; (4) >50% of sleep midpoints ≥ 05:00; (5) ≥ 2 median night awakenings; (6) sleep regularity index in lowest quartile (< 95.2). Cox regression models included adjustments for multiple and differing numbers of observations per subject.

Results: 154 individuals were included, delivering at a median 38.2 (IQR 37.0, 39.3) weeks; 25% had PTB < 37 and 14% PTB < 35 weeks. The median sleep score was 2 (IQR 1,3); range 0-5. Clinical characteristics are shown in Table 1. Each sleep parameter's variation over gestation is shown in Figure 1. In cox regression models, a poor sleep score (≥3; aHR 1.49, 95% CI 1.04, 2.13) and % time in REM sleep (aHR 0.21, 95% CI 0.06-0.73) were associated with delivery gestational age.

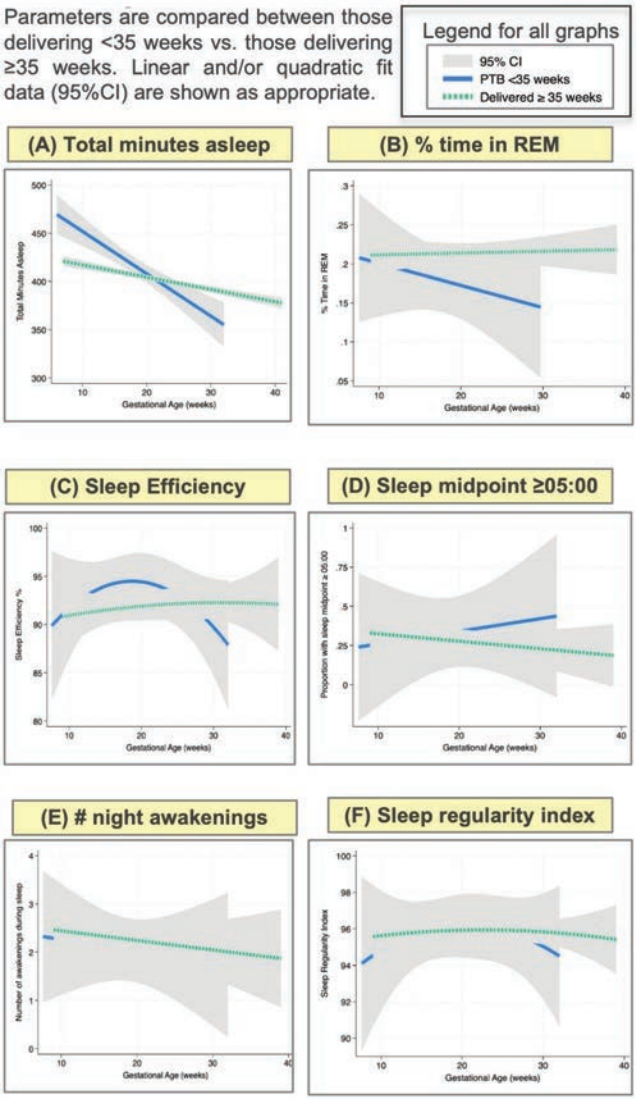
Conclusion: Several sleep metrics vary across gestation, though tend to be similar among those with PTB < 35 weeks vs. those with later delivery. However, individuals with ≥3 poor sleep habits throughout pregnancy carried a higher risk of early delivery.

Table. Demographic, obstetric, and sleep characteristics and initial outcomes stratified by those with and without poor sleep (defined composite sleep score ≥ 2). Data are n(%), as applicable, unless noted.

Characteristic	Poor sleep score (≥2) N=40	Better sleep score (<2) N=114	P-value
Age, mean years ± SD	32.1 ± 5.2	32.1 ± 4.8	0.95
Black race	21 (53)	33 (29)	0.007
White race	15 (38)	68 (60)	0.02
Hispanic ethnicity	5 (13)	18 (16)	0.62
Pre-pregnancy BMI, mean kg/m² ± SD	31.2 ± 10.6	28.6 ± 7.5	0.10
Pregestational diabetes mellitus	5 (13)	4 (4)	0.04
Chronic hypertension	7 (18)	14 (12)	0.41
Prior PTB <35 weeks	33 (83)	71 (62)	0.02
Short cervical length <25mm	15 (38)	23 (20)	0.03
Mean number of sleep nights monitored, ± SD	52 ± 47	90 ± 62	0.001
Average bedtime (military time) ± SD in HH:MM	00:06 ± 02:12	23:18 ± 01:18	0.004
Average wake time (military time) ± SD in HH:MM	08:30 ± 02:42	07:30 ± 01:48	0.008
Mean delivery gestational age, weeks ± SD	36.8 ± 3.2	37.5 ± 3.7	0.33
PTB <37 weeks'	12 (30)	26 (23)	0.17
PTB <35 weeks'	8 (20)	13 (11)	0.36

Figure 1. Shown is the variation in each sleep parameter included in the composite sleep score across gestation,

Parameters are compared between those delivering <35 weeks vs. those delivering ≥35 weeks. Linear and/or quadratic fit data (95%CI) are shown as appropriate.



656 | Impact of Low-Dose Furosemide on Breastfeeding and Newborn Weight: a Randomized Controlled Trial Secondary Analysis

Ukachi N. Emeruwa[1]; Kysha Mercader[2]; Chaukim Peters[3]; Shai Bejerano[4]; Toluwalasé A. Ajayi[5]; Gregory A. Aarons[6]; Bonnie Kaiser[6]; Sarah Averbach[6]; Michelle Leff[6]; Russell S. Miller[4]; Cynthia Gyamfi-Bannerman[1]

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4:00 PM - 6:00 PM

Objective: Growing evidence supports loop-diuretic use to reduce postpartum (PP) hypertensive morbidity, but little is known about how these medications affect breastfeeding and associated neonatal outcomes. We aimed to explore breastfeeding rates and newborn weight loss among lactating patients taking low-dose furosemide after delivery.

Study Design: This was a secondary analysis of the Lasix for the Prevention of de novo Postpartum Hypertension Trial (PMID: 38641089), which randomized 82 normotensive patients at high risk for de novo PP hypertension to 5 days of daily furosemide 20mg PO or placebo within 8 hours after delivery. Parent trial participants completed electronic surveys at 2 and 6 weeks PP, which included infant feeding practice questions. Data on feeding practices and neonatal weight were also abstracted from electronic medical records. The primary outcome of this analysis was exclusive breastfeeding (EBF) continuation rates among those who reported EBF intent on delivery admission. Secondary outcomes included EBF rates among those practicing EBF at discharge, any breastfeeding rates, formula supplementation reasons, and newborn delivery to discharge weight change.

Results: Of 79 parent trial participants enrolled through 6 weeks PP, 70 (89%) at least partially completed the 2 week survey; 55 (70%) at least partially completed the 6 week survey. There was no difference in EBF continuation rates for participants randomly assigned to furosemide who intended to exclusively breastfeed (54% at 2 weeks; 64% at 6 weeks) compared to placebo (38% at 2 weeks, p = 0.43; 31% at 6 weeks, p = 0.11). (**Figure 1**) Of reported supplementation reasons, there was no difference in milk supply or neonatal concerns between groups. Newborn weight declined a median of 5% [IQR -7,-3%] in the furosemide group and 6% [IQR -8,-4%] in the placebo group (p = 0.17) by discharge, consistent with physiologic norms. (**Table 1**)

Conclusion: There is no evidence in our trial that low-dose furosemide impacts breastfeeding continuation rates or physiologic newborn weight loss. These data are reassuring for loop-diuretic use in lactating people.

Figure 1. Breastfeeding rates at 2 and 6 weeks postpartum by intervention group

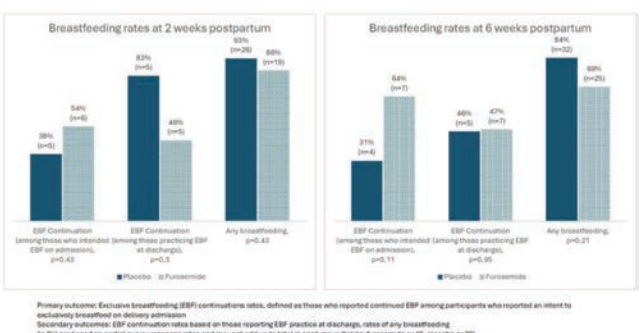

Table 1. Maternal and infant characteristics, feeding practices, and survey data

	Furosemide (n=40)	Placebo (n=39)	P-value[a]
MATERNAL AND INFANT CHARACTERISTICS			
Parity[b] -- median [IQR]	1.0 [1.0 to 2.0]	1.0 [1.0 to 2.0]	-
Gestational age at delivery[b] -- median [IQR], weeks	38.8 [37.0 to 39.4]	39.1 [38.1 to 39.3]	-
Mode of delivery[b] -- n (%)			
Vaginal	14 (35)	18 (45)	-
Cesarean	26 (65)	22 (55)	-
Maternal postpartum length of stay -- median [IQR], days	2.0 [2.0 to 3.0]	2.0 [2.0 to 3.0]	0.80
INFANT FEEDING PRACTICES AND SURVEY DATA			
Infant feeding practice at discharge -- n(%)			
Breastmilk only	20 (50)	23 (58)	0.27
Formula only	18 (45)	12 (30)	
Breast milk and formula	2 (5)	5 (12)	
Infant feeding practice at 2 weeks[c] -- n(%), *n=50*	*n=22*	*n=28*	
Breastmilk only	7 (32)	6 (21)	0.43
Formula only	3 (14)	2 (7)	
Breast milk and formula	12 (54)	20 (71)	
Infant feeding practice at 6 weeks[c] -- n(%), *n=74*	*n=36*	*n=38*	
Breastmilk only	15 (42)	23 (60)	0.21
Formula only	11 (31)	6 (16)	
Breast milk and formula	10 (28)	9 (24)	
Breastfeeding continuation (by intention)[c] -- n(%)			
2 weeks, *n=24*	6 (54)	5 (39)	0.43
6 weeks, *n=24*	7 (64)	4 (31)	0.11
Breastfeeding continuation (by discharge practice)[c] -- n(%)			
2 weeks, *n=17*	5 (46)	5 (83)	0.3
6 weeks, *n=26*	7 (47)	5 (46)	0.95
Reason for supplementation[d] -- n(%), *n=11*			
My milk didn't come in	0 (0)	0 (0)	NA
My milk took too long to come in	1 (14)	0 (0)	>0.99
My milk came in, but I didn't have enough	2 (29)	3 (75)	0.24
It was too painful	2 (29)	1 (25)	>0.99
I didn't get enough help to start or continue	1 (14)	0 (0)	>0.99
My baby didn't gain enough weight/lost too much weight	1 (14)	0 (0)	>0.99
My schedule didn't allow me to breastfeed	1 (14)	0 (0)	>0.99
I had some other problem	2 (29)	0 (0)	0.49
I had no problems but just wanted to stop	3 (43)	0 (0)	0.24

[a] Categorical variables analyzed by Fisher's exact or chi-square test as appropriate. Non-normally distributed continuous or count variables displayed as median [IQR] and analyzed by exact Wilcoxon rank-sum test. Approximately normally distributed variables analyzed by Student's or Welch's t-test, as appropriate, and displayed as mean ± SD.
[b] Pre-randomization characteristics in parent trial (PMID: 33641089)
[c] n (%) are based on partial survey response rates and may not add up to total in each group (totals: furosemide n=40, placebo n=39)
[d] Multiple responses permitted

657 | Automated Unattended Office BP: Is Your Clinician Raising Your Blood Pressure?

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4:00 PM - 6:00 PM

Objective: There is emerging data that in non-pregnant adults measuring clinic blood pressure (CBP) without a clinician present (unattended CBP) may reduce the "white coat effect" and be closer to mean out-of-clinic blood pressure (BP) compared to traditional CBP measurements that involve a clinician in the room (attended CBP). Our objective was to compare unattended CBP with attended CBP in pregnant women with hypertension (HTN).

Study Design: Pregnant patients with a history of chronic or gestational HTN defined using ACOG diagnostic criteria were included in this analysis. Demographic variables were described as median [IQR] for continuous variables and frequencies for categorical variables. Automated attended and unattended CBP were measured at up to two prenatal visits and compared using a paired t-test to account for repeated measures and between-subject variability. Bland-Altman plots were created to evaluate the agreement between unattended and attended CBP.

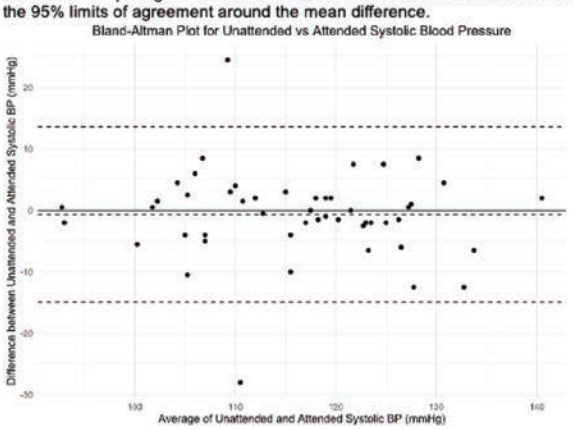
Results: Of 26 pregnant patients with HTN, women were on average 36.5 [5.1] years old and 24 weeks pregnant, with a BMI of 32.2 [8.3] kg/m^2, 19% had diabetes, and the majority were working full time (**Table**). In 49 paired measurements, the mean unattended CBP was 115.8/72.3 mmHg and the mean attended CBP was 116.5/71.5 mmHg. The mean difference (95% CI) between unattended and attended systolic BP was 0.69 (-1.40, 2.78) and diastolic BP was 0.00 (-1.02, 1.02); both mean differences were not statistically significant P >0.5 (**Figure**).

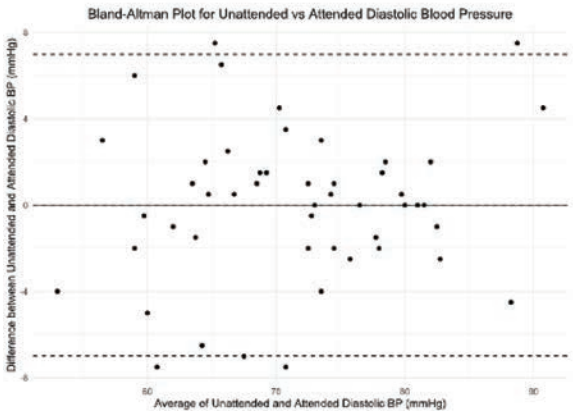
Conclusion: In pregnant patients with HTN, having a provider present during CBP measurements did not result in a statistically significant BP elevation. Based on these findings unattended CBP measurement may not be able to replace out-of-office BP measurement for the diagnosis of white coat hypertension; further research is needed.

Table. Maternal characteristics of the 26 pregnant patients

Maternal age, years	36.5 [5.1]
Gestational age, weeks	24.0 [5.8]
Self-reported Race	
Asian	8 (32.0%)
Black	3 (12.0%)
Native Hawaiian/Pacific Islander	3 (12.0%)
White	11 (44.0%)
Prefer not to answer/unknown	1 (3.8%)
Hispanic/Latino/a/x or Spanish Ethnicity	4 (15.4%)
Maternal Body Mass Index (kg/m^2)	32.2 [8.3]
Heart rate (beats/minute) - Observed	91 [13]
Heart rate (beats/minute) - Unobserved	91 [13]
Diabetes Mellitus (gestational or pre-pregnancy)	5 (19.2%)
Married/living with partner	23 (88.5%)
Employed full time	24 (92.3%)
Private Health Insurance	25 (96.2%)
Education	
High school	1 (3.8%)
Some college	3 (11.5%)
2-year degree	1 (3.8%)
4-year degree	9 (34.6%)
Professional degree	9 (34.6%)
Doctorate	3 (11.5%)
Cigarette Use	
Never	22 (84.6%)
Past Smoker	4 (15.4%)
Current Alcohol Use	2 (7.7%)

Figure. Bland-Altman plots of systolic and diastolic BP demonstrate no proportional bias when comparing unattended and attended measurements. Dashed lines indicate the 95% limits of agreement around the mean difference.





658 | Differential Expression of Placental CD300 Receptors in Preeclampsia (PE) and Preterm Birth (PTB)

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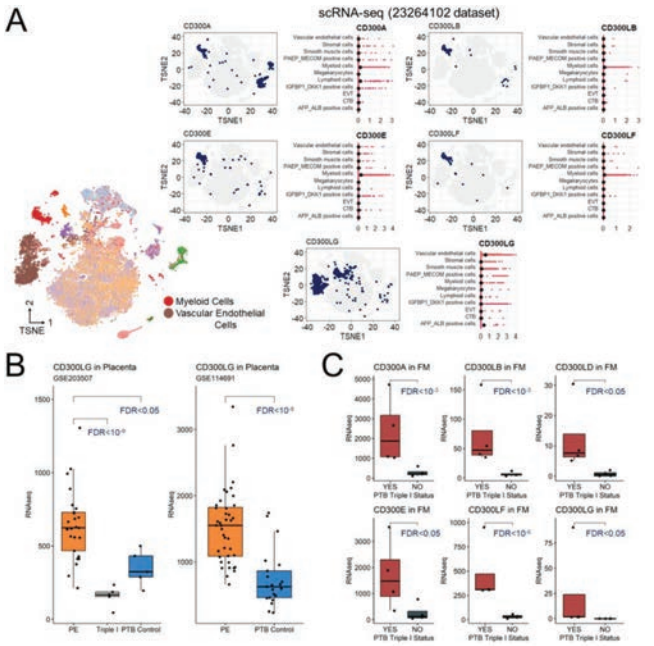
4:00 PM - 6:00 PM

Objective: Through their binding to lipids and other ligands, the 7 member CD300 family of receptors is poised to have a significant role in biological processes with an inflammatory component. Their roles in major inflammatory obstetrical syndromes such as PE and PTB +/- Triple I have not been fully elucidated. We performed a targeted computational analysis of existing placental datasets with transcriptional profiling to understand the expression and distribution of placental CD300 receptors in these pathological contexts.

Study Design: We interrogated bulk and single-cell (sc) placental RNA sequencing (RNAseq) datasets (GEO: GSE73714, GSE203507, GSE114691, GSE173193; Figshare: 23264102) for CD300 expression in PE (n = 65) and PTB (NO-Triple I n = 26; YES-Triple I, n = 5). This analysis was complemented by RNAseq in a new set of 8 fetal membrane (FM) samples as follows: YES-Triple I (n = 4, GA 28±3w), NO-Triple I (n = 4, GA 32±1w). Selected targets were cross validated by qPCR.

Results: Across placental RNAseq datasets, all 7 CD300 mRNAs could be detected, with *CD300LG* predominating in the villous placenta and *CD300A* and *-E* most abundant in FM. By scRNAseq, *CD300LB*, *-E*, and *-LF* displayed myeloid-limited expression, *CD300A* was expressed in myeloid and lymphoid cells, *CD300LG* was abundant in vascular endothelial cells, and *CD300LC* and *-D* expression fell below detection limits. Villous *CD300LG* was significantly more abundant in PE than non-PE samples (FDR< 0.05). In Triple I, *CD300A*, *-LB*, *-LD*, *-E*, *-LF*, and *-LG* were elevated (FDR< 0.05) in FM but not villous placenta by RNAseq, with CD300LF being most significant. Increased expression of placental *CD300LG* in PE and FM *CD300LF* in Triple I were confirmed by qPCR (p< 0.05).

Conclusion: The CD300 family of receptors is present in the human placenta. In pregnancy conditions with strong inflammatory components the signaling pathways emanating from this family of receptors are likely diverse based on disease and their location.



659 | Early Recognition of Fetal Growth Restriction via Clinical Features, Metabolomic Profiles and Polygenic Risk Scores

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[1]*Ministry of Education-Shanghai Key Laboratory of Children's Environmental Health, Xinhua Hospital, affiliated with School of Medicine, Shanghai Jiao Tong University, Shanghai, China, Shanghai, Shanghai;* [2]*Shanghai Jiao Tong University School of Medicine, Shanghai, Shanghai*

4:00 PM - 6:00 PM

Objective: To integrate various factors to predict FGR, enabling early identification and risk stratification of high-risk populations.

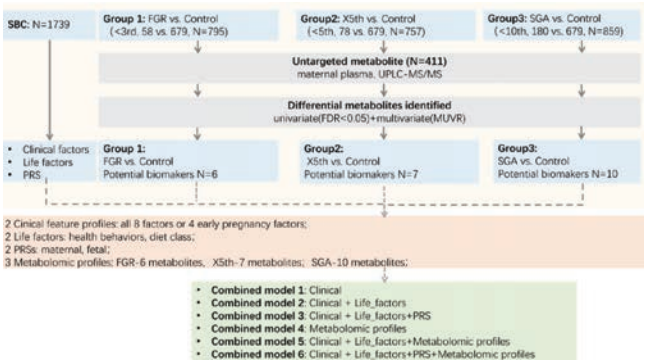
Study Design: This study was conducted based on a prospective birth cohort. A total of 1,739 mother-child pairs were included. Three nested case-control studies were further conducted: 1) 58 FGR cases (< 3rd percentile); 2) 78 X5th cases (< 5th percentile); 3) 180 SGA cases (< 10th percentile). The control group included 679 healthy controls (BW in the 25th to 75th percentile, without major complications). We developed 6 risk prediction models for birth outcomes (FGR, X5th, and SGA) using clinical risk factors, life factors, maternal and fetal polygenic risk scores (PRSs), and maternal plasma metabolic profiles in early pregnancy.

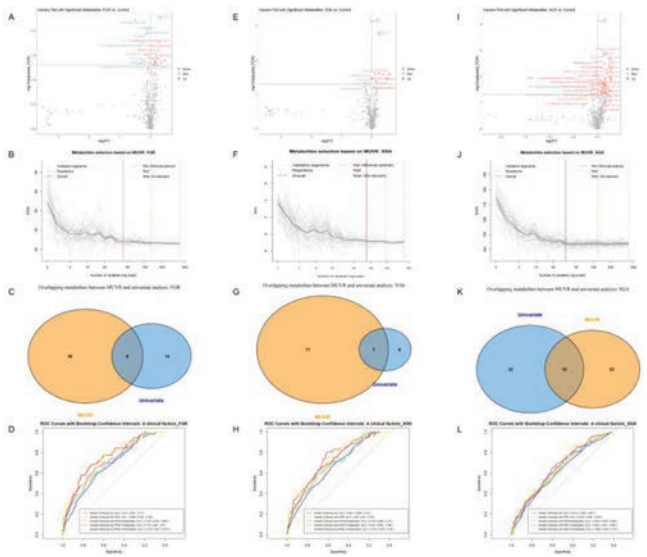
Results: Eight clinical factors and two life factors (health behaviors and diet class) were included. Both maternal and fetal PRSs were derived from the 2019 GWAS meta-analysis for birth weight from the EGG consortium. Univariate analysis and the Unbiased Variable selection in R (MUVR) package identified potential metabolomic biomarkers. For the three case-control groups, 6, 7, and 10 metabolites were identified as potential biomarkers for FGR, X5th, and SGA, respectively.

The final model based on 8 clinical features, 2 life factors, maternal and fetal PRSs, and the 6 metabolite sets demonstrated the best predictive ability, achieving a maximum AUC of 0.826 (95% CI: 0.763-0.879) for predicting FGR. A model built solely on

early pregnancy data achieved a maximum AUC of 0.744 (95% CI: 0.681-0.806) for predicting FGR.

Conclusion: The inclusion of metabolic and genetic information significantly enhanced predictive performance compared to traditional models. Integrating genetic and metabolic data enhances the accuracy of fetal growth assessments, enabling earlier and more precise identification of high-risk pregnancies and facilitating timely interventions to improve outcomes.





660 | Risk Factors for Adverse Outcomes in Uterine Conserving Cesarean Deliveries for Placenta Accreta Spectrum

Yonatan Dror[1]; Elias Castel[2]; Raanan Meyer[3]; Lior Fridrich[2]; Nizan Mor[2]; Aviran Ohayon[2]; Michal Axelrod[4]; Alina Weissmann-Brenner[2]; Gabriel Levin[5]; Shlomi Toussia Cohen[2]

[1]Chaim Sheba Medical Center, Tel-Hashomer, Ramat-Gan, Israel, Chaim Sheba Medical Center, Tel-Hashomer, Ramat-Gan, Israel, HaMerkaz; [2]Sheba Medical Center, Ramat Gan, HaMerkaz; [3]Cedars Sinai Medical Center, Los Angeles, CA; [4]Department of Obstetrics and Gynecology, Sheba Medical Center, Tel HaShomer, Ramat Gan, HaMerkaz; [5]McGill University, Montreal, PQ

4:00 PM - 6:00 PM

Objective: While uterine conserving cesarean delivery for placenta accreta spectrum (PAS) has become more common, data on outcomes are still limited. The aim of this study is to describe the characteristics of patients undergoing uterine conserving cesarean for PAS with and without adverse maternal outcomes, and identify risk factors for their occurrence.

Study Design: A retrospective cohort study conducted at a single tertiary center between 03/2011 and 01/2022. Women with PAS who underwent uterine conserving cesarean delivery were included. Women with scheduled cesarean hysterectomy were excluded. A composite of adverse maternal outcome was defined as the occurrence of at least one of the following: bladder injury, ureteral injury, bowel injury, ≥6 units of blood transfusion, postoperative fever, unplanned cesarean hysterectomy, relaparotomy, intensive care unit admission and hospital readmission.

We compared patients with and without the composite adverse outcome.

Multivariable regression analysis was used to identify factors associated with the composite of adverse outcome.

Results: 238 women with PAS were included in the study group, 70 had composite adverse maternal outcome and 168 did not. The maternal adverse outcome group had earlier gestational age at delivery (median $36^{0/7}$ vs. $36^{3/7}$ weeks), higher preoperative uterine rupture rates (6.2% vs. 0.6%), longer cesarean delivery duration (median 118.5 vs. 68.0 minutes), more drainage placement (72.5% vs. 23.8%) and higher estimated blood loss (median 2500.0 vs. 1200.0 ml).

In multivariable logistic regression analysis, earlier gestational age at delivery, and the sonographic findings of lacunae, bridging vessels and loss of clear zone were independently associated with the composite adverse maternal outcome.

Conclusion: Among women undergoing uterine conserving cesarean delivery for PAS, an earlier gestational age at delivery, and three sonographic findings, are associated with adverse maternal outcomes.

Table 1. Characteristics and operative outcomes of women with and without adverse outcomes in uterine conserving cesarean deliveries for placenta accreta

Characteristics	Adverse outcome n=70	No adverse outcome n=168	p value
Age, years	35.00 [31.3,39.0]	36.00 [32.0, 39.0]	0.824
Body mass index, mean, kg/m2	29.7 [25.2, 34.8]	28.84 [25.6, 31.6]	0.391
Placental bladder invasion perceived by surgeons	16 (22.9)	0 (0.0)	**<0.001**
Sonographic presence of lacunae	55 (78.6)	90 (53.6)	**<0.001**
Sonographic presence of subplacental hypervascularity	17 (25.0)	22 (14.1)	**0.056**
Sonographic presence of bridging vessels	16 (23.5)	12 (7.7)	**0.002**
Sonographic loss of clear zone	52 (78.8)	80 (51.0)	**<0.001**
Gestational age at delivery, weeks	$36^{0/7}$ [$35^{4/7}$, $36^{5/7}$]	$36^{3/7}$ [$35^{6/7}$, $37^{3/7}$]	**<0.001**
Preoperative ureter catheter insertion	9 (12.9)	20 (11.9)	0.830
Preoperative balloon occlusion of vessels	12 (17.1)	11 (6.5)	**0.016**
Uterine artery ligation	6 (15.8)	28 (16.7)	>0.999
Emergent cesarean	12 (17.6)	28 (17.2)	>0.999
Preoperative uterine rupture	4 (6.2)	1 (0.6)	**0.021**
Cesarean delivery duration, minutes	118.5 [100.8, 160.3]	68.0 [49.5, 98.5]	**<0.001**
Blood transfusion during cesarean	58 (82.9)	68 (40.5)	**<0.001**
Number of packed RBCs transfused during operation*	6.0 [3.0, 9.0]	3.0 [2.0, 4.0]	**<0.001**
FFP transfusion during cesarean	48 (68.6)	43 (25.6)	**<0.001**
Number of FFP units transfused*	4.0 [4.0, 6.0]	3.0 [2.0, 4.0]	**0.004**
Cryoprecipitate transfusion during cesarean	42 (60.0)	43 (25.6)	**<0.001**
Number of cryoprecipitate units transfused*	12.0 [10.0, 12.0]	10.0 [8.0,12.0]	0.096
Platelets transfusion during cesarean	3 (4.3)	2 (1.2)	0.153
Misoprostol administration	21 (30.0)	72 (42.9)	0.080
Carboprost administration	13 (18.6)	19 (11.3)	0.147
Methergin administration	13 (18.6)	33 (19.6)	>0.999
Drainage placement	50 (72.5)	40 (23.8)	**<0.001**
Estimated blood loss, ml	2500.0 [2000.0, 4000.0]	1200.0 [700.0, 2000.0]	**<0.001**
Estimated blood loss ≥3000 ml	31 (44.3)	17 (10.1)	**<0.001**
Blood transfusion after cesarean	20 (28.5)	24 (14.2)	**0.028**
Urinary tract infection	2 (2.9)	4 (2.4)	>0.999

Data are presented as number (%) or median [interquartile range]

Table 2. Multivariable regression analysis of factors associated with adverse outcomes

Characteristics	Adjusted odds ratio (95% Confidence interval)	p value
Gestational age at delivery	0.98 (0.96-0.99)	**0.044**
≥3 previous cesarean deliveries	1.63 (0.87-3.05)	0.128
Sonographic presence of lacunae	2.15 (1.06-4.36)	**0.035**
Sonographic presence of bridging vessels	2.84 (1.20-6.69)	**0.017**
Sonographic loss of clear zone	2.04 (1.03-4.03)	**0.041**

Multivariable regression analysis including the following covariates: gestational age at delivery, ≥3 previous cesarean deliveries, sonographic presence of lacunae, sonographic presence of subplacental hypervascularity, sonographic presence of bridging vessels

661 | Maternal Outcomes Associated with Antepartum versus Postpartum Eclampsia

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4:00 PM - 6:00 PM

Objective: The data on eclampsia-related outcomes in the literature relies mainly on studies performed over two decades ago. Our objective was to compare maternal outcomes associated with the timing of eclampsia using a contemporary dataset.

Study Design: We conducted a retrospective cohort study of all patients diagnosed with eclampsia between June 2011 and June 2024 at a tertiary medical center. Patients with antepartum eclampsia (AE) were compared to those with postpartum eclampsia (PPE). The primary outcome was defined as a composite maternal morbidity including stroke, neurologic deficits at discharge, cardiac arrest, myocardial infarction, liver infarction or rupture, pulmonary edema, acute kidney injury, HELLP, disseminated intravascular coagulation, or death. Maternal outcomes were reported using Chi-Square or Fisher's exact tests.

Results: Overall, 80 patients met the inclusion criteria; 39 (49%) had AE, and 41 (51%) had PPE. Baseline maternal characteristics (age, race, BMI, chronic hypertension, diabetes mellitus) were similar between the groups. Four out of every five patients reported symptoms before the seizure, including headache (70%) and visual symptoms (31%), evenly distributed between groups. Simultaneous severe range blood pressure at the time of eclampsia diagnosis was reported in 52 (73%) of the patients, with similar rates between groups. PPE occurred >2 days after delivery in 90% of the cases and >7 days after delivery in 32%. Patients with AE had higher rates of composite maternal morbidity (59.0% vs. 31.7%, p = 0.01), driven mainly by higher rates of acute kidney injury and hemolysis, elevated liver enzymes, and low platelets syndrome (Table). There were also higher rates of post-seizure intubation (30.8% vs. 7.3%, p = 0.01) and intensive care unit admission (51.3% vs. 26.8%, p = 0.02) among patients who had AE.

Conclusion: Eclampsia continues to serve as an important contributor to maternal morbidity and mortality nowadays. Compared to postpartum eclampsia, antepartum eclampsia was associated with higher rates of maternal morbidity.

Table – Antepartum versus postpartum eclampsia and the association with adverse maternal outcomes

Outcome	Antepartum eclampsia (N=39)	Postpartum eclampsia (N=41)	P
Composite maternal morbidity	23 (59.0)	13 (31.7)	**0.01**
Ischemic stroke	3 (7.7)	2 (4.9)	0.67
Hemorrhagic stroke	4 (10.3)	5 (12.2)	>0.99
Neurologic deficits at discharge	3 (7.7)	2 (4.9)	0.67
Cardiac arrest	1 (2.6)	0	0.49
Myocardial infarction	1 (2.6)	0	0.49
Liver infarction	1 (2.6)	0	0.49
Liver rupture	1 (2.6)	0	0.49
Pulmonary edema	3 (7.7)	2 (4.9)	0.67
Acute kidney injury *	12 (30.8)	4 (9.8)	**0.02**
Dialysis	2 (5.1)	0	0.23
HELLP	11 (28.2)	3 (7.3)	**0.02**
DIC	1 (2.6)	0	0.49
Death	0	1 (2.4)	>0.99
RBC Transfusion	11 (28.2)	5 (12.2)	0.10
Intubation after seizure	12 (30.8)	3 (7.3)	**0.01**
ICU admission	20 (51.3)	11 (26.8)	**0.02**

HELLP, hemolysis, elevated liver enzymes, and low platelets; DIC, disseminated intravascular coagulation; RBC, red blood cell; ICU, intensive care unit.
Bolded if significant.
* Acute kidney injury defined as creatinine > 1.2

662 | Do Maternal Outcomes Differ by Specific Blood Pressure Parameters?

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4:00 PM - 6:00 PM

Objective: The role of severe hypertension (sHTN) based on isolated severe systolic or diastolic blood pressure has not been well studied. We aimed to evaluate adverse maternal outcomes in those with isolated sHTN to those with both severe systolic and diastolic hypertension.

Study Design: We conducted a secondary analysis of the Assessment of Perinatal Excellence database. All the patients who had sHTN at the time of delivery, defined as systolic BP (SBP) ≥ 160 mmHg and/or diastolic BP (DBP) ≥ 110 mmHg on two occasions at least 30 minutes apart were included. Individuals with isolated SBP or DBP in the severe range (iSRBP) were compared to those with both (bSRBP). The primary outcome was defined as a composite of maternal outcomes, including hypertensive stroke, pulmonary edema, acute kidney injury, disseminated intravascular coagulation, cardiopulmonary arrest, and death. Multivariate logistic regression was applied to address confounders.

Results: A total of 7,788 individuals met the inclusion criteria. Of those, 5,968 (77%) had isolated SBP ≥ 160, 272 (3%) had isolated DBP ≥ 110 mmHg, and 1,548 (20%) had both. In comparison to those with bSRBP, individuals with iSRBP were older, had higher rates of obesity and multifetal gestation, and lower rates of chronic hypertension. Compared to bSRBP, those with iSRBP had lower composite outcome rates (adjusted relative risk 0.44, 95% CI 0.34-0.57), driven mainly by lower rates of pulmonary edema and acute kidney injury (Table). Intensive-care unit admission rate was also lower among individuals with iSRBP. In a sub-analysis of iSRBP, comparing individuals with isolated SBP vs. isolated DBP in the severe range, no differences in maternal outcomes were noted. Another comparison following further stratification by blood pressure showed a lower composite outcome rate among those with iSRBP compared to bSRBP when SBP was ≥ 180 mmHg (Figure).

Conclusion: Isolated severe systolic or diastolic hypertension was associated with lower rates of maternal morbidity compared

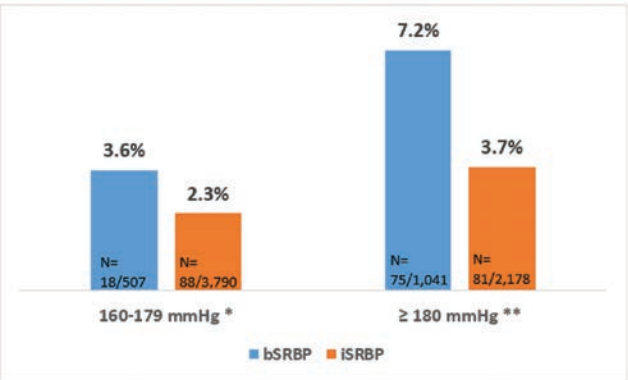
to sHTN with both. This was primarily driven by lower rates of acute kidney injury and pulmonary edema.

Table – The association between severe hypertension based on isolated severe systolic or diastolic blood pressure and maternal outcomes, compared to both

Outcome	bSRBP [a] (N=1,548)	iSRBP [a] (N=6,240)	Adjusted RR [b] (95% CI)
Composite maternal outcome	93 (6.0)	172 (2.8)	**0.44 (0.34-0.57)**
Hypertensive stroke	5 (0.3)	13 (0.2)	0.64 (0.23-1.81)
Pulmonary edema	32 (2.1)	73 (1.2)	**0.56 (0.37-0.85)**
Acute kidney injury [c]	59 (3.8)	81 (1.3)	**0.33 (0.24-0.47)**
DIC	4 (0.3)	12 (0.2)	0.74 (0.24-2.31)
Cardiopulmonary arrest	0	1 (0.0)	-
Maternal death	1 (0.1)	1 (0.0)	-
ICU admission	131 (8.5)	234 (3.8)	**0.42 (0.38-0.53)**

Data presented as N (%).
SRBP, severe-range blood pressure; DIC, disseminated intravascular coagulation; ICU, intensive-care unit.
Bolded if significant.
[a] Individuals with isolated systolic or diastolic blood pressure in the severe range (iSRBP) were compared to those with both (bSRBP).
[b] Adjusted to maternal age ≥ 35 years, obesity (defined as body-mass index ≥ 30 kg/m²), chronic hypertension, and multifetal gestation.
[c] Acute kidney injury was defined as post-partum creatinine ≥ 1.5.

Figure – Composite maternal outcome among individuals with severe-range systolic and diastolic blood pressure compared to systolic alone, following stratification by systolic blood pressure



* P = 0.09
** P < 0.01
bSRBP, both systolic & diastolic severe-range blood pressure; iSRBP, isolated systolic or diastolic severe-range blood pressure

663 | Doulas In Black Birthing Experiences: Perceptions And Utilization Among Black Participants Following Doula-led Education Initiative

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[1]Pennsylvania State College of Medicine, Hershey, PA; [2]Penn State College of Medicine, Hershey, PA

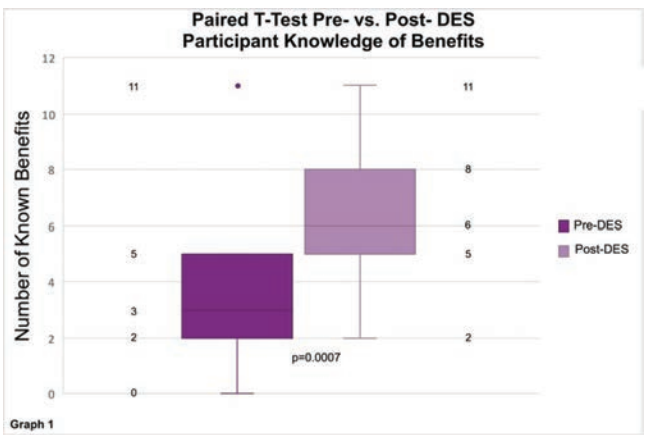
4:00 PM - 6:00 PM

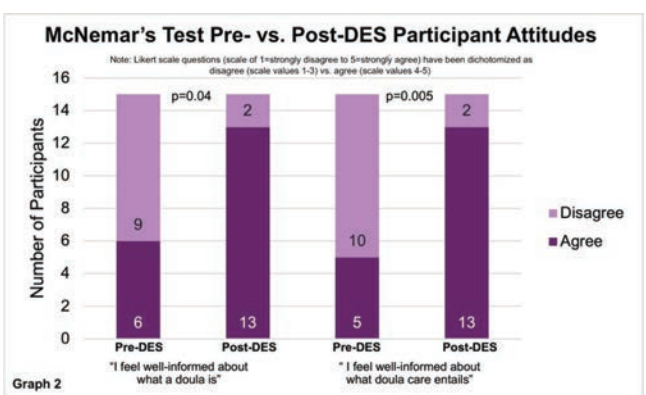
Objective: ACOG and CDC endorse doula use as an evidence-based practice to narrow disparities in Black maternal health outcomes. Despite their benefit, doulas remain underutilized, particularly in Black birthing experiences. Our objective is to assess baseline doula awareness, knowledge, and utilization among Black birthing people and evaluate changes in their attitudes toward integrating doulas into obstetric spaces following an education initiative.

Study Design: During a Black maternal health community initiative, three Black doulas led 15-minute education sessions with small groups. Surveys were given to assess participant knowledge and awareness of doula care, pre- and post-doula education sessions (pre-DES and post-DES). Inclusion criteria were Black participants of reproductive age. Data were analyzed using paired t-tests and McNemar's tests; p-values < 0.05 were considered significant.

Results: Fifteen participants met criteria. All reported no previous doula use or physician-dispensed doula education. Pre-DES, 40% felt well-informed about doulas, compared to 87% post-DES, p = 0.04. Participants knew an average of 4.1 doula health benefits pre-DES and 6.5 benefits post-DES, p = 0.0007 (Graph 1). This mirrors the 54% increase in people who felt more well-informed about what doula care entails post-DES, p = 0.005 (Graph 2). There was no significant difference in number of cited barriers to doula use pre- vs. post-DES, p = 0.31, but the main barrier changed from not knowing how to access doulas (N = 7) to lacking doula insurance coverage (N = 9). Lastly, 87% indicated intent to use doulas in the future.

Conclusion: While baseline knowledge of doula health benefits was high, DES still increased participant knowledge and intent to use doulas in future pregnancies. However, their utilization barriers reveal that increasing doula use among Black birthing people will require an equity framework for better integration of doulas into our health system. Reform is needed in medical trainee education on doula care and patient resourcing, health policy, and legislation for equitable doula insurance coverage and reimbursement.





664 | Variations in MFM Fellowship Clinical Competency through Curriculum Requirements Surpassing ACGME/ABOG Minimums by Geographic Region

Zenobia Gonsalves[1]; Rachel Lee[2]; Chaitali Korgaonkar-Cherala[3]; Kimberly Herrera[4]; Cassandra Heiselman[1]
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Hospital, Stonybrook, NY; [4]Stony Brook University, Stony Brook, NY

4:00 PM - 6:00 PM

Objective: To evaluate curricular differences across geographic regions for fellowship programs by assessing the variations in the distribution of specific types of rotations above the minimum core MFM requirements as defined by ACGME and ABOG.

Study Design: This was a cross-sectional analysis of MFM fellowship curricula conducted in July 2024 for the 109 ACGME-accredited programs. All fellowship program websites were evaluated for rotation schedules. If not available online, programs were contacted via email. The total number of mandated months by rotation for each program were tallied across the three years of fellowship: supervisory L&D (min: 2 mo), inpatient/antepartum service (no minimum), outpatient MFM clinic (min: 2 mo), ultrasound (min: 3 mo), genetics/genomics (min: 2 mo), research (min: 12 mo), electives, and program-specific mandated rotations. For each rotation, the percentage of programs that exceeded ACGME/ABOG minimum duration requirements were compared across geographic regions (Northeast, Midwest, South, and West). Chi-square and Fisher's exact analyses were performed with a p-value < 0.05.

Results: Rotation schedules were available for 64 (59%) of programs. The percentage of total programs that exceeded minimums were 87% for outpatient, 83% for ultrasound, 31% for research, 28% for labor and delivery, and 12% for genetics. When comparing the percentage of programs surpassing minimums by geographic region, only ultrasound requirements differed across regions (Figure 1), specifically 100% of Northeast programs exceeded ultrasound requirements versus 44% in the South ($p = 0.006$). Twenty programs (31%) specified requirements for non-OB, non-ACGME/ABOG rotations, most frequently NICU, anesthesia, and pathology (Table 1). Of these programs, anesthesia was more frequently required in the South ($p = 0.013$). 100% of programs offered flexible elective time.

Conclusion: While there are curricular differences among individual MFM fellowship programs, variability above minimum requirements was only noted for ultrasound and non-obstetric rotations across geographic regions.

Figure 1: Clinical Competency through Curriculum Requirements Surpassing ACGME/ABOG Minimums by Geographic Region

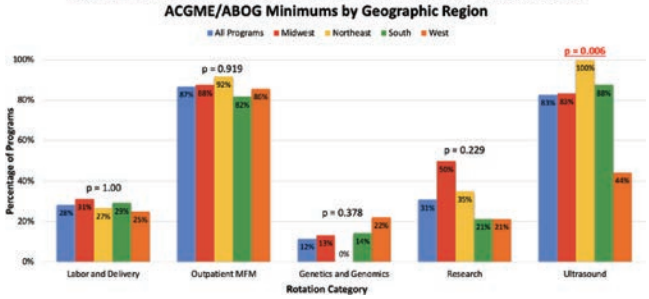

Table 1: Clinical Competency through Program-Specific Mandated Rotations by Geographic Region

Rotation	All Programs	Midwest	Northeast	South	West	p value
Program-Specific Mandated Rotations	20 (53%)	5 (50%)	3 (30%)	9 (64%)	3 (75%)	0.322
Anesthesia	6 (50%)	0 (0%)	1 (50%)	4 (100%)	1 (50%)	0.013
NICU	10 (83%)	2 (50%)	2 (100%)	4 (100%)	2 (100%)	0.273
Pathology	3 (25%)	0 (0%)	1 (50%)	1 (25%)	1 (50%)	0.491
Other Required Rotations	5 (42%)	2 (50%)	0 (0%)	2 (50%)	1 (50%)	0.758

Data are represented as n (%)

665 | Developing Core Endpoints with Stakeholders for Perinatal Clinical Trials

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4:00 PM - 6:00 PM

Objective: The use of core outcome sets (COS) in obstetric and perinatal clinical trials is essential to standardise trial reporting and allow evidence synthesis, but there has been limited assessment of how these outcomes were developed and how they can be used to compare endpoints in clinical trials. Identifying the outcomes that are most meaningful to patients, healthcare professionals and society and standardising their definitions will ensure trial endpoints can be reliably collected and allow results to more rapidly lead to changes in clinical practice.

Study Design: MEDLINE, Embase, PsycINFO, CINAHL and the COMET registry were systematically searched in September 2023. Two authors independently screened abstracts/full texts and performed data extraction. A third reviewer resolved conflicts. The characteristics of each COS, stakeholders and consensus methods were extracted. The development methodology quality was evaluated according to the COS-STAR statement.

Results: 789 studies were screened and 29 COS included. The top 5 reported obstetric outcomes were maternal mortality, patient satisfaction with intervention, adverse outcome of intervention, delivery mode, and breastfeeding at discharge. The top 5 neonatal outcomes were neonatal mortality, gestational age at birth, birthweight, congenital anomaly, and hypoxic ischaemic encephalopathy. Only 59% of COS demonstrated compliance with COS-STAR. 100% included clinician/expert stakeholders. 90% included patients or patient representative stakeholders, although the proportion varied between 4.1% to 81.6%. Standardised definitions and measurement tools are proposed for each of the top 10 outcomes.

Conclusion: We have identified a minimum COS with standardised definitions and measurement tools that can be included in perinatal trials in order to improve the quality of endpoint reporting and implementation. Future research will rank outcomes according to both clinician and patent preference, to develop an ordinal scale that improves trial efficiency and identification of clinically meaningful evidence.

Poster Session 3

Abstracts 666–947

FRIDAY
January 31, 2025
10:30 AM – 12:30 PM

ABSTRACTS OPEN ACCESS

Poster Session 3

Friday, January 31, 2025 10:30 AM – 12:30 PM

666 | Diagnostic Performance of Three Methods of Fetal Growth Restriction Diagnosis

Abby R. Rubenstein[1]; Stephanie L. Pierce[1]; Morgan McDougal[1]; Jennifer Peck[1]; Erin Schone[1]; Angela Xing[1]; Matthew Harter[1]; Rachel Jillson[1]; Dakota St Pierre[1]; Rodney Edwards[2]
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10:30 AM - 12:30 PM

Objective: Recent guidelines changed the diagnostic criteria for fetal growth restriction (FGR) from estimated fetal weight (EFW) < 10%ile alone to EFW and/or abdominal circumference (AC) < 10%ile. Prior studies suggested this change would not substantially affect the number of pregnancies diagnosed with FGR. This study compares 3 methods of FGR diagnosis.

Study Design: This retrospective cohort study classified three groups of women delivering at our institution based on timing of how we diagnosed FGR: Group 1 (7/1/17-6/30/18; EFW < 10%ile), Group 2 (4/1/20-3/31/21; EFW < 10%ile or EFW 10-19%ile and AC < 5%ile), and Group 3 (8/1/21-7/31/22; EFW and/or AC < 10%ile). Multifetal gestations and fetuses with major anomalies were excluded. Cases of neonatal small for gestational age (SGA) were also identified in each time period. The primary outcome was prevalence of FGR among all deliveries in each time period. Test performance characteristics of the three methods of FGR diagnosis for predicting SGA were evaluated.

Results: 320 pregnancies with FGR were identified (n = 44 Group 1, n = 96 Group 2, n = 180 Group 3). Maternal characteristics were similar between groups (Table 1). For groups 1, 2 and 3 respectively, the prevalence of FGR was 1.16%, 2.74% and 4.82% (p< 0.0001), and the prevalence of SGA was 3.39%, 4.44% and 4.53% (p = 0.02). Test performance characteristics of each approach are shown in Table 2.

Conclusion: Application of the newest diagnostic criteria for FGR resulted in a quadrupling of the rate of FGR diagnosis. Though the prevalence of FGR diagnosis with the newest criteria was similar to the prevalence of SGA, this approach identified less than half of neonates with SGA. Given this substantial increase in diagnoses, most of which are false positives, further investigation regarding resource utilization and neonatal outcomes is warranted.

Table 1. Maternal characteristics of deliveries with FGR diagnosis during three study time periods.

	Group 1 (n=44)	Group 2 (n=96)	Group 3 (n=180)	Total (n=320)	P-value
Maternal Age (years)	28.7 (6.2)	26.8 (6.5)	26.7 (6.3)	27.0 (6.4)	0.17
Body Mass Index (kg/m²)	29.5 (8.4)	29.5 (7.7)	29.2 (8.0)	29.4 (7.9)	0.96
Birth weight (grams)	2073 (579)	2196 (544)	2249 (681)	2210 (630)	0.24
Race/Ethnicity					
White	21 (52.5)	38 (42.7)	86 (48.6)	145 (47.4)	0.08*
Black	5 (12.5)	28 (31.5)	45 (25.4)	78 (25.5)	
Hispanic	9 (22.5)	9 (10.1)	20 (11.3)	38 (12.4)	
Asian	0 (0.0)	6 (6.7)	3 (1.7)	9 (2.9)	
Native American	2 (5.0)	6 (6.7)	11 (6.2)	19 (6.2)	
Other[d]	3 (7.5)	2 (2.3)	12 (6.8)	17 (5.6)	
Parity					0.56
0	20 (45.5)	50 (52.1)	82 (45.6)	152 (47.5)	
≥ 1	24 (54.6)	46 (47.9)	98 (54.4)	168 (52.5)	
Chronic Hypertension	7 (15.9)	8 (8.3)	22 (12.2)	37 (11.6)	0.39
Gestational Hypertension	10 (23.8)	15 (16.1)	30 (16.7)	55 (17.5)	0.50
Preeclampsia					0.67*
Severe	10 (22.7)	20 (21.5)	39 (21.7)	69 (21.8)	
Not Severe	1 (2.3)	2 (2.2)	11 (6.1)	14 (4.4)	
No	33 (75.0)	71 (76.3)	130 (72.2)	234 (73.8)	
Diabetes					0.97*
Pre-gestational	1 (2.3)	5 (5.3)	9 (5.0)	15 (4.7)	
Gestational	3 (6.8)	7 (7.5)	16 (8.9)	26 (8.2)	
No	40 (90.9)	82 (87.2)	155 (86.1)	277 (87.1)	
Hx of FGR	4 (9.1)	3 (3.1)	4 (2.2)	11 (3.5)	0.10*

Data are presented as mean (standard deviation) or n (%)
[a] ANOVA
[b] Kruskal Wallis test
[c] Chi-square test, unless otherwise noted
[d] Includes other race/ethnicity and race/ethnicity not recorded
[e] Monte Carlo estimation of Fisher's exact test

Table 2. Statistical comparison of measures of screening test performance for FGR across three study time periods.

	Group 1	Group 2	Group 3	p-value*
Sensitivity	25.8% (18.2, 33.4)	35.5% (28.0, 43.0)	42.6% (35.2, 50.1)	0.01
Specificity	99.7% (99.5, 99.9)	98.8% (98.4, 99.2)	97.0% (96.4, 97.5)	<0.0001
PPV	75.0% (62.2, 87.8)	57.3% (47.4, 67.2)	40.0% (32.8, 47.2)	<0.0001
NPV	97.5% (97.0, 98.0)	97.1% (96.5, 97.6)	97.3% (96.7, 97.8)	0.60

*Chi-square test

667 | Resource Utilization and Neonatal Outcomes with Three Methods of Fetal Growth Restriction Diagnosis

Abby R. Rubenstein[1]; Stephanie L. Pierce[1]; Morgan McDougal[1]; Jennifer Peck[1]; Erin Schone[1]; Angela Xing[1]; Matthew Harter[1]; Rachel Jillson[1]; Dakota St Pierre[1]; Rodney Edwards[2]
[1]University of Oklahoma Health Sciences Center, Oklahoma City, OK; [2]University of Florida College of Medicine, Gainesville, FL

10:30 AM - 12:30 PM

Objective: Fetal growth restriction (FGR) is a known cause of neonatal morbidity. Recent new guidelines changed the diagnostic criteria from estimated fetal weight (EFW) < 10%ile alone to EFW and/or abdominal circumference (AC) < 10%ile. Diagnosing and treating FGR is important to optimize fetal and neonatal outcomes, however does require increased antenatal surveillance. This study compares neonatal outcomes across 3 methods of FGR diagnosis.

Study Design: This secondary analysis of a retrospective cohort study classified three groups of women who delivered at our institution based on timing of how we diagnosed FGR: Group 1 (7/1/2017-6/30/2018; EFW < 10%ile), Group 2 (4/1/2020-3/31/2021; EFW < 10%ile or EFW 10-19%ile and AC < 5%ile), and Group 3 (8/1/2021-7/31/2022; EFW and/or AC < 10%ile). Inclusion criteria were FGR diagnosis and dating ultrasound (US) prior to 22 weeks. Multifetal gestations and fetuses with major anomalies were excluded. The primary outcome was a composite of neonatal complications. Continuous outcome variables were compared across the three groups using ANOVA. Categorical outcomes variables were compared using X^2. P-value < 0.05 was statistically significant.

Results: 320 pregnancies with FGR diagnosis were identified (n = 44 Group 1, n = 96 Group 2, n = 180 Group 3). Overall, gestational age at delivery was similar between groups (Table 1). Compared to Group 1, numbers of growth US and BPP were higher in Group 2 and highest in Group 3. The neonatal complications composite rate was 56.8% in Group 1, 45.8% in Group 2, and 37.2% in Group 3 (p = 0.046; Table 2). NICU admission rate was 54.6% in Group 1, 41.1% in Group 2, and 34.1% in Group 3 (p = 0.04).

Conclusion: The newest method of FGR diagnosis resulted in the highest numbers of prenatal growth US and BPP. The composite complication rate for neonates with prenatal FGR diagnosis was lower during the time period using the new FGR criteria, however this may be due to the inclusion of neonates with less severe FGR and/or absence of SGA. Further investigation is needed into whether broader definitions of FGR result in improved neonatal outcomes.

Table 1. Delivery timing and resource utilization of pregnancies with FGR diagnosis during three study time periods.

	Group 1 (n=44)	Group 2 (n=96)	Group 3 (n=180)	Total (n=320)	P-value
Gestational Age at delivery (days)	259 (9)	260 (16)	262 (24)	261 (20)	0.42[a]
Gestational Age Category at Delivery					0.32[b]
Preterm (<37 weeks)	19 (43.2)	33 (34.4)	67 (37.2)	119 (37.2)	
Early term (37-38 weeks)	19 (43.2)	50 (52.1)	75 (41.7)	144 (45.0)	
Term (≥ 39 weeks)	6 (13.6)	13 (13.5)	38 (21.1)	57 (17.8)	
Number of Growth Ultrasounds					
0	41 (93.2)	73 (76.0)	95 (52.8)	209 (65.3)	<0.0001
1	1 (2.3)	16 (16.7)	48 (26.7)	65 (20.3)	
2	1 (2.3)	5 (5.2)	18 (10.0)	24 (7.5)	
3	1 (2.3)	1 (1.0)	15 (8.3)	17 (5.3)	
4	0 (0.0)	1 (1.0)	4 (2.2)	5 (1.6)	
Number of Biophysical Profiles					
0	23 (52.3)	52 (54.2)	70 (38.9)	145 (45.3)	<0.0001
1-3	20 (45.5)	35 (36.5)	55 (30.6)	110 (34.4)	
4-6	0 (0.0)	7 (7.3)	36 (20.0)	43 (13.4)	
≥ 7	1 (2.3)	2 (2.1)	19 (10.6)	22 (6.9)	

SD = standard deviation; IQR = interquartile range; data are given as mean (SD) or n (%)
[a] ANOVA
[b] Chi-square test

Table 2. Neonatal outcomes of pregnancies with FGR diagnosis during three time periods.

	Group 1 (n=44)	Group 2 (n=96)	Group 3 (n=180)	Total (n=320)	p-value
Neonatal complications composite[c]	25 (56.8)	44 (45.8)	67 (37.2)	136 (42.5)	0.046
1 minute APGAR < 7	11 (25.0)	18 (19.2)	41 (22.8)	70 (22.0)	0.69
5 minute APGAR < 7	1 (2.3)	8 (8.5)	14 (7.8)	23 (7.2)	0.38
CPAP	11 (25.0)	28 (39.5)	45 (25.4)	84 (26.6)	0.75
High Flow Nasal Canula	5 (11.4)	7 (7.4)	17 (9.6)	29 (9.2)	0.72
Intubation	4 (9.1)	5 (5.4)	17 (9.6)	26 (8.3)	0.48
NICU Admission	24 (54.6)	39 (41.1)	61 (34.1)	124 (39.0)	0.04
Neonatal Encephalopathy	1 (2.3)	0 (0.0)	1 (0.6)	2 (0.6)	0.36[b]
Intracranial hemorrhage	2 (4.6)	3 (3.2)	11 (6.2)	16 (5.1)	0.58[b]
Subgaleal hemorrhage	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	--
Neonatal Seizures	1 (2.3)	0 (0.0)	1 (0.6)	2 (0.6)	0.35[b]
Necrotizing enterocolitis	0 (0.0)	1 (1.1)	2 (1.1)	3 (1.0)	1.0[b]
Neonatal Death	1 (2.3)	0 (0.0)	3 (1.7)	4 (1.3)	0.46[b]

[a] Chi-square test, unless otherwise noted
[b] Monte Carlo estimation of Fisher's exact test
[c] Neonatal complication composite defined occurrence of any of the following outcomes: continuous positive airway pressure (CPAP), high-flow nasal cannula for ventilation (HFNC), intubation, NICU admission, neonatal encephalopathy, intracranial hemorrhage, subgaleal hemorrhage, neonatal seizures or neonatal death

668 | Wernicke'S Encephalopathy in Pregnancy: a Systematic Review of Pregnancy and Neonatal Outcomes

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10:30 AM - 12:30 PM

Objective: To assess and report pregnancy and neonatal outcomes related to Wernicke's encephalopathy in pregnancy.

Study Design: We conducted a systematic review of six databases (MEDLINE, EMBASE, Emcare, the Cochrane Library, Web of Science: Core Collection, and Scopus). Articles from January 1st, 2000 until June 1st, 2024 were included.

We included original observational articles that reported neonatal or fetal outcomes following a diagnosis of Wernicke's encephalopathy in the context of a live intrauterine pregnancy. Descriptive statistics were used to aggregate results, as well as a nonparametric chi-square test and ANOVA. The Oxford Center of Evidence-Based Medicine grading tool was used to assess quality of evidence

Results: After screening 1005 references, a total of 65 studies encompassing 88 patients were eligible for analysis, all of which were case series or case reports. The mean gestational age of Wernicke's diagnosis was 16 ± 4.4 weeks. The majority of patients (55/88, 62.5%) had a live delivery, with 35 (63.6%) being reported as term delivery. Mean birthweight was 2523.64 grams. A total of 29 (32.9%) patients experienced pregnancy loss, with the majority (22/29, 75.9%) occurring before 20 weeks of gestation. Pregnancy loss was significantly associated with severe Wernicke's disease (p = 0.006), as well as delayed diagnosis (p = 0.02). A total of 40 studies reported the mode of delivery, with 22 (55%) involving Cesarean deliveries and 18 (45%) involving vaginal deliveries. There was limited data available regarding neonatal outcomes, especially regarding long-term follow-up. Among the 54 live births, 35 (64.8%) were described simply

as “healthy” or “eutrophic”. Seven cases specifically noted no neonatal neurological concerns at birth.

Conclusion: Although evidence regarding Wernicke’s encephalopathy in pregnancy is limited, it is crucial to counsel patients about the increased risk of pregnancy loss associated with severe Wernicke’s disease. Prompt diagnosis and treatment are essential, as delayed diagnosis is also more likely to result in pregnancy loss.

669 | Evaluating the Impact of a Novel Shared Medical Appointment Model for Gestational Diabetes Care

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10:30 AM - 12:30 PM

Objective: Optimizing care delivery for gestational diabetes (GDM) has the potential to improve maternal and fetal/neonatal outcomes. The Shared Medical Appointment (SMA) has emerged as a novel tool to improve access as well as patient engagement and satisfaction by providing group care for patients sharing a common diagnosis. This study evaluated the impact of introducing an SMA model for GDM care.

Study Design: This a retrospective cohort study with a pre/post design at 2 hospitals in a single health system. All patients with a diagnosis of GDM who delivered >20 weeks from 1/1/2018-12/31/2022 were included. The SMA model was initiated 1/1/2021 with 8 patient slots/week, capturing 45% of the GDM patient population. Prior to this, all patients with GDM had traditional MFM consults. Patient demographic and clinical data were compared before and after initiation of the SMA. The primary outcome was a composite of GDM-related adverse obstetric outcomes including fetal demise, macrosomia (> 4000g), NTSV cesarean delivery, and NICU admission. Multivariable logistic regression evaluated the primary outcome before and after instituting the GDM SMA. Yearly incidence of the primary outcome was evaluated for the entire obstetric population during this period to assess for a secular trend.

Results: 2,309 patients with GDM were included (4.8% of all delivered patients during the study period) with 821 cases of the primary outcome (35.6%). Patient characteristics pre/post introduction of the SMA are depicted in Table 1. Significant differences were noted in maternal age and OBCMI (higher post-SMA) and nulliparity and pregravid BMI (higher pre-SMA). On adjusted analysis, there was a lower adjusted odds ratio (aOR) for the primary outcome (0.826, 95% CI 0.685-0.995, p = 0.044) with the SMA, driven by decreased odds of NICU admission (Table 2). There was no evidence of a secular trend in the primary outcome.

Conclusion: Innovations in care delivery for pregnancy complications like GDM have potential to improve obstetric outcomes. Further research can clarify implementation strategies and generalizability of this approach.

Table 1. Patient Characteristics Pre- and Post-Introduction of the SMA Model for GDM Care

	Pre-SMA *N = 1,373*	Post-SMA *N = 936*	P-value
Maternal age (median, IQR)	29.8 (26.2, 33.2)	32.6 (28.7, 36.0)	**< 0.01**
Pregravid BMI (median, IQR)	31.0 (25.6, 37.3)	30.1 (25.1, 36.2)	0.05
Black race (N, %)	219 (16.0%)	148 (15.8%)	0.93
Hispanic ethnicity (N, %)	116 (8.4%)	65 (6.9%)	0.19
Insurance type (N, %)			
Medicaid/Medicare	406 (29.6%)	268 (28.6%)	0.63
Commercial	967 (70.4%)	668 (71.4%)	
Nulliparity (N, %)	556 (40.5%)	337 (36.0%)	**0.03**
Multiple gestation (N, %)	51 (3.7%)	26 (2.8%)	0.22
Chronic hypertension (N, %)	180 (13.1%)	107 (11.4%)	0.23
Gestational hypertension/mild preeclampsia (N, %)	223 (16.2%)	158 (16.9%)	0.68
Severe preeclampsia (N,%)	102 (7.4%)	63 (6.7%)	0.52
Chronic kidney disease (N, %)	9 (0.7%)	2 (0.2%)	0.13
History of bariatric surgery (N, %)	8 (0.6%)	8 (0.9%)	0.44
Intrauterine fetal demise (N, %)	2 (0.1%)	5 (0.5%)	0.10
Cesarean delivery (N, %)	625 (45.5%)	431 (46.0%)	0.80
NTSV cesarean (N, %)	165 (12.0%)	92 (9.8%)	0.10
Estimated blood loss [mL] (median, IQR)	490 (300, 800)	448.5 (259, 766)	0.13
OBCMI (median, IQR)	2 (0, 3)	2 (1, 3)	**0.04**
SMM without transfusion* (N, %)	19 (1.4%)	12 (1.3%)	0.83
Preterm birth < 34 weeks (N, %)	73 (5.3%)	36 (3.8%)	0.10
Preterm birth 34 – 37 weeks (N, %)	182 (13.3%)	135 (14.4%)	0.42
Birthweight [g] (median, IQR)	3286 (2859, 3600)	3310 (2922, 3694)	**0.04**
Macrosomia (N, %)	184 (13.4%)	124 (13.2%)	0.92
NICU admission (N, %)	275 (20.0%)	149 (15.9%)	**0.01**

*CDC definition: https://www.cdc.gov/maternal-infant-health/php/severe-maternal-morbidity/icd.html

Table 2. Adjusted Odds of the Primary Outcome Composite and its Components after Introduction of the Gestational Diabetes Shared Medical Appointment Model

	aOR*	95% CI	P-Value
Primary Outcome Composite	0.826	0.685 - 0.995	**0.044**
Components of the Primary Outcome			
Macrosomia	0.971	0.760 – 1.241	0.816
IUFD	3.760	0.722 – 19.566	0.116
NTSV Cesarean**	0.913	0.661 – 1.262	0.582
NICU Admission	0.693	0.537 – 0.896	**0.005**

*Backward selection used to refine model. Final model included the primary outcome and exposure as well as preterm birth < 37 weeks, OBCMI (which incorporates maternal age and BMI), and nulliparity.
**Nulliparous/Term/Singleton/Vertex

670 | Predictors of Successful Induction of Labor in Patients with Class 3 Obesity

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10:30 AM - 12:30 PM

Objective: Maternal obesity is a known risk factor for cesarean delivery, but risk may be differential based on obesity severity. This study explores predictors of successful vaginal delivery in patients with class 3 obesity undergoing induction of labor.

Study Design: This is a retrospective cohort study of singleton deliveries with BMI $\geq$ 40 following induction of labor $\geq$ 20 weeks at a multi-hospital academic health system from 1/1/2022-6/30/2024. Patients with prior cesarean were excluded. The primary outcome was vaginal delivery. Patient clinical data were extracted from the medical record and demographics, clinical risk factors, and outcomes were compared in univariable analyses by mode of delivery. Based on identified significance in these analyses, a multivariable logistic regression model was utilized to evaluate the impact of potential predictors on adjusted likelihood of vaginal delivery.

Results: 610 total patients were included, 457 of whom delivered vaginally (74.9%). Patients who delivered vaginally had lower pregravid BMI (43.6 v. 44.5, p = 0.01) and lower delivery BMI (46.3 v. 49.4, p < 0.01) [Table 1]. Patients with Medicaid compared to commercial insurance were more likely to delivery vaginally, as were patients who were not nulliparous, did not require cervical ripening at induction, and did not have severe preeclampsia. Patients who delivered by cesarean had higher rates of NICU admission and extended postpartum length of stay, as well as blood loss. Nulliparity was identified as the most significant negative predictor of vaginal delivery on adjusted analysis (aOR 0.01, 95% CI 0.06-0.18, p < 0.01) [Table 2]. Other significant

negative predictors were higher delivery BMI, cervical ripening, and chronic hypertension.

Conclusion: Nulliparous patients with class 3 obesity who require cervical ripening have significantly lower odds of vaginal delivery. These data can help guide counseling and physician decision making surrounding optimizing induction of labor for this patient group.

Table 1. Demographics, Clinical Characteristics, and Obstetric Outcomes by Mode of Delivery among Singleton Pregnancies with Class 3 Obesity undergoing Induction of Labor

	Cesarean Delivery N = 153	Vaginal Delivery N = 457	P-value
Maternal age (median, IQR)	31.0 (28.0, 34.0)	30.0 (27.0, 33.0)	0.25
Pregravid BMI (median, IQR)	44.5 (42.3, 49.1)	43.6 (41.5, 47.5)	**0.01**
Delivery BMI (median, IQR)	49.4 (45.1, 53.0)	46.3 (43.8, 50.1)	**< 0.01**
Black race (N, %)	45 (29.4%)	137 (30.0%)	0.89
Hispanic ethnicity (N, %)	8 (5.2%)	36 (7.9%)	0.27
Insurance type (N, %)			
Medicaid/Medicare	46 (30.1%)	192 (42.0%)	**0.03**
Commercial	106 (69.3%)	263 (57.5%)	
Nulliparity (N, %)	129 (84.3%)	140 (30.6%)	**< 0.01**
Cervical ripening at induction (N, %)	129 (84.3%)	252 (55.1%)	**< 0.01**
Premature rupture of membranes (N, %)	12 (7.8)	35 (7.7)	0.94
Chronic hypertension (N, %)	61 (39.9%)	136 (29.8%)	**0.02**
Gestational hypertension/mild preeclampsia (N, %)	58 (37.9%)	151 (33.0%)	0.27
Severe preeclampsia (N, %)	56 (36.6%)	113 (24.7%)	**< 0.01**
Pregestational diabetes (N, %)	15 (9.8%)	33 (7.2%)	0.30
Gestational diabetes (N, %)	50 (32.7%)	118 (25.8%)	0.10
History of bariatric surgery (N, %)	10 (6.5%)	18 (3.9%)	0.18
Modified OB-CMI* (median, IQR)	1.0 (0.0, 1.0)	0.0 (0.0, 1.0)	0.59
Preterm birth < 34 weeks (N, %)	8 (5.2%)	22 (4.8%)	0.84
Late preterm birth [34-37 weeks] (N, %)	22 (14.4%)	42 (9.2%)	0.07
Birthweight (median, IQR)	3250.0 (2859.9, 3642.1)	3252.0 (2938.9, 3572.0)	0.80
Macrosomia > 4000g (N, %)	11 (7.2%)	32 (7.0%)	0.94
NICU admission (N, %)	29 (19.0%)	55 (12.0%)	**0.03**
Calculated blood loss [mL] (median, IQR)	320.0 (145.0, 725.0)	150.0 (90.0, 280.0)	**< 0.01**
Non-transfusion SMM (N, %)	9 (5.9%)	14 (3.1%)	0.11
Postpartum length of stay ≥ 5 days (N, %)	6 (3.9%)	5 (1.1%)	**0.02**
Readmission [42 days] (N, %)	6 (3.9%)	15 (3.3%)	0.71

*Excluding BMI, hypertensive disorders, and diabetes, which are reported separately.

Table 2. Predictors of Vaginal Delivery in Patients with Class 3 Obesity and Singleton Gestations undergoing Induction of Labor

	Adjusted OR*	95% Confidence Interval	P Value
Nulliparity	0.10	0.06 – 0.18	**< 0.01**
Gestational age	0.94	0.81 – 1.11	0.48
Pre-gravid BMI	1.11	1.00 – 1.16	0.07
Delivery BMI	0.89	0.83 – 0.95	**< 0.01**
Preterm rupture of membranes	0.66	0.27 – 1.61	0.36
Received cervical ripening	0.39	0.22 – 0.71	**< 0.01**
Chronic hypertension	0.51	0.27 – 0.94	**0.03**
Gestational hypertension	0.66	0.36 – 1.22	0.19
Severe preeclampsia	1.32	0.76 – 2.31	0.32
Pre-gestational diabetes	0.64	0.27 – 1.52	0.32
Gestational diabetes	0.71	0.43 – 1.19	0.19
Modified OBCMI	0.83	0.71 – 0.98	**0.03**

*Model adjusted for each of the above co-variates

671 | Neonatal Outcomes in Fetuses with Resolved Growth Restriction

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10:30 AM - 12:30 PM

Objective: Fetal growth restriction (FGR) is associated with neonatal morbidity and mortality, but 17% of fetuses with FGR will return to normal growth prior to delivery (resolved FGR, rFGR). Neonatal outcomes of this group have not been studied, and insufficient data exist to guide management. The aim of this study was to compare neonatal outcomes of pregnancies complicated by rFGR to pregnancies with no history of FGR.

Study Design: This was a retrospective cohort study of live, term singleton deliveries without known or suspected structural or genetic abnormalities from 2018-2023 at a tertiary medical center. The exposed cohort had an ultrasound diagnosis of FGR (either by AC or EFW < 10th percentile) followed by resolution of FGR on a subsequent ultrasound preceding delivery. Maternal demographics, clinical characteristics and delivery outcomes were compared by FGR status (no FGR, FGR and rFGR) at the time of delivery. We fit separate logistic regression models to estimate the association between rFGR and NICU admission, hypoxic ischemic encephalopathy (HIE), and neonatal death, adjusting for confounders. Birth weight, length of hospital stay, and APGAR scores were modeled using linear and proportional odds ordinal regression models.

Results: A total of 11,957 pregnancies were analyzed, of which 393 were complicated by rFGR. No differences were observed between rFGR and no FGR patients in rates of hypertensive disorders, diabetes, gestational age at delivery, or mode of delivery (Table 1). Compared to no FGR, birth weights in the rFGR cohort were lower by 366g (95% CI -422.37, -310.39; p< 0.001). No other significant effects of rFGR were observed in any of the neonatal outcomes assessed (Table 2). Although not statistically significant, the direction of the effect suggests that neonates with rFGR (vs. no FGR) may have increased odds of NICU admission, HIE, neonatal death, and longer duration of hospital stay.

Conclusion: When compared to pregnancies not complicated by FGR, the diagnosis of rFGR did not increase the risk of adverse neonatal outcomes in this cohort.

Table 1: Descriptive Statistics

	No history of FGR[1] (N = 10,873)	FGR (N = 691)	Resolved FGR (N = 393)	*p* value (all 3 groups)	*p* value (no FGR vs FGR)
Maternal age (median, IQR[2])	30.66 (26.24, 35.18)	28.72 (23.53, 33.22)	29.67 (24.67, 33.61)	<0.001*	<0.001¶
Maternal BMI[3] (kg/m^2) (median, IQR)	28.70 (24.37, 34.47)	26.32 (22.83, 32.22)	27.34 (23.63, 33.22)	<0.001*	0.019¶
Medical comorbidities					
Hypertensive disorder	1,227 (11%)	72 (10%)	43 (11%)	0.771‡	
Cardiac disease	762 (7%)	56 (8.1%)	30 (7.6%)	0.505‡	
Diabetes	1,995 (18%)	74 (11%)	66 (17%)	<0.001‡	0.434‡
Thyroid disease	1,060 (9.7%)	48 (6.9%)	20 (5.1%)	<0.001‡	0.002‡
Psychiatric conditions	2,507 (23%)	184 (27%)	184 (21%)	0.067¥	
Tobacco use	919 (8.5%)	129 (19%)	40 (10%)	<0.001‡	0.228‡
Substance use	424 (3.9%)	65 (9.4%)	15 (3.8%)	<0.001‡	0.934‡
Pregnancy complications					
Hyperemesis gravidarum	108 (1%)	10 (1.4%)	7 (1.8%)	0.138¥	
Gestational hypertension, preeclampsia	2,738 (25%)	184 (27%)	99 (25%)	0.697‡	
Gestational diabetes	1,594 (15%)	57 (8.2%)	46 (12%)	<0.001‡	0.103‡
Placental abruption	193 (1.8%)	28 (4.1%)	5 (1.3%)	<0.001‡	0.456‡
Premature rupture of membranes	1,088 (10.0%)	52 (7.5%)	27 (6.9%)	0.015‡	0.041‡
Preterm labor	859 (7.9%)	81 (12%)	19 (4.8%)	<0.001‡	0.026‡
Gestational age at delivery (weeks) (median, IQR)	39.0 (37.57, 39.57)	37.14 (35.29, 38.50)	39.0 (37.57, 39.71)	<0.001*	0.699¶
Mode of delivery				<0.001‡	0.960‡
Vaginal delivery	6,293 (58%)	334 (48%)	227 (58%)		
Cesarean delivery	4,578 (42%)	356 (52%)	166 (42%)		

[1]FGR = fetal growth restriction; [2]IQR = interquartile range; [3]BMI = body mass index.
* = Kruskal Wallis Test; ¶ = Wilcoxon Rank-Sum Test; ‡ = Pearson's X^2 test of homogeneity; ¥ = Fisher's Exact Test.

Table 2: Model Results

	Effect (rFGR[1] vs no FGR[2])	95% CI	*p* value
Birth weight (grams) (median, IQR[3])	-366.38	-422.37, -310.39	<0.001
1-min APGAR*	0.88	0.71, 1.08	0.233
5-min APGAR*	0.80	0.63, 1.00	0.054
10-min APGAR*	0.76	0.45, 1.27	0.289
NICU admission*	1.07	0.82, 1.38	0.628
Hypoxic ischemic encephalopathy*	2.16	0.66, 7.02	0.201
Neonatal death*	1.81	0.83, 3.96	0.136
Length of hospital stay (days)*	1.01	0.85, 1.20	0.883

[1]rFGR = resolved fetal growth restriction; [2]FGR = fetal growth restriction; [3]IQR = interquartile range; * = Effects and CI reported in terms of odds ratios
Model controlled for: Tobacco use, substance use, maternal BMI (only in birth weight model), maternal age, presence of hypertensive disorder, gestational hypertension/preeclampsia, diabetes, gestational diabetes, renal disease, cholestasis, cardiac disease, anemia, chronic lung disease, thyroid disease, malignancy, psychiatric conditions, chronic gastrointestinal disorders, hepatobiliary disease, and connective tissue disorders.

672 | Mid-Trimester Rupture of the Membranes:Irish Perspective from a Tertiary Unit Following Liberalisation of Top Legislation

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10:30 AM - 12:30 PM

Objective: Midtrimester pre-mature pre-labour rupture of membranes(MTPPROM) between 14+0-23+6 gestation age(GA) is a rare complication of pregnancy associated with poor maternal and fetal outcomes. This study measures outcomes between 2018-2024 at a tertiary referral centre in Ireland with approximately 7000 deliveries per annum. Since the Health (Regulation of Termination of Pregnancy (TOP)) Act, 2018, parents can opt to TOP after 12+GA where there is a risk to the "life or health" of the woman or where the fetus is "likely to die within 28 days of life".This legislative change means that accurate data is critical for counselling families. Our objective is to describe the outcomes following MTPPROM and compare to a similar study conducted prior to liberalisation of the TOP legislation.

Study Design: Retrospective cohort study of consecutive MTPPROM January 2018 to February 2024.

Results: 109 patients met inclusion criteria, at a prevalence rate of 0.2%. The median maternal age was 33 and median GA at MTPPROM was 21+0, with an median latency period of 7 days(IQR 26 days, range 0-147 days). 77% experienced maternal morbidity, with no maternal mortalities. The neonatal survival to discharge (NSTD) was 27.5%. Outcomes are compared to the publication by Linehan et al. paper(Table 1) prior to the Health Act 2018 showing a 5% NSTD rate. MTPPROM between 14+0-19+6 had a lower NSTD compared to those over 20+ GA(10%vs41%, p value = 0.0003). These cases also had a higher rate of MROP(30%vs13%, p value = 0.02). Anhydramnios was associated with 0% NSTD. Singleton pregnancies with oligohydramnios had a lower NSTD compared to those with normal liquor volume(21%vs51%, p value = 0.007). 90% of the patients who opted for TOP had a deepest vertical pool of less than 2cm and had a higher rate of chorioamnionitis(34%vs73%, p value = 0.01) (Table 2).

Conclusion: While NSTD is higher for patients with normal liquor volume and PPROM over 20+ GA, mortality and morbidity still continues to be high. The majority of patients who opted for TOP were diagnosed with chorioamnionitis and oligohydramnios reflecting a higher NSTD percentage post legislation.

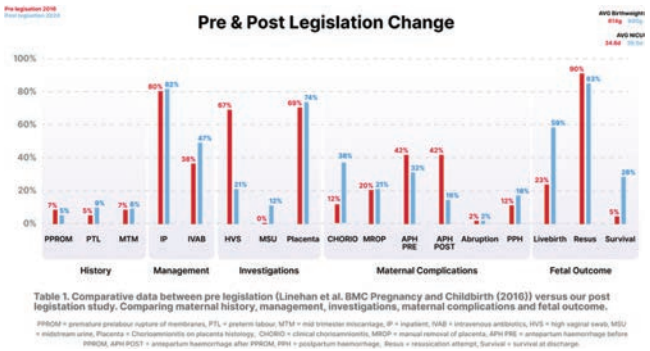

Table 1. Comparative data between pre legislation (Linehan et al. BMC Pregnancy and Childbirth (2016)) versus our post legislation study. Comparing maternal history, management, investigations, maternal complications and fetal outcome.

PPROM = premature prelabour rupture of membranes, PTL = preterm labour, MTM = mid trimester miscarriage, IP = inpatient, IVAB = intravenous antibiotics, HVS = high vaginal swab, MSU = midstream urine, Placenta = Chorioamnionitis on placenta histology, CHORIO = clinical chorioamnionitis, MROP = manual removal of placenta, APH PRE = antepartum haemorrhage before PPROM, APH POST = antepartum haemorrhage after PPROM, PPH = postpartum haemorrhage, Resus = resuscitation attempt, Survival = survival at discharge.

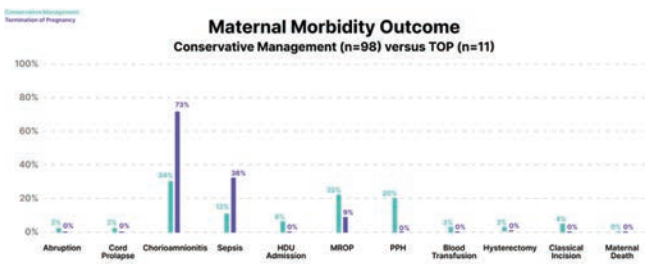

Table 2. Comparative data of maternal morbidities between patients who opted for termination of pregnancy versus conservative management.

TOP = Termination of Pregnancy, HDU = High Dependency Unit, MROP = Manual Removal of Placenta, PPH = Postpartum haemorrhage over 500ml

673 | Mechanical Cervical Ripening Among Patients with a Bmi Greater Than 30

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10:30 AM - 12:30 PM

Objective: Patients with obesity undergoing induction of labor (IOL) are at an increased risk for a prolonged labor duration. The efficacy of a combination of a cervical ripening balloon (CRB) plus vaginal misoprostol (VM) in this population is not well described. We aimed to determine the effect of CRB + VM versus VM alone on time from IOL to delivery in patients with obesity.

Study Design: Secondary analysis of a single center, double-blinded RCT between 6/2022 and 7/2023, which randomized near-term, singleton gestations with a BMI $\geq$ 30 kg/m^2 undergoing IOL, with a cervical dilation $\leq$ 3cm, to either 25mcg or 50mcg of VM. For this analysis, we included only those patients from the primary study who received a CRB +VM upon induction initiation and compared them to those patients receiving only VM. The primary outcome was time from induction initiation to delivery. Multivariable linear regression was used for the primary outcome with adjustments made for randomization group, nulliparity, and cervical dilation on admission.

Results: This secondary analysis included 125 participants: 55 (44%) receiving CRB + VM versus 70 (56%) receiving VM alone. Baseline characteristics were similar, however those with a CRB were younger (26.2 years vs. 29.1 years; p = 0.03) and with fewer Hispanic patients (69.1% vs. 82.9%; p = 0.04). 65 (52%) patients received the 50mcg dose versus 60 (48%) received the 25mcg dose which was used as a covariate in our final model. Following adjustment, patients with a CRB+VM had a reduced time to

delivery (14.7 hrs vs. 17.7 hrs; p = 0.02) and reduced time to active labor (11.8 hrs vs. 14.6 hrs; p = 0.02). No differences in cesarean delivery or adverse maternal/neonatal outcomes were seen.

Conclusion: In patients with obesity undergoing IOL, a combination of CRB+VM reduced time to delivery and active labor by an average of 3 hours. Given this population's increased risk for prolonged delivery times and perinatal morbidity, a combination of mechanical dilation with misoprostol administration should be considered.

Table 1. Demographics

	CRB+VM (n=55)		VM (n=70)		p-value
Nulliparous	29	52.7	33	47.1	0.59
Age (y), mean (SD)	26.18	7.84	29.14	6.87	**0.03**
Gestational age at induction (wk), mean (SD)	39.09	1.39	38.88	1.41	0.41
BMI (kg/m^2)					
BMI 30-39	44	80.0	55	78.6	0.85
BMI 40+	11	20.0	15	21.4	
Dilation at induction, median (IQR)	1.00	1, 1	1.00	1, 1	0.26
Modified Bishop score at induction, median (IQR)	2.00	1, 3	2.00	1, 2	0.52
Randomization group					
25mcg vaginal misoprostol	28	50.9	32	45.7	0.56
50mcg vaginal misoprostol	27	49.1	38	54.3	
Race					
White	50	90.9	60	85.7	
Black	1	1.8	6	8.6	0.27
Asian	1	1.8	0	0	
Not Documented	3	5.5	4	5.7	
Ethnicity					
Hispanic	38	69.1	58	82.9	
Non-Hispanic	17	30.9	10	14.3	**0.04**
Not Documented	0	0	2	2.9	
Group B Colonization (+)	16	29.1	15	21.4	0.60

CRB, Cervical Ripening Ballon; VM, Vaginal Misoprostol; SD, Standard Deviation; IQR, Interquartile Range; y, years; wk, weeks

Data presented as number (percentage) unless otherwise specified.

Table 2. Primary Outcome and Intrapartum Outcomes

	CRB+VM (n=55)		VM (n=70)		P
Time to Delivery (h), mean (SD) [a]	14.73	10.42	17.67	9.24	**0.02**
Time to Active Labor (h), mean (SD) [a]	11.77	9.46	14.55	7.86	**0.02**
Cesarean Delivery [a]	16	29.1	15	21.4	0.67
No. of misoprostol doses, median (IQR)	1.00	1, 1	1.00	1,2	**0.02**
Timing of Amniotomy initiation (h), median (IQR)	6.00	4, 9	8.00	5,10	0.10
Timing of Oxytocin initiation (h), median (IQR)	5.00	5, 7.5	7.50	5, 11	0.06
Duration of Oxytocin (h), median (IQR)	9.00	5, 13.5	9.00	6, 12	0.84
AROM Performed	54	98.2	50	71.4	**<0.01**
Tachysystole	10	18.2	8	11.4	0.31
Tachysystole with associated FHT changes	0	0.0	1	1.4	>0.99
Terbutaline used	0	0.0	1	1.4	>0.99
Meconium Staining	7	12.7	5	7.1	0.36
Chorioamnionitis	3	5.5	7	10.0	0.51
Pre-eclampsia diagnosed intrapartum	6	10.9	12	17.1	0.44
Shoulder Dystocia	3	5.5	3	4.3	>0.99
pRBC Transfusion	0	0.0	2	2.9	0.50
Sepsis	1	1.8	0	0	0.44
Clinical Endometritis	1	1.8	1	1.4	>0.99
Wound Complications	1	1.8	0	0	0.44
Intraperitoneal Hematoma	0	0.0	0	0.0	---
Maternal ICU Admission	0	0.0	0	0.0	---
QBL at 24 hrs (mL), median (IQR)	300	175, 540	375	210, 720	0.13
Postpartum Hemorrhage	7	12.7	8	11.4	>0.99
Maternal Hospital LOS (d), median (IQR)	3.00	2, 4	3.00	2, 4	0.61

[a] *Model adjusted for misoprostol dose, nulliparity, and cervical dilation on admission*

CRB, Cervical Ripening Ballon; VM, Vaginal Misoprostol; SD, Standard Deviation; IQR, Interquartile Range; FHT, Fetal Heart Tracing; pRBC, packed Red Blood Cell; QBL, Quantitative Blood Loss; LOS, Length of Stay

Data presented as number (percentage) unless otherwise specified.

674 | Factors Related to Patient Participation in an Obstetric Clinical Trial

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10:30 AM - 12:30 PM

Objective: Factors related to patient participation in an obstetric clinical trial have not been well described in literature which is vital towards appropriate study design. We aimed to determine factors which may influence participation in an obstetric clinical trial.

Study Design: Cross-sectional survey of persons eligible for a single center, double-blinded, labor induction RCT between 6/2022 and 7/2023. Prior to trial enrollment, we administered a 15-question validated survey which assessed both motivation and barrier factors on a scale from 0 (no influence) to 4 (most influence). Patients were excluded if they voluntarily declined the survey. Comparisons were made between those participating in the trial versus those that declined. The primary outcomes were mean scores obtained in each of the four subset of questions (motivations and barriers). Secondarily, we analyzed differences in these subsets between self-reported ethnicity. Multivariable linear regression was used for all outcomes.

Results: A total of 273 eligible patients were approached for the trial with 180 participating and 93 declining. There were 73 survey respondents with 60 (82.2%) participating in the trial versus 13 (17.8%) declining. Individual questions of the motivation/barrier scales all reached an acceptable level of agreement with Cronbach's alpha scores all > 0.7. Patients who declined the trial expressed less overall influence (0.96 vs. 1.99; p< 0.01) and lower influence by either barriers (p< 0.01) or motivating factors (p = 0.03). Hispanic patients expressed increased influence by motivation 2 questions, such as concordant provider language (1.84 vs. 0.67; p< 0.01) in addition to experiencing an increased impact to barrier 1 and 2 questions, such as family and religious concern (p< 0.05).

Conclusion: Patients who declined trial participation had lower motivating and barrier factors which may be due to overall disinterest in research participation. However, Hispanic patients had an increased desire to participate when there was concordant race/ethnicity, language, and sex with their providers.

Table 1. Reliability assessment for factors related to clinical trial participation scale

Group	*Survey Question*	*Mean*	*SD*	*Cronbach's alpha*
Overall	--	1.81	1.06	0.93
Motivation 1	My relationship with my doctor	2.51	1.56	0.86
	Doctor's reputation in the community	2.35	1.61	
	How well the research study was explained to me	2.83	1.40	
	Knowledge learned from my participation will benefit someone in the future	2.81	1.43	
Motivation 2	My desire to please the doctor	1.76	1.61	0.85
	The doctor conducting the research is the same gender (sex) as me	1.24	1.69	
	The doctor conducting the research is the same race/ethnicity as me	0.97	1.44	
	The doctor conducting the research speaks the same language as I do	1.57	1.62	
Barrier 1	Time commitment	2.15	1.47	0.80
	No follow-up visits related to the study	2.09	1.54	
	Risk of unknown side effects to myself or my baby	2.07	1.47	
Barrier 2	My distrust in doctors	0.90	1.35	0.85
	My family's concern	1.39	1.51	
	My religious beliefs	1.22	1.54	
	Clinical research studies are too hard to understand	1.22	1.38	

All survey questions answered on a scale from 0 (no influence) to 4 (most influence).

SD, standard deviation

Table 2. Motivation and barrier scale scores by trial participation and ethnicity

	Participated in trial				p-value
	Declined (n=13)		Enrolled (n=59)		
	Mean	SD	Mean	SD	
Total	0.96	0.92	1.99	1.01	**<0.01**
Motivation 1	1.62	1.75	2.85	1.01	**0.03**
Motivation 2	0.65	1.20	1.55	1.31	**0.03**
Barrier 1	1.05	0.81	2.34	1.22	**<0.01**
Barrier 2	0.56	0.61	1.32	1.26	**<0.01**
	Ethnicity				p-value
	Hispanic (n=44)		Non-Hispanic (n=15)		
	Mean	SD	Mean	SD	
Total	2.19	1.04	1.32	0.46	**<0.01**
Motivation 1	2.95	1.02	2.50	0.96	0.14
Motivation 2	1.84	1.37	0.67	0.59	**<0.01**
Barrier 1	2.50	1.24	1.67	1.03	**0.02**
Barrier 2	1.58	1.30	0.52	0.61	**<0.01**

All survey questions answered on a scale from 0 (no influence) to 4 (most influence).

SD, standard deviation

675 | Deepest Vertical Pocket with Reflex Amniotic Fluid Index as a Screening Approach for Polyhydramnios

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10:30 AM - 12:30 PM

Objective: To describe concordance between amniotic fluid index (AFI) and deepest vertical pocket (DVP) in the assessment of amniotic fluid volume and to determine the utility of using DVP alone as a screening test for clinically significant polyhydramnios.

Study Design: We performed a retrospective cohort study of all outpatient ultrasounds (US) performed at 20.0-41.6 weeks gestation at an academic institution from 2018-2022. Measurements from the US most proximate to delivery were used to analyze the occurrence of polyhydramnios, defined by DVP (≥ 8cm) or AFI (≥ 24cm). We classified severity using accepted definitions by each methodology. Tests of diagnostic performance were calculated using AFI as the accepted gold standard. Pearson correlation coefficient was calculated to describe the relationship between DVP and AFI.

Results: Measurements from 11,688 US met inclusion criteria. Polyhydramnios was diagnosed in 739 (6.3%) US using AFI and 875 (7.5%) using DVP. Using DVP of ≥ 8cm as a cutoff identified all cases of moderate or severe polyhydramnios by AFI (Table). However, it also indicated polyhydramnios in 337 cases where AFI was normal, a false positive rate of 3.1%. Of 193 patients with moderate or severe polyhydramnios by AFI, 171 (88.6%) were misclassified as mild by DVP. Using DVP as a screening tool to identify moderate or severe polyhydramnios yielded sensitivity of 100% (95% CI 98.1-100%), specificity of 94.1% (95% CI 93.6-94.5%), positive predictive value of 53.1% (95% CI 51.3-54.9%), and negative predictive value of 100% (95% CI 99.9-100%). DVP and AFI were highly correlated (Figure, $r = 0.84$, $p < 0.01$).

Conclusion: Using DVP as a screening tool, with reflex measurement of AFI if DVP is ≥ 8cm, is predicted to identify all cases of moderate or severe polyhydramnios and reduce over-diagnosis of mild polyhydramnios both in cases of normal AFI and in those with more significant polyhydramnios.

Table: Diagnosis of polyhydramnios by DVP and AFI

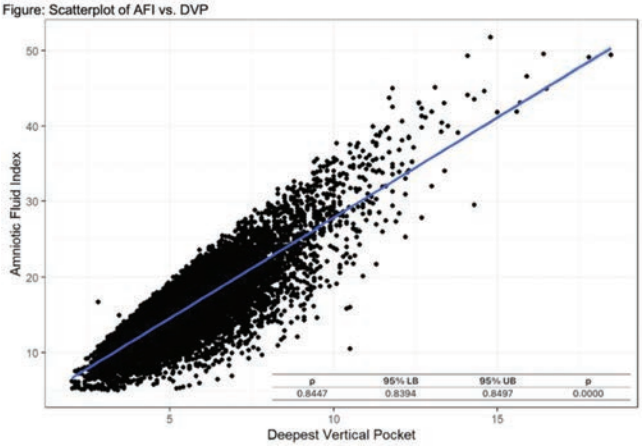
			DVP[2]				
				Polyhydramnios[4]			
			Normal	Mild	Moderate	Severe	Any (n=875)
AFI[1]	Polyhydramnios[3]	Normal	10,612	337	0	0	337
		Mild	201	344	1	0	345
		Moderate	0	122	2	0	124
		Severe	0	49	16	4	69
		Any (n=739)	201	515	19	4	

[1]AFI=amniotic fluid index | [2]DVP=deepest vertical pocket

[3]Polyhydramnios severity by AFI was classified as: mild ≥24cm and <30cm, moderate ≥30cm and <35cm, and severe ≥35cm

[4]Polyhydramnios severity by DVP was classified as: mild ≥8 and <13cm, moderate ≥13cm and <16cm, and severe ≥16cm

Figure: Scatterplot of AFI vs. DVP



676 | Self-Perception of Pregnancy Risk and Contraceptive Safety Among Women with Cardiac Disease

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10:30 AM - 12:30 PM

Objective: To assess perceived safety of contraceptive use and pregnancy among women with cardiac disease in a public hospital setting.

Study Design: Women ages 18-45 with cardiac disease were recruited from the adult congenital cardiac disease or high risk obstetrics clinic at Harbor-UCLA Medical Center from June 2018 - September 2019. A cross-sectional survey was administered regarding contraception use, pregnancy history, and perceptions of risk associated with pregnancy in the context of their cardiac condition. Participants were stratified by WHO Classification (Class 1/2 versus Class 3/4) and tested for differences using Wilcoxon Rank Sum tests for numeric variables and Fisher's Exact tests for categorical variables.

Results: 42 participants completed the survey: 31 with Class 1/2 disease (73.8%) and 11 with Class 3/4 disease (26.2%). 72.7% of participants with WHO Class 3/4 disease, as well as 61.3% of Class 1/2 participants perceived pregnancy as "Dangerous" or "Very Dangerous". All (100%) of Class 3/4 group and 87% of Class 1/2 group reported oral contraceptives, regardless of hormone type, as "not safe" or "unsure" about safety. For non-pill, progesterone-only methods, most participants, regardless of WHO Class, regarded these as "not safe" or "unsure" (DMPA 80.5%, Nexplanon 85.4%, LNG IUD 75%).

Conclusion: High risk cardiac participants accurately recognize pregnancy as dangerous in the context of their disease; however, they are uncertain of safe methods of preventing pregnancy. Low-risk cardiac patients also perceive pregnancy as dangerous, even though their risk is not significantly different from the general population. The majority of participants with cardiac disease perceive hormonal birth control to be unsafe regardless of disease severity or hormone type. This study highlights the need for improved patient education to increase utilization of effective methods of contraception in this high-risk patient population.

677 | Antenatal Mood Disorders in Placenta Accreta Spectrum

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10:30 AM - 12:30 PM

Objective: Placenta Accreta Spectrum (PAS) is a disorder of abnormal invasion of the placenta into or through the myometrium typically treated by cesarean hysterectomy and is associated with increased morbidity and mortality. PAS is associated with increased risks of postpartum mood disorders, but no studies have directly explored antenatal mood disorders in patients with PAS. We aimed to assess antenatal rates of depression and anxiety in those with PAS compared to those with a diagnosis of placenta previa and all pregnancies without these placental diagnoses.

Study Design: We performed a retrospective cohort study using data from the EpicCosmos dataset which combines information from >1500 hospitals and >260 million patients. We queried all pregnancies between 7/1/2015-7/1/2024. We identified those with a diagnosis of placenta accreta, increta, percreta, or placenta previa during pregnancy as well as new diagnoses of depression or anxiety during pregnancy using ICD-10 codes. Demographic and mood disorder data was compared between groups using chi-square for categorical variables and ANOVA for continuous variables.

Results: In our cohort, we identified 13,944 patients with PAS, 315,756 patients with placenta previa, and 8,153,662 other pregnancies. Mean maternal age was older in those with PAS (37 +/-6years). Placenta previa had a significantly higher association with antenatal diagnosis of depression (12.1%) and anxiety (18.2%) compared to both PAS (9.9% and 14.5%) and all other pregnancies (9.5% and 13.6%). PAS had non-significantly increased rates of depression, but significantly increased rates of anxiety compared to all other pregnancies (14.5% vs 13.6%). There were no differences between the subgroups of PAS.

Conclusion: In our large cohort, placenta previa was associated with higher rates of depression and anxiety. PAS was associated with higher rates of anxiety compared to all other pregnancies. Given these findings, further investigations focused on how to best screen for perinatal mood disorders and support those affected by placental conditions requiring surgical delivery is needed.

Table 1. Demographics pregnancies complicated by placenta accreta spectrum, placenta previa, and all other pregnancies.

	Placenta Accreta Spectrum (n= 13,944)	Placenta Previa (n= 315,756)	Total Pregnancies (n= 8,153,662)	P-value
Maternal age *mean (SD)*	37 (6)	35 (6)	33 (7)	<0.01
Race*				<0.01
American Indian/Alaskan Native	183 (1.3)	4,286 (1.4)	111,894 (1.4)	
Asian	642 (4.6)	20,742 (6.6)	477,908 (5.9)	
Black	2,491 (17.9)	47,434 (15.0)	1,625,624 (19.9)	
White	7,389 (53.0)	219,099 (69.4)	5,174,111 (63.5)	
Other	1,792 (12.9)	45,825 (14.5)	1,212,591 (14.9)	
Not reported	427 (3.1)	10,541 (3.3)	380,576 (4.7)	
Ethnicity				<0.01
Hispanic/Latinx	2,388 (17.1)	52,583 (16.7)	1,568,339 (19.2)	
Non-Hispanic/Latinx	8,603 (61.7)	248,136 (78.6)	6,105,161 (74.9)	
Not reported	665 (4.8)	15,037 (4.8)	480,162 (5.9)	
Rural/Urban Area				<0.01
Metropolitan area	10,450 (74.9)	287,820 (91.2)	7,460,201 (91.5)	
Small town	385 (2.8)	9,080 (2.9)	229,100 (2.8)	
Rural	329 (2.4)	6,959 (2.2)	164,970 (2.0)	
Not reported	2,780 (19.9)	11,897 (3.8)	299,391 (3.7)	
Gestational age at delivery *mean*	36w0d	38w6d	38w6d	

Data are displayed as n(%) unless otherwise specified.
*Some individuals identify as multiple races.

Table 2. Perinatal mood disorders in placenta accreta spectrum, placenta previa, and all other pregnancies.

	Placenta Accreta Spectrum (n= 13,944)	Placenta Previa (n= 315,756)	Total Pregnancies (n= 8,153,662)	P-value
Depression	1,375 (9.9)	38,081 (12.1)	774,727 (9.5)	<0.01
Anxiety	2,026 (14.5)	57,545 (18.2)	1,109,749 (13.6)	<0.01
	Placenta Accreta (n= 10,902)	Placenta Increta (n= 864)	Placenta Percreta (n= 1,355)	P-value
Depression	1,154 (10.6)	89 (10.3)	132 (9.7)	.623
Anxiety	1,708 (12.2)	128 (14.8)	190 (14.0)	.250

Data are displayed as n(%) unless otherwise specified.

678 | Risk of Hypertension 2-7 Years After Delivery by Timing of Hypertensive Disorder of Pregnancy

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10:30 AM - 12:30 PM

Objective: We sought to assess whether the timing of onset of a hypertensive disorder of pregnancy (HDP) was related to the risk of incident hypertension 2-7 years after delivery.

Study Design: This is a secondary analysis of the NuMoM2b-Heart Health Study (NuMoM2b-HHS), a multi-site cohort that enrolled nulliparous pregnant individuals in their first trimester who were followed during pregnancy and subsequently underwent a cardiovascular screening visit at 2-7 years after delivery. For this analysis, we excluded individuals with pre-pregnancy chronic hypertension. We compared rates of hypertension (blood pressure ≥130/80 mmHg or use of anti-hypertensive medications) at the 2-7 year postpartum study visit based on timing of onset of HDP (categorized as antepartum, intrapartum, postpartum) versus no HDP (referent). Multivariable logistic regression models adjusted for baseline covariates (age, insurance, tobacco use, diabetes, and early pregnancy body mass index). Interaction analysis was performed to evaluate effect modification by the presence of severe features of HDP.

Results: Of 4,342 individuals included in this analysis, 23% had a HDP and underwent follow up at a mean of 3.2± 0.9 years after their first birth. Hypertension at follow up was more prevalent among those with antepartum (37.6%) or postpartum HDP (40.0%) compared to those with intrapartum HDP (26.0%) or no HDP pregnancies (16.5%). Compared to those with non-HDP pregnancies, those with HDP had higher odds of incident hypertension at follow up regardless of the timing of onset (Table). Findings were similar regardless of the presence of severe features (interaction p = 0.56).

Conclusion: Individuals with HDP, regardless of whether it is diagnosed antepartum, intrapartum or postpartum appear to have similarly increased odds of incident hypertension at 2-7 years postpartum, compared with individuals without HDP in their first birth.

Table 1. Characteristics in pregnancy and at 2-7 year follow up by timing of onset of hypertensive disorder of pregnancy (HDP).

	Normotensive pregnancy (n= 3,335)	Antepartum HDP (n= 540)	Intrapartum HDP (n=427)	Postpartum HDP (n=40)
Characteristics at first pregnancy				
Age at delivery (years)	26.9 (5.5)	26.9 (5.6)	27.6 (6.2)	26.8 (5.3)
Early pregnancy BMI (kg/m^2)	24.2 [21.9, 28.2]	28.5 [24.1, 34.2]	25.6 [22.7, 31.4]	26.0 [23.4, 29.2]
Race				
Non-Hispanic White	2100 (63.0%)	364 (67.4%)	238 (55.7%)	24 (60.0%)
Non-Hispanic Black	383 (11.5%)	87 (16.1%)	86 (20.1%)	10 (25.0%)
Hispanic	602 (18.1%)	52 (9.6%)	58 (13.6%)	5 (12.5%)
Asian	102 (3.1%)	12 (2.2%)	17 (4.0%)	0 (0.0%)
Other	148 (4.4%)	25 (4.6%)	28 (6.6%)	1 (2.5%)
Early pregnancy SBP (mmHg)	108 (10)	114 (11)	110 (11)	113 (11)
Early pregnancy DBP (mmHg)	66 (8)	71 (9)	68 (9)	68 (8)
Gestational age at delivery (weeks)	38.9 (2.1)	37.9 (3.0)	39.0 (2.3)	38.6 (1.9)
Cesarean delivery	805 (24.1%)	221 (40.9%)	134 (31.4%)	19 (47.5%)
Postpartum readmission	46 (1.4%)	19 (3.5%)	6 (1.4%)	8 (20.0%)
Characteristics at follow up visit 2-7 years after delivery				
Age (years)	30.7 (5.5)	30.5 (5.6)	31.2 (6.1)	30.5 (5.5)
BMI (kg/m^2)	24.9 [21.9, 30.1]	29.8 [24.7, 36.1]	26.5 [22.6, 33.2]	27.9 [24.1, 32.2]
Time since delivery (years)	3.1 [2.5, 3.7]	3.1 [2.5, 3.7]	3.0 [2.5, 3.6]	3.2 [2.6, 4.0]
SBP (mmHg)	110 (10)	116 (11)	114 (11)	115 (12)
DBP (mmHg)	71 (9)	77 (10)	73 (11)	76 (12)
Use of anti-hypertensive medications	14 (0.4%)	27 (5.0%)	14 (3.3%)	3 (7.5%)

Data are mean (SD) or median [IQR] unless otherwise noted.
BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure

Table 2. Hypertension at 2-7 years postpartum by timing of onset of hypertensive disorder of pregnancy (HDP).

	Normotensive pregnancy (n= 3,335)	Antepartum HDP (n= 540)	Intrapartum HDP (n=427)	Postpartum HDP (n=40)
Stage 1 hypertension or greater (Blood pressure ≥130/80 mmHg or use of anti-hypertensive medications)	550 (16.5%)	203 (37.6%)	111 (26.0%)	16 (40.0%)
	Referent	OR 3.05 (95%CI 2.51-3.71)	OR 1.78 (95%CI 1.41-2.25)	OR 3.38 (95%CI 1.78-6.40)
	Referent	aOR 2.24 (95%CI 1.83-2.74)	aOR 1.43 (95%CI 1.12-1.82)	aOR 2.85 (95%CI 1.48-5.49)

OR: odds ratio
aOR: adjusted odds ratio, adjusted for baseline age, insurance type, tobacco use, diabetes, early pregnancy body mass index (BMI)

679 | The Influence of Epidural Analgesia on Neonatal Outcomes After Balloon Induction of Labor at Term

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10:30 AM - 12:30 PM

Objective: Epidural analgesia is commonly used for labor and delivery and is generally considered safe. However, it can affect the fetus either directly, through the placental transfer of local anesthetics or opioids, or indirectly, via maternal hypotension. Previous studies have largely focused on comparisons between epidural analgesia and systemic opioids regarding neonatal status. Balloon induction of labor has also become popular due to its minimal side effects. However, only a few studies have specifically addressed the influence of epidural analgesia in the context of balloon induction of labor. This study aims to investigate the association between the use of epidural analgesia following balloon induction of labor and the risk of neonatal adverse outcomes.

Study Design: A population-based retrospective cohort study was conducted, including all term (≥37 weeks of gestation) singleton pregnancies that underwent balloon induction of labor at a tertiary medical center between
February 2020 and January 2022. Neonatal adverse outcomes were compared based on the use of epidural analgesia during delivery.

Results: The study population included 3,424 deliveries, of which 2,400 (70.1%) used epidural anesthesia and 1,024 (29.9%) delivered without epidural. Neonatal adverse outcomes for both groups are shown in the table. Rates of neonatal adverse outcomes, including low Apgar scores, low cord pH, neonatal intensive care unit (NICU) admission, mortality, and a composite of adverse neonatal outcomes, were comparable between the groups. No significant differences were observed in these outcomes between the groups.

Conclusion: The use of epidural analgesia during delivery following balloon induction of labor at term is not associated with an increased risk of short-term neonatal adverse outcomes.

Table: *Adverse neonatal outcomes of women underwent balloon induction of labor with and without epidural analgesia*

Characteristics	Women with epidural analgesia n=2, 400 (%)	Women without epidural analgesia n=1,024 (%)	P
1-minute APGAR score ≤7	136 (5.7)	66 (6.4)	0.376
5-minute APGAR score ≤7	36 (1.5)	20 (2.0)	0.339
PH below 7.1	69 (3.0)	25 (2.6)	0.531
NICU admission	30 (1.3)	16 (1.6)	0.467
Neonatal length of stay > 4 days	407 (17.1)	157 (15.5)	0.247
Neonatal mortality	2 (0.1)	1 (0.1)	1.000
Meconium aspiration syndrome	3 (0.1)	3 (0.3)	0.372
Asphyxia	2 (0.1)	0 (0.0)	1.000
Hypothermia	0 (0.0)	2 (0.2)	0.089
Hypoglycemia	8 (0.3)	4 (0.4)	0.759
Polycythemia	3 (0.1)	1 (0.1)	1.000
Hyperbilirubinemia	1 (0.0)	0 (0.0)	1.000
HIE	4 (0.2)	2 (0.2)	1.000
RDS	5 (0.2)	5 (0.5)	0.177
IVH	0 (0.0)	1 (0.1)	0.299
Pulmonary hypertension	0 (0.0)	6 (0.2)	1.000
Composite of adverse neonatal outcomes[a]	530 (22.1)	212 (20.7)	0.369

P P-value, NICU neonatal intensive care unit, APD antepartum death, IPD intrapartum death, HIE Hypoxic-ischemic encephalopathy, RDS respiratory distress syndrome, NEC necrotizing enterocolitis, IVH
[a]Defined as composite of 1 & 5 APGAR scores <7, PH <7.1, NICU admission, neonatal length of stay > 4 days, meconium aspiration syndrome, neonatal mortality, asphyxia, hypothermia, hypoglycemia, polycythemia, Hyperbilirubinemia, HIE, RDS, sepsis, IVH and pulmonary hypertension

680 | The Association Between Timing of Tobacco Smoking Cessation and Fetal Growth Restriction

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10:30 AM - 12:30 PM

Objective: Tobacco smoking is a leading cause of fetal growth restriction (FGR). Our objective was to estimate the association between timing of tobacco smoking cessation and FGR in a cohort of current or former smokers.

Study Design: This retrospective cohort study includes all pregnant patients who received prenatal care and delivered in a university health system, delivered a viable neonate between 4/1/22 and 3/31/23, and reported tobacco smoking either during pregnancy or within one year prior to conception. FGR was defined as estimated fetal weight (EFW) or abdominal circumference (AC) < 10% on the most recent ultrasound prior to delivery. Bivariable and multivariable logistic regression analyses were performed. Adjusted odds ratios (aOR) are reported.

Results: Of 343 patients included in this study (10.5% of the delivery cohort), 148 (43.2%) quit smoking in the year prior to conception or in the first trimester of pregnancy, 22 (6.1%) quit in the 2nd trimester, 16 (4.4%) quit in the 3rd trimester and 157 (43.6%) continued smoking. Compared to patients who quit smoking early, those who continued smoking beyond the 1st trimester were more likely to identify as Black or Other/unknown race and to be nulliparous. After controlling for confounders, patients who quit tobacco in the year prior to pregnancy or in the first trimester were significantly less likely to be diagnosed with FGR (aOR 0.48, 95% CI 0.24–0.96). Smoking cessation any time prior to delivery was also associated with reduced odds of FGR (aOR 0.46, 95% CI 0.23–0.89) but risk reduction from quitting in the 3rd trimester appeared attenuated.

Conclusion: Smoking cessation pre-pregnancy or in the first trimester is associated with a 52% reduction in FGR compared to continued smoking later in pregnancy. These findings can be used to direct counseling on the benefits of tobacco cessation as early as possible.

681 | The Relationship between Neighborhood Food Environment and Readmissions for Postpartum Hypertension and Cardiovascular Complications

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10:30 AM - 12:30 PM

Objective: Postpartum readmissions have negative consequences on patients and the healthcare system. Some of the most frequent etiologies for postpartum readmission are hypertensive and cardiovascular-related. Few studies have assessed the effects of social factors on postpartum readmissions. We aimed to determine whether the neighborhood food environment impacts the frequency of readmission for hypertensive and cardiovascular complications.

Study Design: A regional hospital dataset was queried for cardiovascular and hypertension-related readmissions in the postpartum period using ICD 9/10 codes. We looked at readmissions within 12 weeks of delivery for hypertension and 12 months for cardiovascular complications between 2014 and 2018. Each encounter included a patient's GEO-ID which allowed linkage to geospatial datasets. The neighborhood food environment was then assessed by measuring the density/distance to select business points-of-interest obtained from Data Axle. The Wilcoxon rank-sum test was used to compare the cohort of patients requiring readmission to those who did not. The effect size was then quantified by quantile regression estimating with 95% confidence the difference in medians.

Results: There were 443,578 deliveries in the study timeframe. Of these, 432,947 had associated Data Axle information available and were included in the study. 5,363 (1.2%) patients had a readmission for hypertension within 12 weeks. 2,165 (0.5%) patients had a cardiovascular readmission within 365 days. Patients who required hypertensive-related readmission were shown to have a significantly lower density of eating places within one kilometer ($p = < 0.001$). Similarly, individuals who required readmission for cardiovascular-related complications also had a lower density of eating places within one kilometer ($p = < 0.002$).

Conclusion: It is imperative to consider the interplay of social factors such as the neighborhood food environment on pregnancy outcomes. Differences in food density may impact patients' ability to access healthy foods, which may relate to subsequent increased readmissions and other health consequences.

682 | Postpartum Glycemic Trends Among People with Gestational Diabetes Using Continuous Glucose Monitoring

Alyssa R. Hersh[1]; Alexandra C. Gallagher[2]; Lucy Ward[1]; Christian Huertas-Pagán[1]; Monica Rincon[1]; Amy M. Valent[1]
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10:30 AM - 12:30 PM

Objective: The immediate changes in glycemia following delivery have not been well characterized among pregnant people with gestational diabetes mellitus (GDM), particularly considering the heterogeneity of GDM. Therefore, we sought to characterize postpartum glycemia using continuous glucose monitoring (CGM) data and explore postpartum glycemic trends among people with GDM by GDM and delivery characteristics.

Study Design: This was a secondary analysis of pregnant people with GDM randomized to using CGM versus capillary blood glucose for management of GDM. Our primary outcome was mean glucose by hour from delivery through 48 hours after delivery. We stratified by GDM type, mode of delivery and time in range during pregnancy (≥90%, 70-140) to determine influence on glycemia postpartum.

Results: Of the 111 participants in the original analysis, 79 participants with postpartum data were included in this analysis, 22.8% with A1GDM and 77.2% with A2GDM. In the overall cohort, glucose values had a slight downward trend over the first 48 hours post-delivery (Figure 1a). Upon stratification, participants with A1GDM had lower glucose by 48 hours compared to those with A2GDM (Figure 1b), as did participants with high time-in-range compared with lower time-in-range during pregnancy (Figure 1c). After cesarean delivery, participants initially had lower glucose values compared to vaginal delivery, which then rose after the first 24 hours prior to returning to baseline by 48 hours (Figure 1d).

Conclusion: In this study, we found that postpartum glycemia had a downward trend after delivery and was impacted by multiple pregnancy and delivery characteristics. These results highlight the physiologic changes that are occurring in regard to glycemia during the postpartum period. Future studies should assess whether differences in postpartum glycemic parameters are associated with clinically relevant outcomes.

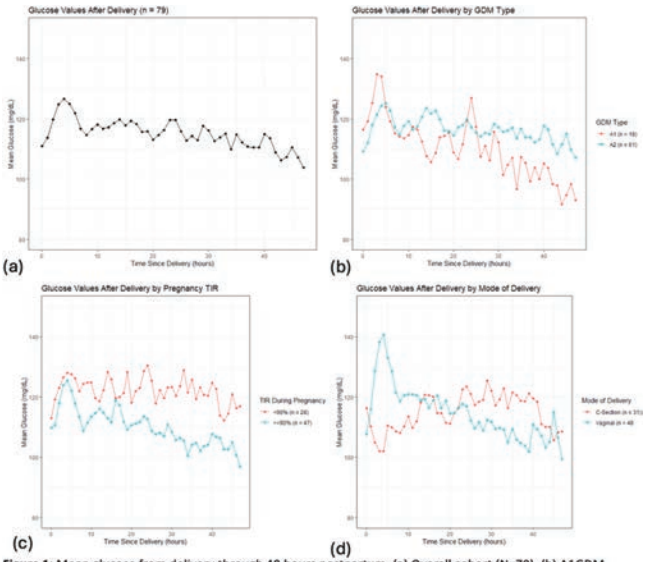

Figure 1: Mean glucose from delivery through 48 hours postpartum. (a) Overall cohort (N=79), (b) A1GDM (N=18) versus A2GDM (N=61), (c) TIR ≥90% (N=47) versus <90% (N=28), (d) vaginal (N=48) versus cesarean (N=31) birth
X axis: Time. Y-axis: Glucose (mg/dL) 0-48 hours. Time 0 represents delivery.

683 | Postpartum Glucose Tolerance Test Results Among People with Gestational Diabetes Using Continuous Glucose Monitoring

Alyssa R. Hersh[1]; Alexandra C. Gallagher[2]; Lucy Ward[1]; Christian Huertas-Pagán[1]; Monica Rincon[1]; Amy M. Valent[1]
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10:30 AM - 12:30 PM

Objective: The glycemic profile of people with gestational diabetes mellitus (GDM) at the time of postpartum oral glucose tolerance testing (OGTT; 75 gram 2-hour challenge) is not well understood. Therefore, we assessed continuous glucose monitoring (CGM) data during the postpartum OGTT, stratifying by normal versus abnormal OGTT and GDM type.

Study Design: This was a secondary analysis of pregnant people with GDM randomized to using CGM versus capillary blood glucose (CBG) for management of GDM. Our primary outcome was mean glucose during an OGTT comparing people who had abnormal postpartum OGTT (fasting ≥100 mg/dL or 2-hour ≥140 mg/dL) compared to normal OGTT results. We performed additional stratified analyses of those by GDM type.

Results: Of the 111 participants in the initial trial, there were 51 that had postpartum data available for inclusion of this secondary analysis. Participants had higher fasting (104.3 ± 10.5 vs 89.8 ± 5.2) and 2-hour plasma glucose (129.9 ± 37.5 vs 103.5 ± 17.9) in the group with abnormal postpartum OGTT results compared to those with a normal OGTT response. Additionally, the glucose excursion following the 75 grams of glucose and mean CGM glucose at all time points were higher in the group with abnormal OGTT results (Figure). When stratified by GDM type, mean CGM glucose was similar between groups.

Conclusion: This study demonstrates that CGM values follow the expected trend regarding physiologic response to the OGTT, and those with abnormal OGTT results had a distinct glycemic pattern in response to the OGTT with higher mean CGM glucose at all time points assessed. Future studies will need to assess the predictability of CGM in identifying those with abnormal

glycemia postpartum (i.e. prediabetes) with an elevated risk for development of type 2 diabetes mellitus.

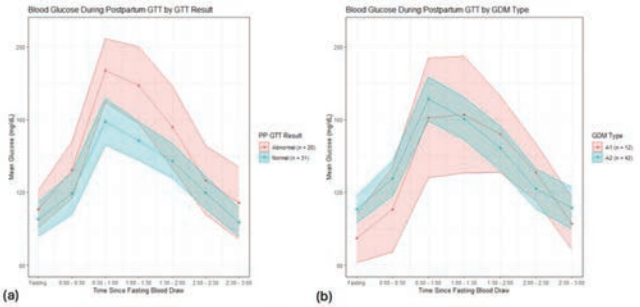

Figure: Mean glucose measurements with CGM during OGTT (start 1 hour before fasting blood draw to 1 hour after 2-hour blood draw; figure demonstrates mean value at 30-minute time increments with 95% confidence intervals). (a) Normal versus abnormal OGTT result; (b) A1GDM versus A2GDM.
X axis: Time. Y-axis: Mean glucose (mg/dL).
Abnormal OGTT = Fasting ≥100 mg/dL or 2-hour ≥140 mg/dL
Fasting = 8 hours before

684 | Impact of a Surgical Bundle on Hospital Readmission Rates in Obese Women Undergoing Cesarean Delivery

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Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA

10:30 AM - 12:30 PM

Objective: To assess whether implementing an obesity surgical bundle for patients with a BMI of 40 kg/m^2 or greater reduces hospital readmission rates after unscheduled cesarean delivery.

Study Design: This was a pre- and post-intervention study of individuals with a BMI > 40 kg/m^2 undergoing unscheduled cesarean delivery at 24 weeks of gestation or greater between January 2018 and December 2022 at a single tertiary care center. In January of 2021, we implemented an obesity bundle that included vaginal preparation with povidone-iodine in the setting of ruptured membranes, and a 48-hour course of oral cephalexin and metronidazole. Our primary outcome was hospital readmission or emergency department visits within 6 weeks postpartum. We also examined the rate of hospital readmission alone. Relative risks with 95% confidence intervals (95% CI) were calculated using modified Poisson regression, adjusting for potential confounders.

Results: Of 1823 individuals who underwent unscheduled cesarean, 980 (54%) were in the pre-intervention period and 843 (46%) in the post-intervention period. Maternal demographics were overall similar, except for lower gestational age at delivery in the post-intervention period (Table 1). Compared to the pre-intervention period, the rate of hospital readmission or emergency department visits was significantly lower in the post-intervention period (35.0% vs. 28.7%, aRR 0.82 95%CI 0.72-0.94, P < 0.01). Hospital readmission alone was also significantly lower in the post-intervention period (33.0% vs. 26.2%, aRR 0.80 95%CI 0.69-0.92, P < 0.01) (Table 2).

Conclusion: The rate of hospital readmissions and emergency department visits decreased significantly after the implementation of a surgical bundle for individuals with a BMI greater than 40 kg/m^2 undergoing cesarean delivery.

Table 1. Maternal demographics

	Pre-intervention (n=980)	Post-intervention (n=843)	P-value
Age (yr)	30.4 (± 5.7)	30.8 (± 5.7)	0.14
GA (wk)	37.9 (35.9,39.1)	37.4 (35.4,39.0)	0.04
BMI (kg/m^2)	46.4 (43.3,52.2)	47.2 (43.4,53.0)	0.12
Rupture to delivery >3 hr	282 (28.8)	257 (30.5)	0.43
Race			0.50
Black	654 (66.7)	545 (64.7)	
White	298 (30.4)	277 (32.9)	
Other	28 (2.9)	21 (2.5)	
Hispanic	53 (5.4)	54 (6.4)	0.37

Numbers are shown as n (%), mean (SD), or median (IQR).

Table 2. Readmission and emergency department visits

	Pre-intervention (n=980)	Post-intervention (n=843)	P-value	Adjusted RR (95% CI)
Readmission or ED visit	343 (35.0)	242 (28.7)	<0.01	0.82 (0.72-0.94)
Readmission only	323 (33.0)	221 (26.2)	<0.01	0.80 (0.69-0.92)

Abbreviations: CI (confidence interval); ED (emergency department); RR (relative risks)

RRs were adjusted for age, body mass index, and duration of rupture of membranes

685 | Smartphone Application use for Gestational Diabetes Management and Immediate Postpartum Glucose Tolerance Outcomes

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10:30 AM - 12:30 PM

Objective: Use of smartphone applications for gestational diabetes (GDM) management has increased in recent years, but their effect on maternal postpartum glucose tolerance is unknown. This pilot randomized controlled trial investigated the effect of the Malama smartphone application, a glucose monitoring and interactive diet education tool, on early postpartum glucose tolerance and perinatal outcomes.

Study Design: Patients with GDM receiving prenatal care at an urban academic medical center were randomized 1:1 to Malama application use compared to standard care. The primary outcome was 2 hour oral glucose tolerance test (OGTT) level measured during the delivery hospitalization. Secondary outcomes included patient satisfaction, postpartum hemoglobin A1c (HbA1c), delivery outcomes, and perinatal morbidity.

Results: Twenty-eight participants were randomized (14 participants per group). Malama users had lower median 2 hour OGTT levels compared to patients receiving standard care (120 vs 155 mg/dL; $P = .05$; incident rate ratio, 0.78 [95% CI 0.61-0.99]). There were no differences in postpartum HbA1c, mode of delivery, birthweight, or other perinatal outcomes. Patient satisfaction with glucose logging methods was equivalent between groups. When the groups' baseline characteristics were compared, Malama users were younger than those receiving standard care (30.9±4.1 vs 36.4±3.8 years; $p = .001$), while other characteristics were similar between groups. After adjusting for maternal age, the difference in 2 hour OGTT was no longer significant (adjusted incident rate ratio, 0.92 [95% CI 0.69-1.23]).

Conclusion: Compared with standard glucose logging methods, Malama application use was acceptable to patients with GDM and was associated with improved early postpartum glucose tolerance values in the unadjusted model, but not after adjusting

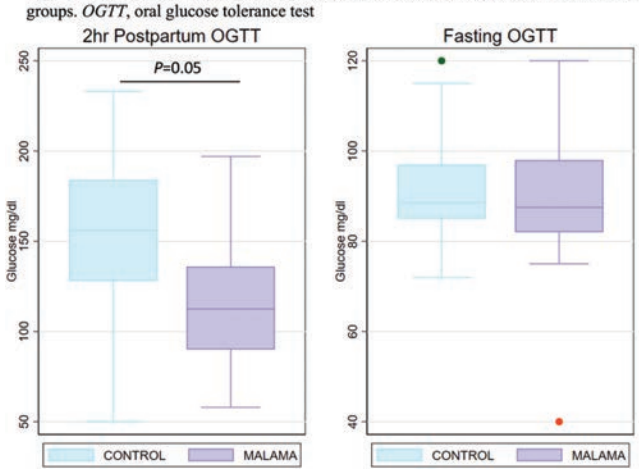
for differences in age. Larger studies are needed, stratifying by age, to fully evaluate the impact of smartphone applications on postpartum glucose and perinatal outcomes.

Table 1. Comparison of baseline characteristics and perinatal outcomes between randomization groups.

CHARACTERISTIC	MALAMA N = 14	CONTROL N=14	*P*- VALUE
BASELINE CHARACTERISTICS			
AGE (years)	30.9 (4.1)	36.4 (3.8)	0.001
RACE/ETHNICITY			0.073
Black, Non-Hispanic	0 (0)	3 (21)	
White, Non-Hispanic	10 (71)	7 (50)	
Hispanic	3 (21)	0 (0)	
Asian	1 (7)	3 (21)	
PRIVATELY INSURED	9 (64)	10 (71)	1.00
NULLIPAROUS	7 (50)	3 (21)	0.24
PREGRAVID BMI (kg/m²)	30.7 (6.8)	29.5 (4)	0.60
GA AT GDM DIAGNOSIS (weeks)	27.5 (2.4)	27.7 (1.5)	0.80
GA AT RANDOMIZATION (weeks)	30.3 (2.7)	29.8 (1.5)	0.53
GLUCOSE MONITOR TYPE			0.16
CGM	5 (36)	1 (7)	
Standard glucometer	9 (64)	13 (93)	
OBSTETRIC OUTCOMES			
ANTIHYPERGLYCEMIC MEDICATION USE	6 (43)	8 (57)	0.45
WEEKS ON ANTIHYPERGLYCEMIC MEDICATIONS	7.0 (2.6)	8.1 (2.3)	0.46
INDUCTION OF LABOR	8 (57)	8 (57)	1.00
MODE OF DELIVERY			0.45
Cesarean	6 (43)	8 (57)	
SVD	8 (57)	5 (36)	
Operative vaginal	0 (0)	1 (7)	
SHOULDER DYSTOCIA	0 (0)	0 (0)	NA
NEONATAL OUTCOMES			
GA AT DELIVERY (weeks)	38.0 (1.5)	38.6 (0.9)	0.23
BIRTHWEIGHT (g)	3,178.6 (632.1)	3155.3 (410.6)	0.91
MACROSOMIA (>4000g)	1 (7)	1 (7)	1.00
NICU ADMISSION	3 (21)	1 (7)	0.60
FIRST BG LEVEL AFTER BIRTH (mg/dL)	56.3 (15.5)	54.9 (13.7)	0.80
HYPOGLYCEMIA TREATMENT	2 (14)	0 (0)	0.48

Data presented as mean (standard deviation) or number (percentage). *GA*, gestational age; *GDM*, gestational diabetes; *CGM*, continuous glucose monitor; *SVD*, spontaneous vaginal delivery; *NICU*, neonatal intensive care unit; *BG*, blood glucose.

Figure 1. Comparison of postpartum glucose tolerance outcomes between randomization groups. *OGTT*, oral glucose tolerance test



686 | Association of Periviable Birth and Postpartum Psychiatric Morbidity in the Medicaid Population

Alyssa L. Trochtenberg[1]; Sebastian Z. Ramos[2]; Benjamin C. Koethe[2]; Mohak Mhatre[2]

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10:30 AM - 12:30 PM

Objective: Publicly insured patients have increased risk of adverse obstetric outcomes and perinatal psychiatric morbidity. Although periviable birth is a significantly stressful obstetric event, its association with postpartum psychiatric outcomes has not been studied in this high-risk population.

Study Design: Singleton liveborn periviable births (22 0/7 to 25 6/7 weeks) vs non-periviable births (≥26 0/7 weeks) were identified using claims data in the Merative MarketScan Medicaid database from 2020-2022. The primary outcome was a composite of psychiatric morbidity, defined as one or more of the following within 12 months postpartum: emergency department (ED) or outpatient encounters associated with depression, anxiety, psychosis, posttraumatic stress disorder, adjustment disorder, self-harm, or suicide attempt; new psychotropic medication prescription; or inpatient psychiatry admission. Analysis was adjusted for maternal age, cesarean delivery (CD), severe maternal morbidity (SMM), maternal comorbidity index, and history of mental health disorder.

Results: Out of 639,971 deliveries, there were 3,518 (0.5%) periviable births (PB) and 636,453 non-periviable births (NPB) included for analysis. Baseline prevalence of mental health disorders was similar between groups. The incidence of SMM, hypertensive disorders of pregnancy, and CD was higher among individuals with PB. Compared to NPB, PB was associated with greater incidence of composite psychiatric morbidity (27.3% vs 22.5%, aOR 1.32 [95% CI 1.22-1.42]) and increased ED utilization for mental health disorders (5.1% vs 3.9%, aOR 1.37 [95% CI 1.17-1.60]); furthermore, patients with PB were more than twice as likely to have postpartum inpatient psychiatric admission (5.8% vs 2.8%, aOR 2.26 [95% CI 1.95-2.62]). PB was associated with increased incidence of new psychotropic medication prescriptions and outpatient behavioral health visits.

Conclusion: Despite increased outpatient behavioral healthcare utilization, publicly insured patients who experience periviable birth are at high risk for psychiatric morbidity requiring emergency or inpatient-level of care.

Table 1. Primary and secondary psychiatric outcomes within 12 months postpartum among publicly insured patients in MarketScan with and without a periviable birth, 2020-2022.

Outcome	PB (n = 3,518)	NPB (n = 636,453)	Adjusted OR (95% CI)
Composite of psychiatric morbidity	**960 (27.3)**	**142,962 (22.5)**	**1.32 (1.22, 1.42)**
ED visit	181 (5.1)	24,704 (3.9)	1.37 (1.17, 1.60)
New psychotropic medication	645 (18.3)	100,532 (15.8)	1.20 (1.10, 1.31)
New behavioral health visit	382 (10.9)	60,693 (9.5)	1.18 (1.06, 1.32)
Inpatient psychiatry admission	208 (5.9)	18,058 (2.8)	2.26 (1.95, 2.62

Data presented as number (percentage). Analysis was adjusted for maternal age, cesarean delivery, severe maternal morbidity (SMM), maternal comorbidity index, and history of mental health disorder.
PB, periviable birth; *NPB*, nonperiviable birth; *ED*, emergency department

687 | Umbilical Artery Doppler Pulsatility Index as a Predictive Biomarker for Preterm Premature Rupture of Membranes

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10:30 AM - 12:30 PM

Objective: Although known risk factors for preterm premature rupture of the fetal membranes (PPROM) can be assessed, otherwise predicting PPROM is not currently clinically feasible. The objective of this study was to assess the predictive value of umbilical artery Doppler pulsatility index (UA-PI) alone for PPROM, and when combined with previously established predictive risk factors.

Study Design: This was a retrospective cohort study of liveborn non-anomalous chromosomally normal infants admitted to the neonatology intensive care unit at a single tertiary care center from April 2009 to March 2016. All cases had umbilical artery (UA) Doppler studies routinely measured during second and third trimester ultrasounds. The pre-rupture UA-PI of patients whose pregnancies were complicated by PPROM were compared to gestational age-matched controls without PPROM. The area under the receiver operating characteristic curve (AUC) was used to estimate the predictive ability of pulsatility index (UA-PI) for predicting PPROM, and the Liu method was used to identify the UA-PI threshold that maximized both sensitivity and specificity. The AUC, sensitivity, and specificity were also assessed when maternal age, parity, and singleton vs multiple gestation as predictive variables were combined by forward selection with UA-PI.

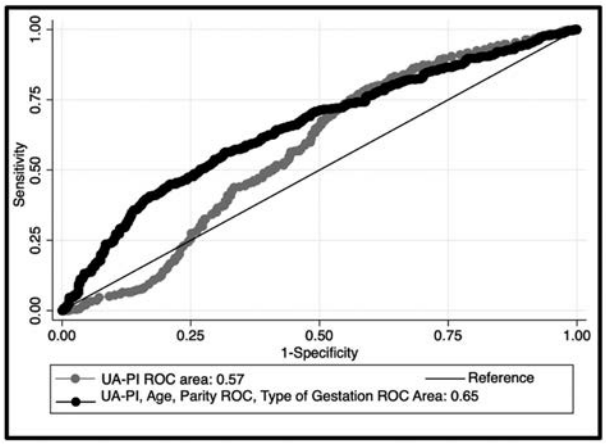
Results: Of 1,145 high-risk gestations studied, 262 (23%) were complicated by PPROM and 883 (77%) were without PPROM. Multivariable analysis identified elevated UA-PI (AOR 1.24, 95% CI 1.18-1.31, $p = 0.002$) as an independent risk factor for PPROM. The AUC for UA-PI was 0.57 (95% CI 0.54-0.61) for an elevated UA-PI. When maternal age, parity, and singleton vs multiple gestation as predictive variables were combined by forward selection with UA-PI, the AUC increased to 0.65 (95% CI 0.62-0.68). The optimal UA-PI threshold was 0.95 (26% sensitivity, 73% specificity).

Conclusion: Elevated UA-PI is moderately predictive of PPROM, and inclusion in a predictive model for PPROM in high-risk pregnancies may be justified pending validation.

Table 1: Receiver Operating Characteristic (ROC) Summary of the association between Umbilical Artery Pulsatility Index and Preterm Prelabor Rupture of Fetal Membranes

Variable	Number of observations	ROC Area	Standard Error	95% Confidence Interval
UA-PI alone	1,145	0.57	0.017	0.54, 0.61
UA-PI plus maternal age	1,145	0.59	0.017	0.56, 0.62
UA-PI plus maternal age and parity	1,145	0.60	0.017	0.57, 0.63
UA-PI plus maternal age, parity, and singleton vs. multiple gestation	1,145	0.65	0.017	0.62, 0.68

Figure 1: Receiver Operating Characteristic (ROC) Curves of the association between Umbilical Artery Pulsatility Index and Preterm Prelabor Rupture of Fetal Membranes



688 | Hybrid versus Natural Immunity to Protect Against Neonatal Hospitalization: A Cost-Effectiveness Analysis

Amelia H. Gagliuso[1]; Lily Ben Avi[2]; Sarah K. Dzubay[2]; Nicole E. Marshall[2]; Aaron B. Caughey[2]
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10:30 AM - 12:30 PM

Objective: Neonates are ineligible for COVID-19 vaccination and are at increased risk for complications from COVID-19 infections compared with vaccine-eligible populations. Passive immunity from maternal anti-SARS-COV-2 immunoglobulins crossing the placenta and in human milk demonstrates that vaccine-mediated immunity compared to natural immunity is clinically beneficial for both maternal and infant outcomes as shown with TdaP and influenza. The purpose of this analysis was to determine the cost-effectiveness of maternal hybrid immunity in protection against neonatal outcomes in the United States.

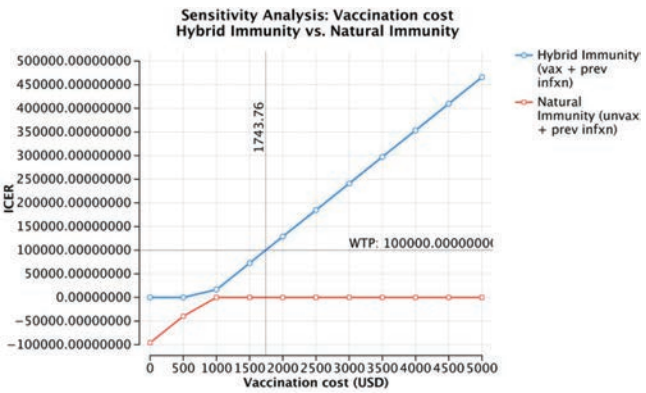
Study Design: A TreeAge model was constructed to compare outcomes for a theoretical cohort that were vaccinated with one dose and had a previous infection (Hybrid immunity) with those who received no vaccine and had a previous infection (Natural immunity). Our cohort contained 3,664,292 individuals, the estimated number of annual live births in the United States. Model outcomes included cases of neonatal deaths, neurodevelopmental disabilities, and neonatal hospitalization. Probabilities, utilities, and costs were derived from literature. QALYs were discounted at a rate of 3%.

Results: Hybrid immunity in our theoretical cohort was associated with a decrease in 462 neonatal deaths, 482 cases of neurodevelopmental delay, and 132 cases of neonatal hospitalization (Table 1). Hybrid immunity was the dominant strategy as it saved $2,981,154,191 and led to 32,619 additional QALYs (Table 1). Univariate sensitivity analysis demonstrated that the COVID-19 vaccine is cost-saving until the cost of the vaccine exceeds $500, which is far above the current price (Figure 1).

Conclusion: This study demonstrates that vaccination even among those with a previous infection improves outcomes and is cost saving in pregnant persons. Ensuring that all pregnant people are aware of the positive impact on their neonates from obtaining the COVID vaccine during pregnancy is important to achieve these potential benefits.

Table 1. Outcomes in a theoretical cohort of 3,664,292 annual pregnancies

	Hybrid Immunity	Natural Immunity	Difference (Treatment-No Treatment)
Neonatal Death	3,587	4,049	-462
Neurodevelopmental Delay	6,870	7,351	-482
Neonatal Hospitalization	77	209	-132
Cost ($)	38,142,930,398	41,124,084,592	-2,981,154,191
Effectiveness (QALYs)	208,065,504	208,032,885	32,619
Strategy	Dominant	Dominated	



689 | Recurrent Intrahepatic Cholestasis of Pregnancy-Incidence and Risk Factors

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10:30 AM - 12:30 PM

Objective: The incidence of intrahepatic cholestasis of pregnancy (ICP) varies throughout the world and is influenced by genetic, hormonal and environmental factors. However, data is highly limited regarding the risk of ICP recurrence in subsequent pregnancies. We aimed to incidence of recurrent ICP and its associated risk factors.

Study Design: A retrospective cohort study conducted at a university hospital, including all pregnant women who underwent serum bile acids (BA) levels testing due to suspected ICP in a 13-year period. Among women diagnosed with ICP, records were reviewed to identify those with a subsequent gestation.

Results: Of 640 women who met the inclusion criteria, 22.2% (n = 142) were diagnosed with ICP (fasting serum BA >10 mmol/L) in the index pregnancy. Of them, 51 (35.9%) had a subsequent pregnancy. The rate of recurrent ICP in the subsequent pregnancy was 29.4% (15/51). Timing of ICP diagnosis did not differ significantly between the index and subsequent gestation (median 33 [IQR 30-36] vs. 34 [IQR 31-35] weeks, P = 0.90). In multivariable analysis, fasting serum BA levels at the index pregnancy above 40 mmol/L was the only independent factor associated with ICP recurrence.

Conclusion: Recurrence of ICP is common, occurring in over one fourth of women with a history of ICP. BA levels at the first pregnancy in which ICP was diagnosed were found as the only independent factor associated with the occurrence of ICP in subsequent gestation.

690 | Long-Term Gastrointestinal Morbidity Among Twins Conceived by Assisted Reproductive Technology

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10:30 AM - 12:30 PM

Objective: Using assisted reproductive technologies (ART) increased the incidence of multiple pregnancies, which has a negative effect on offspring health outcomes. The long-term health outcomes for singletons born after ART is well studied with numerous publications, however, studies on ART twin's long-term morbidities are scarce. This study aimed to investigate a possible association between ART resulting in twin pregnancy and long-term gastrointestinal (GI) morbidity of the offspring.

Study Design: A population-based cohort study was performed in a tertiary medical center including twin deliveries born between 1991-2021. Long-term GI morbidities among twins conceived via ART including ovulation induction (OI) and in-vitro fertilization (IVF) were compared with twins born following spontaneous pregnancies. The diagnoses of GI morbidities were defined based on ICD-9 codes as recorded in community clinics and hospitalization files. A Kaplan–Meier survival curve was used to compare the cumulative incidence of GI morbidity among the study group and a Cox proportional hazards model was constructed to control for confounders.

Results: A total of 7,790 twins met the inclusion criteria: 2,076 twins (26.6%) were conceived by ART. The total GI morbidity rate was significantly higher in twins conceived by ART as compared with twins from spontaneous pregnancies (34.9% for IVF, 34.3% for OI and 27.0% for spontaneous twins, $p< 0.001$, **Table**). In addition, the cumulative incidence of GI morbidity over time was elevated for twins conceived by ART (log-rank test, $p < 0.001$, **Figure**). The Cox model, controlling for confounders such as maternal age, gestational age, hypertensive disorders and diabetes mellitus found that using ART resulting in twin pregnancy is an independent risk factor for long-term GI morbidity of twin offspring (adjusted hazards ratio (aHR) for IVF vs. spontaneous = 1.42 (95%CI 1.27-1.58, $p< 0.001$; aHR for OI vs spontaneous = 1.38 (95%CI 1.20–1.60, $p< 0.001$).

Conclusion: In our cohort, twins conceived by ART have a higher risk for long-term GI morbidity as compared with twins from spontaneous pregnancies.

Figure. Kaplan-Meier survival curve demonstrating the cumulative incidence of gastrointestinal morbidity among study groups

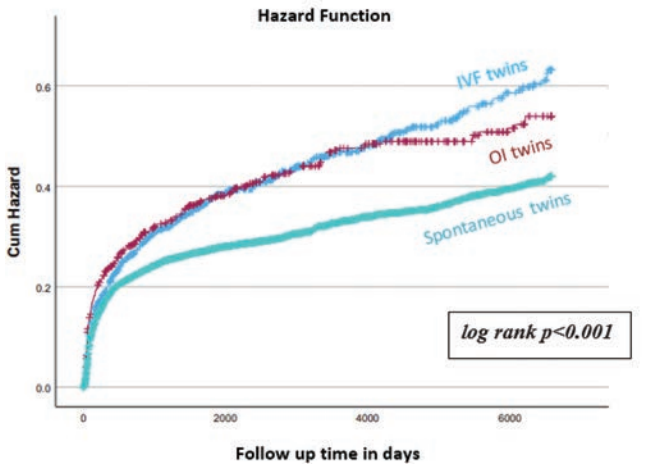

Table. Selected long-term gastrointestinal morbidities and total gastrointestinal morbidity rates in twins conceived by ART and spontaneously conceived twins

Gastrointestinal morbidity by organ function	IVF n = 1380	Ovulation Induction n = 696	Spontaneous Pregnancy n = 5714	P Value
Gastroduodenal (%)	20 (1.4)	4 (0.6)	32 (0.6)	0.002
Colonic functional (%)	244 (17.7)	109 (15.7)	599 (10.5)	< 0.001
Esophageal (%)	3 (0.2)	5 (0.7)	34 (0.6)	0.181
Peritoneal (%)	1 (0.1)	0 (0.0)	3 (0.1)	0.787
Anorectal (%)	17 (1.2)	12 (1.7)	63 (1.1)	0.351
Total (%)	**481 (34.9)**	**239 (34.4)**	**1541 (27.0)**	**<0.001**

691 | Empowering Patients to Conduct Nsts from Home: Success Rates from Over 2000 Remote Nsts

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10:30 AM - 12:30 PM

Objective: Many pregnancies require multiple, in-person non-stress tests (NSTs), adding significant patient burden. Novel technologies can enable remote NSTs; however, the feasibility of this solution in real-world, clinical settings remains uncertain. We analyzed success rates for patients conducting home NSTs under the remote supervision of their healthcare providers.

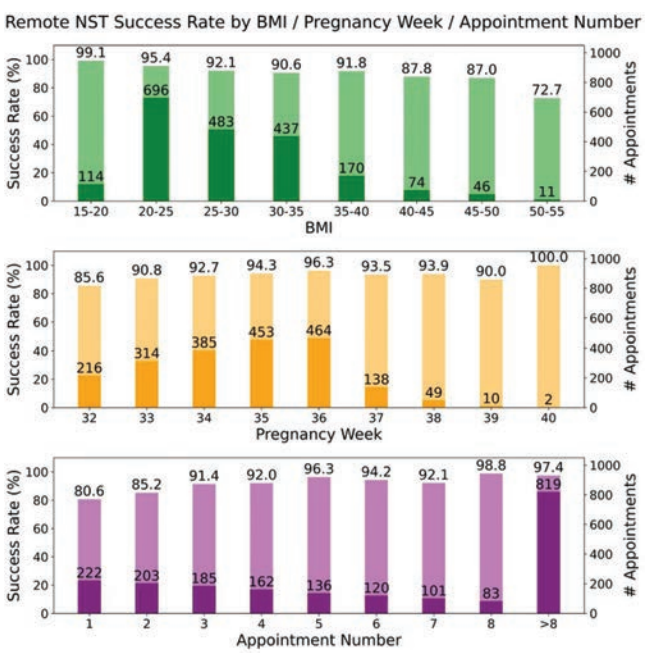
Study Design: In this retrospective study, we queried an anonymized database to identify remote NST appointments conducted using an FDA-cleared, remote fetal monitoring device. All NSTs were prescribed and remotely monitored by local healthcare providers. We included remote NSTs conducted ≥32 wks outside of a medical office or research trial and excluded sites with < 10 NSTs. The primary outcome was successful NST appointment, defined as one with a clinically interpretable NST, as documented by the provider. An appointment window was defined as a day in which a remote NST was attempted. For one site conducting twice daily NSTs for de-hospitalized patients, the appointment was a half-day. We analyzed maternal age, pre-gravid BMI, gestational age (GA) and appointment number (appt#) as predictors of success.

Results: Between July 2022 and June 2024, 2080 NST appointments we performed in 227 subjects across 10 clinical sites. After excluding 5 subjects and 59 NSTs with no provider documentation, 2031 NST appointments in 222 patients were analyzed. A successful NST was obtained in 92.9% (N = 1887) of appointments. NST success was not related to maternal age (p = 0.51) but was associated with GA (P< 0.01), lower BMI (P< 0.01) and higher appt# (P< 0.01), with the appt# having the greatest impact on success variance (**Table**). Success rates < 85% were observed for first appt# (81%) and BMI≥50 (72%) (**Figure**).

Conclusion: Antenatal fetal surveillance is critical to reducing adverse pregnancy outcomes but adds significant burden. Remote NSTs can empower patients to access care from home, while remaining under healthcare team supervision. Our results demonstrate that patients can successfully obtain clinically interpretable NSTs at home in a real-world setting.

Variable	Overall Cohort (N=2031)	Coefficient***	p-value***
Age, years*	32.0 (6.4)	0.058	0.553
BMI, kg/m^2*	28.1 (6.6)	-0.274	0.001
Gest Age, weeks*	35.1 (1.6)	0.300	0.001
Appt number**	6 [3-14]	1.021	0.000

* Mean (sd)
** median [IQR]
*** output from multivariable regression models including all 4 co-variates



692 | Novel Amniotic Fluid Characterization Shows Significant Elevation of EPO and Sflt-1 in Early FGR Pregnancies

Amrita Roy[1]; Hannah Spector[2]; Sarah Crimmins[3]; Ponnila S. Marinescu[2]

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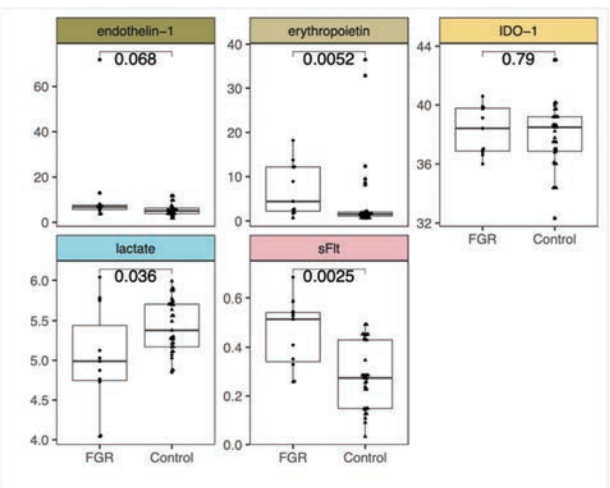
10:30 AM - 12:30 PM

Objective: Fetal growth restriction is a major contributor to fetal and neonatal morbidity/mortality. Early onset FGR [eFGR, diagnosed < 32 weeks] has a strong association with catabolism, and markers of chronic hypoxia are proportionally increased in this state, likely in amniotic fluid (AF). However, comparisons of AF analytes between eFGR and appropriately grown for gestational age (AGA) pregnancies are limited. We analyzed concentrations of AF lactate, endothelin-1 (ET-1), soluble fms-like tyrosine kinase 1 (sFlt-1), erythropoietin (EPO), and indoleamine-2,3-dioxygenase (IDO) in eFGR vs AGA control groups.

Study Design: Retrospective case control study using cryopreserved AF samples; eFGR (cases) and AGA (control) pregnancies were identified via EMR. Analyses of lactate, ET-1, EPO, IDO-1, and sFlt-1 were performed using ELISA. Primary outcome was concentration of AF analytes in eFGR versus control groups. Subgroup analyses assessed concentrations of AF analytes in eFGR, eFGR with brain sparing (eFGR+BS) and control groups.

Results: 44 AF samples were evaluated, 11 with eFGR [7 of which were eFGR+BS], 33 with AGA. AF concentrations of EPO and sFlt-1 were higher in the eFGR group (EPO eFGR 4.41mIU/mL vs. control 1.54 mIU/mL p = 0.005; sFlt-1 eFGR 0.51 ng/mL vs. control 0.27 ng/mL p = 0.002). AF lactate concentrations were lower in the eFGR group (eFGR 4.99 mmol/L vs. control 5.37 mmol/L p = 0.034). There were no statistically significant differences in ET-1 or IDO-1 between groups. AF concentrations of EPO and sFlt-1 were higher in the eFGR and eFGR+BS cohorts when compared to control (EPO eFGR 7.82 mIU/mL, eFGR+BS 4.41 mIU/mL vs. control 1.54 mIU/mL p = 0.005; sFlt-1 eFGR 0.56 ng/mL, eFGR+BS 0.40 ng/mL vs. control 0.27 ng/mL p = 0.002).

Conclusion: Our novel characterization of AF analytes shows that EPO and sFLt-1 are significantly elevated in pregnancies with eFGR and eFGR+BS. Ability to identify at risk pregnancies has the potential to meaningfully impact management, particularly in identifying time frame for intervention. Further studies will assess predictability of eFGR by AF analyte combinations.



Comparisons of amniotic fluid biomarker concentrations between fetal growth restriction and control groups. FGR, fetal growth restriction; IDO-1, indoleamine 2,3-dioxygenase-1; sFlt, soluble fms-like tyrosine kinase-1.

693 | Aortocaval Compression during Maternal Cardiac Arrest: An MRI Study of Uterus-Great Vessel Dynamics Across Trimesters

Andrea D. Shields[1]; Ava G. Holland[2]; Olatoyosi Olafuyi[3]; Makayla Murphy[4]

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10:30 AM - 12:30 PM

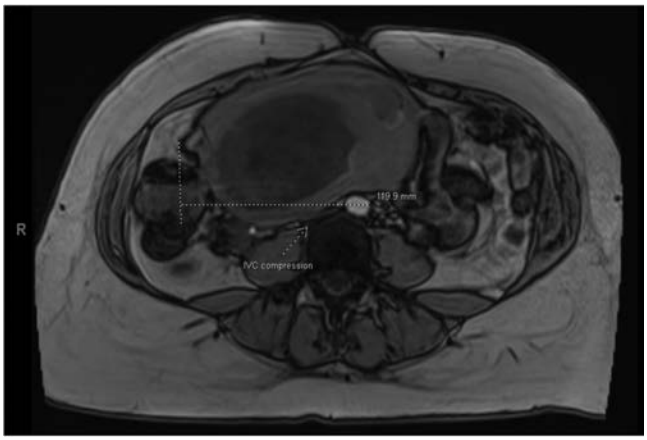
Objective: During maternal cardiac arrest (MCA), two crucial maneuvers to alleviate aortocaval compression caused by the gravid uterus are left uterine displacement (LUD) and resuscitative cesarean delivery (RCD). This study aims to examine the anatomic relationship between the uterus and aorta, as well as the presence of inferior vena cava (IVC) compression, using magnetic resonance imaging (MRI).

Study Design: Post-acquisition measurements were obtained from MRI imaging of pregnant women with singleton fetuses between 12+4–35+0 weeks for various indications. Measurements were obtained with patients in the supine position at the transverse plane just above the level of the aortic bifurcation, including the distance between the left aortic wall and right uterine wall (LAo-RUt) and presence of inferior vena cava (IVC) compression (Figure).

Results: Fifty MRIs in pregnant patients were analyzed and stratified by gestational age (Table 1). As expected, the LAo-RUt distance increased with advancing gestational age, with a range of 67.7–180.5 mm. MRI evidence of compression of the IVC was present in 36% of pregnant patients between 12+0–19+6 weeks, 75% of gravidas between weeks 20+0–23+6 weeks, and 90% of gravidas between 32+0 –35+0 weeks. The earliest gestational age IVC compression was noted was 15+5 weeks.

Conclusion: These findings indicate that most pregnant patients experience IVC compression beyond 20 weeks' gestation due to the uterus overlying the great vessels. LUD and RCD are most likely to be effective in alleviating aortocaval compression after 20 weeks. However, given that 1/3 of patients less than 20 weeks have evidence of IVC compression, LUD and RCD may also play a role in the resuscitation of patients after 15 weeks, especially those in refractory MCA.

Gestational Age Categories (weeks+days)	N	Gestational age (mean)	BMI (mean)	Mean left Aortic wall to right uterine wall (mm)	IVC compression (percent)	Mean right uterine wall to right abdominal wall (mm)	Mean anterior aortic wall to anterior abdominal wall (mm)	Mean uterine width (mm)	Mean uterine depth (mm)	Mean uterine length (mm)
12-19+6	14	16.4	26.5	94.8	36	71.08	70.62	129.8	83.85	166.26
20-23+6	11	17.00	27.95	94.84	67	73.39	82.58	129.80	83.85	203.39
24-27+6	6	25.67	36.25	124.50	86	59.46	98.55	181.28	115.42	214.20
28-31+6	9	29.33	34.88	126.99	89	75.66	131.17	207.56	119.11	224.80
32+0-35+0	10	32.90	34.90	141.66	90	56.92	133.89	218.77	120.62	244.43



694 | Care-Ier to Be Screened Today? an Insight on Partner Genetic Screening Uptake Rates

Ajitha Chivukula[1]; Brittany Gancarz[2]; Makayla Murphy[2]; Andrea D. Shields[3]
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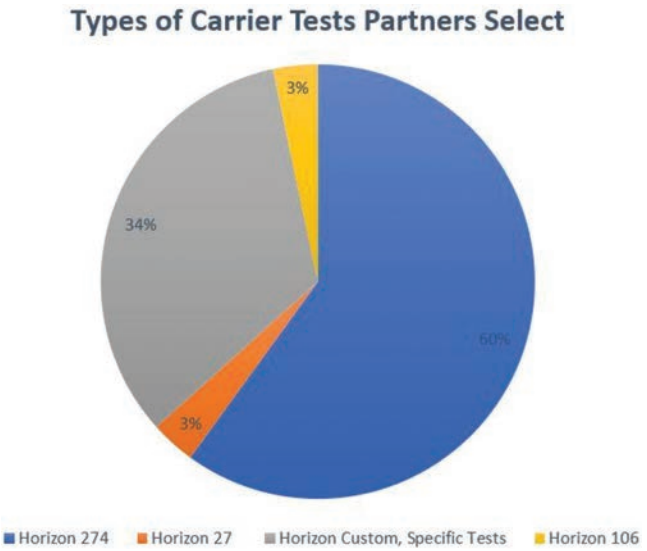
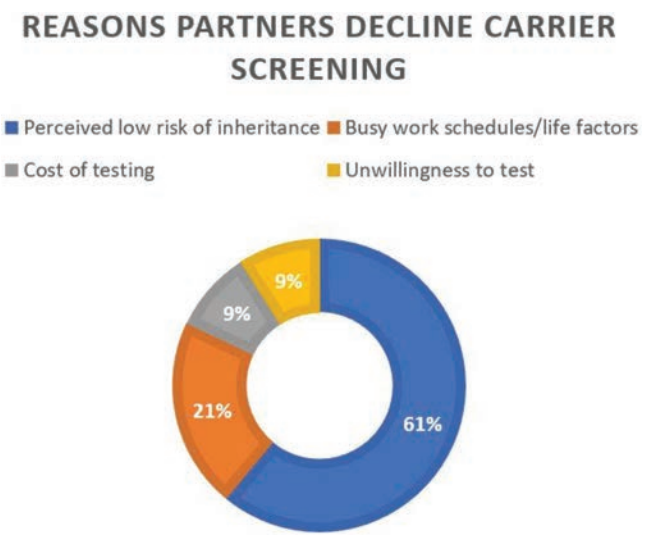
10:30 AM - 12:30 PM

Objective: We aimed to analyze the uptake rates for genetic carrier screening in partners of pregnant people with abnormal carrier screens and investigate the reasons for deferred screening.
Study Design: A retrospective cohort analysis was conducted on pregnant patients with positive carrier screens and their partners at a tertiary academic medical center between 6/1/2021 and 5/31/2024. Inclusion criteria were pregnant people (18+) with singleton pregnancies who tested positive for an autosomal recessive condition in the first or second trimester and underwent genetic counseling. The primary outcome was uptake rates for genetic screening in partners of pregnant people with positive carrier screens. Secondary outcomes were reasons for deferring partner screening. Baseline characteristics were summarized using frequencies and percentages for categorical variables and mean and standard deviation for continuous variables.
Results: During the study period, 701 abnormal genetic screens were identified, of which 587 were in pregnant people who met inclusion criteria. Most abnormal screens (56.4%) were identified from pan-ethnic screening while 8% were identified through targeted carrier screening. The uptake rate of partner screening was 48.04%, with 33.3% undergoing targeted screening for a specific condition and 60% undergoing a panethnic panel. 38.9% of partners had discordant positive carrier results for conditions unrelated to the pregnant person's condition. Genetic screening by blood samples occurred in 76.7% of partner tests, while 23.3% were from saliva samples. The most common reasons partners deferred genetic screening included perceived low risk of inheritance for the condition (61%), busy work schedules/life factors (21%), and costs (9%).
Conclusion: Our results show that nearly half of the partners of pregnant individuals who receive genetic counseling for abnormal carrier screens accept targeted or enhanced genetic screening, mostly through blood sampling. Partners' perceptions of risk and screening convenience significantly influenced their decisions to defer screening.





695 | Increased Chronic Inflammation of the Placenta in COVID-19-Infected Pregnant Patients

Jasmine Rios[1]; Renee Odom-Konja[2]; Lauren S. Keenan-Devlin[3]; Linda M. Ernst[2]; Alexa A. Freedman[4]; Greg E. Miller[4]; Ann EB Borders[5]
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10:30 AM - 12:30 PM

Objective: COVID-19 infection during pregnancy has been linked to adverse birth outcomes, potentially due to increased inflammation. This study compared placental inflammation in individuals with COVID-19 infection during pregnancy to placentas of those who delivered prior to the pandemic to understand inflammation associated with COVID-19 infection and timing.

Study Design: Participants were enrolled in the Stress, Pregnancy, and Health study from 2018-2022. Placentas were collected < 2 hours from delivery and histologically examined. Medical records were manually reviewed for evidence of COVID-19; infection timing, severity, symptoms, vaccination status were abstracted for those infected. The control group included placentas from births before December 1, 2019. Models were adjusted for maternal age, race/ethnicity, and socioeconomic characteristics.
Results: Among the 605 participants, 57 had confirmed COVID-19 infections and 214 delivered before December 1, 2019. Of the 57 positive cases, 5(8.7%) were asymptomatic, 39(68.4%) mild, 1(1.7%) severe, and 6(10.5%) did not have documented symptoms. Those infected with COVID-19 during pregnancy had increased odds of high-grade placental chronic inflammation (OR = 2.23, CI 1.06-4.69), particularly amongst those infected before 20 weeks gestation (OR = 3.57, CI 1.25-10.18). Prevalence of chronic basal villitis was higher in those infected with COVID-19 (p< 0.001). There were no significant differences in acute inflammation (p = 0.169), fetal vascular pathology (p = 0.488), or maternal vascular pathology (p = 0.255) between the infected and uninfected cohorts.
Conclusion: In a cohort of predominantly mild COVID-19 infections during pregnancy, COVID-19 was associated with increased odds of placental chronic inflammation, driven primarily by chronic basal villitis. Inflammatory patterns differed by timing of infection, with increased odds of chronic placental lesions among those infected early in pregnancy. These findings enhance understanding of COVID-19 infection's inflammatory effects in pregnancy, aiding in prevention and treatment of at-risk pregnant patients.

696 | Implementation of Birth Equity Strategies in a Statewide Quality Improvement Initiative Supports Equitable Care Efforts

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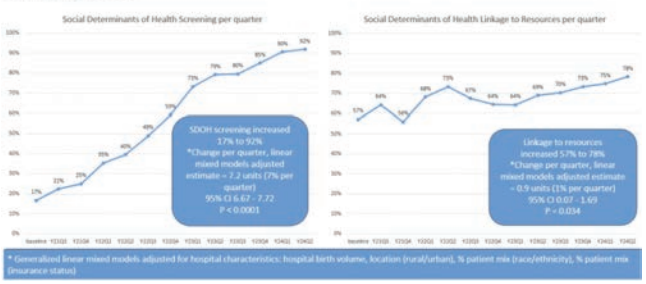
10:30 AM - 12:30 PM
Objective: The Illinois Perinatal Quality Collaborative (ILPQC) Birth Equity (BE) quality improvement (QI) initiative, launched in July 2021 to implement key actionable strategies to address birth equity across Illinois hospitals. We aim to identify hospital team progress towards meeting initiative goals from baseline (Oct-Dec 2020) to initiative end and transition to sustainability (Jan-Mar/Q1 2024).
Study Design: ILPQC facilitated collaborative learning, rapid-response data and QI support for hospitals. Hospitals reported monthly progress on implementation of key systems changes, including staff respectful care and implicit bias education. Hospitals also conducted a monthly review of 10 randomly sampled patient charts to evaluate progress on Social Determinants of Health (SDOH) screening and documentation of linkage to resources. Chi-square tests analyzed birthing hospitals' progress on key systems changes and implementation differences by hospital characteristics from baseline to initiative end Q1 2024. Generalized linear mixed models, adjusted for hospital characteristics, were used to evaluate progress on staff education, SDOH screening and SDOH linkage.
Results: 63 participating hospitals were included. Hospital teams significantly increased implementation of all BE key systems changes between baseline and Q1 2024, regardless of hospital characteristics (Table 1). Staff receiving education on respectful care and implicit bias increased from 21% at baseline to 93% in Q1 2024 (p< .0001). SDOH screening increased from 17% at baseline to 92% in Q1 2024 (7% per quarter, p< .0001). SDOH linkage to resources increased from 57% at baseline to 78% in Q1 2024 (1% per quarter, p = .034, Figure 1).
Conclusion: The results suggest that a statewide collaborative can facilitate equitable implementation of key Birth Equity strategies through a QI initiative. Hospital teams submitted plans to sustain these improvements by engaging patient partners to obtain respectful care feedback, partner with community organizations to improve SDOH linkages and continue to disaggregate data by race, ethnicity and insurance status.

Table 1. Comparing birthing hospitals' progress on implementation of key Birth Equity Initiative systems changes at baseline Q4 2020 and initiative end and transition to sustainability Q1 2024

	Baseline Q4 2020 n=60	Q1 2024 n=63	
Key Systems Changes	**n (%)**	**n (%)**	**p-value**
Hospital has implemented standardized social determinants of health screening tools for screening all pregnant women during delivery admission in order to link patients to needed resources and services	11 (18.3)	63 (100)	<.0001
Hospital has implemented a protocol for improving the collection and accuracy of patient-reported race/ethnicity data	4 (6.7)	59 (93.7)	<.0001
Hospital has developed a process to review maternal health quality data stratified by race/ethnicity and Medicaid status	4 (6.7)	55 (87.3)	<.0001
Hospital has engaged patients and/or community members to provide input on quality improvement efforts	3 (5.0)	40 (63.5)	<.0001
Hospital has a strategy for sharing expected respectful care practices with delivery staff and patients (i.e. posting in L&D) including appropriately engaging support partners and/or doulas	6 (10.0)	58 (92.1)	<.0001
Hospital has implemented a Patient Reported Experience Measure (PREM) patient survey to obtain feedback from postpartum patients on respectful care practices and a process to review and share results	6 (10.0)	58 (92.1)	<.0001
Hospital has standardized system to provide all patients the recommended postpartum safety patient education materials prior to hospital discharge including urgent maternal warning signs and where patients call for immediate help with concerns as well as scheduling early postpartum follow-up	38 (63.3)	63 (100)	<.0001

Figure 1: Birthing hospitals' quarterly progress on Social Determinants of Health Screening during delivery admission and linkage to resources from baseline Q4 2020 to initiative end and transition to sustainability Q1 2024



697 | Cardiac and Obstetric Outcomes Among Individuals with Hereditary Thoracic Aortic Diseases: Leveraging Large EMR Data

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10:30 AM - 12:30 PM

Objective: Pregnancy, delivery, and the postpartum time period are times of increased risk for aortic dissection (AD) among patients with hereditary thoracic aortic diseases (HTAD). Due to the relative rarity of AD and HTAD, data on the risks of AD and other cardiac complications comes from small case series. We aimed to leverage Epic Cosmos, a large dataset comprised of electronic medical records from across the country to estimate current risks of AD and cardiac complications among patients with HTAD during pregnancy.

Study Design: We performed a descriptive analysis of a cohort of pregnancies from The Epic Cosmos dataset, which combines data from over 1500 hospitals and >250 million patients. Epic Cosmos was queried for patients with simultaneous diagnoses codes for HTAD (Marfan Syndrome, Loeys-Dietz Syndrome, Vascular Ehlers-Danlos Syndrome and bicuspid associated aortopathy) and pregnancy between July 5, 2021 and July 4, 2024. Rates of AD, other cardiac complications (including aortic rupture, cardiac arrest, cardiac arrhythmia), and pregnancy outcomes were abstracted for all included individuals.

Results: We identified 1171 individuals with HTAD and pregnancy in the selected time frame. Most individuals identified as White (81.6%). Marfan syndrome was the most common HTAD diagnosis (74.6%). The rate of AD in this cohort was 1.1% (n = 13). The most common cardiac complication experienced by these individuals was arrhythmia (18.4%). For 698 individuals, complete pregnancy and obstetric outcome data was available, and 46.8% were nulliparous. Approximately 20.8% of patients had a cesarean delivery and 30.5% had a preterm delivery (< 37 weeks). Twelve percent of individuals opted for a form a long-acting reversible contraception following pregnancy (Implant n = 27, IUD n = 113).

Conclusion: In this large, contemporary cohort rates of AD were 1.1% among patients with HTAD in pregnancy. Prospective studies are needed to assess the optimal management of pregnancy among patients with HTAD to decrease cardiac and obstetric complications.

Table 1. Cardiac and Pregnancy Outcomes among Individuals with Hereditary Thoracic Aortic Disease

Demographics	**n=1,171**
Maternal age *(mean, SD)*	32 years (±8 years)
Race*	
American Indian/Alaskan Native	19 (1.6)
Asian	20 (1.7)
Black	182 (15.5)
White	956 (81.6)
Other	125 (10.7)
Unknown	20 (1.7)
Ethnicity	
Hispanic/Latinx	100 (8.5)
Non-Hispanic/Latinx	1,005 (85.8)
Unknown	66 (5.7)
HTAD Diagnosis Code:	
Marfan Syndrome	873 (74.6)
Vascular Ehlers-Danlos Syndrome	170 (14.5)
Loeys-Dietz Syndrome	117 (10.0)
Bicuspid aortopathy	11 (0.9)
Cardiac outcomes during pregnancy	**n=1,171**
Aortic Dissection	13 (1.1)
Aortic Rupture	<10
Cardiac Arrest	<10
Cardiac arrhythmia	216 (18.4)
Maternal Death	11
Perinatal outcomes†	**n=698**
HTAD Diagnosis Code:	
Marfan Syndrome	589 (84.4)
Vascular Ehlers-Danlos Syndrome	60 (8.6)
Loeys-Dietz Syndrome	44 (6.3)
Bicuspid aortopathy	5 (0.7)
Nulliparous	327 (46.8)
Pregnancy outcome	
First trimester loss	54 (7.7)
Second trimester loss	12 (1.7)
22-28 weeks gestation	<10
28-32 weeks gestation	<10
32-34 weeks gestation	<10
34-36+6 weeks gestation	58 (8.3)
Term delivery (37+ weeks gestation)	422 (60.5)
Cesarean delivery ††	145 (22.8)
Postpartum LARC use	
Implant	27 (3.9)
Intrauterine device	113 (16.2)

Data are n(%) unless otherwise indicated
*Some individuals may identify as multiracial.
†Complete perinatal outcomes were only available for a subset of patients.
††Denominator is pregnancies that continued past 22 weeks (n=635)
Due to the nature of the Epic Cosmos database, cells with <10 are noted as <10 to maintain anonymity of the protected health data.

698 | Association of CDC Social Vulnerability Index and Postpartum Care Attendance

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10:30 AM - 12:30 PM

Objective: Increasing the rate of postpartum follow-up has been identified as a national priority to decrease maternal morbidity and promote maternal health. We sought to evaluate whether there is an association between the CDC's Social Vulnerability Index (SVI) and postpartum care attendance.

Study Design: This is a retrospective case control study of patients who delivered at ≥20 weeks' gestation at any of 3 hospitals within a New York City healthcare system from 1/1/2022 to 2/1/2024 and had at least one prenatal visit at an affiliated site prior to delivery. The outcome of postpartum care was dichotomized as at least one outpatient obstetric visit within 12 weeks of delivery. The exposure was CDC-defined SVI, using a validated technique for geocoding patient addresses to assign overall SVI as well as SVI theme scores. SVI was categorized into quartiles representing low to high social vulnerability; more vulnerable patients have higher SVI scores. Demographic, medical, and obstetric factors were examined, and bivariate and multivariate logistic regressions performed.

Results: A total of 21,864 patients were included. Overall, 89.2% attended their PPV, but 33.3% of those with public insurance

and 37.8% of those who delivered at community-based sites did not attend their PPV. Among all patients, the distribution of PPV attendance substantially varied based on SVI quartile (Figure), and the odds of attending at least one PPV significantly decreased as SVI increased in a dose-dependent fashion (Table). These patterns persisted among the socioeconomic, household, and housing/transport themes for SVI (Table). After adjusting for important potential confounders, the significant association between high SVI and decreased odds of attending PPV persisted (aOR 0.72, 95% CI 0.59, 0.88).

Conclusion: Social vulnerability is significantly associated with likelihood of postpartum visit attendance within 12 weeks of delivery: those with the highest vulnerability have the lowest odds of following up for postpartum care. The CDC's SVI may be an effective screening tool to identify those at risk of loss to follow-up postpartum.

Figure: Distribution of patients attending and not attending at least one postpartum (PP) visit within 12 weeks of delivery based on CDC Social Vulnerability Index (SVI)

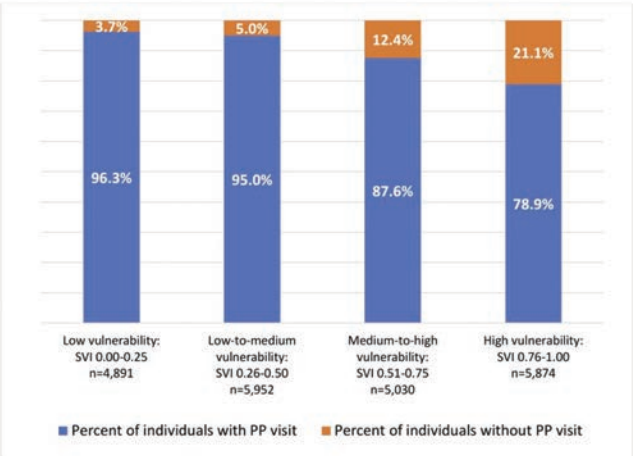

Table – Frequency and odds of attending at least one postpartum visit within 12 weeks of delivery by CDC Social Vulnerability Index (SVI)

Characteristic	Number of patients (n, %)		Odds of PP visit (OR, [95% CI])	Adjusted Odds of PP visit* (aOR, [95% CI])
	Did attend PP visit *n*=19,512	Did not attend PP visit *n*=2,352		
SVI: overall^				
Low vulnerability	4,709 (24.2)	182 (7.7)	Ref	Ref
Low to medium vulnerability	5,652 (29.1)	300 (12.7)	0.73 (0.60, 0.88)	0.92 (0.74, 1.14)
Medium to high vulnerability	4,404 (22.7)	626 (26.6)	0.27 (0.23, 0.32)	0.89 (0.73, 1.09)
High vulnerability	4,634 (23.8)	1,240 (52.8)	0.14 (0.12, 0.17)	0.72 (0.59, 0.88)
SVI: SES Theme^				
Low vulnerability	8,151 (42.0)	328 (13.9)	Ref	
Low to medium vulnerability	4,068 (20.9)	289 (12.3)	0.57 (0.48, 0.67)	
Medium to high vulnerability	3,326 (17.1)	642 (27.3)	0.21 (0.18, 0.24)	
High vulnerability	3,854 (19.8)	1,089 (46.3)	0.14 (0.12, 0.16)	
SVI: Household Theme^				
Low vulnerability	9,820 (50.6)	726 (30.9)	Ref	
Low to medium vulnerability	4,192 (21.6)	604 (25.7)	0.51 (0.46, 0.58)	
Medium to high vulnerability	2,807 (14.4)	485 (20.6)	0.43 (0.38, 0.48)	
High vulnerability	2,580 (13.3)	533 (22.7)	0.36 (0.32, 0.40)	
SVI: Minority Status and Language Theme^				
Low vulnerability	1,459 (7.5)	337 (14.3)	Ref	
Low to medium vulnerability	5,893 (30.3)	518 (22.0)	2.63 (2.26, 3.05)	
Medium to high vulnerability	7,010 (36.1)	600 (25.5)	2.70 (2.33, 3.12)	
High vulnerability	5,052 (26.0)	893 (38.0)	1.31 (1.14, 1.50)	
SVI: Housing/Transport Theme^				
Low vulnerability	1,116 (5.7)	58 (2.4)	Ref	
Low to medium vulnerability	1,419 (7.3)	107 (4.5)	0.69 (0.49, 0.95)	
Medium to high vulnerability	4,734 (24.4)	447 (19.0)	0.55 (0.41, 0.72)	
High vulnerability	12,130 (62.5)	1,736 (73.9)	0.36 (0.27, 0.47)	

SVI=social vulnerability index, PP=postpartum, OR=odds ratio, CI=confidence interval, aOR=adjusted odds ratio, SES=socioeconomic status

^The Centers for Disease Control and Prevention Social Vulnerability Index (SVI) uses 16 U.S. census variables from the 5-year American Community Survey; these variables are grouped into four themes (socioeconomic status, household characteristics, racial and ethnic minority status, housing type and transportation) and then combined into a single measure of overall social vulnerability.

*Multivariable analyses included characteristics that were significantly associated with attending one postpartum visit in the unadjusted analysis: maternal age, marital status, preferred language, insurance type, employment status, number of OB providers seen during prenatal care, GA at first visit, and mode of delivery. SVI themes, race/ethnicity, and insurance were excluded due to multicollinearity within the model.

**Those with unknown SVI were excluded from univariate and multivariate analyses.

699 | Association Between Breastfeeding and Neurodevelopmental Outcomes After Late Preterm Birth

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10:30 AM - 12:30 PM

Objective: Despite the known benefits, it remains unclear whether breastfeeding improves neurodevelopmental outcomes. We tested the hypothesis that breastfeeding is associated with improved neurodevelopmental outcomes among children delivered late preterm.

Study Design: Secondary analysis of a prospective, follow-up study of ≥ 6 years old children enrolled in the NICHD Antenatal Late Preterm Steroid (ALPS) Trial, a multicenter study that assessed betamethasone administration in pregnancies at risk for late preterm birth (34-36wks). Term births and those with missing breastfeeding data or the Differential Ability Scales-II (DAS-II) were excluded. The exposure was breastfeeding at 3 months of life collected via interviews. The primary outcome was cognitive function at age ≥ 6, measured by DAS-II core components of the General Conceptual Ability (GCA) that includes verbal, non-verbal reasoning, and spatial abilities. General linear models were used to evaluate the association of breastfeeding with DAS-II GCA after controlling for pre-specified baseline characteristics (maternal age and education, gestational age at birth, child age, sex, tobacco use in pregnancy, ALPS study group, study center).

Results: Of 541 participants included in the analysis, 273 (50.5%) were breastfeeding at 3 months of life. Participants who breastfed were older, more likely to be white, have a college degree, be married, have private insurance, and less likely to use tobacco in pregnancy (Table 1). There was no difference in birthweight or gestational age at birth by breastfeeding status. The primary outcome, DAS-II GGA, was higher among children who were breastfed at 3 months, 98.9±13.3 vs. 93.0±12.9, mean difference of 5.90 (95% CI 3.59, 8.21, adjusted mean difference 2.27, 95% CI 0.03, 4.50) (Table 2). In secondary analyses, differences in the overall GCA appear to be driven by increased scores for spatial ability.

Conclusion: Among children born late preterm at 34-36 weeks, breastfeeding at 3 months of life was associated with improved neurodevelopmental outcomes at age 6 or older.

Table 1. Maternal and Child Characteristics by Breastfeeding Status at 3 Months

Characteristic	Breastfeeding (N=273)	No Breastfeeding (N=268)	P Value
Maternal characteristics			
Treatment Assignment			0.52
Betamethasone	137 (50.2%)	127 (47.4%)	
Placebo	136 (49.8%)	141 (52.6%)	
Race/ethnicity			<.001
Black	42 (15.4%)	92 (34.3%)	
Hispanic	86 (31.5%)	76 (28.4%)	
Other	11 (4.0%)	9 (3.4%)	
White	134 (49.1%)	91 (34.0%)	
Age, y	30.4 ± 6.0	27.3 ± 6.3	<.001
College degree or higher (maternal)	135/273 (49.5%)	67/267 (25.1%)	<.001
Body Mass Index, kg/m²	30.6 (27.5,35.3)	31.6 (26.6,38.3)	0.45
Number of prior pregnancies ≥20 weeks			0.97
No prior pregnancy	120 (44.0%)	117 (43.7%)	
1 prior pregnancy	70 (25.6%)	71 (26.5%)	
≥2 prior pregnancies	83 (30.4%)	80 (29.9%)	
Married	216 (79.1%)	140 (52.2%)	<.001
Tobacco use during pregnancy	21 (7.7%)	44 (16.4%)	0.002
Alcohol use during pregnancy	11 (4.0%)	16 (6.0%)	0.30
Hypertensive disorder of pregnancy	105 (38.5%)	102 (38.1%)	0.92
Chronic hypertension	32 (11.7%)	35 (13.1%)	0.64
Gestational diabetes	30 (11.0%)	27 (10.1%)	0.73
Cesarean delivery	82 (30.0%)	98 (36.6%)	0.11
Neonatal characteristics			
Gestational age at delivery, weeks	35.9 (35.1,36.3)	35.9 (35.1,36.6)	0.56
Birth weight, g	2559 ± 439.5	2491 ± 432.2	0.07
Small for gestational age (<10th%tile)	53 (19.4%)	51 (19.0%)	0.91
Follow-up Study, Child			
Age at follow-up, y	6.8 (6.4,7.5)	6.8 (6.3,7.3)	0.46
Height for age z-score	0.3 ± 1.1	0.2 ± 1.1	0.38
Weight for age z-score	0.4 ± 1.2	0.4 ± 1.2	0.51
Sex			0.62
Female	129 (47.3%)	121 (45.1%)	
Male	144 (52.7%)	147 (54.9%)	
Private insurance	164 (60.1%)	82 (30.6%)	<.001
Race/ethnicity			<.001
Black	38 (13.9%)	86 (32.1%)	
Hispanic	94 (34.4%)	85 (31.7%)	
Other	14 (5.1%)	15 (5.6%)	
White	127 (46.5%)	82 (30.6%)	
Surgeries with general or IV/IM narcotic anesthesia	43 (15.8%)	52 (19.4%)	0.26
Seizures	3 (1.1%)	7 (2.6%)	0.22
Meningitis or encephalitis	0	0	
Head trauma requiring hospitalization	1 (0.4%)	0	1.00

Data are mean +/- standard deviation, median (Q1,Q3), or n (%) unless otherwise specified.
Weight and height missing in 1.

Table 2. Primary and Secondary Outcomes by Breastfeeding Status at 3 Months

Outcome	Breastfeeding (N=251)	No Breastfeeding (N=246)	Unadjusted	Adjusted*
			Mean Difference (95% CI)	Mean Difference (95% CI)
DAS-II General Conceptual Ability	98.9 (13.3)	93.0 (12.9)	**5.90 (3.59,8.21)**	**2.27 (0.03,4.50)**
DAS-II General Conceptual Ability Components				
Verbal ability	100.6 (19.2)	93.5 (18.3)	**7.02 (3.71,10.33)**	2.66 (-0.61,5.93)
Nonverbal reasoning	97.9 (14.2)	93.0 (14.9)	**4.91 (2.34,7.47)**	1.29 (-1.31,3.89)
Spatial ability	99.5 (13.6)	94.2 (13.9)	**5.30 (2.88,7.73)**	**2.84 (0.42,5.26)**

*Adjusted by pre-specified baseline characteristics including maternal age, gestational at delivery, child age, sex, maternal education, tobacco use during pregnancy, treatment assignment and center. Bold text indicates statistical significance

700 | Risk Factors of Prostaglandin Failure in the Management of Postpartum Hemorrhage After Vaginal Delivery

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10:30 AM - 12:30 PM

Objective: To identify risk factors for prostaglandin E2 (sulprostone) failure in postpartum hemorrhage after vaginal delivery.

Study Design: We conducted a secondary analysis of the TUB trial, a multicenter randomized trial assessing the efficacy of intrauterine balloon tamponade (IUBT) used simultaneously with prostaglandin versus its use after prostaglandin failure. We selected women of the control group who received standard care, *i.e.* prostaglandin administration and then IUBT if bleeding persisted. Prostaglandin failure was defined as the need for IUBT to stop bleeding. We compared maternal and labor characteristics according to prostaglandin failure. Multivariate logistic regression was used to identify independent risk factors for prostaglandin failure and calculate adjusted odds ratios with 95% confidence intervals.

Results: Among the 193 women, 39 (20.2%) required IUBT for persistent bleeding despite prostaglandin administration. Maternal and labor characteristics did not differ between the groups. The mean time from birth to prostaglandin administration was 81±63 minutes in the success group and 76±55 minutes in the failure group (p-value .6). The rate of women receiving prostaglandin within 30 minutes after birth was 8.7% in the success group versus 10% in the failure group (p-value .8). The mean quantified blood loss at prostaglandin administration was 872 ± 286 mL in the success group and 955 ± 411 mL in the failure group (p-value .2). Thrombocytopenia (OR 15.8 [1.89-329], p-value .02) and multiple pregnancy (OR 2.76 [1.01-7.16], p-value .04) were identified as independent risk factors for prostaglandin failure.

Conclusion: Neither the time of administration of prostaglandins nor the amount of bleeding predicts failure of this treatment. Only thrombocytopenia and multiple pregnancy were independently associated with prostaglandin failure.

	Succes of prostaglandin n=154 (79.8%)	Failure of prostaglandin n=39 (20.2%)	p-value**
Maternal characteristics			
Age >= 35 year old	40 (26.0)	9 (23.1)	.70
Obesity (BMI ≥ 30kg/m2)	16 (10.4)	4 (9.75)	.99
Maternal country of birth*			.80
Europe	103 (67.8)	24 (61.5)	
North Africa	22 (14.5)	8 (20.5)	
Subsaharian africa	18 (11.8)	5 (12.8)	
Other	9 (5.9)	2 (5.2)	
Previous PPH	31 (20.1)	6 (15.4)	.65
Parity			.79
Nulliparous	63 (40.9)	18 (46.2)	
Primiparous without cesarean delivery	80 (51.9)	19 (48.6)	
Primiparous with cesarean delivery	11 (7.1)	2 (5.2)	
Multiple pregnancy	15 (9.7)	8 (20.5)	.09
Diabetes	30 (19.5)	6 (15.4)	.65
Hypertensive disorders	9 (5.8)	2 (5.1)	.99
Hydramnios	2 (1.3)	2 (5.1)	.18
Thrombocytopenia	1 (0.6)	3 (7.7)	.02
Anemia	61 (39.6)	17 (43.6)	.65
Labor characteristics			
Induction of labor	55 (37.7)	12 (30.8)	.56
Epidural analgesia	139 (90.3)	33 (84.7)	.38
Oxytocine for labor augmentation	81 (52.6)	21 (53.9)	.64
Episiotomy	19 (12.3)	9 (23.1)	.12
Instrumental delivery	33 (21.4)	9 (23.1)	.82
Macrosomia	17 (11.0)	6 (15.4)	.41
Oxytocin for PPH prevention	154 (100)	39 (100)	1
Time from birth to prostaglandin administration (min)	81 (63)	76 (55)	.6
Quantified blood loss at prostaglandin (mL)	872 (286)	955 (411)	.2

*2 missing datas for maternal country of birth variable ** p-value calculated with Finger exact test or Chi2 test as appropriate Qualitative variables are expressed by numerber (percentage) and quantitatives variables by mean (sd) BMI body mass index; PPH postpartum hemorrhage

701 | Outcomes of Cesarean and Vaginal Delivery in Nulliparous Deliveries by Hospital Cesarean Delivery Rate

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[1]Oregon Health & Science University, Bend, OR; [2]Oregon Health & Science University, Portland, OR

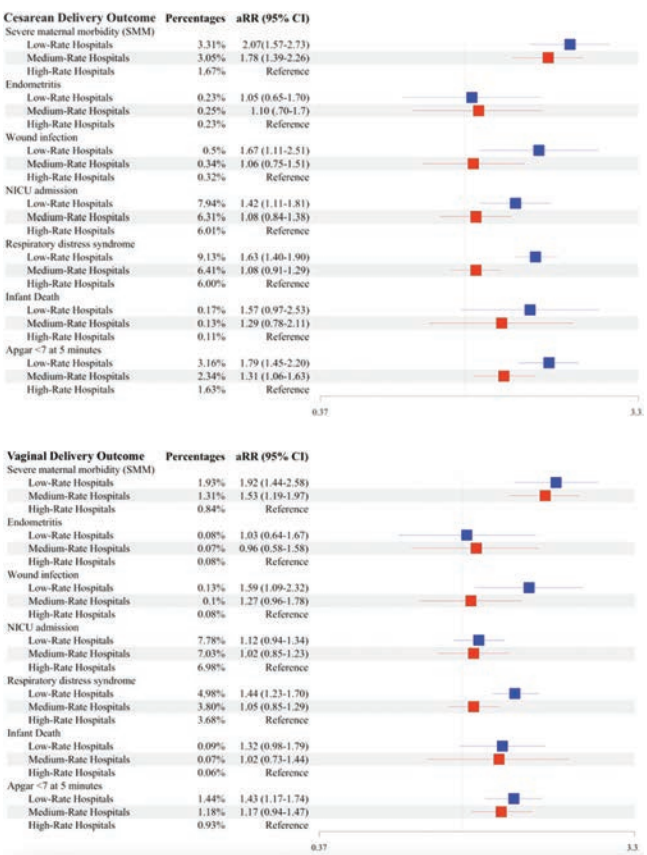
10:30 AM - 12:30 PM

Objective: It is unknown how outcomes differ among patients delivering in hospitals with differing rates of cesarean delivery. Therefore, we sought to assess an association between patients delivering at hospitals with different cesarean delivery rates and adverse perinatal outcomes stratified by cesarean or vaginal delivery.

Study Design: This was a retrospective cohort study of singleton, non-anomalous, term deliveries with vertex presentation in nulliparous individuals of California (2016-2020). Using the cesarean delivery rate in each hospital, we categorized hospitals into low (< 22%), medium (22.1-26.3%) and high (≥26.3%) cesarean rate hospitals. Multivariable Poisson regression models were used to examine the association of low and medium cesarean rate hospitals with adverse outcomes, using high cesarean rate hospitals as reference. These association were examined separately among patients delivering via cesarean or vaginally. Adjusted risk ratios (aRR) with 95% CI were estimated.

Results: In this study, we included 507,455 deliveries, of which 102,486 (20.2%) were cesarean and 404,968 (79.8%) were vaginal. As compared to high CD rate hospitals, individuals with cesareans in low CD rate hospitals had higher risk of SMM (3.31% vs 1.67%; aRR = 2.07 (1.57-2.73)), wound infection (0.50% vs 0.32%; aRR = 1.67 (1.11-2.51)), NICU admissions (7.94% vs. 6.01%; aRR = 1.42 (1.11-1.81)), and lower Apgar scores (3.16% vs. 1.63%; aRR = 1.79 (1.45-2.20)). Results were similar in individuals with vaginal deliveries, such as low CD rate hospitals had higher risk of SMM (1.93% vs 0.84%; aRR = 1.92 (1.44-2.58)), wound infection (0.13% vs 0.08%; aRR = 1.59 (1.09-2.32)) and lower Apgar scores (1.44% vs 0.93%; aRR = 1.43 (1.17-1.74)).

Conclusion: We found that patients delivering at hospitals with a low cesarean delivery rate had higher rates of several adverse outcomes in both cesarean and vaginal deliveries. Further investigation should be conducted to further evaluate this relationship.



702 | Cost-Effectiveness of Universal Screening for Measles Immunity in Pregnancy

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10:30 AM - 12:30 PM

Objective: Routine screening for measles immunity is not currently recommended in pregnancy. However, vaccination rates have declined and there have been over a dozen measles outbreaks in the United States in 2024. We aim to assess the cost-effectiveness of universal screening for measles immunity in pregnancy.

Study Design: We conducted a cost-effectiveness analysis comparing outcomes and costs associated with universal screening for measles immunity in pregnancy compared to no screening. We designed a Markov model that ran over 3 pregnancy cycles. Our outcomes included: measles exposure, measles infection including mild and severe infections, maternal death, fetal death, preterm delivery, vaccination, and vaccine response in addition to cost and quality-adjusted life years (QALYs). Model inputs were derived from the literature, with a willingness-to-pay threshold of $100,000 per QALY. Sensitivity analyses were conducted to evaluate the robustness of the results.

Results: Universal screening for measles immunity was the dominant strategy. Using the current measles rate of 0.1%, the incremental cost effectiveness ratio (ICER) of universal screening versus no screening was $25.07/QALY. Tornado one-way sensitivity analyses demonstrated that the costs of measles screening and cases, maternal death, and MMR vaccination, along with the probability of measles exposure had greatest impact on the cost-effectiveness of the screening strategy. Univariate sensitivity analysis demonstrated that universal screening for measles was cost-saving until the cost of testing for measles immunity passed $3,957, far exceeding the current average cost of screening, $44. When varying the measles exposure rate, screening remained the dominant strategy.

Conclusion: Universal screening for measles immunity during pregnancy was identified as a cost-effective strategy supporting its implementation. Until adopted, providers should consider screening their pregnant patients and recommending postpartum vaccination to ensure protection from measles in a subsequent pregnancy.

Figure 1: Tornado diagram of one-way sensitivity analyses with greatest impact on ICER

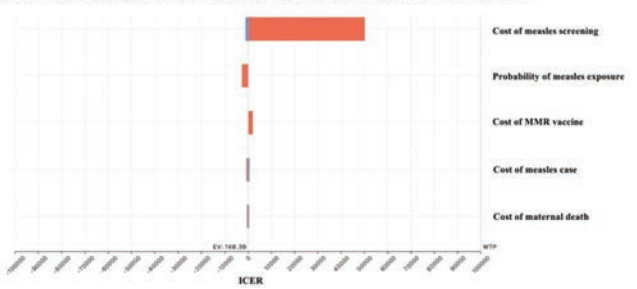
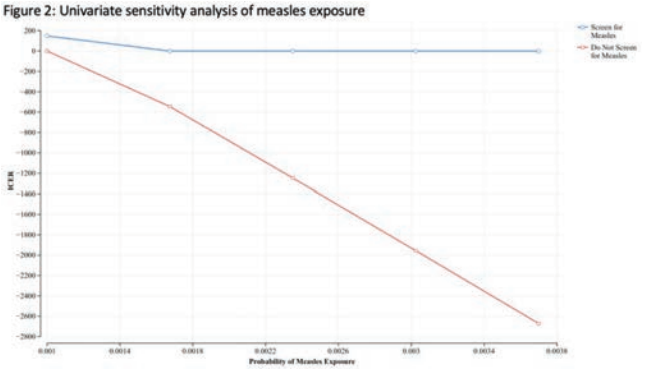


Figure 2: Univariate sensitivity analysis of measles exposure



703 | Diagnostic Accuracy of Sonographic Fetal Weight Estimation for Intertwin Size Discordance

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10:30 AM - 12:30 PM

Objective: Antenatal diagnosis of intertwin size discordance can affect management decisions. Therefore, care providers need to be aware of the accuracy of antenatal ultrasound for size discordance at birth. The current study aimed to estimate the diagnostic accuracy of estimated fetal weight (EFW) and abdominal circumference (AC) for large birthweight discordance and the diagnosis of selective fetal growth restriction (sFGR) at birth.

Study Design: Retrospective cohort study of twin pregnancies followed at a single center (2011-2023) who had ultrasound within 14 days before birth. We compared the diagnostic accuracy of EFW discordance and AC discordance for birthweight discordance and the diagnosis of sFGR at birth.

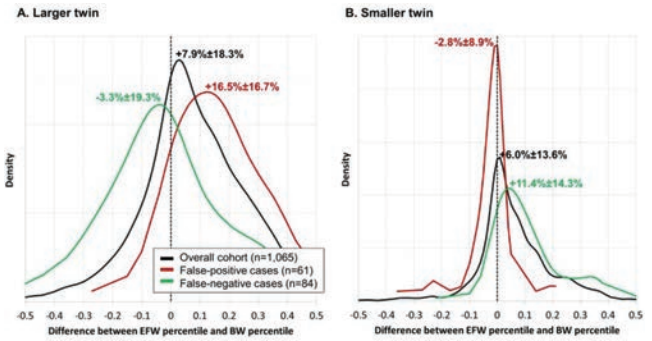
Results: Of the 1,065 twin pregnancies included, the rate of birthweight discordance > 20% and > 25% was 15.5% and 6.7%, respectively. EFW discordance was more accurate than AC discordance in estimating birthweight discordance, as reflected by a lower systematic error and mean absolute percentage error (**Table**). Still, both EFW and AC discordance had low diagnostic accuracy for large birthweight discordance and sFGR. For example, EFW discordance >20% had a sensitivity of 49.1% and a positive predictive value of 57.0% for birthweight discordance >20%, and the antenatal diagnosis of sFGR had a sensitivity of 45.8-54.4% and a positive predictive value of 50.9-55.2% for the postnatal diagnosis of sFGR. A false positive diagnosis of large birthweight discordance was mainly the result of overestimation of EFW percentile in the larger twin (**Figure A**), while failure to detect large birthweight discordance was mainly the result of overestimation of EFW percentile in the smaller twin (**Figure B**).

Conclusion: EFW discordance is more accurate than AC discordance in estimating birthweight discordance. However, both antenatal measures have low diagnostic accuracy for large birthweight discordance and sFGR. Care providers should be aware of the limited diagnostic accuracy when making management decisions on the timing and mode of delivery.

Table 1: Accuracy of fetal size discordance in estimating birthweight discordance

Measure of accuracy	EFW discordance vs. BW discordance	AC discordance vs. BW discordance	P-value
Systematic error (%, 95%-CI) [a]	-0.97% (-1.42%, -0.53%)	-6.43% (-6.85%, -6.00%)	**<0.001**
Random error (%, 95%-CI)	7.41% (7.11%, 7.74%)	7.02% (6.73%, 7.33%)	**0.011**
Mean absolute error (95%-CI)	5.70% (5.41%, 5.99%)	7.35% (6.99%, 7.71%)	**<0.001**
Proportion within 5% (% [95%-CI])	53.1% (50.1%, 56.1%)	45.4% (42.4%, 48.3%)	**<0.001**
Proportion within 10% (% [95%-CI])	84.3% (82.1%, 86.5%)	72.4% (69.7%, 75.1%)	**<0.001**
Proportion within 15% (% [95%-CI])	95.1% (93.8%, 96.4%)	87.0% (85.0%, 89.1%)	**<0.001**

[a] Negative and positive values for the systematic error reflect underestimation and overestimation of birthweight discordance, respectively.
EFW, estimated fetal weight; AC, abdominal circumference; BW, birthweight.



704 | Equity in First Trimester Congenital Anomaly Detection: Population Based Analysis in >1 Million Women in England

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10:30 AM - 12:30 PM

Objective: As there is no unified policy for first trimester anatomical screening in England, our aim was to establish whether differences in screening methods impact on the timing of diagnosis of major congenital anomalies.

Study Design: We linked data from two sources: a nationwide survey of current first trimester practice distributed to all NHS maternity units in England (n = 131) that established current first trimester ultrasound practice; and data from the National Congenital Anomalies Disease Registry (NCARDRS) database. The proportion of major anomalies diagnosed prior to 16 weeks gestation was then evaluated based on current first trimester screening policy.

Results: We included 1,030,224 pregnancies including 5,598 fetuses with one of 14 major conditions. Overall, n = 1,929 (32.7%, 95% CI 31.5–33.9) of these anomalies were diagnosed < 16 weeks. The screening policy in the 110 responding was grouped into four first trimester anatomy screening policies: A. no routine evaluation (n = 27), B. basic (n = 22), C. intermediate (n = 45), and D. advanced assessment (n = 16). Early detection rates were lowest in Group A (27.7%, 95% CI 25.4–30.0) and an increase in detection was seen in Group B (31.2%, 95% CI 28.5–34.1), C (33.2%, 95% CI 31.3–35.2) and D (40.4%, 95% CI 37.3–43.4, p< 0.0001).

Conclusion: Most NHS hospitals in England offer women some form of first trimester anomaly screening. The absence of national recommendations means there are significant variations in practice, which are associated with differences in fetal anomaly detection rates prior to 16 weeks gestation at population level. Centres with clear protocols for first trimester fetal anomaly screening have higher early detection rates for major congenital anomalies. The differences in the standard of antenatal screening care offered to women across England has resulted in regional and local inequities in maternal care.

705 | Utilization of Genetic-Counseling and Carrier-Screening at a Single Center: A Quality Assessment Study

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10:30 AM - 12:30 PM

Objective: To evaluate completion of basic carrier screening in a first pregnancy (G1) and factors associated with receipt.

Study Design: Chart review of G1 pregnancies at a single center between 01/2017–01/2024. Charts were randomly selected for quality assessment and were manually reviewed for provider notes to assess documentation (offered, accepted, declined); to review partner charts; and review neonatal charts for newborn screening (NBS) results. Patients were excluded if they received preconception care, infertility services, transferred into care above 20 weeks, or prenatal records were not available. Screening for variants in Cystic Fibrosis (CF), Spinal Muscular Atrophy (SMA), and Hemoglobinopathies (HB) defined complete carrier screening. Participants that elected for expanded carrier screening (ECS) were noted. Data was analyzed using descriptive statistics, t-test, and chi-square as appropriate. Analyses were completed using Stata 15.

Results: 450 maternal charts were reviewed. 158 were excluded (as above). The final cohort included 292 maternal, paternal, and neonatal charts (Table 1). 109 (37.3%) had genetic counseling and 98 (33.6%) had complete carrier screening. Of those that had genetic counseling, 54% had carrier screening; those that declined had 'declined' documented in the clinical note 100% of the time. Obstetric care providers did not routinely document declining carrier screening; this was identified 6 times in obstetric provider notes. 129 (44.2%) had CF screening, 109 (37.2%) had SMA screening, and 178 (61%) were screened for HB. Eleven (4%) of participants had ECS. No carrier couples or abnormal NBS were identified. Frequency of complete paternal testing when a maternal screen was positive is shown in Table 2. There were no significant differences in complete carrier screening or use of genetic counseling services based on race or insurance status.

Conclusion: One-third of randomly sampled G1 pregnancies since 2017 received complete carrier screening suggesting need to improve implementation and larger sample.

Table 1. Cohort Demographic Characteristics

Demographic Characteristic	N=292
Age (mean, SD)	26.7 (4.7)
Gestational age in weeks (mean, SD)	12 (5)
Self-identified race/ethnicity	
White	128 (43.8)
African American	118 (40.4)
Asian	6 (2.1)
Hispanic/Latino	24 (8.2)
Native American/Pacific Islander	3 (1)
Other	11 (3.8)
None Reported	2 (1)
Insured	273 (93.4)
Insurance Type	
Medicaid	124 (42.4)
Medicare	4 (1)
Private	132 (45.0)
Tricare	2 (0.6)
None	25 (8.6)
Genetic Counseling	109 (37.3)

[a]Data shown as n(%) unless noted otherwise.
[b]Note, participants may be bi or multi-racial, however were only able to select one race or ethnicity when data is entered into electronic medical record.

Table 2. Completion of Paternal Carrier Screening if Mom Positive

	Maternal (n positive)	Paternal (n with screening)
CF Screening	7	4
SMA Screening	9	3
HB Screening	14	1

706 | Trends in Postpartum Sflt-1 Among Patients Diagnosed with Preeclampsia with Severe Features

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10:30 AM - 12:30 PM

Objective: Because an excess of anti-angiogenic proteins like soluble fms-like tyrosine kinase 1 (sFlt-1) relative to pro-angiogenic proteins is thought to result in preeclampsia, placental delivery is regarded as curative for this condition. As there is little research on the impact of delivery on such placental proteins, this study sought to examine postpartum trends in sFlt-1 among patients with preeclampsia.

Study Design: A prospective pilot study of pregnant persons without chronic hypertension delivered for preeclampsia with severe features between 7/2023–6/2024. Subjects had at least 2 postpartum sFlt-1 levels drawn, the first within 24 hours of delivery and the second within 10 days of delivery. Primary outcome measures included change in sFlt-1 over time and postpartum half-life of sFlt-1. The normality of distribution for these continuous outcomes was tested by Kolmogorov-Smirnov test, and outcomes with normal distributions were presented as means while those with non-normal distributions were presented as medians. Half-life was calculated according to first-order elimination principles.

Results: Among 20 subjects with preeclampsia with severe features, 16 (80%) had at least 2 postpartum sFlt-1 levels drawn. Median sFlt-1 was 9,304pg/mL (IQR 7,060–25,051pg/mL) and 508pg/mL (IQR 402–855pg/mL) on postpartum day 1 and 7, respectively. This translated to a median reduction in sFlt-1 of 8,800 pg/mL (IQR 7,076–24,650pg/mL) and a median half-life of only 1.51 days (IQR 1.13–1.73 days). These trends did not vary when assessed according to variables including maternal age, ethnicity, body mass index, medical comorbidities, antenatal aspirin exposure, gestational age at diagnosis, blood pressure at delivery, or need for antihypertensives postpartum ($p \geq 0.32$).

Conclusion: Even in patients with preeclampsia with severe features, serum sFlt-1 levels declined rapidly over the first week postpartum. This suggests that factors other than clearance of abnormal placental proteins are likely responsible for persistent postpartum hypertensive disease.

Baseline characteristics of the study population	
Variable	**Number (%)[a]**
Maternal age, years, Mean (SD)	29.4 (5.23)
Patient-reported ethnicity	
White	1 (5.00)
Hispanic	11 (55.0)
Black	5 (25.00)
Asian	1 (5.0)
Other, unknown	2 (10.0)
BMI[b], Mean (SD)	37.9 (35.0 – 44.1)
Nulliparity	13 (65.0)
Multifetal gestation	1 (5.0)
Obstetric co-morbidities	
Pre-gestational diabetes	5 (25.0)
Autoimmune disease	1 (5.0)
Prenatal aspirin use	10 (50.0)
EGA[c] at diagnosis, weeks, Median (IQR)	36 (34 – 38.5)
EGA[c] at delivery, weeks, Median (IQR)	37 (34.5 – 38.5)
Mode of delivery	
Spontaneous vaginal	7 (35.0)
Operative vaginal	1 (5.0)
Cesarean	12 (60.0)
Postpartum day 1 sFLt-1[d], pg/mL, Median (IQR)	9,304 (25,051 - 97,060)
1-week postpartum sFLt-1[d], pg/mL, Median (IQR)	508 (402 – 855)
Birthweight, grams, Mean (SD)	2,757 (934)
5-minute Apgar, Median (IQR)	9.0 (8-9)

[a] Except where otherwise noted
[b] Body mass index
[c] Estimated gestational age
[d] Soluble fms-like tyrosine kinase 1

Postpartum sFlt-1 half-life calculations				
Subject	**sFlt-1 #1 (pg/mL)**	**sFlt-1 #2 (pg/mL)**	**Time between Collection (days)**	**Half-life (days)**
1	9,201.70	401.8	6.8	1.51
2	9,303.60	510.0	6.6	1.58
3	4,972.10	508.0	7	2.13
4	17,291.30	-	-	-
5	6,785.80	884.6	7.1	2.4
6	53,495.70	914	7.8	1.32
7	50,707.40	855.1	6.5	1.1
8	16,989.10	-	-	-
9	25,111.00	461.4	6.7	1.15
10	9,194.90	397.6	6.7	1.48
11	4,211.70	-	-	-
12	7,336.60	250.9	9.1	1.78
13	19,063.80	503.8	9.1	1.71
14	9,183.00	654.8	9.0	1.73
15	25,051.30	451	6.6	1.11
16	47,995.20	872.4	6.5	1.13
17	3,631.40	-	-	-
18	7,060.40	348.2	6.8	1.58
19	21,505.70	668.1	5.6	1.11
20	3,594.4	462.1	6.0	2.04

707 | Results of Diagnostic Cardiac Testing Among Pregnant Persons with Positive Cardiovascular Disease Screening

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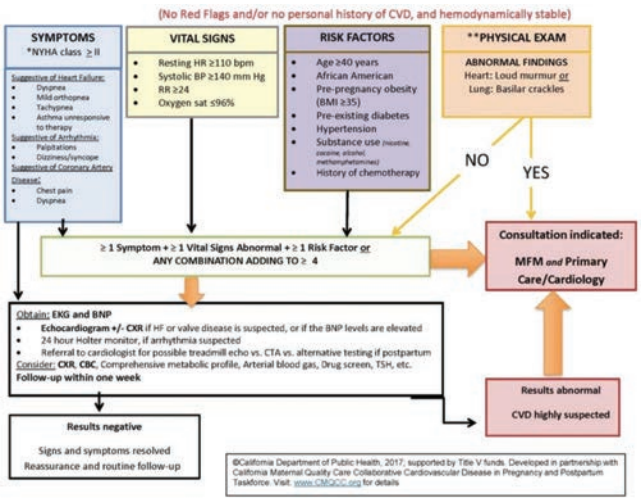
[1]University of California Irvine, Orange, CA; [2]University of Missouri-Kansas City/Saint Luke's Hospital, Kansas City, MO; [3]University of California San Diego, San Diego, CA; [4]University of California, Irvine, Orange, CA

10:30 AM - 12:30 PM

Objective: Cardiovascular disease (CVD) is a significant cause of pregnancy-related morbidity and mortality, and global CVD risk assessment is a key step in mitigating this trend. Our practice includes referring patients with a positive CVD risk assessment for further cardiac testing. This study aimed to establish the rate of abnormal cardiac test results among this group.
Study Design: A prospective cohort study of 3 academic medical centers using our CVD risk assessment between 2020–2024. Primary outcome was an abnormal composite of cardiac test results (e.g. abnormal brain natriuretic peptide (BNP), electrocardiogram (EKG), or echocardiogram) calculated as a percentage. Bivariate analyses with two-sample t-tests and chi-square tests were performed to compare demographic and clinical characteristics between those with normal and abnormal results. Multivariate logistic regression was also fitted to evaluate the association between an abnormal test and patients' sociodemographic characteristics.
Results: A total of 16,900 patients had CVD risk assessment, of whom 334 (2%) had a positive and 16,655 (98%) had a negative result. Among those who screened positive, 207 (62%) went on to have diagnostic cardiac testing, including 117 BNP levels, 159 EKGs, and 81 echocardiograms. In this cohort, 78 (38%) had an abnormal composite cardiac test result, encompassing 14 (12%) abnormal BNP levels, 78 (38%) abnormal EKGs, and 2 (3%) abnormal echocardiograms. There were no significant differences between those with normal and abnormal composite cardiac test results with respect to age, ethnicity, insurance, medical conditions, symptoms, or total score on the CVD risk assessment ($p \geq 0.05$); however, in bivariate analysis, those with a heart rate above 110 were more likely to have an abnormal test ($p = 0.0458$).
Conclusion: Over one-third of patients with a positive CVD risk assessment had abnormal findings on subsequent cardiac testing. As there was inconsistency in the cardiac tests ordered following a positive screening, further research is required to determine which testing strategies have the highest yield for future use.



Baseline characteristics of the study population by composite cardiac testing results

Variable	Number (%)[a] Entire Cohort (n = 207)	Normal CVD Test (n = 129)	Abnormal CVD Test (n = 78)	P-Value
Maternal age, years, Mean (SD)	32.6 (6.6)	32.1 (6.6)	33.4 (6.6)	0.19
Patient-reported race/ethnicity				0.29
White	49 (23.7%)	28 (21.7%)	21 (26.9%)	
Hispanic	76 (36.7%)	53 (41.1%)	23 (29.5%)	
Black	46 (22.2%)	30 (23.3%)	16 (20.5%)	
Asian/Pacific Islander	21 (10.1%)	11 (8.5%)	10 (12.8%)	
Other, unknown	15 (7.2%)	7 (5.4%)	8 (10.3%)	
Obesity	95 (45.9%)	60 (46.5%)	35 (44.9%)	0.82
Insurance status				0.35
Private	81 (39.1%)	54 (41.9%)	27 (34.6%)	
Public	83 (40.1%)	52 (40.3%)	31 (39.7%)	
Other	43 (20.8%)	23 (17.8%)	20 (25.6%)	
Substance use	28 (13.5%)	13 (10.1%)	15 (19.2%)	0.06
Obstetric co-morbidities				
Chronic hypertension	81 (39.1%)	47 (36.4%)	34 (43.6%)	0.31
Pre-gestational diabetes	49 (23.7%)	28 (21.7%)	21 (26.9%)	0.39
Asthma	4 (1.9%)	2 (1.6%)	2 (2.6%)	0.61
Chemotherapy history	0 (0.0%)	0 (0.0%)	0 (0.0%)	1.00
Symptoms				
Dyspnea	88 (42.5%)	56 (43.4%)	32 (41.0%)	0.74
Orthopnea	42 (20.3%)	30 (23.3%)	12 (15.4%)	0.17
Tachypnea	89 (43.0%)	57 (44.2%)	32 (41.0%)	0.66
Palpitations	80 (38.6%)	54 (41.9%)	26 (33.3%)	0.87
Dizziness	25 (12.1%)	16 (12.4%)	9 (11.5%)	0.85
Chest pain	29 (13.5%)	20 (15.5%)	8 (10.3%)	0.28
Vital Signs				
Resting HR[b] > 110 bpm	41 (19.8%)	20 (15.5%)	21 (26.9%)	0.04
Systolic BP[c] > 140 mm Hg	50 (24.2%)	31 (24.0%)	19 (24.4%)	0.96
RR[d] > 24	2 (1.0%)	1 (0.8%)	1 (1.3%)	1.0
SpO2[e] < 96%	30 (14.5%)	16 (12.4%)	14 (17.9%)	0.27
Total CVD risk score, Mean (SD)	4.0 (1.5)	3.9 (1.4)	4.0 (1.6)	0.94

[a] Unless otherwise specified
[b] Heart rate
[c] Blood pressure
[d] Respiratory rate
[e] Oxygen saturation

708 | Neonatal Outcomes in Maternal Heart Disease: A Multidisciplinary Approach toward Congenital and Acquired Conditions

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10:30 AM - 12:30 PM

Objective: Maternal heart disease remains one of the leading causes of preventable pregnancy-related deaths in the US. Limited data compares specific maternal and neonatal outcomes among this high-risk population. Therefore, we sought to investigate how multidisciplinary clinical care affects neonatal outcomes.

Study Design: This was a cohort study of pregnancies (n = 466) affected by maternal cardiac diseases that received multidisciplinary care (MFM/Cardiology/OB/Anesthesia/Cardiac Surgery/Genetics) in a single tertiary center between 2012 and 2024. The study groups consisted of pregnancies with maternal acquired heart disease (AHD) (n = 242), maternal congenital disease (CHD) (n = 224), and pregnancies without any cardiac disease (n = 183). Neonatal outcomes—birth weight, gestational age, Apgar scores, and NICU admissions—across these groups were compared by Pearson Chi-Square, Fisher Exact, and Kruskal-Wallis rank sum tests. A pairwise comparison was conducted for significant differences. The significance level was set at alpha = 0.05.

Results: This study showed increased adverse neonatal outcomes in the heart disease cohort, especially within the maternal CHD group compared to the group without heart disease. Infants born to people with CHD or AHD had lower birth weights, shorter gestational ages, lower Apgar scores, and higher rates of NICU admissions compared to those without heart disease (Table 1) (p value < 0.01 for all comparisons). The proportion of small for gestational age infants born to people with CHD was significantly higher than those born to people with AHD (p = 0.007). All other outcomes were similar in the CHD and AHD cohorts.

Conclusion: Maternal heart diseases are associated with an increased risk of adverse neonatal outcomes, necessitating a multidisciplinary approach in prenatal care and tailored strategies for CHD and AHD. In this study, infants born to people with CHDs had an increased risk for small for gestational age as compared to AHD, thus further studies are necessary to better understand this biological difference.

Table 1: Neonatal Outcomes

	Maternal Acquired Heart Disease[1] (n = 242)	Maternal Congenital Heart Disease [1] (n = 224)	No Maternal Heart Disease [1] (n = 183)	P-Value[2]
Pre-term Birth (<37 weeks)	54 (22.3%)	40 (17.9%)	13 (7.1%)	< 0.001
Gestational Age, week	38.29 (37, 39.27)	38.78 (37.30, 39.40)	39 (38, 40)	< 0.001
Birthweight, grams	3,081.5 (2,692.5, 3,465.5)	3,072.5 (2,701.75, 3,350.25)	3,319 (2,995, 3,578)	< 0.001
Small for Gestational Age	21 (8.7%)	38 (17.0%)	19 (10.4%)	0.017
Apgar score at 5 minutes <7	4 (1.7%)	7 (3.1%)	1 (0.5%)	0.2
NICU Admission	33 (13.6%)	43 (19.2%)	11 (6.0%)	< 0.001
Mechanical Ventilation During Hospitalization	15 (6.2%)	19 (8.5%)	3 (1.6%)	0.011
Length of Initial Hospitalization, days	3 (2,4)	3 (2,4)	2 (2,3)	< 0.001
Death before Discharge	0 (0)	4 (1.8%)	1 (0.5%)	0.056

1. Cells show n (%) or median (25% quantile, 75% quantile)
2. P value reflects overall comparison among three groups

Table 2: Maternal Demographics

Characteristics	Acquired Heart Disease (n = 242) [1]	Congenital Heart Disease (n = 224) [1]	No Heart Disease (n = 183) [1]
Maternal Age	33 (30,36)	32 (28, 36)	33 (30, 35)
Maternal Age Group			
< 35	144 (60%)	152 (67.9%)	128 (69.9%)
>=35	98 (40%)	72 (32.1%)	55 (30.1%)
Maternal Race			
Asian	47 (19.4%)	56 (25.0%)	67 (36.6%)
Black	5 (2.1%)	5 (2.3%)	4 (2.2%)
Caucasian	117 (48.3%)	98 (43.8%)	98 (53.6%)
Pacific Islander	5 (2.1%)	1 (0.5%)	2 (1.1%)
Other	73 (30.2%)	65 (29.0%)	14 (7.7%)
Maternal Ethnicity			
Non-Hispanic	175 (72.3 %)	156 (69.6%)	162 (88.5%)
Hispanic	67 (27.7%)	68 (30.4%)	21 (11.5%)
Insurance			
Private	163 (67.4%)	146 (65.2%)	171 (93.4%)
Public	74 (30.6%)	76 (33.9%)	12 (6.6%)
Other	5 (2.1%)	2 (0.9%)	0 (0.0%)
Nulliparous	120 (49.6%)	118 (52.7%)	111 (60.7%)
Delivery Mode			
Vaginal	129 (53.3%)	127 (56.7%)	126 (68.9%)
Cesarean	113 (46.7%)	97 (43.3%)	57 (31.1%)

1. Cells show n (%) or median (25% quantile, 75% quantile)

709 | Immediate Delivery versus Expectant Management in Twin Pregnancies with Late Preterm Rupture of Membranes

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10:30 AM - 12:30 PM

Objective: In recent years, the management of late preterm premature rupture of membrane (PPROM) has changed from expedient delivery towards expected management. Current literature provides limited information on preferred management in twin pregnancy. We aimed to compare maternal and neonatal outcomes in twin pregnancies presented with PPROM at 34-36 weeks.

Study Design:
A retrospective study was conducted at a single tertiary care center between 2011 and 2024. All individuals with twin pregnancies who presented with PPROM between 34.0 to 36.0 weeks of gestation were included. We compared those who were dispositioned for immediate delivery versus those managed expectantly. Maternal and neonatal outcomes were evaluated using frequentist statistics.

Results: During the study period, 146 twin pregnancies presented with PPROM and met inclusion criteria; 37 (25.3%) were managed expectantly, and 109 (74.7%) were dispositioned for delivery. Baseline and pregnancy characteristics were similar between the groups (Table 1). Expectant management was associated with a higher rate of intrapartum fever (8.1% vs. 0.9%, p = 0.05) and Cesarean delivery due to arrest of dilatation (13.5% vs. 1.8% p = 0.01) compared to immediate delivery. Furthermore, expectant management was associated with a higher rate of NICU admission (36.5% vs 23.9%, p = 0.03), respiratory distress syndrome (6.8% vs 1.4%, p = 0.01), and need for antibiotic treatment (63.5% vs. 28.9%, p< 0.01) compared to immediate delivery (Table 2).

Conclusion: In our cohort, expectant management for individuals with twin pregnancies presenting with PPROM at 34-36 weeks of gestation was associated with a higher rate of maternal and neonatal outcomes compared to immediate delivery.

Table 1- Characteristics of individuals based on management

	Expected management n=37 (%)	Active management n=109 (%)	P value
	Maternal characteristics		
Maternal age (years)	33 (30-38)	32(29-37)	0.61
Nulliparous	27 (73.0)	63 (57.8)	0.1
Chorionicity (Bichorionic biamniotic)	30 (81.1)	88 (80.7)	0.96
History of PTL	0 (0)	5 (4.6)	0.33
Maternal BMI in pregnancy (Kg/m^2)	28.22(25.5-32.1)	28.87(26.7-33.0)	0.36
ART	19 (51.4)	53 (48.6)	0.77
Diabetes			
Pregestaional diabetes	0 (0)	1 (0.9)	NC
Gestational diabetes	10 (27.03)	23 (21.1)	0.45
Chronic hypertension	0 (0)	1 (0.9)	NC
Hypertension disorder	5 (13.5)	9 (8.3)	0.34
Suspected FGR	5 (13.5)	3 (2.8)	0.41
GBS status			0.33
Positive	3 (8.1)	20(18.5)	
Negative	3 (8.1)	7 (6.4)	
Unknown	31(83.8)	82(75.2)	
Antenatal corticosteroids	21 (56.8)	55 (50.5)	0.5
Rescue antenatal corticosteroids	5 (13.5)	12 (11.0)	0.68
GA at PROM	35.14(34.2-35.5)	35.14(34.6-35.7)	0.09
34-35 weeks	13(35.1)	44(40.4)	0.57
35-36 weeks	24(64.9)	65(59.6)	0.57
	Labor and Delivery characteristics		
Latency from PROM to delivery (hours)	**36(16.3-52.7)**	**6(4-12)**	**<0.01**
Gestation age at delivery (weeks)	35.28(34.5-35.7)	35.28(34.6-35.7)	0.77
Placental abruption	0 (0)	3 (2.8)	0.3
Cord prolapse	0 (0)	0 (0)	NC
Intrapartum fever	**3 (8.1)**	**1 (0.9)**	**0.05**
Mode of delivery			
Vaginal delivery/Instrumental	25 (67.6)	54 (49.5)	0.057
Cesarean delivery	12 (32.4)	52 (47.7)	0.1
Cesarean delivery second twin (combined)	1 (2.7)	4 (3.7)	NC
Indication for CD			
NRFHR	1 (2.7)	6 (5.5)	0.67
Arrest of decent	0 (0)	1 (0.9)	NC
Arrest of dilatation	**5 (13.5)**	**2 (1.8)**	**0.01**
***Others**	**7 (18.9)**	**44 (40.4)**	**0.01**

*Others- Previous 2 cesarean delivery, Maternal request.

PTL- Preterm labor, BMI- Body mass index, ART- Assisted reproductive technology, FGR- Fetal growth restriction, NRFHR- Non reassuring fetal heart rate, NC- not calculate

Bolded if significant

Table 2- Maternal and neonatal outcomes based on management

	Maternal outcomes		
	Expected management n=37 (%)	**Active management n=109 (%)**	**P value**
Postpartum hemorrhage	4 (10.8)	14 (12.84)	0.74
Endometritis	1 (2.7)	1 (0.92)	0.44
Blood transfusion	2 (5.4)	6 (5.5)	0.98
Deep vein thrombosis	0 (0)	0 (0)	NC
Postpartum readmission	7 (18.9)	14 (12.84)	0.36
Neonatal outcomes			
	Expected management n=74 (%)	**Active management n=218 (%)**	**P value**
Birth weight (gram)	2160(1969.5-2446.2)	2170(1988.75-2385.5)	0.93
LGA	3 (4.1)	10 (4.6)	0.84
SGA	3 (4.1)	10 (4.6)	0.84
5' Apgar score <7	0 (0)	3 (1.4)	0.57
Cord PH Artery	7.28(7.2-7.3)	7.26(7.2-7.3)	0.52
Cord PH Vein	7.29(7.2-7.3)	7.3(7.3-7.3)	0.74
NICU admission	**27 (36.5)**	**52 (23.8)**	**0.03**
Respiratory support	11 (14.9)	19 (8.7)	0.13
Intubation	1 (1.4)	0 (0)	0.25
NEC	0 (0)	0 (0)	NC
RDS	**5 (6.8)**	**3 (1.4)**	**0.01**
Sepsis	0 (0)	1 (0.5)	N/C
Antibiotic therapy	**47 (63.5)**	**63 (28.9)**	**<0.01**
Hypoglycemia	18 (24.3)	67 (30.7)	0.29
Hyperbilirubinemia requiring therapy	8 (10.8)	29 (13.3)	0.57

LGA- Large for gestational age, SGA- Small for gestational age, NICU- Neonatal intensive care unit, NEC- Necrotizing enterocolitis, RDS- Respiratory distress syndrome, NC- not calculated

Bolded if significant

710 | Association of Glucagon Like Peptide-1 Agonist (GLP1) use With Pregnancy Outcomes

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10:30 AM - 12:30 PM

Objective: Treatment of obesity with GLP1 improves metabolic health and national use is rising since approval in 2017. As unintended pregnancy rates are >40%, GLP1 pregnancy exposures may be increasing. Data are limited on pregnancy outcomes after exposure. We quantified the risks of adverse pregnancy outcomes after GLP1 exposure and how duration of use modifies these associations.

Study Design: Retrospective cohort study of singleton deliveries at a single US center from 2017-2024. Pregnancies after GLP1 use (Semaglutide, Tirzepatide) were matched (1:many ratio) on BMI and demographics to unexposed pregnancies using propensity scores. The primary outcome was a composite of hypertensive disorders of pregnancy (HDP), fetal macrosomia or growth restriction. Secondary outcomes included fetal anomalies, NICU admission, mode of delivery and gestational weight gain (GWG). Regression models estimated the association between GLP1 use and study outcomes. Stratification by duration of use prior to pregnancy (>1yr, ≤1yr) was performed.

Results: Fifty-eight exposed patients were matched to 1578 unexposed patients. Among 1636 patients, 86% were obese, 31% had pregestational diabetes and mean weight at first prenatal visit was 110±27kg. Forty-five patients used GLP1 for ≤1 year. Mean weight change with GLP1 use until pregnancy was -0.11±6.44kg. There were no significant differences between groups after propensity score matching. The primary outcome occurred in 37(64.0%) exposed patients and 864 (54.8%) unexposed patients (OR 1.46, 95% CI 0.84-2.51). Exposed patients had a higher odds of GWG (difference 2.36kg, 95% CI 1.43-3.29) and NICU admission (OR 1.85, 95% CI 1.10-3.13). Other secondary outcomes were similar between both groups. In stratified analysis, NICU admission and GWG risks were significantly higher only with preconception use ≤1yr.

Conclusion: GLP1 use was not associated with HDP/fetal growth disorders. However, preconception use ≤1yr may have higher NICU admission/GWG risks. Future studies of weight trajectories by use duration and timing of discontinuation are needed.

Figure: Primary Outcome and Individual Components for Pregnant Patients Exposed to GLP1 Agonists Compared to Controls

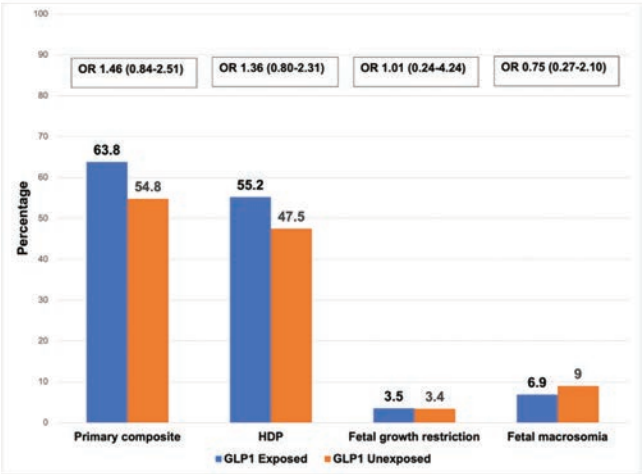

Table: Secondary Outcomes of Pregnant Patients Exposed to GLP1 Agonists Compared to Controls

	GLP1 Agonist Exposed (N = 58)	GLP1 Agonist Unexposed (N = 1578)	Odds Ratio / Difference (95% CI)
Maternal Secondary Outcomes			
Spontaneous abortion	0 (0.0)	31 (2.0)	-
Live birth	57 (98.3)	1511 (95.9)	2.41 (0.33-17.71)
Stillbirth	1 (1.7)	33 (2.1)	0.82 (0.11-6.10)
Preterm delivery <37 weeks	20 (34.5)	443 (28.1)	1.35 (0.78-2.34)
Gestational diabetes	7 (17.9)	235 (21.4)	0.78 (0.35-1.75)
Preeclampsia	25 (43.1)	578 (36.6)	1.31 (0.77-2.23)
Cesarean delivery	28 (48.3)	881 (55.8)	0.74 (0.44-1.25)
Excess gestational weight gain	6 (10.3)	88 (5.6)	1.95 (0.82-4.67)
Maternal gestational weight gain (kg)	10.5 ± 7.8	8.2 ± 10.7	2.36 (1.43-3.29)
Neonatal Secondary Outcomes			
Any fetal anomaly	3 (5.2)	78 (4.9)	1.05 (0.32-3.43)
SGA< 10th percentile	5 (13.5)	142 (9.9)	1.42 (0.54-3.70)
NICU admission	30 (51.7)	578 (36.6)	1.85 (1.10-3.13)
Low birth weight (<2500g)	11 (19.0)	293 (18.7)	1.02 (0.52-1.99)
Neonatal birth weight (g)	3005.8 ± 818.2	3024.1 ± 919.6	-18.3 (-102.60-66.01)

Data are N (%) or mean ± standard deviation as appropriate; Primary composite outcome – hypertensive disorder of pregnancy, fetal macrosomia or growth restriction; Patients with pregestational diabetes excluded from outcome of GDM; Excess gestational weight gain per IOM guidelines; SGA- small for gestational age.

Variables used to generate propensity score are: Age, Race/Ethnicity, Body mass index, Parity, Marital status, Previous cesarean delivery, Prior stillbirth, Health insurance type, Weight at first prenatal visit (kg), Pregestational diabetes, Chronic hypertension, spontaneous labor, Seizure disorder, Current tobacco use, Prior tobacco use, Alcohol use, Substance Abuse, History of substance use, Lupus, Rheumatoid Arthritis, Any sexually transmitted infections, Medications (Aspirin, Metformin, Insulin use, Lovenox/Heparin, Antidepressant use [Lithium/SSRI], Angiotensin converting enzyme inhibitor/ Angiotensin receptor blocker, Corticosteroids prior to delivery, Magnesium prior to delivery). Average standardized absolute mean difference= 0.014 ± 0.041; p value for differences in baseline characteristics between exposed and unexposed range 0.7-1.0.

711 | Late Gestation Iuts Enable Later Delivery Without Adverse Outcomes in Fetuses with Alpha Thalassemia Major

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10:30 AM - 12:30 PM

Objective: To understand the impact of in-utero blood transfusion (IUT) performed > 35 weeks' gestation (WG) on perinatal outcomes in fetuses with alpha thalassemia major (ATM).

Study Design: UCSF established an international patient registry for patients affected by ATM which includes all patients referred to our institution and collaborating sites. We conducted a retrospective chart review and prospective enrollment of registry participants, including all singleton pregnancies with ATM who underwent IUTs and received their last IUT >32 WG. Data collected covered prenatal and postnatal outcomes, including details of IUTs. Patients were stratified into two groups based on the timing of the final IUT: **A**: 32-35 WG (N = 17), **B**: > 35 WG (N = 10). Fisher's exact test and unpaired t-test were used to assess the association between the gestational age (GA) of the final IUT and key outcomes such as survival rate, 5' APGAR scores, the need for mechanical ventilation, prolonged neonatal hospitalization, GA at delivery, and time between last IUT and delivery.

Results: There were no differences between groups in the mean age at first IUT (A 25.2, B 23.8; P = 0.41) or the presence of hydrops upon presentation. Extension of IUTs beyond 35 weeks allowed for delivery later in gestation (A 37.4, B 38.3; P< 0.0001), with a shorter time interval between IUT and delivery (A 3.4, B 2.07; P = 0.01). There were no adverse outcomes associated with extended IUTs as evidenced by survival rate (A 100%, B 90%; P = 0.37), 5' APGAR < 7 scores (A 88%, B 90%; P = >0.99), need for mechanical ventilation (A 24%, B 20%; P >0.99); there was a trend for decreased rates of prolonged hospitalization (A 53%, B 22%; P = 0.22).

Conclusion: Expert opinion recommends performing IUTs up to 35 WG, with subsequent planned delivery 2-3 weeks later. However, our analysis indicates that IUTs performed beyond 35 WG are not associated with higher morbidity but allow for later GA at delivery without an additional risk of urgent delivery or other adverse perinatal outcomes.

Timing of last IUT (weeks)	Group A (N=17) 32-35	Group B (N=10) >35*	P-value
Survival – Number (%)			
Deceased	0/17 (0)	1/10 (10)	0.37
Alive	17/17 (100)	9/10 (90)	
5' APGAR - Number (%)			
<7	2/17 (12)	1/10 (10)	>0.99
>or= 7	15/17 (88)	9/10 (90)	
Mechanical ventilation - Number (%)			
Yes	4/17 (24)	2/10 (20)	>0.99
No	13/17 (76)	8/10 (80)	
Prolonged Hospitalization - (days till discharge) - Number (%)			
>or= 20	9/17 (53)	2/9 (22)	0.22
<20*	8/17 (47)	7/9 (78)	
Hydrops Presentation - Number (%)			
yes	13/17 (76)	7/10 (70)	>0.99
no	4/17 (24)	3/10 (30)	
Number of IUTs			
Mean (SD)	4.2 (1.8)	5.3 (2.3)	0.196
Weeks of Gestation at delivery			
Mean (SD)	37.36 (0.8)	38.25 (1.3)	0.02
Weeks of Gestation at last IUT			
Mean (SD)	33.96 (0.7)	36.18 (1.3)	<0.0001
Weeks of Gestation at initiation of IUT			
Mean (SD)	25.2 (3.9)	23.8 (4.2)	0.41
Weeks between last IUT and delivery			
Mean (SD)	3.4 (1.1)	2.07 (1.4)	0.01

*1 deceased neonate that received 2 IUTs (25 and 36.9 WG). Delivery occurred within 24 hours after final IUT.

712 | Cost-Effectiveness of Implementing a Multidisciplinary Team Approach the Management of Placenta Accreta Spectrum

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10:30 AM - 12:30 PM

Objective: **Objective**: Placenta accreta spectrum (PAS) is associated with high maternal morbidity. Recent studies have shown that a multidisciplinary team approach to managing PAS can improve outcomes. This study aimed to evaluate the cost-effectiveness of implementing a multidisciplinary team for the management of PAS.

Study Design: **Methods**: A decision-analytic model was built using TreeAge software to compare the outcomes and cost-effectiveness of the multidisciplinary team approach versus standard of care (i.e. without immediate availability of a gynecologic oncologist, anesthesiologist, etc.) The theoretical cohort included 5,000 individuals in the U.S. with PAS. Maternal outcomes included severe postpartum hemorrhage (>2000 mL estimated blood loss), adjacent organ injury, ICU admission, maternal death, and hospital readmission. The cost of the multidisciplinary team was estimated by assuming there would be specific MFM physician and nursing leadership assigned. Model inputs were derived from the literature. The cost-effectiveness threshold was $100,000/quality-adjusted life-year (QALY). Sensitivity analyses were performed to assess the robustness of the results.

Results: **Results**: A multidisciplinary team approach for the management of PAS resulted in 3,724 fewer severe postpartum hemorrhages, 139 fewer adjacent organ injuries, 506 fewer ICU

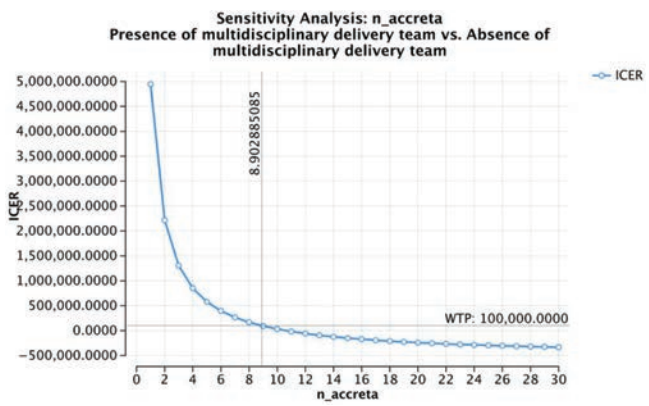
admissions, 87 fewer hospital readmissions within 6 months, and 1 fewer maternal death compared to standard of care (Table 1). When assuming a minimum baseline of 15 PAS cases per year, the multidisciplinary team approach was a dominant strategy resulting in a $8.8 million cost reduction and an increase of 59 QALYs relative to standard care. A one-way sensitive analysis on the number of PAS cases per medical center demonstrated the multidisciplinary team strategy remains cost-effective when centers treat [3] 8 PAS cases annually (Figure 1).

Conclusion: Implementing a multidisciplinary team was cost-effective and improved maternal outcomes. These findings may inform interventions that promote multidisciplinary teams in the management of this high-risk condition.

Table 1: Maternal outcomes, cost, and effectiveness associated with presence of multidisciplinary team versus standard of care in the management of PAS

	Multidisciplinary Team Approach	Standard of Care	Difference
Severe Postpartum Hemorrhage* (cases)	926	4,650	-3,724
ICU Admissions	506	645	-139
Adjacent Organ Injury (cases)	440	548	-108
Maternal Deaths	80	81	-1
Readmissions within 6 months	316	403	-87
Cost ($USD)	214,326,130	223,115,069	-8,788,939
Effectiveness (QALYs)	116,314	116,256	59
Strategy	Dominant	Dominated	

*defined as > 2000mL estimated blood loss



713 | Fetal Sex Influences the Maternal Plasma Proteome in Sars-Cov-2 Including Anti-Viral Response

Bogdan Panaitescu[1]; Roberto Romero[2]; Nardhy Gomez-Lopez[3]; Maria Fernanda Escobar[4]; Gaurav Bhatti[5]; Victor Tarca[6]; Tanay Panja[6]; Arun Mezzayhagan[1]; Awoniyi Awonuga[1]; Tinnakorn Chaiworapongsa[1]; David R. Bryant[1]; Adi L. Tarca[5]

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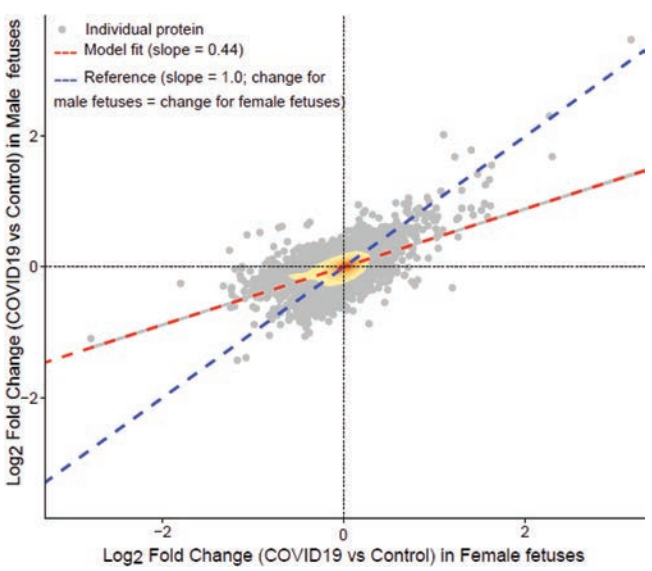
10:30 AM - 12:30 PM

Objective: Fetal sex influences physiological and pathological processes during pregnancy. This study was designed to determine the impact of fetal sex on the maternal response to SARS-CoV-2 infection using large-scale proteomics.

Study Design: This was a prospective observational study of 101 pregnant patients, including 72 with confirmed SARS-CoV-2 infection and 29 controls without infection. Severity was assigned according to the NIH classification for COVID-19. Large-scale plasma proteomics was undertaken with the SomaScan platform, which analyzes 7,288 proteins. Fetal sex-specific changes in the maternal proteome was assessed using linear models and moderated t-tests while accounting for COVID-19 severity and relevant clinical co-variates.

Results: 1) In normal pregnancy, fetal sex did not alter the maternal plasma proteome; 2) SARS-CoV-2 infection during pregnancy exhibited a fetal sex-dependent modulation of the plasma proteome; 3) pregnancies with a male fetus had a lower magnitude of plasma proteomic responses to SARS-CoV-2 infection compared to those with a female fetus (see figure; slope = 0.44, r = 0.61, $p < 0.001$); 4) the dampened maternal plasma proteomic response to infection in pregnancies with a male fetus was also noted according to disease severity; and 5) in severe COVID-19, proteins showing fetal sex-specific magnitude of change (interaction $p < 0.05$) were enriched for antiviral response pathways, endocytosis, and VEGF signaling, among others (adjusted $p < 0.1$).

Conclusion: 1) Fetal sex dimorphism in the maternal proteome is not present in normal pregnancy, but in patients with COVID-19; 2) pregnancies with male fetuses had a dampened proteomic response; and 3) these findings suggest that fetal sex is an important factor modulating the maternal response during SARS-CoV-2 infection and may determine disease progression and outcome.



714 | Nanoparticle-Based Fetal Intraperitoneal Injection is an Alternative to Intravascular Drug Delivery to the Pulmonary Endothelium

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10:30 AM - 12:30 PM

Objective: Fetal intravascular injection of nanoparticle-based therapy is proposed as a technique for targeted in-utero therapies. However, in humans, umbilical cord access is limited both by gestational age and physician skillset, thus limiting the application of emerging therapies. Specifically in disorders of the fetal lungs, critical phases of development would be missed by waiting for the opportunity for umbilical cord access. Intraperitoneal transfusions have been used in early pregnancy when intravascular access is not feasible, therefore we sought to assess the feasibility of fetal intraperitoneal nanoparticle injections.

Study Design: Polyethylenimine-(5) myristic acid/ poly(ethylene glycol)-oleic acid/cholesterol (PEI-PEG) nanoparticles were created as per prior publications and were tagged with fluorescent-AF647 Dylight. Pregnant rats underwent midline laparotomy at E17.5-E18.5 to fetal injection. Three arms were pre-determined, either fetal intraperitoneal injection of nanoparticles, intra-amniotic injection of nanoparticles, or sham. Fetuses were harvested at E20.5 and cells were immediately isolated and sorted via flow cytometry. As these nanoparticles localize to the pulmonary endothelium in newborn rodents, flow cytometry was used to evaluate pulmonary vascular endothelial cell uptake.

Results: Cell sorting successfully isolated fetal lung tissue and CD31+ CD45- cell lines were considered pulmonary vascular endothelium. Pulmonary endothelium of fetuses that underwent intraperitoneal injection were found to have 50.2% of cells positive for Dylight, vs 0.2% in fetuses that had intra-amniotic injection and 0.0% in control ($p < 0.001$), Figure 1. Every fetus that had an intraperitoneal injection had at least 42% of pulmonary endothelial cells with nanoparticles present, and no intra-amniotic injection had greater than 1%.

Conclusion: Fetal intraperitoneal injection of PEI-PEG nanoparticles successfully targets pulmonary endothelium. IP injections of PEI-PEG nanoparticles provides a vehicle for targeted treatment of the fetal lungs early in gestation.

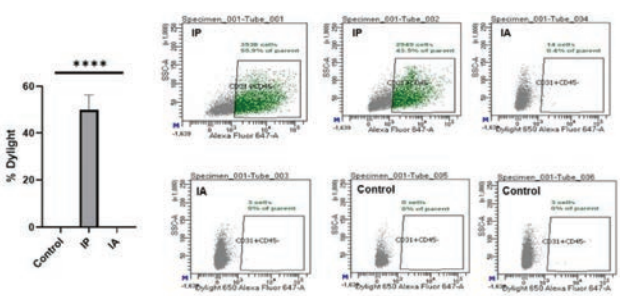

Figure 1. Flow cytometry reveals excellent pulmonary endothelial uptake of PEI-PEG nanoparticles with fetal intraperitoneal injections relative to control and intra-amniotic injections. IP= intraperitoneal, IA= intra-amniotic.

715 | The Association with Severe Lacerations and Increased Risk of Perinatal Depressive Symptoms

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10:30 AM - 12:30 PM

Objective: To evaluate the association of severe perineal lacerations and increased risk of perinatal depressive symptoms at the 6-week postpartum visit.

Study Design: We performed a retrospective cohort study of patients who had a vaginal delivery between July 1, 2021-July 1, 2023. Perineal lacerations were classified as either severe (3rd or 4th degree) or non-severe (1st, 2nd degree or intact perineum). Positive perinatal depressive symptoms were defined as a score of ≥10 on the Edinburgh Postnatal Depression Scale (EPDS) or positive response to question 10 at the 6-week postpartum visit. Univariable analyses of demographic and clinical characteristics and positive EPDS scores at the 6-week postpartum visit were performed. Multivariable logistic regression was performed using variables determined a priori (multiparity, gestational age (GA) at delivery, mode of delivery, race/ethnicity, exclusively breastfeeding at 6-weeks postpartum) to evaluate the independent association of severe perineal laceration and positive EPDS scores at the 6-week postpartum visit.

Results: 689 patients met inclusion criteria with 661 (95.9%) with non-severe perineal lacerations and 28 (4.1%) with severe. In univariable analysis, those with severe perineal lacerations were more likely to be White non-Hispanic or of Asian race/ethnicity, be multiparous, have a lower admission body mass index, have an operative assisted delivery, be delivered at a later GA, have greater blood loss, have a shoulder dystocia or episiotomy, and require a laceration revision within 6 weeks postpartum compared to those without (Table 1). Patients with severe lacerations were less likely to have a positive EPDS at 6-weeks postpartum but these results were not significant (7.1 vs 9.9%, $p = 0.66$) and these findings persisted in adjusted analysis (aOR 0.62, 95%CI 0.13, 2.84).

Conclusion: Severe perineal lacerations was not associated with an increased risk of perinatal depressive symptoms at the 6-week postpartum visit.

Table 1: Maternal demographics and clinical characteristics

	Non-severe laceration n = 661	Severe laceration n = 28	P value
Age (years)	30 ± 8	30 ± 6.5	0.532
Race/ethnicity			**0.044**
White, non-Hispanic	165 (25.0)	8 (28.6)	
Black non-Hispanic	175 (26.5)	6 (21.5)	
Asian	50 (7.6)	7 (25.0)	
Hispanic	251 (38.0)	7 (25.0)	
Other/unknown	20 (3.0)	0 (0.0)	
Insurance status			0.078
Public	224 (33.9)	5 (17.9)	
Private	437 (66.1)	23 (82.1)	
Tobacco Use	68 (10.3)	0 (0.0)	0.074
Nulliparity	317 (48.0)	5 (17.9)	**0.002**
Delivery Admission BMI	31.6 ± 7.6	29.0 ± 6.1	**0.022**
Method of Delivery			**<0.001**
Spontaneous	630 (95.3)	17 (60.7)	
Operative	31 (4.7)	11 (39.3)	
Gestational age at delivery	39.1 ± 1.6	39.5 ± 2.1	**0.038**
Depression	124 (18.8)	7 (25.0)	0.459
Anxiety	152 (23.0)	5 (18.9)	0.525
Hypertensive disorder of pregnancy	217 (32.8)	7 (25.0)	0.259
Diabetes (gestational or pregestational)	57 (8.6)	4 (14.3)	0.302
Quantitative Blood Loss (mL)	229 ± 242	481 ± 419	**<0.001**
Delivery event			
Shoulder dystocia	15 (2.3)	4 (14.3)	**<0.001**
Episiotomy	1 (0.2)	3 (10.7)	**<0.001**
Repair in OR	7 (1.1)	1 (3.6)	0.224
NICU admission	12 (1.8)	2 (7.1)	0.050
Laceration Revision	2 (0.3)	2 (7.1)	**<0.001**
Exclusive breastfeeding at 6 weeks	153 (21.1)	9 (27.3)	0.398

BMI: Body Mass Index (kg/m2), OR: operating room, NICU: neonatal intensive care unit
Hypertensive disorder of pregnancy including chronic hypertension in pregnancy, gestational hypertension, preeclampsia without severe features, preeclampsia with severe features, eclampsia
Laceration revision defined as revision within 6 weeks of date of delivery
There were no cases of perinatal death (defined as death within 6 weeks postpartum)
Data are presented as n(%) and median (interquartile range)

716 | Monochorionic Twins with Selective Fetal Growth Restriction: characteristics, course, management, and outcomes by type

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10:30 AM - 12:30 PM

Objective: To compare characteristics, Doppler course, and outcomes in Type I, II, and III selective fetal growth restriction (sFGR).

Study Design: Single-center retrospective review of monochorionic twins with sFGR from 6/2014 to 1/2024. Twin to Twin Transfusion Syndrome, high order multiples, and severe fetal anomalies were excluded. Type at diagnosis was assigned by Gratacos criteria. Doppler course (deterioration or improvement) was defined as progression of umbilical artery (UA) end diastolic flow patterns from best to worst: persistent forward →intermittent forward, absent →intermittent forward, absent, reversed→persistent absent→persistent reversed. Ultrasound characteristics at presentation, antenatal course, and obstetric outcomes were compared between groups via Kruskal-Wallis and Pearson Chi-Squared.

Results: Of 199 patients, 133 (67%) were Type I, 18 (9%) Type II, and 48 (24%) Type III. There was no difference in gestational age (GA) at diagnosis. The estimated fetal weight discordance was lowest in Type I and highest in Type II (p< 0.001). UA Doppler deterioration was frequent in all groups and occurred in 28.4% of Type 1, 76.9% of Type II, and 51.4% of Type III (P< 0.001). UA Dopplers also improved in some Type II (15.4%) and Type III (25.7%, p = 0.449). Management varied but was expectant for most (178/199, 89%) though 7 (4%) underwent laser (6/7 had Twin Anemia Polycythemia Sequence), 12 (6%) had selective reduction of the small fetus, and 2 (1%) terminated. Double survival was 89.6% in Type I, 25% in Type II, and 77.8% in Type III (p< 0.001). There was no difference in delivery GA between types, however, the majority of Type II were delivering a single fetus, and amongst all patients, those with 1 vs. 2 livebirths delivered later (36.1 [31.7-38.7] vs. 33.1 [30.9-34.3] weeks, p = 0.002). (Table 1)

Conclusion: Doppler deterioration is common in all Types of sFGR. Types II and III can improve in some cases and can be successfully managed to achieve favorable delivery gestational ages, however double survival is significantly lower in Type II.

Selective fetal growth restriction characteristics, course, and outcomes by type

Characteristic	Type I N=130	Type II N=17	Type III N=48	P-value
Diagnosis Characteristics				
GA at sFGR Diagnosis	20.5 [17.7-23.1]	18.3 [17.0-19.6]	20.7 [18.3-22.8]	0.045
F1 EFW Percentile	51.5 [30.2-74.9]	61.2 [35.8-66.9]	50.9 [18.3-67.0]	0.902
F2 EFW Percentile	1.5 [0.4-3.4]	0.2 [0.0-0.6]	0.7 [0.3-1.6]	<0.001
EFW Discordance	27.9 [24.7-33.1]	35.9 [30.4-41.4]	31.1 [26.4-34.9]	<0.001
F2 UA PI	1.57 [1.37-1.78]	2.83 [2.48-3.11]	2.00 [1.63-2.45]	<0.001
F2 UA Doppler				
Persistent Forward	130 (100.0)	0 (0)	0 (0)	
iAEDF	0 (0)	0 (0)	15 (31.3)	
iAREDF	0 (0)	0 (0)	33 (68.8)	
Persistent Absent	0 (0)	11 (64.7)	0 (0)	
Persistent Reverse	0 (0)	6 (35.3)	0 (0)	-
F1 MCA PSV MoM	1.09 [0.96-1.25]	1.20 [1.06-1.52]	1.13 [0.94-1.27]	0.093
F2 MCA PSV MoM	1.19 [0.98-1.37]	1.55 [1.35-1.68]	1.20 [1.07-1.44]	0.002
MCA Discordance	0.15 [0.06-0.25]	0.17 [0.11-0.31]	0.19 [0.10-0.36]	0.356
MCA Discordance > 0.5 MoM	19 (14)	2 (12)	5 (10)	
Antenatal Course and Outcomes				
GA at Treatment (if applicable)	19.0 [18.7-21.1]	18.7 [18.6-19.0]	20.2 [18.7-21.6]	0.639
Management				
Expectant	123 (94.6)	12 (70.6)	42 (87.5)	
Laser	4 (3.1)	2 (11.8)	1 (2.1)	
Selective Reduction	2 (1.5)	3 (17.6)	4 (8.3)	
Termination	1 (0.8)	0 (0)	1 (2.1)	0.015
F2 UA Doppler Course				
Improvement	-	2/13 (15.4)	9/35 (25.7)	0.449
Deterioration	23/81 (28.4)	10/13 (76.9)	18/35 (51.4)	<0.001
Stable	58/81 (71.6)	1/13 (7.7)	8/35 (22.9)	<0.001
Fetal Demise including SR				
None	108/115 (93.9)	6/17 (35.3)	35/44 (79.5)	
Single	6/115 (5.2)	7/17 (41.2)	6/44 (13.6)	
Double	1/115 (0.9)	4/17 (23.5)	3/44 (6.8)	<0.001
Single Fetal Demise				
F1	1/114 (0.09)	0/13 (0)	1/41 (2.4)	0.672
F2	5/114 (4.4)	7/13 (53.8)	5/41 (12.2)	<0.001
Delivery Outcomes				
GA at Delivery	33.4 [31.7-34.3]	32.0 [25.6-38.7]	30.4 [28.0-34.4]	0.052
Unplanned Delivery	41/99 (41.4)	4/9 (44.4)	24/35 (32.4)	0.021
Obstetric Indication	32/41 (78.0)	2/4 (50.0)	4/24 (16.7)	
Fetal Distress	7/41 (17.1)	2/4 (50.0)	20/24 (83.3)	
N/A	2/41 (4.9)	0/4 (0.0)	0/24 (0)	<0.001
Live Births				
0	6/115 (5.2)	6/16 (37.5)	5/45 (11.1)	
1	6/115 (5.2)	6/16 (37.5)	5/45 (11.1)	
2	103/115 (89.6)	4/16 (25.0)	35/45 (77.8)	<0.001
Birthweight Discordance	24.6 [14.8-33.2]	32.6 [21.9-42.6]	31.0 [23.2-40.0]	0.190

Data are presented as n (%) or median [interquartile range]. Fraction denominators indicate number of patients with available data. GA, gestational age; sFGR, selective fetal growth restriction; F1, larger fetus; F2, smaller fetus; EFW, estimated fetal weight; UA, umbilical artery; PI, pulsatility index; iAEDF, intermittent absent end-diastolic flow; iAREDF, intermittent absent and reversed end diastolic flow; MCA, middle cerebral artery; MoM, multiples of median; PSV, peak systolic velocity; SR, selective reduction.

717 | Effect of Dental Treatments on Reduction of Preterm Birth: a Systematic Review and Meta-Analysis

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10:30 AM - 12:30 PM

Objective: This study aims to assess the effectiveness of treating dental disease during pregnancy in reducing the risk of preterm birth.

Study Design: We conducted a systematic review and meta-analysis of randomized controlled trials (RCTs). We searched EMBASE, MEDLINE, PubMed, and Cochrane Central Register of Controlled Trials from inception to December 2023 with no language restrictions for RCTs enrolling pregnant persons with any dental disease who were randomized to receiving dental treatment versus a control. Pairs of independent reviewers screened studies, and abstracted and assessed the risk of bias of the studies using the Cochrane Risk of Bias tool, RoB 2. We conducted meta-analysis using a random effects model with the Mantel-Haenszel variance estimate. We assessed the certainty of evidence using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach.

Results: We included 19 RCTs, enrolling 8526 participants. The risk of bias for most of the RCTs ranged from some concerns to high risk. The most frequent interventions addressed were scaling

and root planing (SRP) with oral hygiene instructions (OHI, 10 RCTs), and SRP with OHI and chlorhexidine mouthwash (6 RCTs). Meta-analysis found low-quality evidence suggesting that dental treatment results in a 22% relative risk reduction of preterm birth (RR 0.78; 95% CI 0.63-0.95) when compared to placebo or control, which was usually minimal dental treatment or oral examination only (absolute difference 29 fewer preterm births per 1000 individuals; 95% CI from 48 fewer to 6 fewer).

Conclusion: This systematic review suggests that treating dental disease during pregnancy reduces the risk of preterm birth. The main limitations of the evidence are risk of bias and inconsistency. Additional well-powered RCTs at low risk of bias are necessary to increase the certainty about the effect of dental disease treatments during pregnancy on reduction of preterm births.

Figure 1: Meta-analysis of pooled risk ratio of effect of dental treatments on preterm birth (<37 weeks' gestation) and risk of bias

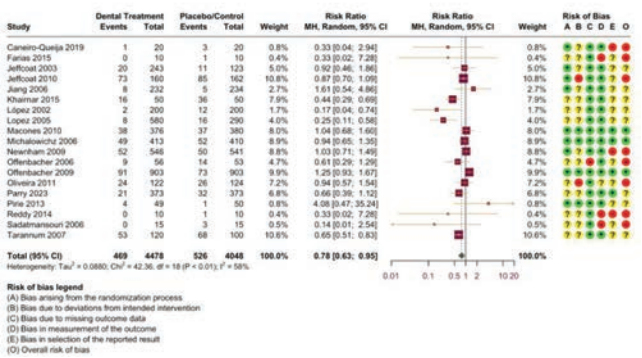

Figure 2: GRADE evidence profile of dental treatments on preterm birth (<37 weeks' gestation)

718 | Perinatal Outcomes of Resolved Fetal Cystic Hygromas

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10:30 AM - 12:30 PM

Objective: We described the perinatal phenotype of pregnancies with resolved fetal cystic hygroma and compared outcomes among fetuses with and without genetic abnormalities.

Study Design: A retrospective cohort study (2013-2023) at a single tertiary center identified fetuses with cystic hygroma in the first or second trimester that resolved on subsequent ultrasound imaging. Pregnancies resulting in live birth with prenatal and delivery data were included. We describe perinatal characteristics, delivery outcomes, and genetic diagnoses. Bivariate statistics compared outcomes among fetuses with and without genetic abnormalities. A p-value < 0.05 was considered statistically significant.

Results: Of 297 fetal cystic hygromas, we identified 59(20%) fetuses with cystic hygromas that resolved on subsequent imaging and resulted in live birth. Of these, 46 pursued prenatal and/or postnatal genetic diagnosis; 31(67%) had normal results and 15(33%) had a genetic abnormality, such as aneuploidy(n = 10), copy number variant(n = 2), or single-gene disorder(n = 3).(Figure) Compared to fetuses with normal genetic testing, fetuses with genetic abnormalities were more likely to have a later gestational age at cystic hygroma diagnosis(12.3 vs 11.6 weeks, p = 0.007) and resolution(20.1 vs 17.3 weeks p = 0.006).(Table) Compared to fetuses with normal genetic evaluations, fetuses with genetic abnormalities were more likely to have additional structural anomalies on ultrasound(67% vs 13%,p = 0.001). The most common ultrasound findings were cardiac anomalies, followed by abdominal and renal abnormalities. Fetuses with resolved cystic hygromas and genetic abnormalities were more likely to have growth restriction, an earlier delivery, longer length of neonatal stay, and neonatal complications.

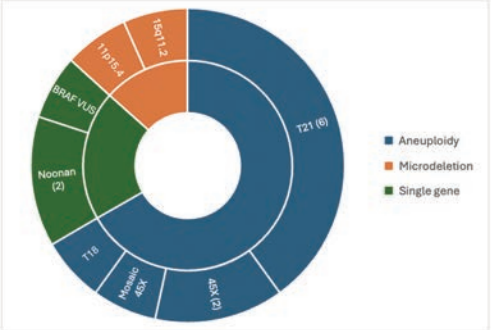
Conclusion: Fetuses with resolved cystic hygromas and genetic abnormalities were more likely to have other structural anomalies and obstetric complications when compared to those with normal results of genetic testing. These data are important for framing expectations and counseling of patients who experience resolution of fetal cystic hygroma.

Table. Pregnancy characteristics of resolved fetal cystic hygromas with abnormal prenatal or postnatal genetic diagnosis (N=15) compared to those with normal genetic results (N=31).

Characteristic	Resolved cystic hygroma with genetic abnormality N=15 (%)	Resolved cystic hygroma normal genetic results N=31 (%)	P-value
Maternal age (years)	33 [29, 35]	33 [30, 36]	0.70
Advanced maternal age	4 (26.7%)	10 (32.3%)	0.99
Singleton gestation	15 (100%)	29 (93.5%)	0.99
Median GA at cystic hygroma diagnosis (weeks)	12.3 [12.1, 12.6]	11.6 [11.2, 12.2]	0.007
Median GA at cystic hygroma resolution (weeks)	20.1 [18, 26.2]	17.3 [16.6, 18.2]	0.006
Median cystic hygroma latency to resolution (weeks)	7.8 [5.6, 10.0]	5.2 [4.6, 7]	0.04
Cystic hygroma size (mm)	4.8 [4.6, 6.9]	4.6 [3.6, 6.1]	0.06
Presence of septations	9 (60.0%)	17 (54.8%)	0.99
Cystic hygroma extension	N=8	N=20	0.20
Nuchal/neck region	3 (37.5%)	14 (70.0%)	
Extend beyond nuchal	5 (62.5%)	6 (30.0%)	
Thorax	2 (25.0%)	4 (20.0%)	
Abdomen	2 (25.0%)	1 (5.0%)	
Entire body	1 (12.5%)	1 (5.0%)	
Additional ultrasound findings	10 (66.7%)	4 (12.9%)	0.001
Presence of FGR	4 (26.7%)	1 (3.2%)	0.03
Delivery GA (weeks)	36.7 [35.5, 39.1]	39.1 [37.1, 39.5]	0.02
Preterm delivery <37 weeks GA	8 (53.3%)	9 (29.0%)	0.19
Length of neonatal stay (days)	13 (6, 47)	2 (2, 5)	0.007
Neonatal complications	N=11	N=14	0.001
Any complication	8 (72.7%)	1 (7.1%)	
Respiratory distress	7	1	
Hyperbilirubinemia	4	1	
Necrotizing enterocolitis	0	0	
Neonatal sepsis	1	0	
Intracranial hemorrhage	2	0	
Neonatal death	1 (9.1%)	0 (0.0%)	0.46
Infant death	1 (10%)	0 (0.0%)	0.44

GA, gestational age. FGR, fetal growth restriction. Data in brackets displays interquartile range.

Figure. Abnormal prenatal and postnatal genetic results among fetuses with resolved cystic hygroma resulting in live birth.



719 | Antenatal Characteristics Predict Need for Dental Referral Using the ACOG-Recommended Oral Health Screening Tool

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10:30 AM - 12:30 PM

Objective: The American College of Obstetricians and Gynecologists (ACOG) recommends screening pregnant patients with a 3-question survey at their first prenatal visit for oral health. We sought to evaluate which characteristics are associated with an overall positive screen (defined as a positive response on any of the three questions) or with positive screen for each specific question.

Study Design: We screened pregnant individuals at a university-based prenatal clinic using the 3-question ACOG screening tool (Figure 1). We performed generalized linear models with stepwise forward AIC regression to evaluate antenatal characteristics (Table 1) with a positive overall screen and each specific question including adjusted odds ratios per included variable. Missing data for binary risk factors was imputed assuming the predictor was unknown. The dataset was divided 80:20 for model development and validation, respectively.

Results: Among 817 patients that completed the ACOG screen, 44.9% screened positive (367/817) with 14.9% (122/817) screening positive on question 1, 37.1% (303/817) on question 2, and 5.8% (48/817) on question 3. The models predicted 89.5%, 78.0%, and 93.2% accuracy with a positive screen for questions 1, 2, or 3, respectively. The model also predicted a positive overall screen with 66.7% accuracy. Antenatal factors with >1.5-fold increased odds of a positive overall screen (Figure 1A) and symptomatic oral disease (Figure 1B) were Medicaid insurance, self-identifying as Hispanic, having COVID, or having substance abuse during pregnancy.

Conclusion: Our models using antenatal characteristics can accurately (≥89%) predict symptomatic oral disease in pregnancy. Medicaid insurance, self-identifying as Hispanic, having COVID or substance abuse during pregnancy were strongly associated with increased odds of having symptomatic oral disease or needing referral to a dentist underscoring that health disparities are present related to oral care in pregnancy. Antenatal efforts improving access to oral health in pregnancy are needed to reduce health disparities.

Figure 1: Forest plots demonstrating the generalized linear models after stepwise forward AIC antenatally known characteristics. The ACOG 3-question screening tool includes three questions: (1) Do you have any swollen or bleeding gums, a toothache, problems eating or chewing food, or other problems in your mouth? (2) Has it been more than 6 months since you last saw a dentist? (3) Do you need help finding a dentist? (A) Model A demonstrates the antenatal characteristics associated with an overall positive screen, defined as a positive answer to any of the 3 ACOG-recommended questions. (B) Model B demonstrates the antenatal characteristics associated with a positive answer to the first of the 3 ACOG-recommended questions focusing on symptomatic oral disease. (C) Model C demonstrates the antenatal characteristics associated with a positive answer to the second of the 3 ACOG-recommended questions focusing on time since last dental visit. (D) Model D demonstrates the antenatal characteristics associated with a positive answer to the final of the 3 ACOG-recommended questions focusing on needing assistance finding a dentist. aOR = adjusted odds ratio. All aORs are written as point estimates with 95% confidence intervals (CI).

Table 1 – Table Representing Antenatal Characteristics of All Screened Pregnant Individuals Evaluating Those with a Positive Overall ACOG Screen Compared to Those with a Negative Overall Screen

	Screen Positive (n=367)	Screen Negative (n=450)	p-value
Age (years), median (IQR)	33.0 (28-36)	34.0 (30.3-37)	**<0.01**[c]
Race/Ethnicity, n(%)			
White	211 (57.5%)	319 (70.9%)	**<0.01**[b]
Black/African American	47 (12.8%)	27 (6.0%)	
Asian	66 (18.0%)	74 (16.4%)	
American Indian/Native American	18 (4.9%)	5 (1.1%)	
Pacific Islander/Native Hawaiian	5 (1.4%)	4 (0.9%)	
Multiracial	6 (1.6%)	12 (2.7%)	
Other	14 (3.8%)	9 (2.0%)	
Hispanic	64 (17.4%)	32 (7.1%)	**<0.01**[a]
Type of Medical Insurance, n(%)			
Private	234 (63.8%)	376 (83.6%)	**<0.01**[b]
Medicaid	126 (34.3%)	67 (14.9%)	
No Insurance	7 (1.9%)	7 (1.6%)	
Antenatal Diagnoses, n(%)			
Preterm labor	47 (12.8%)	50 (11.1%)	0.51[a]
Cerclage	17 (4.6%)	12 (2.7%)	0.18[a]
Cervical Insufficiency	16 (4.4%)	15 (3.3%)	0.47[a]
Pre-eclampsia	47 (12.8%)	34 (7.6%)	**0.01**[a]
COVID diagnosis during pregnancy	19 (5.2%)	10 (2.2%)	**0.04**[a]
HIV Positive (Diagnosed Before or During Pregnancy)	6 (1.6%)	2 (0.4%)	0.15[a]
Syphilis Positive (Diagnosed During Pregnancy)	4 (1.1%)	2 (0.4%)	0.42[a]
Gonorrhea Positive (Diagnosed During Pregnancy)	1 (0.3%)	0 (0.0%)	0.45[a]
Chlamydia Positive (Diagnosed During Pregnancy)	2 (0.5%)	3 (0.7%)	1.0[a]
Hepatitis B Infection (Historical or During Pregnancy)	2 (0.5%)	1 (0.2%)	0.59[a]
Hepatitis C Infection (Historical or During Pregnancy)	4 (1.1%)	3 (0.7%)	0.71[a]
Substance Abuse Prior to Pregnancy	30 (8.2%)	40 (8.9%)	0.80[a]
Substance Abuse During Pregnancy	13 (3.5%)	8 (1.8%)	0.12[a]
Gestational Hypertension	44 (12.0%)	28 (6.2%)	**<0.01**[a]
Chronic Hypertension	56 (15.3%)	52 (11.6%)	0.15[a]
Gestational Diabetes	45 (12.3%)	32 (7.1%)	**0.02**[a]
Chronic Diabetes	38 (10.4%)	35 (7.8%)	0.22[a]
Cancer Diagnosis (During Pregnancy)	7 (1.9%)	5 (1.1%)	0.39[a]
Autoimmune Condition	22 (6.0%)	42 (9.3%)	0.09[a]

[a]p-value calculated using Fisher's Exact Test. [b]p-value calculated using Chi-square test. [c]p-value calculated using Mann-Whitney U test. Of note, this table depicts the data after imputing missing data. Missing or unknown data was imputed assuming the condition was not present.

720 | Severe Maternal Morbidity Surveillance in Maryland: Trends Observed between 2021-2023

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10:30 AM - 12:30 PM

Objective: Maryland implemented facility-based severe maternal morbidity (SMM) surveillance and review in 2020 following AGOG/SMFM guidance. This study aims to analyze trends in primary cause of SMM, preventability and contributing factors. We also examine policy and practice changes that have resulted from the program.

Study Design: Data are from SMM surveillance for 2021-2023 among the 5 hospitals that participated over the full period (level III & IV birthing facilities in rural and urban settings). Using X^2 tests, we analyzed changes in primary cause of SMM, patient characteristics, and contributing factors. We further examined policy and practice changes that resulted from SMM reviews.

Results: Of 428 SMM events identified and reviewed, 80%, 78%, and 86% of patients had preexisting comorbidities in 2021, 2022, and 2023, respectively ($p = 0.24$). A growing proportion of patients did not receive prenatal care (1.6% in 2021, 5.4% in 2022, and 8.7% in 2023; $p = 0.035$). Obstetric hemorrhage was the leading cause (>50%) of SMM across all 3 years; however, the distribution of other causes varied (Table 1). COVID-19 was the second primary cause of SMM in 2021 (18%), but resulted in only 3 SMM events in 2022-23. Over the 3-year period, review committees determined that 37% (increasing from 34% to 40% between 2021 and 2023) of SMM events were preventable with changes to one or more provider, system, or patient factor. System and patient factors were identified in a larger percentage of preventable SMM events in 2023 than 2021-2022, while the contribution of provider factors did not change significantly (Table 2). In response to SMM reviews, all participating hospitals made specific policy and practice changes to address factors that contributed to leading causes of preventable SMM.

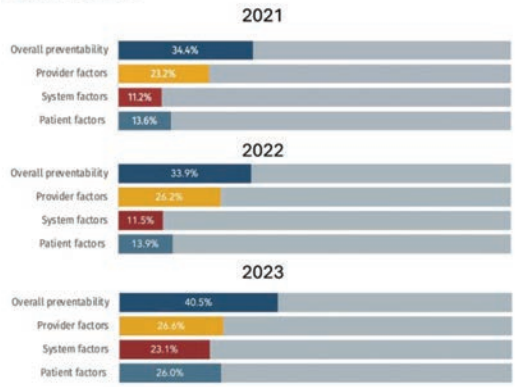
Conclusion: 40% of SMM events were deemed preventable by review committees in 2023. With hemorrhage being the leading cause of SMM, participating hospitals introduced policy and practice changes targeting hemorrhage and implementation of AIM's Obstetric Hemorrhage bundle is underway in Maryland.

Table 1. Primary Cause of SMM Surveillance & Review, Maryland 2021-2023

	2021 (N=125)		2022 (N=130)		2023 (N=173)		Overall	
	N	%	N	%	N	%	N	%
Obstetric Hemorrhage	66	52.8	69	53.1	79	45.7	214	50.0
Hypertensive Disorder of Pregnancy	13	10.4	13	10.0	25	14.5	51	11.9
Infection (non-COVID)	3	2.4	14	10.8	15	8.7	32	7.5
COVID-19	22	17.6	2	1.5	1	0.6	25	5.8
Cardiovascular Conditions	7	5.6	3	2.3	11	6.4	21	4.9
Neurological Conditions	4	3.2	4	3.1	7	4.0	15	3.5
Hematologic	3	2.4	4	3.1	7	4.0	14	3.3
Metabolic/Endocrine Conditions	2	1.6	3	2.3	8	4.6	13	3.0
Pulmonary Conditions	1	0.8	5	3.8	6	3.5	12	2.8
Injury	1	0.8	3	2.	3	1.7	7	1.6
Cancer	0	0.0	5	3.8	1	0.6	6	1.4
Embolism	2	1.6	0	0.0	3	1.7	5	1.2
Gastrointestinal Disorders	0	0.0	1	0.8	3	1.7	4	0.9
Adverse Drug Reaction	1	0.8	1	0.8	2	1.2	4	0.9
Other	0	0.0	3	2.3	2	1.2	5	1.2

Note: Pearson X^2=86.4, p<0.001.
In line with ACOG/SMFM guidance for facility-based surveillance for SMM, Maryland's SMM surveillance definition includes patients during pregnancy or within 42 days postpartum who are: a) admitted to an intensive care or critical care unit, and/or b) receive transfusion of 4 or more units of blood products.

Figure 1. Preventability and Types of Factors That Could Have Altered the SMM Outcome, Maryland 2021-2023



Note: Percent preventable assessed among all SMM events identified each year (2021, N=125 2022, N=130; 2023, N=173). Pearson X^2 for overall preventability=1.79, p=0.41; provider factors=0.49, p=0.78; system factors= 10.53, p=0.005; patient factors=10.24, p=0.006.

721 | Urine Culture Speciation During Pregnancy and Association with Maternal Attributes and Neonatal Outcomes

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10:30 AM - 12:30 PM

Objective: Urine culture(UC) is commonly ordered during pregnancy for urinary tract infection(UTI) symptoms or abdominopelvic pain. Little is known about the positivity rate of UC during pregnancy or associated maternal and neonatal outcomes. We aimed to assess the rate of positivity of UCs, and to assess maternal attributes and neonatal outcomes associated with different speciations.

Study Design: This is a retrospective study of pregnant patients who had a UC performed in our hospital system in non-ambulatory settings from 2013-2022. Patients with UCs were classified as 1) always negative (< 10k colony forming units-CFU), 2) ever positive for GBS (>10k CFU) or UTI-causing microbes (>100k CFU) or 3) ever positive for non-UTI microbes (>100k CFU). Maternal characteristics of age, insurance, race, parity, language, BMI, chronic hypertension(cHTN), hypertensive disorders of pregnancy(HDP), gestational diabetes(GDM), and pregestational diabetes were compared between the 3 groups using chi-square or ANOVA. Pregnancy outcomes of preterm birth(PTB), small for gestational age(SGA), mode of delivery, and neonatal intensive care unit(NICU) admission were also compared.

Results: 19,698 patients had a UC performed. The ever positive rate for GBS/UTI was 3.3% in patients with 1 UC, increasing to 18% among patients with ≥7 UC(Fig 1). Statistically significant differences across groups were noted in age, insurance, race, parity, language, BMI, and smoking(Table 1). There were also significant differences for cHTN, HDP, pregestational diabetes, PTB, NICU admission and SGA (Table 1). There was no statistical difference between groups for mode of delivery.

Conclusion: This is one of the first studies to classify rate of positivity by UC speciation during pregnancy. Maternal attributes were significantly different between groups, suggesting a need for further exploration of the basis of these differences. Surprisingly,

PTB was more common in the always negative UC group compared to the positive UC groups. Thus, more studies are needed to understand relationships between positive UC, sociodemographics, and obstetric outcomes.

Figure 1

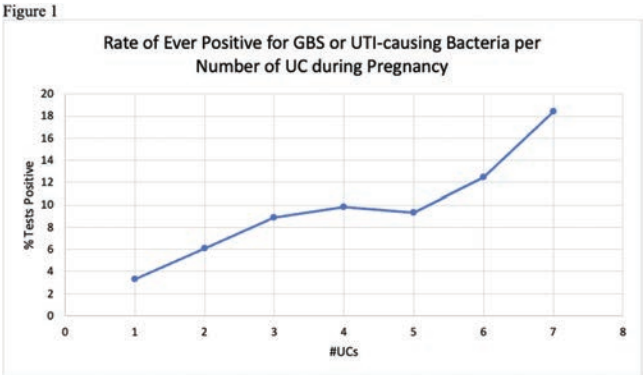

Table 1: Comparison of Maternal Attributes and Neonatal Outcomes by UC Speciation

	Group 1- Always Negative UC n=4518 (23%)	Group 2- Ever Positive for GBS or UTI bacteria n=877 (4.5%)	Group 3- Ever Positive for non-UTI bacteria n=14303 (72.6%)	p-value
Age <35	3431 (75.9)	712 (81.2)	11572 (80.9)	<0.0001
Public Insurance	2121 (46.9)	654 (74.6)	9126 (63.8)	<0.0001
Race				
Hispanic	1445 (32.0)	387 (44.1)	4990 (34.9)	<0.0001
Black	777 (17.2)	226 (25.8)	3929 (27.5)	
White	1857 (41.1)	208 (23.7)	4408 (30.8)	
Asian	189 (4.2)	18 (2.1)	401 (2.8)	
Other	250 (5.5)	38 (4.3)	575 (4.0)	
Nulliparous	1952 (43.8)	288 (32.9)	5577 (39.7)	<0.0001
Non-English Speaking	613 (13.6)	163 (18.6)	1865 (13.0)	<0.0001
BMI >30	2233 (50.4)	508 (58.4)	9052 (64.0)	<0.0001
Current Smoking or Quit During Pregnancy	369 (8.2)	139 (15.8)	1794 (12.5)	<0.0001
Chronic HTN	343 (7.6)	117 (13.3)	1622 (11.3)	<0.0001
Hypertensive disorders of Pregnancy	898 (19.9)	202 (23.0)	3265 (22.8)	0.0001
Gestational Diabetes	513 (11.4)	114 (13.0)	1734 (12.1)	0.24
Pregestational Diabetes	178 (3.9)	78 (8.9)	878 (6.1)	<0.0001
Cesarean Section	1617 (36.0)	350 (40.1)	5145 (36.4)	0.07
Preterm Birth	1090 (24.4)	153 (17.4)	2842 (20.0)	<0.0001
NICU admission	1328 (29.4)	229 (26.1)	3774 (26.4)	0.0003
Small for Gestational Age	455 (10.2)	119 (13.8)	1666 (11.8)	0.0017

722 | Progesterone Supplementation in Preeclamptic Women Reduces Blood Pressure and Inflammatory Mediators of Hypertension During Pregnancy

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10:30 AM - 12:30 PM

Objective: **Introduction**: Preeclampsia (PE), new onset hypertension after 20 weeks of gestation, is associated with lower progesterone, increased CD4+T cells, inflammatory cytokines, and autoantibodies to angiotensin II type 1 receptor (AT1-AA). We have previously shown that placental PE CD4+ T cells cause a PE phenotype in athymic nude rats. Moreover, we have shown that 17-hydroxyprogesterone caproate (17-OHPC), lowers blood pressure in PE patients, however, it is unclear if this was mediated via a T cell effect.

Objective: Determine if placental CD4+ T cells from 17-OHPC treated PE women increase blood pressure in athymic nude recipient rats.

Study Design: PE women received 17-OHPC (250 mg, I.M.) with blood draws before and after injection. One million placental CD4+ T cells from normal pregnant (NP) or PE participants were isolated by magnetic beads and injected I.P. into pregnant nude athymic rats on gestational day (GD) 12. On GD18, carotid catheters were inserted. On GD19, mean arterial blood pressure (MAP), blood and tissues were collected. One-way ANOVA was used for statistical analysis.

Results: Participants had matched GA. Maternal blood pressure was 116 +/-4 mmHg in NP women (n = 8), 147 +/- 4 mmHg in PE women (n = 19) and reduced to 136 +/- 3 mmHg in PE+17-OHPC women (n = 14, $p < 0.05$). AT1-AAs were 23 +/- 5 beats per minute in PE (n = 4) and 10 +/-2 in PE+17-OHPC (n = 8; student t-test, $p < 0.05$). Placental CD4+T cells were 2+/- 1% gate in NP, 6 +/- 1 in PE, and 3 +/-1 % gate in PE+17-OHPC (n = 4-5). Circulating TNF-α was 21 +/- 4 pg/mL in NP, 41 +/-8 in PE ($p < 0.05$), 21+/-5 pg/ml in PE+17-OHPC (n = 6-8, $p < 0.05$). In pregnant nude recipient rats, MAP was 98 +/- 2 mmHg with NP CD4+ T cells (n = 5), 122 +/-7 (n = 7, $p < 0.05$) with PE CD4+ T cells (n = 7) and 102+/- 5 with PE+17-OHPC CD4+ T cells (n = 7, $p < 0.05$).

Conclusion: 17-OHPC in PE women reduces blood pressure and inflammatory mediators of hypertension during pregnancy. Moreover, PE CD4+ T cells treated with 17-OHPC do not mediate a PE phenotype in recipient pregnant rats.

723 | Delivery and Neonatal Outcomes of Resolved Vasa Previa Cases

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10:30 AM - 12:30 PM

Objective: Recent expert opinion has questioned the definition of vasa previa. We examined delivery and neonatal outcomes in cases of resolved vasa previa, comparing fetal vessels 2-5cm from the cervical os versus >5cm away from the os.

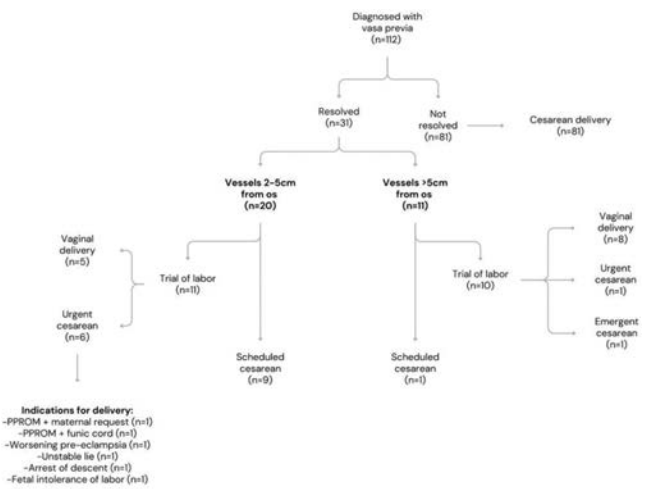
Study Design: Retrospective cohort study of patients diagnosed with vasa previa at a single academic urban institution between 2004 to 2024. We conducted an electronic chart review, including ultrasound images, to obtain variables at diagnosis and throughout pregnancy, along with delivery and neonatal outcomes. We used descriptive and chi-square statistics.

Results: We identified 112 pregnancies with vasa previa, of which 31 (28%) resolved on a subsequent ultrasound. Of the 31 resolved vasa previa cases, 20 were 2-5cm from the os and 11 were >5cm. Of those with vessels 2-5cm from the cervical os, 9 (45%) delivered by scheduled cesarean and 11 (55%) had a trial of labor (TOL). Of those that had a TOL, five (45%) delivered vaginally and six (55%) had a cesarean delivery due to PPROM (n = 2), fetal intolerance of labor (n = 1), arrest of descent (n = 1), unstable lie (n = 1) and worsening pre-eclampsia (n = 1). Of those with vessels >5cm from the os, one (9%) delivered by scheduled cesarean and 10 (91%) had a TOL, of which 8 (80%) delivered vaginally. The only emergent cesarean delivery and neonatal blood transfusion occurred in a patient with fetal vessels >5cm from the os; the suspected etiology was placental abruption. There were no statistically significant differences in neonatal APGAR scores, umbilical artery pH and intensive care nursery admissions between groups. There were no perinatal deaths.

Conclusion: The majority of resolved vasa previa cases with vessels 2-5cm from the cervical os delivered by cesarean. While many were scheduled, there were urgent cesareans for PPROM, unstable lie, arrest of descent, worsening pre-eclampsia and fetal intolerance. Most cases with vessels >5cm from the os delivered vaginally. Larger studies are needed to further assess delivery and neonatal outcomes of resolved vasa previa.

Characteristics	Fetal vessels 2-5cm from cervical os (N=20)	Fetal vessels >5cm from cervical os (N=11)	P-value
Maternal age, y	37 [34 – 39]	32 [31 – 37]	
Nulliparous	14 (70)	4 (36)	
Number of prior CD	0 (0)	0 (0)	
Twin gestation[1]	4 (20)	0 (0)	
IVF pregnancy	7 (35)	3 (27)	
Vasa previa type[2]			
-Type 1	12 (60)	6 (55)	
-Type 2	6 (30)	6 (55)	
-Type 3	3 (15)	0	
-Unknown	1 (5)	1 (1)	
GA at delivery, weeks	37 [36 – 39]	39 [38 – 40]	0.05
Birth weight, g	2650 [2325 – 3110]	3520 [3310 – 3745]	<0.01
5-min APGAR score < 7*	9 [9 – 9]	9 [8 – 9]	0.24
Umbilical artery pH*	7.29 [7.24 – 7.34]	7.20 [7.16 – 7.35]	0.55
Admission to ICN	7 (35)	3 (27)	0.85
Blood transfusion	0 (0)	1 (9)	0.15
Perinatal death	0 (0)	0 (0)	N/A
Mode of delivery			0.03
-Vaginal delivery	5 (25)	8 (73)	
-Cesarean delivery	15 (75)	3 (27)	
Urgency of CD			0.07
-Scheduled	9 (60)	1 (33)	
-Urgent	6 (40)	1 (33)	
-Emergent	0 (0)	1 (33)	

Values are presented as median [interquartile range] and n (percentage)
CD, cesarean delivery; IVF, in-vitro fertilization; ICN, intensive care nursery
[1] One twin gestation underwent radiofrequency ablation at 15wks
[2] % does not add up to 100 as some participants diagnosed with multiple vasa previa types
**Missing values (n=1 for 5-min Apgar score <7, n=12 for umbilical artery pH)*



724 | Metabolic Recovery at 12 Months Postpartum Among Individuals with Glucose Intolerance in Pregnancy

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10:30 AM - 12:30 PM

Objective: Glucose intolerance in pregnancy is associated with long-term risk for type 2 diabetes (T2D). We evaluated metabolic characteristics and β-cell function during pregnancy and at 12 months postpartum among varying levels of glucose intolerance in pregnancy.

Study Design: This is a planned follow-up to the Gestational Diabetes Diagnostic Methods (GDM2) trial, which randomized pregnant individuals to either a 75-gram oral glucose tolerance test (OGTT) with GDM diagnosed using the IADPSG criteria, or a 100g OGTT with GDM diagnosed by the Carpenter-Coustan (CC) criteria. All participants with treated GDM (diagnosed by either CC or IADPSG), those with untreated mild glucose intolerance (MGI, one abnormal value on CC criteria), and half of the participants with normal glucose tolerance were invited for a 75g OGTT at 12 months postpartum. Measures assessed at the time of GDM screening and at follow-up included metabolic characteristics, Stumvoll and Matsuda Indices to evaluate insulin sensitivity and resistance, and the Disposition Index (DI), which integrates insulin sensitivity and response.

Results: Of the 407 individuals seen at 12 months, 49 (12%) had MGI and 53 (13%) had treated GDM (CC and IADPSG). MGI was associated with lower insulin sensitivity, lower beta cell function, dyslipidemia, and alterations in leptin and adiponectin similar to those individuals with treated GDM (Table). Measures of metabolic function, insulin sensitivity and β-cell function demonstrated similar rates of change from pregnancy to postpartum after adjusting for maternal age, BMI, and history of GDM.

Conclusion: Patients with MGI have impaired β-cell function and significant metabolic abnormalities at 12 months postpartum similar to individuals with treated GDM and require ongoing follow-up for progression to T2D. The similar rate of change from pregnancy to postpartum in insulin sensitivity, β-cell function, and metabolic assessments among groups indicates that individuals were returning to their baseline levels of glucose tolerance rather than recovering from pregnancy-induced glucose intolerance.

TABLE: Maternal Metabolic Outcomes at 24-28 Weeks' Gestation and 12 Months Postpartum

Characteristic	No GDM (n=305)	Mild Glucose Intolerance (n=49)	Treated GDM (n=53)	P-value
Pregnancy				
Stumvoll Index	1,470.5 (±607.6)	1,465.5 (±750.9)	1,755.6 (±848.3)	0.037
Matsuda Index (n=402)	23.5 (±18.3)	13.3 (±8.1)	9.4 (±8.4)	<0.001
Disposition Index (n=402)	27,937 (±14,892)	15,359 (±5,479)	12,519 (±5,222)	<0.001
Triglycerides (mg/dL)	160.3 (±57.3)	200.4 (±73.5)	203.8 (±71.7)	<0.001
Cholesterol (mg/dL)	235.7 (±43.2)	231.4 (±46.8)	233.0 (±50.7)	0.75
HDL Cholesterol (mg/dL)	70.9 (±15.1)	66.1 (±14.3)	64.8 (±12.6)	0.007
LDL Cholesterol (mg/dL) (n=406)	132.9 (±36.9)	126.4 (±40.9)	127.4 (±42.1)	0.38
Leptin (ng/ml) (n=403)	52.2 (±50.6)	81.1 (±125.6)	97.2 (±128.2)	<0.001
Adiponectin (µg/ml) (n=402)	20.2 (±13.4)	16.6 (±8.2)	14.6 (±6.9)	<0.001
12 months postpartum				
Stumvoll Index (n=321)	1,371.9 (±876.4)	1,350.2 (±594.8)	1,475.8 (±567.0)	0.25
Matsuda Index (n=377)	41.0 (±41.6)	28.7 (±26.6)	20.0 (±15.9)	<0.001
Disposition Index (n=321)	35,422 (±20,974)	27,441 (±17,559)	22,328.3 (±13,175)	<0.001
Triglycerides (mg/dL) (n=378)	83.8 (±47.4)	103.4 (±53.8)	111.6 (±57.5)	<0.001
Cholesterol (mg/dL) (n=378)	174.5 (±35.7)	175.4 (±24.6)	189.8 (±40.6)	0.024
HDL Cholesterol (mg/dL) (n=378)	57.5 (±17.5)	52.5 (±13.0)	52.7 (±11.8)	0.042
LDL Cholesterol (mg/dL) (n=377)	100.9 (±28.1)	102.1 (±22.9)	114.7 (±35.1)	0.028
Leptin (ng/ml) (n=328)	36.8 (±53.4)	71.2 (±144.7)	81.3 (±108.9)	<0.001
Adiponectin (µg/ml) (n=328)	20.2 (±9.4)	17.3 (±8.2)	15.3 (±6.0)	<0.001

Legend: All data shown as mean ±SD. Data were compared using the Kruskal-Wallis Test. Variables with incomplete data are noted with the n available.

725 | Symptoms of Post Traumatic Stress Disorder Among Placenta Accreta Spectrum Providers

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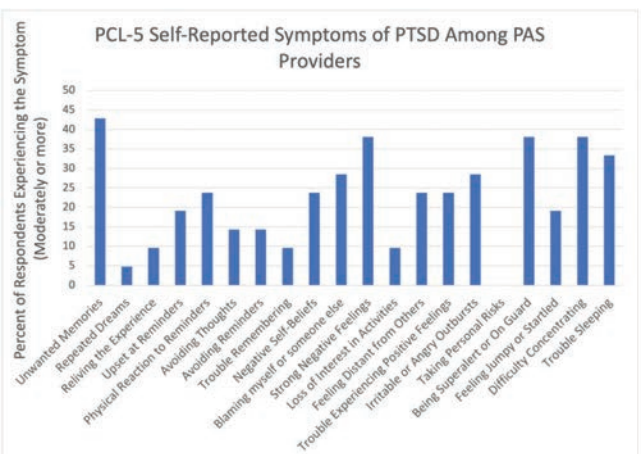
10:30 AM - 12:30 PM

Objective: Physicians as a second victim have been increasingly recognized since the COVID-19 pandemic. However, physician post-traumatic stress disorder (PTSD) is less frequently recognized. We sought to evaluate for symptoms of PTSD among physicians caring for women with placenta accreta spectrum (PAS), a medical condition with known high acuity and high mortality.

Study Design: This is a cross-sectional study consisting of a quantitative survey distributed via email to physicians who either are members of the Pan-American Society for Placenta Accreta Spectrum, or who attended a PAS Post-Graduate Course or Scientific Session at the SMFM Annual Meeting in 2024. The survey included the PTSD Checklist for DSM-5 (PCL-5), as well as demographic questions, and open ended questions regarding institutional support after severe cases of PAS. Scoring was performed as recommended by the National Center for PTSD.

Results: The email containing the survey was opened by 71 individuals, and the survey completed by 21 (30%). All responders cared for women with PAS, the majority for 3-5 years (38.1%) although 28.6% reported greater than 10 years experience in caring for PAS, and 38.1% reported caring for a women who died of PAS. Most (71.4%) reported perceiving personal psychologic impact occasionally from severe PAS cases, with only one respondent never impacted. 66.6% of the cohort met diagnostic criteria for PTSD (PCL-5 >30), with highest responses being for unwanted memories (42.9%), strong negative feelings, feeling superalert or onguard, and difficulty concentrating (38.1% each). 28.6% reported that their institution provided no psychological support after difficult cases.

Conclusion: This preliminary study demonstrates that physicians caring for the obstetric patients at highest risk for mortality are themselves at high risk for post-traumatic stress disorder. Although our results are likely biased towards respondents experiencing the outcome of interest, we demonstrate that institutions must build capacity for supporting their physicians when adverse obstetric outcomes occur, particularly among patients with PAS.



726 | Placenta Accreta Spectrum is Associated with Lower Rates of Hypertensive Disorders of Pregnancy

Colleen Sinnott[1]; Olga Grechukhina[2]; Jennifer F. Culhane[2]; Sonya Abdel-Razeq[2]; Khadija Alshowaikh[2]; Viktoriia Kolesnyk[2]; Yang Yang-Hartwich[2]; Mert Ozan Bahtiyar[1]; Kevin Dysart[3]
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10:30 AM - 12:30 PM

Objective: Placenta accreta spectrum (PAS) arises from over-invasion of the placenta, while hypertensive disorders of pregnancy (HDP) are thought to arise from trophoblast under-invasion; these may represent two ends of a spectrum of disordered placentation. In a single-institution study, we previously demonstrated clinical evidence suggesting PAS is protective against HDP. Here, we validated this finding in a larger patient cohort.

Study Design: This retrospective study utilizes Epic Systems' Cosmos research platform, an electronic health record database with de-identified patient-level data. PAS, HDP (gestational hypertension, preeclampsia, eclampsia, and HELLP) and other clinical and sociodemographic characteristics were extracted from the database for all deliveries from 2017-2023. Patients with and without HDP were compared across a range of maternal attributes. To account for scheduled preterm deliveries for PAS, such that some patients with PAS deliver before HDP is clinically diagnosed, these comparisons were repeated with cohorts stratified by gestational age (GA) at delivery (< 34 weeks and ≥ 34 weeks). For all cohorts, the crude and adjusted odds of HDP by PAS diagnosis was calculated using logistic regression. All covariates in the bivariate tests of association were included in the multivariable regression models.

Results: A total of 4,287,549 delivery encounters were included. Of those, 8,979 (0.21%) had PAS, 869,759 (20.3%) had HDP, and 125,332 deliveries (2.9%) occurred < 34 weeks. In the total cohort, after adjusting for GA at delivery and maternal factors, patients with PAS were half as likely to be diagnosed with HDP (aOR 0.55 [0.51, 0.59]). In both GA-stratified cohorts, < 34 weeks and ≥34 weeks, this effect remained stable with aOR 0.54 [0.47, 0.62] and aOR 0.42 [0.38, 0.45], respectively.

Conclusion: Patients with PAS develop HDP at half the rates seen in those without PAS after controlling for GA at delivery and patient factors. These two seemingly unrelated conditions may result from abnormalities of the same biologic mechanisms and may benefit from future tandem investigation.

Table 1. Patient demographic and clinical characteristics

	Gestational age at delivery			
	< 34 weeks (n=125,332)		≥ 34 weeks (n=4,162,217)	
	No HDP* (n= 73,744)	HDP (n=51,588)	No HDP (3,345,932)	HDP (n= 816,285)
PAS*	1,250 (1.7%)	456 (0.9%)	5649 (0.2%)	1596 (0.2%)
Race				
Asian	3,856 (5.2%)	1,845 (3.6%)	218542 (6.5%)	29402 (3.6%)
Black	20,145 (27.3%)	16,745 (32.5%)	575148 (17.2%)	183355 (22.5%)
Hispanic	12,953 (17.6%)	7,121 (13.8%)	624292 (18.7%)	124307 (15.2%)
Other	2,540 (3.4%)	1,480 (2.9%)	109626 (3.3%)	22546 (2.8%)
Unknown	989 (1.3%)	502 (0.9%)	47935 (1.4%)	8444 (1.0%)
White	33,261 (45.1%)	23,895 (46.3%)	1770389 (52.9%)	448231 (54.9%)
High SVI‡	41,966 (56.9%)	29,524 (57.2%)	1590414 (47.5%)	419421 (51.4%)
Public insurance	20,385 (27.6%)	13,005 (25.2%)	728266 (21.8%)	175756 (21.5%)
Nulliparous	30,888 (41.9%)	25,242 (48.9%)	1320844 (39.5%)	402931 (49.4%)
Chronic hypertension	2,107 (2.9%)	6,855 (13.3%)	50627 (1.5%)	66408 (8.1%)
Obesity	4,961 (6.7%)	6,519 (12.6%)	182327 (5.4%)	99508 (12.2%)
Pregestational diabetes	1,483 (2.0%)	2,823 (5.5%)	25357 (0.8%)	19728 (2.4%)
Gestational diabetes	11,781 (16.0%)	11,526 (22.3%)	526759 (15.7%)	195570 (24.0%)
Magnesium treatment	34,614 (46.9%)	38,984 (75.6%)	13308 (0.4%)	171495 (21.0%)
GA at delivery (*mean, weeks*)	27.0 (23.0, 28.0)	27.0 (25.0, 29.0)	39.0 (38.0, 40.0)	38.0 (37.0, 39.0)

Note: All comparisons within both gestational age subsets are statistically significant at p<0.001.
*HDP: hypertensive disorders of pregnancy; *PAS: placenta accreta spectrum ‡SVI: Social vulnerability index, per Centers for Disease Control definition*

Table 2. Diagnosis of placenta accreta is associated with reduced odds of hypertensive disorders of pregnancy

	Crude OR (95% CI)	Adjusted* OR (95% CI)
Total cohort (n = 4,287,549)		
No PAS		REF
PAS	1.2 (1.14, 1.27)	0.55 (0.51, 0.59)
< 34 weeks cohort (n = 125,332)		
No PAS		REF
PAS	0.52 (0.46, 0.58)	0.54 (0.47, 0.62)
≥ 34 weeks cohort (n = 4,162,217)		
No PAS		REF
PAS	1.15 (1.08, 1.28)	0.42 (0.38, 0.45)

Adjusted for all covariates in Table 1.

727 | Correlation Between Blood Pressures and Markers of Inflammation in the Maternal Circulation in Pregnancy

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10:30 AM - 12:30 PM

Objective: Hypertensive diagnostic criteria from the American Heart Association has been revised in non-pregnant individuals. However, in pregnancy the diagnosis of chronic hypertension, defined as blood pressure >/ = 140/90 prior to pregnancy or 20 weeks gestation, has remained consistent. It is unclear if changes in blood pressure, such as in elevated and stage 1 hypertension, are associated with inflammatory markers. Therefore, we determine if levels of markers of inflammation were associated with blood pressure in a cohort of uncomplicated pregnancies and as compared to patients with gestational hypertension (gHTN).

Study Design: Maternal blood samples were obtained in the third trimester close to delivery in a cohort of pregnant patients with uncomplicated pregnancies (n = 96) or with gHTN (n = 36), and plasma isolated for multiplex analysis of inflammatory mediators. In-depth review of the medical record was performed.

Results: Circulating levels of several mediators were significantly associated with increased blood pressure. Of interest, the pro-inflammatory chemokine MCP-1 was positively correlated with blood pressure (r = 0.47, p< 0.001) whilst CXCL10 was negatively correlated (r = -0.36, p< 0.01). In addition, pro-inflammatory cytokines IL-5 and TNFa presented trending positive correlation with blood pressure (IL-5: r = 0.22, p = 0.072; TNFa: r = 0.024, p = 0.055). Surprisingly, the anti-inflammatory cytokine IL-4 was also positively correlated with blood pressure (r = 0.24, p< 0.05). Of note, MCP-1 and CXCL10 were both significantly elevated in gHTN while IL-5 and TNFa were unchanged.

Conclusion: Our data suggest that specific inflammatory markers, including MCP-1–responsible for monocyte recruitment, IL-5 and TNFa are correlated with increased blood pressure in a cohort of uncomplicated pregnancies. While MCP-1 was also significantly elevated in gHTN, this was not the case for the other cytokines. Further analysis will ascertain the role of pre-pregnancy body mass index in the level of these markers. In addition, a larger cohort is needed to have better understanding of the clinical significance of this work.

728 | Should Transvaginal Cervical Length Surveillance be Conducted After Cerclage Placement to Predict Spontaneous Preterm Birth?

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10:30 AM - 12:30 PM

Objective: Transvaginal cervical length (CL) surveillance after cerclage placement is not universally performed and recommended. The objective of our study was to assess whether a cervical length < 25 mm after cerclage placement affects the risk of spontaneous preterm birth (sPTB).

Study Design: Retrospective cohort of the International Collaborative for Cerclage Longitudinal Evaluation and Research (IC-CLEAR) study included singleton pregnancies managed with cerclage for history, ultrasound, or physical exam indications between June 2016 and August 2020 at 8 sites across the United States (6) and Colombia (2). Exclusion criteria were patients without CL measurement post cerclage and iatrogenic preterm birth < 37 weeks. The exposure of interest was cervical length after cerclage < 25 mm. Statistical analysis included univariable and multivariable models. Each model was adjusted for the use of vaginal progesterone after cerclage.

Results: Of 839 patients managed with cerclage, 408 (49.39%) had a CL measurement after cerclage, but only 219 patients met the criteria. Patients with a CL < 25mm post-cerclage did not have a significantly increased risk of sPTB < 37 weeks or < 34 weeks (76% vs 73%, p 0.680, 52 vs 42%, p 0.140 respectively) compared to those whose cervix returned to a normal length of >25 mm; however, a CL < 20mm was associated with an increased risk of spontaneous

preterm birth < 34 weeks (59% vs 43% p 0.039). After adjusting for the use of vaginal progesterone, there was a reduction in the risk of sPTB before 34 weeks (RR 1.49,95% CI 0.88 -2.54, p 0.131).

Conclusion: The results indicate that if the cervical length after cerclage is less than 20 mm, there remains an elevated risk of preterm birth before 34 weeks. Monitoring the cervical length following cerclage placement could be beneficial. In these instances, additional treatments such as progesterone might be considered when counseling patients to help lower the rate of early spontaneous preterm birth.

Table 1. Demographics and patient characteristics of pregnancies who had cervical length measurement after cerclage and spontaneous preterm birth (sPTB) before 37 weeks.

Baseline Characteristics	Overall	Gestational Age		p-value
		≥ 37 weeks	< 37 weeks	
	n=219	n=56	n=163	
Age (y)*	29.65 (5.61)	29.12 (5.12)	29.83 (5.77)	0.420
BMI (kg/m²)*	29.13 (6.41)	28.19 (5.45)	29.41 (6.66)	0.250
GA at cerclage placement*	19.12 (4.01)	19.73 (4.06)	18.92 (3.98)	0.200
Study country				<0.001
United States	124 (56.62%)	9 (16.07%)	115 (70.55%)	
Colombia	95 (43.38%)	47 (83.93%)	48 (29.45%)	
Race				<0.001
Black	45 (20.55%)	1 (1.79%)	44 (26.99%)	
Caucasian	45 (20.55%)	4 (7.14%)	41 (25.15%)	
Asian	3 (1.37%)	1 (1.79%)	2 (1.23%)	
Latino	122 (55.71%)	50 (89.29%)	72 (44.17%)	
Other	3 (1.37%)	0 (0.00%)	3 (1.84%)	
Unknown	1 (0.46%)	0 (0.00%)	1 (0.61%)	
Previous preterm birth				0.029
0	81 (36.99%)	15 (26.79%)	66 (40.49%)	
1	87 (39.73%)	31 (55.36%)	56 (34.36%)	
2	38 (17.35%)	9 (16.07%)	29 (17.79%)	
+3	13 (5.94%)	1 (1.79%)	12 (7.36%)	
Indication for cerclage placement				
History	101 (46.12%)	35 (62.50%)	66 (40.49%)	0.004
Ultrasound	131 (59.82%)	38 (67.86%)	93 (57.06%)	0.150
Exam	30 (13.70%)	4 (7.14%)	26 (15.95%)	0.098
CL pre-cerclage (mm)*	17.25 (13.77)	19.72 (13.60)	16.38 (13.76)	0.140
CL post-cerclage (mm)*	25.96 (12.32)	26.58 (10.65)	25.75 (12.86)	0.670
GA at delivery*	32.26 (6.06)	38.27 (1.06)	30.19 (5.68)	<0.001
Birth weight (g)*	2115(1018.54)	3054(433.83)	1773(953.53)	<0.001
Progesterone use after cerclage placement	168 (76.71%)	47 (83.93%)	121 (74.23%)	0.160
Type of progesterone				
Vaginal Progesterone	66 (39.29%)	20 (42.55%)	46 (38.02%)	0.006
17-OHPC intramuscular	84 (50.00%)	17 (36.17%)	67 (55.37%)	
17-OHPC subcutaneous	2 (1.19%)	0 (0.00%)	2 (1.65%)	
Oral Progesterone	14 (8.33%)	8 (17.02%)	6 (4.96%)	
Unknown	2 (1.19%)	2 (4.26%)	0 (0.00%)	
Clinical chorioamnionitis	26 (11.93%)	1 (1.79%)	25 (15.43%)	0.004
NICU admission	89 (43.00%)	1 (1.79%)	88 (58.28%)	<0.001
Neonatal death	26 (13.54%)	1 (2.00%)	25 (17.61%)	0.003

BMI, body mass index; GA, gestational age; 17-OHPC, 17-hydroxyprogesterone caproate; NICU, neonatal intensive care unit. * Data expressed as mean (SD)

Table 2. Risk of spontaneous preterm birth < 34 weeks by cervical length post-cerclage

Outcome	Exposure	RR	95% C.I.		p-value
Gestational Age < 34 weeks	CL < 25 mm	1.31	0.77	2.23	0.313
	CL < 20 mm	1.49	0.88	2.54	0.131
	CL < 15 mm	1.77	1.02	3.05	0.040
	CL < 10 mm	1.96	1.08	3.55	0.026

** Relative risk model has been adjusted for vaginal progesterone use post-cerclage.*

729 | An Updated Rapid Review of Pain Management Following Cesarean Birth

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10:30 AM - 12:30 PM

Objective: To update our rapid review assessing the evidence for key aspects of pain management following cesarean birth, to inform new clinical practice guidelines.

Study Design: We used Ovid MEDLINE, Elsevier's Scopus, Elsevier's Embase, Google Scholar, PubMed, and Web of Science to perform a narrative synthesis of studies that assessed opioid use, analgesia effects, patient-centered outcomes, and disparities in the general population, patients with opioid use disorder (OUD), chronic pain, and psychiatric conditions. Articles were screened and abstracted by two reviewers. Quality was assessed using the RAND/UCLA Appropriateness Methodology approach.

Results: Of 2753 studies screened, 106 were included: 24 RCTs, 5 non-RCTs, and 77 observational studies (7 with very high/critical, 28 with high/serious, 25 with moderate/some concerns for, and 17 with low risk of bias). Following cesarean birth, multimodal, non-opioid interventions (e.g. scheduled ibuprofen and acetaminophen) consistently reduced opioid consumption and/or prescribing without increasing pain. discharge prescribing studies showed variability and racial/ethnic disparities following cesarean births. Patients with chronic pain and psychiatric conditions had increased opioid exposure and persistent use. Non-pharmacologic strategies had limited evidence for pain reduction but high satisfaction. Tailored prescribing reduced outpatient opioid use without worsening pain control. Higher inpatient use, discharge prescription size, and substance abuse history were associated with new persistent opioid use. Patients with chronic pain and psychiatric conditions had increased opioid exposure and persistent use.

Conclusion: Multimodal opioid-sparing strategies provide adequate pain control while limiting opioid use after cesarean birth. Non-pharmacologic methods may provide low-risk enhancement in pain management. There are significant evidence gaps for postpartum pain management in patients with OUD, chronic pain, and psychiatric conditions.

730 | Non-Hormonal Treatments for Vasomotor Sequelae in Patients with Postpartum Hemorrhage Requiring Peripartum Hysterectomy

Daniel J. Martingano[1]; Amanda F. Francis Oladipo[2]; Marwah Al-Dulaimi[3]; Sandra Kumwong[4]; Andrea Ouyang[5]; Lauren Cue[6]; Ashley Nguyen[3]; Francis X. Martingano[7]; Shailini Singh[8]; Mark Rebolos[3]; Kristin Cohen[9]; Alexander Ulfers[10]; Donald Morrish[3]; Iffath A. Hoskins[11]
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10:30 AM - 12:30 PM

Objective: Emergent peripartum hysterectomy may be required as a lifesaving procedure for sever postpartum hemorrhage (SPPH). SPHH requiring hysterectomy can rarely be associated with severe complications such as unintended oophorectomy or

Sheehan syndrome, which respectively can lead to vasomotor sequelae. This study sought to evaluate the effectiveness of non-hormonal treatment regimens for vasomotor sequelae in patients with pregnancies complicated by SPHH requiring peripartum hysterectomy.

Study Design: We conducted a multi-center, prospective observational study from 7/2019 to 7/2024 comparing all pregnant patients requiring a peripartum hysterectomy due to SPHH and endorsed vasomotor symptoms up to 6-months postpartum. Monotherapy clonidine 24-hour patch, paroxetine, gabapentin, black cohosh, sertraline, and fluoxetine were included as covariates. Patients less than 34 0/7 weeks gestation, with prior endocrine or rheumatology disorders, or allergies to or prior use of any of the covariates were excluded. The primary outcomes included patient-reported resolution of daytime and/or nighttime symptoms confirmed by provider assessment and the need to switch medication, as discrete events.

Results: The study included 27 patients who reported vasomotor symptoms following SPHH requiring hysterectomy. Study groups' demographics were not significantly different. 16 (59.3%) patients had complications of unintended oophorectomy, 20 (74.1%) were diagnosed with Sheehan Syndrome, and 9 (33.3%) were diagnosed with both conditions. Patients using the clonidine 24-hour patch were more likely to achieve daytime vasomotor symptom resolution (92.6% v. 18.5%, p = 0.030) and were less likely to switch medications (85.2% v. 22.2%, p = 0.004). Patients using paroxetine at doses of 10mg or greater were more likely to achieve resolution of both nighttime vasomotor and insomnia symptoms compared to non-use (88.9% v. 11.1%, p = 0.021).

Conclusion: Clonidine and paroxetine are reasonable nonhormonal treatment therapies for vasomotor sequelae in patients with pregnancies complicated by SPHH requiring peripartum hysterectomy.

731 | Effect of Oral Magnesium Supplementation as Adjunctive Treatment in Pregnancies Complicated by Chronic Hypertension

Daniel J. Martingano[1]; Amanda F. Francis Oladipo[2]; Marwah Al-Dulaimi[3]; Sandra Kumwong[4]; Andrea Ouyang[5]; Lauren Cue[6]; Ashley Nguyen[3]; Francis X. Martingano[7]; Shailini Singh[8]; Alexander Ulfers[9]; Mark Rebolos[3]; Kristin Cohen[10]; Donald Morrish[3]; Iffath A. Hoskins[11]

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10:30 AM - 12:30 PM

Objective: Intravenous magnesium sulfate remains an essential medication for seizure prophylaxis in the context of severe preeclampsia (SPEC), with oral formulations reserved for non-severe comorbid conditions with inconsistent results. This study sought to determine the effect of oral magnesium supplementation as adjunctive treatment in pregnancies complicated by chronic hypertension (CHTN).

Study Design: We conducted a multi-center, prospective observational study from 7/2022 to 7/2024 and included all pregnant women diagnosed with chronic hypertension requiring antihypertensive medication with gestational ages ranging from 24 0/7 through 38 0/7 weeks-gestation. All patients were prescribed low-dose aspirin prophylaxis. Monotherapy magnesium oxide and magnesium citrate were included as covariates. The primary outcomes included diagnosis of superimposed SPEC, new-onset headache (NOH) not relieved by acetaminophen monotherapy, and worsening hypertension requiring additional or initiation of antihypertensive medications, as discrete events. Patients with preexisting neurological or cardiac disorders or allergies to any included medications were excluded. Medication choice was determined by physician clinical assessment.

Results: The study included 693 patients diagnosed with CHTN. 351 patients were given magnesium oxide and 342 patients were given magnesium citrate. Baseline demographic factors were not significantly different. Patients who received magnesium oxide were less likely to develop SPEC (30.1% v. 69.9% p = 0.001) or NOH (14.1% v. 73.1%, p< 0.001) with a 14% (RR = 0.86, 95% CI 0.68-0.93, p = 0.004) and 33% (RR = 0.67, 95% CI 0.41-0.82, p = 0.002) decreased risk in adjusted models, respectively. In stratified analysis, patients with BMI < 30 kg/m2 who received magnesium oxide were less likely to require addition or initiation of antihypertensive medications (54.8% v. 22.9%, $p = < 0.001$). None of the primary outcomes were significant for patients receiving magnesium citrate.

Conclusion: Magnesium oxide supplementation may be beneficial for patients with pregnancies complicated by CHTN.

732 | Twin Pregnancy is a Significant Risk Factor for Delivery within 24 hours in P-PROM

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10:30 AM - 12:30 PM

Objective: To assess the likelihood of delivery within 24 hours after preterm premature rupture of membranes (P-PROM) in twin pregnancies in comparison to singleton pregnancies.

Study Design: We conducted a retrospective cohort study in a tertiary university-affiliated medical center with approximately 12,500 deliveries annually (2012-2023). Data collected encompassed demographic and obstetrics characteristics including maternal age, gestational age at delivery, body mass index, parity, mode of delivery, and delivery outcomes. A comparison was made between twin (study group) and singleton (control group) pregnancies with P-PROM (gestational age 24+0-36+6). Statistical analyses, including Cox regression and multivariate

logistic regression, were performed to evaluate the impact of twin pregnancies on the likelihood of delivery within 24 hours.

Results: 1) During the study period, 145,883 women delivered in our center. Of them, 1,498 [1%] women were admitted with P-PROM, of whom 297 (19.9%) with twin pregnancies.

2) The characteristics of the two groups differ regarding gestational age at delivery, parity, previous cesarean deliveries, and mode of conception [Table 1].

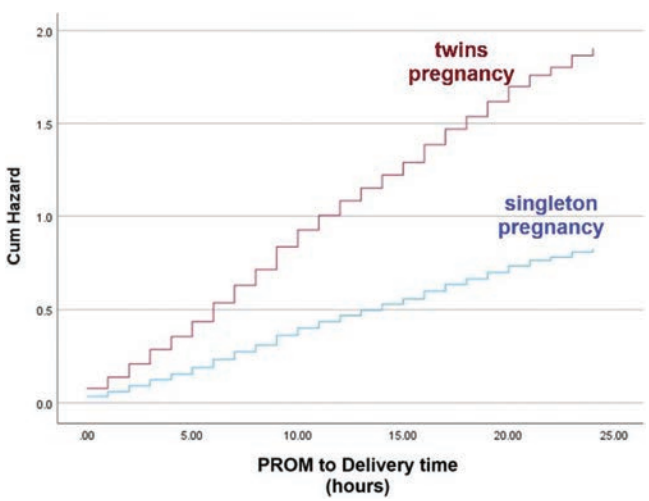
3) In the study group, 234 women (78.8%) delivered within 24 hours, while 697 women (58.3%) in singleton pregnancies (p-value< 0.001).

4) Using a Cox regression and multivariate logistic regression, twin pregnancy was identified as a significant factor for delivery within 24 hours: HR 2.3 (95%CI 1.9-2.7, p< 0.001) [Table 2].

Conclusion: Twin pregnancy was found to be the most significant risk factor for delivery within 24 hours in women with P-PROM.

Table 1: Cox regression for delivery within 24 hours

	HR (95%CI)	p-value
Multiple pregnancies	**2.3 (1.9-2.7)**	**<0.001**
Gestational week < 34	**0.7 (0.6-0.87)**	**<0.001**
Assisted Reproductive Technology	0.9 (0.8 -1.17)	0.805
Nulliparity	1.12 (0.9-1.3)	0.135
Antibiotics during labor	**0.6 (0.5 – 0.73)**	**<0.001**
Previous Cesarean Delivery	1.12 (0.8-1.5)	0.4
Spontaneous delivery	**1.6 (1.4-1.8)**	**<0.001**



733 | The 5-Year Results of an Institutional Shadowing Program Aiming to Train New Senior "Obstetricians On-Call"

Daniel Tairy[1]; Eran Weiner[2]; Anat Engel[3]; Yael Ganor Paz[1]

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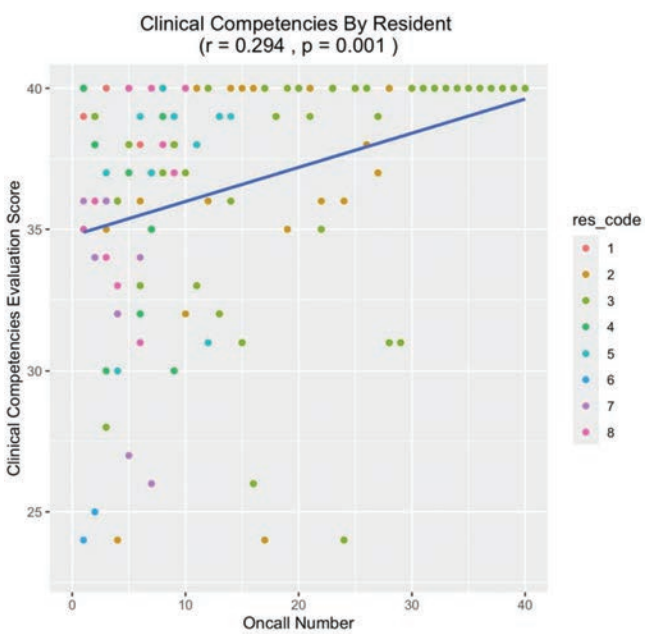
10:30 AM - 12:30 PM

Objective: On-call night and weekend shifts are pivotal components of the clinical activity of any obstetric unit. Worldwide, these teams are usually led by a senior in-house "obstetrician on call" (OOC). This study presents the effects of a structured institutional shadowing program to train future OOCs (fOOC) on their clinical competencies and on obstetric adverse outcomes.

Study Design: In August 2022 we implemented a training program where senior residents (fOOCs) improve complex obstetric and leadership competencies by performing repeated 24h calls shadowed by an experienced obstetrician. After each 24h call the fOOC received a structured oral and written feedback scoring their competencies. Additionally, the fOOC's self-assessed their respective competencies upon entering and completing the program using structured questionnaires. Lastly, we compared the occurrence of major maternal and neonatal adverse outcomes before (January 2019 to July 2022 = P1) vs. after (August 2022 to July 2024 = P2) the program implementation.

Results: As of August 2024 we performed 151 shadowed 24h shifts, performed by 8 fOOCs trained by 15 obstetricians. The fOOC's skills were evaluated with a higher performance degree when compared between upon entering vs. completing the program as assessed by the fOOCs as well as by the senior obstetricians (p< 0.05 to all). Figure 1 describes an example for the improvement of the clinical competencies as were assessed by the senior obstetricians for the cohort of fOOCs during the program. Additionally, when comparing the 13336 on-call deliveries in P1 to the 8718 on-call deliveries in P2, P2 was characterized by lower rates of maternal bleeding and transfusion (p< 0.001), shoulder dystocia (p = 0.04), neonatal Apgar score< 7 (p = 0.009), respiratory morbidity (p = 0.02), Erb's palsy (p = 0.03), and neonatal death (p = 0.05)- table 1.

Conclusion: The implementation of a shadowing training program to fOOC was associated with a higher reported perception of clinical competencies, and the 2-year period post implementation was associated with institutional lower rates of important obstetric adverse outcomes.



Table– Selected outcomes compared between the time periods

	P1 n=13336 deliveries	P2 n=8718 deliveries	*p* value
Selected obstetric outcomes			
Perineal tear grade 3/4	50 (0.4)	37 (0.4)	0.56
Shoulder dystocia during labor	112 (0.8)	52 (0.6)	**0.04**
Bleeding necessitating blood transfusion	283 (2.1)	77 (0.9)	**<0.001**
Selected neonatal outcomes			
NICU admission	2519 (19.9)	1766 (20.9)	0.06
Umbilical Ph< 7.1	92 (0.7)	56 (0.7)	0.59
5 minute Apgar score< 7	223 (1.8)	110 (1.3)	**0.009**
Respiratory morbidity*	40 (0.3)	13 (0.2)	**0.02**
Cerebral morbidity**	3 (0.02)	4 (0.04)	0.35
Sepsis	2 (0.002)	1 (0.001)	0.81
Transfusion	4 (0.003)	0 (0)	0.1
Erb's palsy	18 (0.1)	4 (0.04)	**0.03**
Clavicular fracture	21 (0.1)	14 (0.2)	0.99
Neonatal death	17 (0.1)	4 (0.04)	**0.05**

All data are shown as number (%). Values in bold are statistically significant (p<0.05).

NICU- neonatal intensive care unit; *Respiratory morbidity include- respiratory distress syndrome or mechanical ventilation; **Cerebral morbidity include- intra ventricular hemorrhage, seizures or hypoxic-ischemic encephalopathy

734 | Preterm Medically Indicated Labor Induction and Mode of Delivery in Patients with Obesity

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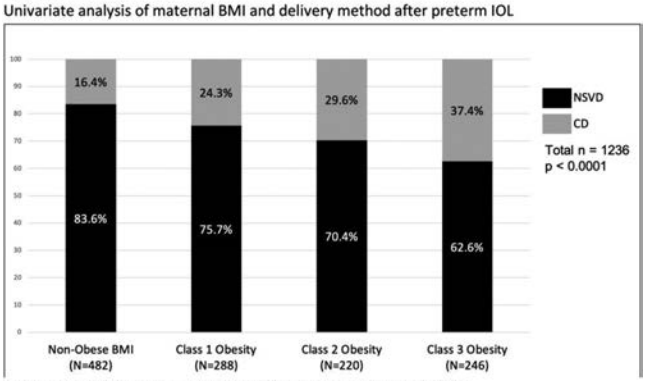
10:30 AM - 12:30 PM

Objective: Maternal obesity is associated with cesarean delivery (CD) during induction of labor (IOL) at term; whether the same is true for patients with obesity undergoing preterm IOL is unknown. We sought to evaluate CD rates for patients with and without obese BMI undergoing medically indicated preterm IOL.
Study Design: This is a secondary analysis of a multicenter, randomized trial of singleton pregnancies at risk for preterm delivery. Participants with body mass index (BMI) >18.5 who underwent IOL for any indication were included. Planned CD and spontaneous labor were excluded. We compared delivery mode among participants undergoing preterm IOL by body mass index (BMI) at delivery: non-obese 18.5-29.9, class 1 30-34.9, class 2 35-39.9, class 3 > 40. The primary outcome was incidence of CD by BMI class. Chi-square, ANOVA and multivariable regression tests determined the strength of association.
Results: Of 1236 included participants, 482 had non-obese BMI (39%); 288 (23%), 220 (18%) and 246 (20%) had class 1-3 obesity. Pregnancies with class 1-3 obesity were more likely to be of Black race (20% for non-obese; 27%, 29% and 37% for class 1-3) or have hypertension (HTN) (6% non-obese; 13%, 21%, 33% class 1-3) or gestational diabetes (GDM) (6% non-obese; 13%, 18%, 21% class 1-3) (p values < .0001). In a univariate analysis, those with obesity were more likely to undergo unplanned CD than their non-obese counterparts (p< .0001). In a multivariable analysis adjusted for nulliparity, advanced maternal age, HTN, GDM, and treatment group, participants with class 1-3 obesity were more likely to undergo CD than their non-obese counterparts (class 1 aOR 1.62, 95% CI 1.12-2.36, class 2 aOR 2.30, 95% CI 1.55-3.41, class 3 aOR 2.96, 95% CI 2.02-4.33).
Conclusion: These novel findings suggest that while participants with obesity are more likely to undergo CD during medically indicated pre-term IOL, the majority still deliver vaginally. This data may aid in counseling patients undergoing medically indicated pre-term delivery who have obese BMI.

Figure 1
Univariate analysis of maternal BMI and delivery method after preterm IOL



NSVD – normal spontaneous vaginal delivery. CD – cesarean delivery.

Table 2

Multivariate logistic regression of maternal BMI and delivery method after preterm IOL* *Adjusted for nulliparity, AMA, HTN, GDM, and treatment group.				
	Non-Obese BMI (N=482)	Class 1 Obesity (N=288)	Class 2 Obesity (N=220)	Class 3 Obesity (N=246)
Adjusted OR (95% CI)	ref	**1.62 (1.12-2.36)**	**2.30 (1.55-3.41)**	**2.96 (2.02-4.33)**

AMA – advanced maternal age, HTN – hypertension, GDM – gestational diabetes mellitus. Treatment group per the original trial was betamethasone administration versus placebo.

735 | Nicu Admission for Neonatal Hypoglycemia and Impact on Breastfeeding Outcomes Among Gravidas with Diabetes

Daniella Rogerson[1]; Marni B. Jacobs[2]; Minhazur R. Sarker[3]; Kim Boggess[4]; Ashley N. Battarbee[5]; Gladys (Sandy) A. Ramos[3]; On behalf of the MOMPOD Study Consortium
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10:30 AM - 12:30 PM

Objective: Neonatal hypoglycemia (NH) is common in pregnancies with diabetes mellitus (DM) and can lead to neonatal intensive care unit (NICU) admission, a known barrier to breastfeeding (BF). We hypothesized that BF rates are lower after NICU admission among infants with NH compared to NICU admission without NH. This study compares BF rates among gravidas with DM with neonatal NICU admission.
Study Design: This is a secondary analysis of the MOMPOD randomized controlled trial of metformin versus placebo in insulin treated DM. Participants with live births and intention to BF were included. NH was defined as glucose < 40mg/dL or requiring IV glucose within 72 hours. A BF questionnaire was collected

30 days postpartum. Primary outcome was exclusive and partial BF among participants with neonatal NICU admission with NH versus other indications. Secondary outcomes were time and reasons for BF cessation. Characteristics were compared with Chi-square and t-tests or Wilcoxon; multivariable regression tests were performed.

Results: Of 468 participants who completed a BF survey, 378 were included. 142 neonates were admitted to the NICU: 102 with NH and 40 without. Neonates admitted to the NICU with NH were more often born by cesarean and had higher birthweight than those without ($p < 0.05$, Table 1). No BF, exclusive BF, and partial BF did not differ between groups; this remained true when adjusting for birthweight and mode of delivery (aOR 0.62, 95% CI 0.25–1.51, aOR 2.72, 95% CI 0.54 –13.60, aOR 1.10, 95% CI 0.44–2.70, Table 2). Participants who stopped BF did so at an average of 2.8 weeks for both groups ($p = 0.91$) and for similar reasons (trouble latching, pain, poor weight gain, low supply, $p > 0.05$, data not shown).

Conclusion: Among pregnancies complicated by DM, NICU admission with NH did not pose additional barriers to BF compared with NICU admission in general, although analysis is limited by sample size. Future studies examining specific reasons for BF cessation pertinent to NH are needed to understand which factors affect BF in this population.

Table 1

Baseline demographics for infants with NICU admission among participants intending to breastfeed

Demographic	Neonatal Hypoglycemia (n = 102)	No Hypoglycemia (n = 40)	p-value
Maternal age, mean years (SD)	32.1 (6.2)	33.9 (5.5)	0.11
Maternal BMI, mean (SD)	37.2 (8.1)	38.3 (9.9)	0.51
Hispanic ethnicity, n (%)	41 (40.2)	20 (50.0)	0.29
Highest level of education, n (%)			0.62
Less than high school	18 (18.4)	7 (18.0)	
High school diploma/GED	47 (48.0)	22 (56.4)	
College degree or higher	33 (33.7)	10 (25.6)	
Insurance, n (%)			0.2
Private	16 (15.7)	7 (17.5)	
Public	84 (82.3)	30 (75.0)	
No insurance	2 (2.0)	3 (7.5)	
Parity, median (IQR)	2 (1, 3)	2 (1, 3)	0.39
Mode of delivery, n (%)			**0.02**
Vaginal	19 (18.6)	15 (37.5)	
Cesarean	83 (81.4)	25 (62.5)	
GA at delivery, mean weeks (SD)	35.8 (2.5)	35.3 (2.9)	0.32
Preterm birth, n (%)	53 (52.0)	26 (65.0)	0.16
Birthweight, mean grams (SD)	3027.0 (903.1)	2592.2 (775.8)	**0.008**
Neonatal LOS, median days (IQR)	7 (3, 20)	6 (2, 15.5)	0.51
NICU LOS, median days (IQR)	8 (4, 24)	6 (2, 15.5)	0.29
Steroids for fetal lung maturity, n (%)			0.28
None	73 (71.6)	26 (65.0)	
Partial Course	7 (6.9)	1 (2.5)	
Full Course	22(21.6)	12 (32.5)	
Treatment group, n (%)			0.80
Metformin	46 (45.1)	19 (47.5)	
Placebo	56 (54.9)	21 (52.5)	

GA – Gestational age, LOS – Length of stay

Table 2

Breastfeeding outcomes after NICU admission among participants intending to breastfeed

	Neonatal Hypoglycemia (n = 102)	No Hypoglycemia (n = 40)	p-value	OR (95% CI)	aOR* (95% CI)
Not BF, n (%)	28 (40.6)	17 (54.8)	0.29	0.56 (0.24 – 1.32)	0.62 (0.25 – 1.51)
Exclusive BF, n (%)	12 (17.4)	2 (6.5)		3.01 (0.64 –14.56)	2.72 (0.54 –13.60)
Partial BF, n (%)	29 (42.0)	12 (38.7)		1.15 (0.48 – 2.73)	1.10 (0.44 – 2.70)
Weeks at BF cessation					
Mean (SE)	2.8 (0.4)	2.8 (0.4)	0.98		
Adjusted, mean (SE)*	2.9 (0.4)	2.8 (0.4)	0.91		

*Adjusted for mode of delivery and birthweight. BF – breastfeeding

736 | The Rate of Weight Gain During Pregnancy and Newborn Head Circumference

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10:30 AM - 12:30 PM

Objective: Weight during pregnancy, a marker of gestational biology and maternal health, has been related to neonatal outcomes. However, no study has examined the effects of the *rate of weight gain* during pregnancy on newborn head circumference, an early indicator of children's neurodevelopment (e.g., autism spectrum disorder). In this study, we aim to examine the association between the initial level and the rate of body mass index (BMI) change during pregnancy and newborn head circumference.

Study Design: This is a secondary data analysis from the Prenatal Stress: The Epigenetic Basis of Maternal and Perinatal Effects Study. From n = 187 pregnant participants ($M_{Age} = 29.64$; $SD_{Age} = 6.24$), BMI in pregnancy was collected three times at gestational week 15, 25, and 35, respectively. Newborn head circumference, gestational age at birth, and sex were abstracted from the medical record. We hypothesized that BMI intercept (from 15 weeks) and slope would be positively associated with newborn head circumference.

A latent growth curve model (LGCM) was used to delineate the trajectories of mothers' BMI across three assessments, treating the intercept (BMI at 15 weeks) and the slope (rate of BMI change) as two latent variables. Additionally, a structural equation model (SEM) was built, predicting newborn head circumference from the intercept and the slope of BMI while controlling for mother's age, newborn gestational age at birth and sex.

Results: Sample characteristics are shown in Table 1. Pregnant individuals' BMI intercept (B = 1.27, $p < .05$) and slope across three assessments (B = 1.19, $p < .05$) were positively associated with newborn head circumference (Figure 1).

Conclusion: Individuals' BMI at the start of the 2nd trimester and its rate of change throughout the 2nd and 3rd trimesters were positively associated with newborn head circumference. These findings suggested that the *rate* of gestational weight gain, in addition to weight status, may play an important role in influencing infant growth and future health.

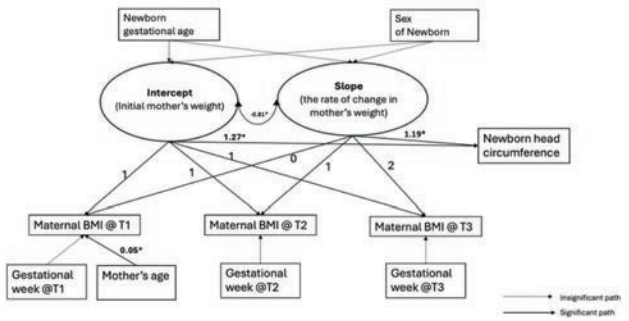
Table 1

Characteristics of Participants (n=187)

Participant Characteristics	Mean (SD)
Mother	
Age at the first assessment (in years)	29.64 (6.24)
Race	
American Indian and/or Alaskan	39%
Asian	2%
Black/African American	15%
White	30%
Biracial	5%
Other	9%
Ethnicity	
Hispanics	69%
Gestational age at the 1st assessment (in weeks)	15.94 (2.01)
Gestational age at the 2nd assessment (in weeks)	25.17 (1.93)
Gestational age at the 3rd assessment (in weeks)	34.68 (1.55)
BMI before pregnancy	26.14 (5.79)
BMI at the 1st assessment	26.96 (5.52)
BMI at the 2nd assessment	28.42 (5.07)
BMI at the 3rd assessment	29.71 (5.00)
Newborn	
Sex (% of female)	48
Race	
American Indian and/or Alaskan	11%
Asian	1%
Black/African American	5%
White	14%
Biracial	4%
Unreported	65%
Gestational age (in weeks)	38.74 (3.16)
Body length (in m)	0.51 (0.04)
Body weight (in kg)	3.32 (0.51)
Baby Ponderal Index (PI)	25.28 (2.46)
Head circumference (in cm)	34.36 (1.55)

Note. Participants who are Latinx identified themselves as American Indians in our study.

Figure 1. The Intercept and Slope of BMI in Pregnancy are Associated with Newborn Head Circumference.



Note. Fit statistics indicated an acceptable fit of the final model (CFI =0.98, RMSEA=0.07, SRMR=0.06, NNFI=0.97, χ^2 with 21 df = 28.55, p = 0.13). The intercept and the slope of maternal BMI across three assessments during pregnancy (from the beginning of the 2nd trimester to the end of the 3rd) were positively associated with newborn head circumference. T1 (time 1), gestational week 15; T2 (time 2), gestational week 25; T3 (time 3), gestational week 35. *p <0.05; **p <0.01; ***p <0. 001. All estimates shown are standardized.

737 | Risk Factors for Preeclampsia Following Early Onset Fetal Growth Restriction

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10:30 AM - 12:30 PM

Objective: Early onset fetal growth restriction (FGR) may precede the development of preeclampsia (PE). The aim of this study was to evaluate risk factors associated with the development of PE in individuals with early onset FGR.

Study Design: The study included all consecutive individuals admitted to the antepartum unit of a tertiary university affiliated medical center between 2011-2024 for the diagnosis of early onset FGR. Maternal and pregnancy characteristics were recorded, including: maternal age, BMI, smoking, parity, gestational age (GA) at diagnosis, chronic hypertension, maternal cardiac disease, pre- or gestational diabetes, thrombophilia, chronic renal disease, history of major pregnancy complications, mode of conception, number of fetuses, premature contractions, ultrasound (US) measured abdominal circumference (AC), US measured estimated fetal weight (EFW), umbilical artery doppler PI (UAPI) and middle cerebral artery doppler PI (MCAPI).

AC and EFW were classified as < 5% and < %3 respectively based on local population growth charts. UAPI and MCAPI percentiles calculated per specific gestational age.

We investigated the association of these variables with development of PE using univariate and multivariable logistic regression.

Results: During the study period 774 pregnant individuals were admitted for early-onset FGR, while 79 of them (10.2%) subsequently developed PE. Table 1 presents maternal and pregnancy characteristics according to the development of PE. Using multivariate analysis (Table 2) GA 24-28 weeks at diagnosis (OR 2.54, CI 1.20-5.36, p = 0.01), AC below the 5th percentile (OR 2.31, CI 1.10-4.86, P = 0.02), and UAPI above the 95th percentile (OR 3.35, CI 1.55-7.20, P< 0.01) were significantly associated with the subsequent development of PE.

Conclusion: Early GA at diagnosis of FGR, AC below the 5th percentile and UAPI >95th percentile are significantly associated with the development of PE in pregnancies complicated by early-onset FGR.

Table 1- Maternal and pregnancy characteristics according to the subsequent development of preeclampsia (univariate analysis)

Variables	Overall	Preeclampsia		P value
	774	Yes 79 (10.2%)	No 695 (89.8%)	
Age Group n (%)				
<=18	0	0	0	
18-35	525 (67.8)	48 (60.8)	477 (68.6)	
36-40	167 (21.6)	21 (26.6)	146 (21.0)	
=>41	82 (10.6)	10 (12.7)	72 (10.4)	0.36
Age (median [IQR])	31.95 [27.71, 36.49]	32.75 [28.74, 37.51]	31.81 [27.63, 36.40]	0.11
BMI n (%)		1 (1.3)		
<18.5	17 (2.2)	64 (81.0)	16 (2.3)	
18.5-30	646 (83.5)	14 (17.7)	582 (83.7)	
>30	111 (14.3)		97 (14.0)	0.57
BMI (median [IQR])	25 [22.5, 28.3]	24.40 [22.35, 29.65]	25.00 [22.60, 28.30]	0.84
Parity n (%)				
0	126 (16.3)	18 (22.8)	108 (15.5)	
1-4	612 (79)	57 (72.2)	555 (79.9)	
=>5	36 (4.7)	4 (5.1)	32 (4.6)	0.24
Gestational age at diagnosis n (%)				
24-28	376 (48.6)	47 (59.5)	329 (47.3)	
29-32	398 (51.4)	32 (40.5)	366 (52.7)	**0.05**
Gestational age at diagnosis (median [IQR])	29 [26, 31]	28 [25.5, 30]	29 [26, 31]	0.06
Cardiac diseases n (%)	4 (0.5)	1 (1.3)	3 (0.4)	0.35
Chronic hypertension n (%)	16 (2.0)	2 (2.5)	14 (2.0)	0.67
Diabetes mellitus n (%)	13 (1.6)	1 (1.5)	12 (1.7)	1
Gestational diabetes mellitus n (%)	90 (11.6)	11 (13.9)	79 (11.4)	0.46
Thrombophilia n (%)	21 (2.7)	17 (2.4)	4 (5.1)	0.25
Chronic renal disease n (%)	0	0	0	1
Smoking n (%)	24 (3.1)	2 (2.5)	22 (3.2)	1
History Of Preeclampsia n (%)	5 (0.6)1	1 (1.3)	4 (0.6)	0.41
History of pregnancy complications n (%)				
FGR	51 (6.5)	6 (7.6)	45 (6.5)	0.63
IUFD	15 (1.9)	1 (1.3)	14 (2.0)	1
Preterm Delivery	10 (1.2)	1(1.3)	9 (1.3)	1
Mode of Conception n (%)				
Spontaneous	723(93.4)	72 (91.1)	651(93.7)	
ART	51(6.5)	7 (8.9)	44(6.3)	0.34
Premature contraction n (%)	66 (8.5)	7 (8.9)	59 (8.5)	0.83
Number of fetuses n (%)				
Singletons	592 (76.4)	61 (77.2)	531 (76.4)	
Multiple pregnancy	182 (23.6)	18 (22.8)	164 (23.6)	1
Abdominal circumference <5th percentile n (%)	**625** 184 (29.4)	**72** 32 (44.4)	**553** 152 (27.4)	**<0.01**
EFW<3rd percentile n (%)	**660** 144 (21.8)	**73** 20 (27.4)	**587** 124 (21.1)	0.23
Abnormal Umbilical artery Doppler n (%) PI>95th percentile	**344** 65 (18.8)	**39** 16 (41)	**305** 49 (16.1)	**<0.01**
Abnormal Middle cerebral artery Doppler n (%) PI>95th percentile	**129** 2 (1.6)	**13** 0 (0)	**116** 2 (1.7)	1

Table 2- multivariable analysis of risk factors for the development of preeclampsia

Variables	Odds Ratio	CI 95%	P-value
Gestational age 24-28 at diagnosis	2.54	1.20-5.36	0.01
Abdominal Circumference <5th percentile	2.31	1.10-4.86	0.02
Umbilical artery Doppler PI>95TH centile	3.35	1.55-7.20	<0.01

738 | Severe Maternal Morbidity In Urban vs Rural Populations Following Patient Safety Bundle Implementation in Hawaii

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10:30 AM - 12:30 PM

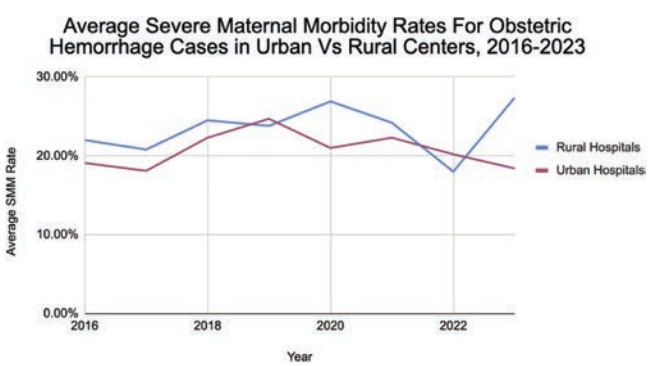
Objective: The Alliance for Innovation on Maternal Health (AIM) has developed evidence-based patient safety bundles (PSB) to decrease severe maternal morbidity (SMM) for several obstetric outcomes including hemorrhage. In 2021, 10/12 hospitals with birthing facilities in Hawaii adopted AIM safety bundles.

Hawaii faces challenges in implementing such interventions given its unique geography. Hawaii has 5 urban birthing facilities, all located on the island of Oahu, and 7 rural facilities, located on neighbor islands. Resources, such as blood products, are limited on neighbor islands and transfer to higher level tertiary urban facilities requires air transportation. Our goal was to explore how SMM rates in the setting of obstetric (OB) hemorrhage differ between rural vs urban centers in Hawaii, particularly since AIM PSB implementation.

Study Design: We abstracted data from the AIM Data Center, which provided aggregated SMM rates among OB hemorrhage cases (excluding ectopic pregnancy and spontaneous abortion) for 4 urban and 6 rural birthing facilities in the state of Hawaii, and stratified by year from 2016 to 2023.

Results: A total of 9,527 births were included. Average SMM rates in OB hemorrhage at rural centers ranged from 18.0% to 27.4% over the course of the 2016 to 2023 study period (Figure 1). At the time of implementation of AIM PSB in 2021, SMM rate was 24.2%, fluctuating to 18.0% and 27.4% in 2022 and 2023 respectively. In Hawaii's urban centers, SMM fluctuated between 18.1% to 24.7% during the study period, with a rate of 22.3% in 2021, decreased to 18.4% by 2023.

Conclusion: Our analysis showed that Hawaii's rural centers often have a higher rate of SMM than Hawaii's urban centers. Our analysis also revealed that urban populations did have a reduction in SMM rates among OB hemorrhage after the implementation of AIM PSB in 2021; rural populations did not see a similar decrease. This data supports previous known association between rural residence and increased SMM. Further studies are warranted to identify specific trends and interventions for the unique challenges rural Hawaiian communities face.



739 | Risk Factors Associated with Uterine Rupture in Stillbirth Pregnancies with Prior Cesarean

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10:30 AM - 12:30 PM

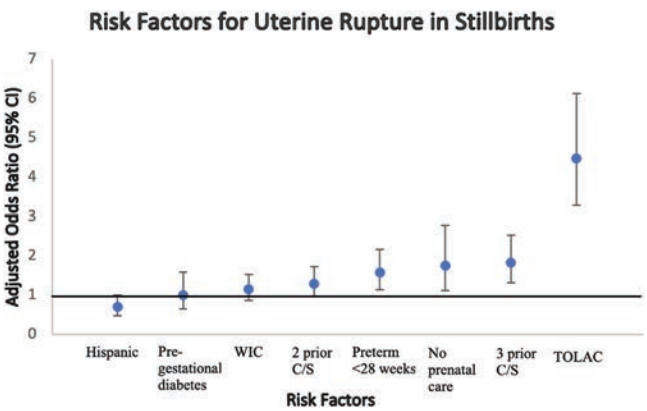
Objective: The risk-benefit ratio of trial of labor after cesarean differs when fetal risk is absent, as in pregnancies complicated by stillbirth. We aimed to quantify risk factors associated with uterine rupture in mothers with stillbirth and prior cesarean to help inform counseling regarding mode of delivery and risk.

Study Design: Case-control study using US vital statistics fetal death data from all stillbirths in the US, 2005-2021. Study population was limited to patients with prior cesarean and birth at ≥ 20 weeks gestation. The case and controls were deliveries with and without uterine rupture, respectively. Logistic regression estimated the risk of various factors and uterine rupture while adjusting for coexisting risks.

Results: There were 422,963 stillbirths during the study period. 15,132(3.6%) were ≥ 20wks and had prior cesarean. 332 (2.2%) cases had uterine rupture and 14,800 (97.8%) controls did not. Hispanic ethnicity was associated with lower odds of rupture, whereas no prenatal care, two or more prior cesareans, preterm delivery < 28 weeks, and TOLAC were associated with higher odds of rupture, even after adjusted analyses. The most significant association was trial of labor after cesarean (TOLAC) being nearly 4.5 times more likely to result in uterine rupture (OR = 4.48 [3.28-6.13], p< 0.001). The rate of uterine rupture among those undergoing TOLAC with 1, 2 and 3 or greater cesareans was 8.9%, 22.9%, and 19.7%, respectively.

Conclusion: Sociodemographic, medical, and obstetric factors influence the risk of uterine rupture among pregnancies complicated by stillbirth and prior cesarean. The highest risk for uterine rupture was observed with no prenatal care, early preterm delivery, higher number of prior cesareans and TOLAC attempt. These data may be useful in counseling regarding mode of delivery and anticipated risks when managing delivery in cases of stillbirth.

Characteristic	Cases of uterine rupture (2.2%) (N=332)	Controls w/o uterine rupture (97.8%) (N=14,800)	OR (95% CI)	Adjusted OR (95% CI)	p-value
Sociodemographic characteristics					
Maternal age (years)					
<20	3 (0.9)	134 (0.9)	0.99 (0.20-2.98)		0.982
20-34	230 (69.3)	10,136 (68.5)	Ref.		
≥35	99 (29.8)	4,530 (30.6)	0.96 (0.75-1.23)		0.757
Race/ethnicity					
Asian	15 (4.5)	484 (3.3)	1.39 (0.77-2.36)		0.213
Hispanic	46 (13.9)	3,042 (20.6)	0.62 (0.44-0.85)	0.70 (0.48-1.00)	0.002
Non-Hispanic Black	102 (30.7)	4,191 (28.3)	1.12 (0.87-1.42)		0.356
Non-Hispanic White	153 (46.1)	6,304 (42.6)	1.15 (0.91-1.44)		0.221
Other	10 (3.0)	460 (3.1)	0.96 (0.45-1.81)		0.912
Education					
No high school education	18 (5.4)	628 (4.2)	1.31 (0.74-2.19)		0.301
High school, no diploma	34 (10.2)	1,665 (11.3)	0.93 (0.61-1.39)		0.722
High school graduate	100 (30.1)	4,560 (30.8)	Ref.		
College, no degree	66 (19.9)	2,769 (18.7)	1.09 (0.78-1.50)		0.603
Advanced degree	90 (27.1)	3,872 (26.2)	1.06 (0.79-1.43)		0.692
WIC	115 (34.6)	3,991 (27.0)	1.44 (1.12-1.83)	1.16 (0.87-1.53)	0.003
Tobacco use	46 (13.9)	1,880 (12.7)	1.12 (0.80-1.54)		0.491
Pregnancy characteristics					
Trimester prenatal care began					
No prenatal care	35 (10.5)	1,179 (8.0)	1.50 (1.01-2.17)	1.76 (1.12-2.79)	0.029
1st trimester	190 (57.2)	9,601 (64.9)	Ref.		
Pre-gestational diabetes	39 (11.7)	1,218 (8.2)	1.48 (1.03-2.09)	1.01 (0.65-1.59)	0.022
Gestational diabetes	21 (6.3)	1,146 (7.7)	0.80 (0.49-1.26)		0.338
Number of prior cesareans					
1 cesarean	139 (41.9)	9,095 (61.5)	Ref.		
2 cesareans	113 (34.0)	3,631 (24.5)	2.04 (1.57-2.64)	1.29 (0.97-1.73)	<0.001
3+ cesareans	73 (22.0)	1,714 (11.6)	2.79 (2.06-3.74)	1.83 (1.32-2.53)	<0.001
TOLAC attempted	82 (24.7)	526 (3.6)	4.32 (3.25-5.69)	4.48 (3.28-6.13)	<0.001
Gestational age (weeks)					
20-27 weeks	79 (23.8)	5,907 (39.9)	0.47 (0.34-0.65)	1.58 (1.14-2.17)	<0.001
28-36 weeks	162 (48.8)	5685 (38.4)	1.00 (0.77-1.32)		0.973
≥37 weeks	91 (27.4)	3,208 (21.7)	Ref.		
Birth weight (grams)					
<1500 grams	108 (32.5)	8,013 (54.1)	0.38 (0.29-0.51)		<0.001
1500-2499 grams	95 (28.6)	2,791 (18.9)	0.96 (0.71-1.29)		0.779
2500-4000 grams	100 (30.1)	2,820 (19.1)	Ref.		
>4000 grams	15 (4.5)	524 (3.5)	0.81 (0.43-1.41)		0.445



740 | The Association Between Maternal Preeclampsia and the Risk for Offspring Endocrine Morbidity– Sibling Matched Analysis

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10:30 AM - 12:30 PM

Objective: Emerging research suggests maternal preeclampsia may be linked to long-term endocrine morbidities in offspring, but these studies may be biased due to uncontrolled confounding variables. This sibling-matched study investigates the association between maternal preeclampsia during pregnancy and long-term endocrine hospitalizations in offspring, rigorously controlling for potential confounders.

Study Design: A retrospective population-based cohort study was conducted with parous women diagnosed with preeclampsia in one pregnancy. A sibling-matched analysis compared siblings where one was prenatally exposed to maternal preeclampsia, and the other was not. The incidence of hospitalization for endocrine morbidities, including diabetes mellitus, thyroid disorders, and obesity, was compared between siblings, as well as the time to first hospitalization. Multivariable generalized estimation equation (GEE) analysis adjusted for confounding variables.

Results: Among 8544 siblings, with half born after a preeclamptic pregnancy, the Kaplan-Meier survival curve showed no higher cumulative endocrine-related hospitalization rates in the preeclampsia group (log-rank P = 0.363). The crude rates of total endocrine hospitalizations were comparable between the preeclampsia and non-preeclampsia groups (0.6% vs. 0.5%; OR = 0.994; 95% CI 0.992-0.997 P = 1.0). After adjusting for confounders such as maternal age, gestational age, and induction of labor, the adjusted hazard ratio from the GEE model was not significant (adjusted HR = 1.112; 95% CI 0.598-2.068 P = 0.737).

Conclusion: This sibling-controlled cohort study found no significant association between maternal preeclampsia and long-term endocrine-related hospitalization in offspring after adjusting for potential confounders. These findings suggest that prior associations may have been influenced by unmeasured confounding variables. Further research is needed to validate these results and continue exploring the long-term endocrine implications of maternal preeclampsia.

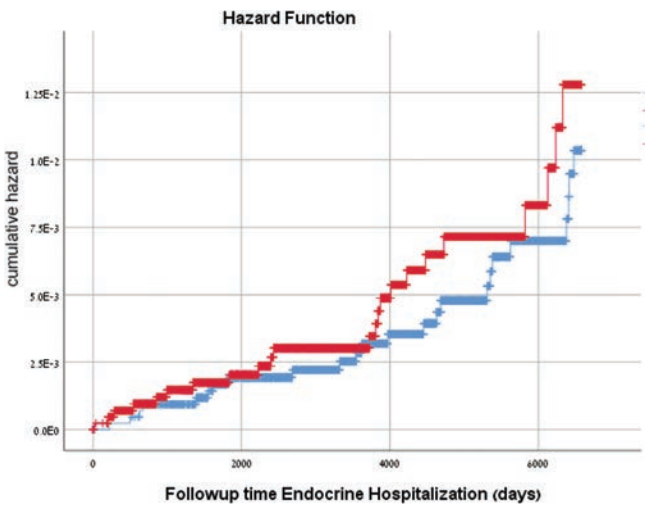

Figure – The association between maternal preeclampsia and endocrine morbidity in the offspring: Generalized estimating equation model and Kaplan-Meier survival curve.

Preeclampsia N= 4272 %(N)	No preeclampsia N= 4272 %(N)	OR; 95% CI	Adjusted HR[a]
0.6% (24)	0.5% (23)	0.99; 0.99; 0.99	1.11; 0.59; 2.06

[a]Adjusted for maternal age, preterm delivery, and time of exposure.

741 | Menopausal Pregnancy–should there be a Ceiling for Advanced Maternal Age?

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10:30 AM - 12:30 PM

Objective: It has been well described that pregnancies in women who are ≥ age 35 carry an increased risk of adverse maternal

and neonatal outcomes. The age at which patients are becoming pregnant through reproductive technology has steadily been increasing to age 50 and beyond, potentially pushing the boundaries of what may be considered a safe age for pregnancy. Because pregnancies in this age range are not well studied, our objective was to describe the rates of adverse pregnancy outcomes of patients age 50 and older and compare them to previously reported rates of outcomes in advanced maternal age (AMA) patients age ≥ 35 and < 50 years.

Study Design: This is a retrospective observation study describing maternal and neonatal outcomes of pregnancy ≥ age 50 from 2019–2024 at our institution. The rates of adverse pregnancy outcomes were compared to previously reported outcome data from large meta-analyses of AMA pregnancy ≥ 35 and < 50 years. Demographic factors, pregnancy and neonatal outcomes were obtained from medical records.

Results: 15 patients were included with a total of 14 live births. Median gestational age at conception was 51 years old, with an age range from 51-65 years. Compared to previously reported outcome data of pregnancies in patients ≥ 35 and < 50 years, there was a statistically significant increase in the rate of hypertensive disorders of pregnancy (26.7% vs. 3.1%; p-value < 0.001) and cesarean delivery (73.3% vs 28.7%; p-value < 0.001). Rates of NICU admission and preterm birth were also increased, but not significantly different among the two groups.

Conclusion: There was an increased risk of some adverse pregnancy in patients age 50 or above compared to AMA patients younger than 50. Due to the rarity of these pregnancies, evidenced-based protocols to optimize pregnancy outcomes in postmenopausal patients have not yet been developed. Patients planning pregnancy at age 50 or later should be strongly cautioned about the increased risk of adverse outcomes, and alternative options should be considered.

Outcome	Age ≥35 and < 50 (proportions based on meta-analyses outcome data)	Age ≥ 50	p-value
Cesarean delivery	0.28	0.73	<0.001
IUFD	0.005	0.133	<0.001
NICU admission	0.05	0.133	0.103
Hypertensive disorder of pregnancy (including preeclampsia and gestational hypertension)	0.31	0.27	<0.001
Preterm birth	0.94	0.200	0.16

742 | Utility of Prenatal Nutrition Consult in Achieving Recommended Weight Gain in Diamniotic Twin Pregnancies

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10:30 AM - 12:30 PM

Objective: To determine if prenatal nutrition counseling affected maternal weight gain and birth outcomes in diamniotic pregnancies

Study Design: A retrospective cohort of diamniotic twin pregnancies cared for by maternal-fetal medicine specialists at one academic institution from January 2021 to December 2022 was collected. Patients were grouped based on whether they received a nutrition consult or not. Institute of Medicine (IOM) goals for twin pregnancies were used to determine appropriate weight gain based on pre-gravid BMI. Comparisons were performed with Chi-square, t-tests, and multivariable logistic regression adjusted for characteristics that were significantly associated with the outcome.

Results: Our cohort included 109 patients with and 70 without a nutrition consult. The rate of monochorionicity was significantly higher in the nutrition group at 49 versus 13% (p< 0.001). The mean pre-gravid BMI was significantly lower in the nutrition group (26 vs. 28.9, p = 0.006). The groups were otherwise similar (Table 1).

Nutrition consult was associated with a significantly higher mean total weight gain (17.9 vs. 13.4 kg, p< 0.001) and a significantly higher rate of meeting IOM goals (59 vs. 29%, p = 0.003). Mean gestational age at delivery was 5.6 days later in the nutrition group (p = 0.04). When adjusted for age, race, parity, marital status, pregravid BMI, and chorionicity, those who did not receive a nutrition consult had over doubled odds of delivery < 34 weeks (aOR 2.65, 95% CI 1.12-6.23) and of a very low birthweight neonate (aOR 2.34, 95% CI 1.19-4.62) (Table 2).

Conclusion: Prenatal nutrition consult in diamniotic twin pregnancies resulted in a significantly higher proportion of patients meeting IOM weight gain goals, later gestational age at delivery with significantly fewer births before 34 weeks, and lower risk of very low birthweight neonates. This supports the importance of prenatal nutrition consult for twin pregnancies.

Table 1. Demographics and Clinical Data	**Overall (n=179)**	**Nutrition group (n=109)**	**Nonreferral group (n=70)**	p-value
Maternal Characteristics:				
Mean age (years)	34.5 (4.6)	34.3 (4.2)	34.7 (5.1)	0.531
Nulliparous	96 (53.6)	63 (57.8)	33 (47.1)	0.163
Race				
White	121 (67.6)	69 (63.3)	52 (74.3)	
Black	21 (11.7)	13 (11.9)	8 (11.4)	
Asian	15 (8.4)	13 (11.9)	2 (2.9)	
Other/unavailable/declined	22 (12.3)	14 (12.8)	8 (11.4)	0.165
Hispanic ethnicity	23 (12.9)	10 (9.3)	13 (18.6)	0.070
Married	133 (74.3)	79 (72.5)	54 (77.1)	0.486
Smoker (former or current)	23 (12.9)	15 (13.8)	8 (11.4)	0.649
Pre-gravid BMI	27.1 (6.8)	26.0 (6.5)	28.9 (7.0)	**0.006**
Chronic hypertension	6 (3.4)	2 (1.8)	4 (5.7)	0.211
Hypertensive disorder of pregnancy	23 (12.9)	11 (10.1)	12 (17.1)	0.169
Pre-existing diabetes	6 (3.4)	3 (2.8)	3 (4.3)	0.680
Gestational diabetes	15 (8.4)	10 (9.2)	5 (7.1)	0.632
History of preterm birth	7 (3.9)	2 (1.8)	5 (7.1)	0.112
Neonatal Characteristics:				
Twin type:				
Dichorionic, diamniotic	117 (65.4)	60 (55.1)	57 (81.4)	**<0.001**
Monochorionic, diamniotic	62 (34.6)	49 (45.0)	13 (18.6)	

Table 2. Pregnancy Outcomes	Overall (n=179)	Nutrition group (n=109)	Nonreferral group (n=70)	p-value
Mean total weight gain (kg)	16.1 (8.1)	17.9 (7.6)	13.4 (8.3)	**<0.001**
% meeting IOM goals	88 (57.1)	59 (64.1)	29 (46.8)	**0.003**
Mean birthweight of larger twin (g)	2417.0 (523.1)	2445.1 (478.1)	2373.3 (587.3)	0.371
Mean birthweight of smaller twin (g)	2132.0 (537.5)	2162.2 (495.6)	2085.1 (597.8)	0.351
Mean GA at delivery (weeks; mean, SD)	35.8 (3.1)	35.6 (2.1)	34.8 (3.1)	**0.043**
Delivered at <34 weeks gestation*#	36 (20.1)	OR, 95% CI 2.33, 1.11-4.88 **aOR, 95% CI 2.65, 1.12-6.23**		
Spontaneous preterm birth*#	53 (29.6)	OR, 95% CI 1.29, 0.67-2.47 aOR, 95% CI 1.32, 0.65-2.67		
Unexpected NICU admission*#	21 (11.7)	**OR, 95% CI 0.23, 0.06-0.80** aOR, 95% CI 0.30, 0.07-1.25		
Any low birthweight (<2500g) neonate**#	133 (74.3)	OR, 95% CI 1.0, 0.50-1.99 aOR, 95% CI 1.55, 0.74-3.28		
Any very low birthweight (<2000g) neonate**#	68 (38.0)	**OR, 95% CI 1.89, 1.02-3.50** **aOR, 95% CI 2.34, 1.19-4.62**		
Any extremely low birthweight (<1500g) neonate**#	21 (11.7)	OR, 95% CI 1.48, 0.60-3.71 aOR, 95% CI 1.91, 0.69-5.27		

#Reference: non-intervention group
Adjusted for age, race, parity, marital status, pregravid BMI, and chorionicity
***Adjusted for parity, pregravid BMI, chorionicity*

743 | Association Between Adverse Pregnancy Outcomes and Awareness of Cardiovascular Risk Factors: a Numom2b-HHS Secondary Analysis

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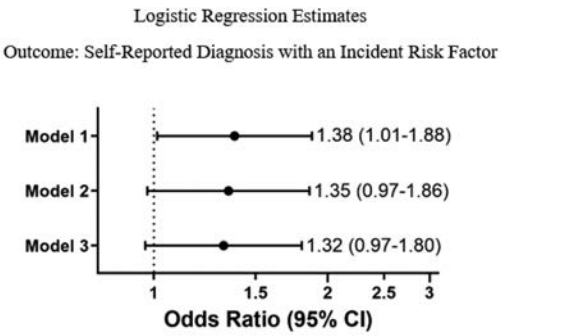
10:30 AM - 12:30 PM

Objective: Adverse pregnancy outcomes (APOs) complicate up to 20% of pregnancies and are associated with increased risk of subsequent cardiovascular (CV) disease. We aimed to determine whether having had an APO is associated with greater patient awareness of their own CV risk factors 2-7 years postpartum.
Study Design: This is a secondary analysis of the NuMoM2b-HHS study. We included participants with a CV risk factor (hypertension [HTN], diabetes/prediabetes [DM], and/or dyslipidemia) identified 2-7 years after index pregnancy (Table 1). We excluded patients with a CV risk factor during the index pregnancy; a subsequent pregnancy; and patients who did not fast for their blood draw. Exposure was an APO in the index pregnancy: hypertensive disorders of pregnancy, gestational DM, preterm delivery, small-for-gestational age, and stillbirth. The primary outcome is a composite of self-awareness of HTN, DM, or dyslipidemia diagnoses after the index pregnancy utilizing patient questionnaire data. Using logistic regression, we estimated the association between exposure and outcome using three models (unadjusted, fully adjusted, and parsimonious).
Results: Among 980 included participants with CV risk factors identified 2-7 years after the index pregnancy, 77% had only one risk factor with the most common being HTN (34%). APO was present in 35% of patients with the most common being hypertensive disorders of pregnancy. The primary outcome (awareness of a CV risk factor) was present in 22% of women (220/980) - 26% of women with an APO versus 20% without. Prior to adjustment, odds ratio (OR) of APO history and awareness of later CV risk factors was 1.379 (95% CI 1.013-1.877). After full adjustment and the use of a parsimonious model, there was no significant association between APO history and awareness of later CV risk factors with an OR of 1.346 (95% CI 0.974-1.859) and 1.313 (95% CI of 0.960-1.797), respectively (Figure 1).
Conclusion: History of APO was not associated with awareness of CV risk factors 2-7 years later. Women with CV risk factors were infrequently aware of their diagnosis (22%).

Table 1. Comparisons at the time of HHS visit 1 (2-7 years postpartum)

Characteristic	Value	APO	No APO	P
		n=344	n=636	
Years since delivery	Mean ± SD	2.58 ± 0.9	Mean ± SD	0.887
Age in years at Visit 5	Mean ± SD	30.8 ± 6.3	30.4 ± 5.4	0.273
Race/ethnicity	Asian	7 (2.0)	18 (2.8)	0.051
	Hispanic	55 (16.0)	105 (16.5)	
	Non-Hispanic Black	67 (19.5)	79 (12.4)	
	Non-Hispanic White	197 (57.3)	403 (63.4)	
	Other	18 (5.2)	31 (4.9)	
Post-Partum Weight Retention	Mean ± SD	17.6 ± 24.2	14.7 ± 27.1	0.101
	Non-optimal (>|10| lbs pp wt)	208 (60.6)	351 (55.8)	0.145
BMI at Visit 5	Mean ± SD	30.5 ± 8.1	28.0 ± 7.7	<.001
	<25 (normal weight)	104 (30.3)	280 (44.2)	<.001
	25 - <30 (overweight)	82 (23.9)	163 (25.8)	
	>=30 (obese)	157 (45.8)	190 (30.0)	
Education status attained at v5	Less than 4y college degree	193 (56.1)	320 (50.3)	0.083
Tobacco	previously	60 (17.4)	117 (18.4)	0.711
	currently	55 (16.0)	64 (10.1)	0.007
Ever government insurance	Yes (at either V1 or V5)	135 (39.2)	228 (35.8)	0.294
Testing	Cholesterol test since index pregnancy	120 (34.9)	228 (35.8)	0.763
	Glucose test other than during pregnancy	49 (14.3)	65 (10.3)	0.06
Is there a place you usually go when sick / need health advice?	Yes, there is one place only	251 (73.2)	451 (71.6)	0.808
	Yes, there is more than one place	59 (17.2)	119 (18.9)	
	No, there is no place	33 (9.6)	60 (9.5)	
During the past 24 months, have you seen or talked with	a doctor who specializes in women's health	278 (81.0)	559 (87.9)	0.004
	a general doctor who treats a variety of illnesses?	260 (75.6)	442 (69.6)	0.048

Values reported as frequency and percent unless otherwise noted



Model 1: Unadjusted
Model 2: Adjusted for: insurance, age at visit 5, BMI at visit 5, education at visit 5, postpartum weight retention, time from index pregnancy to HHS visit, and if they were seen by a 'general doctor who treats a variety of illnesses'
Model 3: Parsimonious model via backwards selection (APO history forced to remain in) adjusted for age at visit 2-7 years after index pregnancy and seen by a 'general doctor who treats a variety of illnesses'

744 | Can Doulas Help Improve Equity in the Operating Room?: Clinician Perspectives

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Care, Boston, MA; [7]Department of Obstetrics and Gynecology, Beth Israel Deaconess Medical Center, Boston, MA

10:30 AM - 12:30 PM

Objective: We aimed to describe obstetric clinical care team members' perspectives on doulas' impact on equity for birthing persons in the operating room.

Study Design: We used in-depth, semi-structured interviews with questions based on the Consolidated Framework for Implementation Research. Using criterion-I and stratified random sampling, OB/GYNs, labor and delivery nurses, and anesthesiologists were recruited via fliers and emails. Rapid Qualitative Analysis was used for data coding and analysis.

Results: Twenty-seven clinicians were interviewed: seven anesthesiologists, ten OB/GYNs, and ten labor and delivery nurses. Of these, three quarters expressed a positive view on the impact of doulas on equity, describing benefit from an additional voice advocating for the patient and their goals. Many saw particular benefit for non-English speaking patients, for whom a language-concordant doula may significantly improve communication and trust. Participants also often mentioned benefits for their patients of color, who they noted sometimes have distrust in the medical system or may not see themselves reflected in their care team. Participants also observed that doulas improved equity by "translating" across levels of health literacy to help patients understand and accept recommendations, such as the need for cesarean delivery. Clinicians who were uncertain about doulas' effect on equity cited concerns about possible inequities in the implementation of doula support (cost of doula care, variation in doula experience), while the two clinicians who endorsed a negative view expressed doubt that doulas improve equity, one of whom specifically expressed skepticism about the benefit of a race-concordant doula.

Conclusion: Most clinicians view doulas as beneficial in improving equity for patients undergoing cesarean delivery. These benefits mirror those of prior qualitative work exploring general benefits of doulas for equity, specifically aligning with themes of patient agency, knowledge, connectedness, and respect. Further work should examine impact of doulas on equitable experiences and outcomes in cesarean deliveries.

Overall View	Theme	Example Quote(s)
Positive	Language Concordance	"When people speak different languages, I do see a change, whether it be conversations that are happening behind the curtain, whether it be the noise level in an operating room or even a delivery room, whether it be the care provided... [So when patients have a doula who speaks their language], they're their support, they're this interpreter, they're helping us out and they're providing excellent care for that patient"
	Racial/Ethnic Concordance	"Especially patients of color, are in an environment where they don't see anyone that looks like them, so having a concordant doula can help." "[There are things with] concordance and race that I think [are] really empowering... [the doula's] physical presence can be symbolic to the patient in a really special way, and I think that just gets amplified in the OR."
	Advocacy and Translation	A doula "can be a facilitator...explaining to the patient what it is what I'm asking and then advocating for the patient." "I think it's important...having somebody to advocate for them and possibly either kind of translate down to their health literacy level or advocate for the provider to do so." "Doulas can be extremely helpful in advocating for the patient in some situations. Especially patients who don't feel like they can advocate for themselves."
Neutral	Implementation of Doula Support	"I don't really know the finances of hiring a doula...if there are any racial or ethnic disparities in terms of utilization of doulas... but improving access to anyone who wants a doula, I think, can ultimately improve... people's birth experiences." "I sometimes have a hard time with the way we like operationalize it right now, because I've seen plenty of white patients who have doulas... they paid for them privately and sometimes they're there for longer...it's just a very different experience than the patients who…are getting a volunteer doula who doesn't know them [and] was often... less well-trained."
Negative	Racial/Ethnic Concordance	"Some would say that a Black patient may feel better with a Black doula. I [would] personally not necessarily agree with that..."

745 | Peripartum Hysterectomy: evolving trends over 50 years in a single European city

Elizabeth Tunney[1]; Karen Flood[2]; Ronan Daly[1]; Shahad Al-Tikriti[3]; Carmen Regan[1]; Declan Keane[4]; Mike P. Geary[5]; Fergal D. Malone[6]

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10:30 AM - 12:30 PM

Objective: The objective of this study was to determine trends in incidence of, and indications for, peripartum hysterectomy (PH) over 50 years at a single European city.

Study Design: A retrospective cohort study was performed between 1966 and 2022 of PH cases performed in the three large tertiary obstetric hospitals of a single European city. After identifying all cases, data were collected from the published clinical reports of all three hospitals.

Results: During the 56 years, there were 1,332,115 deliveries, with 596 PH performed (0.5/1,000 deliveries). When comparing study periods, PH incidence in the most recent seven year period 2016-2022 (0.74/1,000 deliveries) has returned to 1966-1975 levels (0.85/1,000 deliveries) despite transient reduced incidence between 1986-2006 (0.2/1,000 deliveries). The indications for PH have changed significantly over the years. While uterine rupture was the main indication for PH in early years, it is now rare decreasing from 41% to 1% ($p< 0.001$). Placenta accreta spectrum (PAS) has significantly overtaken other indications for PH from 5% to 32% ($p< 0.001$). The focus towards antenatal diagnosis of PAS and optimizing surgical management is reflected in our study, with a notable increase in rates of elective PH from 14% to 26% ($p< 0.001$). A strong correlation was observed between the cesarean delivery rate (6% - 37%) and the prevalence of peripartum hysterectomy in this large obstetric population ($p< 0.001$).

Conclusion: The influence of increased cesarean deliveries internationally is reflected in the increasing incidence of PH, largely for PAS cases and the increased role of elective PH. Our data serve to inform how emergency obstetric practice has evolved over five decades and in turn may be helpful in the focus on training required for PH in the future.

Table 1 Incidence of Peripartum Hysterectomy

Years Analyzed	Total Deliveries	Peripartum Hysterectomy performed	Incidence rate
1966-1975	193,413	n=165	0.85/1000
1976-1985	232,325	n=104	0.44/1000
1986-1995	209,969	n = 40	0.20/1000
1996-2005	272,468	n = 49	0.20/1000
2006-2015	257,188	n =115	0.44/1000
2016-2022	166,752	n =123	0.74/1000
1966 - 2022	1,332,115	n=596	0.50/1000

Table 2 Known Indications for Peripartum Hysterectomy (PH)

Indications for Peripartum Hysterectomy	Cases of PH with known indication	Uterine Rupture (%)	Major Obstetric Hemorrage (%)	Placenta Accreta (%)	Elective (%)	Malignancy (%)	Placenta Praevia (%)
1966-1975	148	61 (41)	36 (24)	8 (5)	21 (14)	2 (1)	9 (6)
1976-1985	98	25 (26)	47 (48)	8 (8)	4 (4)	1 (1)	6 (6)
1986-1995	31	1 (3)	13 (42)	7 (23)	0	5 (16)	4 (13)
1996-2005	43	4 (9)	13 (30)	20 (47)	0	0	5 (12)
2006-2015	115	5 (4)	38 (33)	60 (52)	5 (4)	3 (3)	9 (8)
2016-2022	123	1 (1)	37 (30)	48 (39)	39 (32)	1 (1)	0

746 | Optimal Aspirin Dose in Preeclampsia Prevention: A Retrospective Comparison of 81 mg and 162 mg

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10:30 AM - 12:30 PM

Objective: There is a lack of consensus regarding the optimal dosing for aspirin (ASA) in preeclampsia prevention, with recommendations ranging from 75 to 162 mg daily. This practice reflects evidence suggesting that dosages above 100 mg are most effective at reducing preeclampsia risk. Our objective was to compare the incidence of preeclampsia in patients taking 81 mg versus 162 mg ASA daily using national data.

Study Design: A retrospective cohort study was conducted using the Cosmos Epic database. Data from pregnancies between June 2021 and July 2024 in which ASA was prescribed were pooled based on ICD-10 codes. Baseline clinical characteristics and risk factors were compared between groups. Two-sided chi-square tests and odds ratios were used for statistical analysis.

Results: A total of 328,310 pregnant patients taking ASA were identified—81.2% in the 81 mg group and 18.8% in the 162 mg group. The 162 mg ASA group had significantly higher rates of BMI ≥30, multiple gestation, pre-gestational diabetes, antiphospholipid syndrome, chronic kidney disease, and chronic hypertension (Table 1). Obstetric outcomes were poorer in this group, with increased rates of cesarean delivery and birth weight < 2500 g. More patients in the 162 mg group developed preeclampsia compared with the 81 mg group (OR 1.31, 95% CI 1.29-1.35). This difference remained significant despite accounting for the above-mentioned confounding variables (aOR 1.11, 95% CI 1.11-1.13; Table 2).

Conclusion: In this national dataset, a higher daily dose of aspirin (162 mg) was not more effective than a lower dose (81 mg) in reducing the risk of preeclampsia, despite correcting for differences in risk factors that may have prompted clinicians to use a higher dose. More research is needed to confirm these findings and optimize aspirin dosing guidelines for preeclampsia prevention.

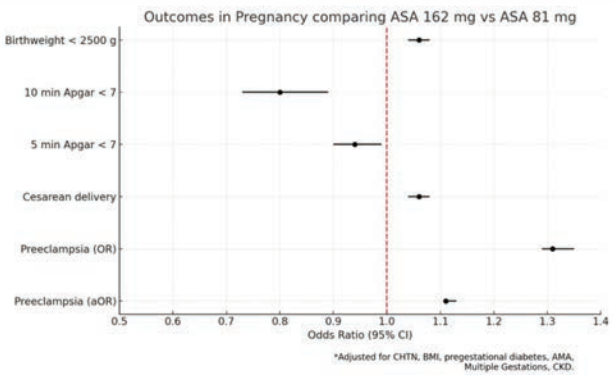
Table 1: Baseline Characteristics

Characteristics	Aspirin 81 mg	Aspirin 162 mg	p-value	OR	95% CI
Advanced maternal age (AMA)	74151/264637 (28.0%)	16073/61034 (26.3%)	<0.0001	0.92	0.90-0.94
BMI >30	115945/210820 (55.0%)	32775/56027 (58.5%)	<0.0001	1.15	1.13-1.18
In vitro fertilization (IVF)	6156/266727 (2.3%)	1540/61583 (2.5%)	0.004	1.09	1.03-1.15
Multiple gestation	19838/266727 (7.4%)	5308/61583 (8.6%)	<0.0001	1.17	1.14-1.21
Pregestational diabetes	49292/266727 (18.5%)	13764/61583 (22.4%)	<0.0001	1.27	1.24-1.30
Chronic kidney disease (CKD)	1747/266727 (0.7%)	539/61583 (0.9%)	<0.0001	1.34	1.22-1.48
Chronic hypertension (CHTN)	36887/266727 (13.8%)	9967/61583 (16.2%)	<0.0001	1.20	1.18-1.23

Table 2: Outcomes

Primary Outcome	Aspirin 81 mg	Aspirin 162 mg	OR	95% CI	*aOR	95% CI
Preeclampsia	37650/266727 (14.1%)	10984/61583 (17.8%)	1.31	1.29-1.35	1.11	1.11-1.13
Secondary Outcomes	**Aspirin 81 mg**	**Aspirin 162 mg**	**OR**	**95% CI**	**p-value**	
Cesarean delivery	115394/266727 (43.3%)	27465/61583 (44.6%)	1.06	1.04-1.08	<0.0001	
5 min Apgar <7	9000/264026 (3.4%)	1961/60811 (3.2%)	0.94	0.90-0.99	0.02	
10 min Apgar <7	2221/18243 (12.2%)	527/5272 (10%)	0.80	0.73-0.89	<0.0001	
Birthweight <2500 g	45576/266246 (17.1%)	11038/61472 (18.0%)	1.06	1.04-1.08	<0.0001	

*Adjusted for CHTN, BMI, pregestational diabetes, AMA, Multiple Gestations, CKD



747 | Impact of Early Zygosity Determination via NIPT on Maternal and Neonatal Outcomes in Twin Pregnancies

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10:30 AM - 12:30 PM

Objective: Monochorionic (MC) twins have significant morbidity compared with dichorionic twins (DC) due to their risk for unequal placental sharing. Non-invasive prenatal testing (NIPT) can now determine zygosity, which often informs chorionicity. This study examines pregnancy outcomes in monozygous (MZ) and dizygous (DZ) pregnancies and the correlation between zygosity and chorionicity.

Study Design: A retrospective cohort study of twin pregnancies with NIPT zygosity results at two tertiary care centers from January 2020 to 2024 was conducted. Demographics, pregnancy complications, NIPT results, fetal fractions, placental pathology, and delivery outcomes were collected. DZ twins were classified

as DC while chorionicity within the MZ group was determined by placental pathology. Statistical tests such as Chi-square, Fisher exact, Wilcoxon rank sum test, or logistical regression were used as appropriate.

Results: In 177 twin pregnancies with NIPT zygosity testing, 66.3% were DZ and 33.7% MZ. Baseline characteristics did not differ among groups except for race and gestational age. After adjusting for these variables, a subgroup analysis was performed to compare MZ DC and MZ MC to DC subtypes. Within the MZ group, 8 (17%) were DC and 38 (82.6%) were MC. MZ MC twins were significantly more likely to experience neonatal morbidities such as hypoglycemia and hyperbilirubinemia requiring phototherapy, NICU admission, and additional respiratory support (Figure & Table). The MZ DC group was not more likely to experience these outcomes. Composite neonatal morbidity was also more common in the MZ MC group (aOR 6.01 [1.89-10.12], p = 0.002). Maternal outcomes did not differ between groups.

Conclusion: The early differentiation of chorionicity and zygosity allows for the implementation of tailored care strategies to enhance outcomes. Our study shows that MZ MC twins have significantly higher neonatal morbidity, thus underscoring the necessity for vigilant monitoring and intervention.

Outcome	Dizygotic (N=116)	Monozygotic					
		Dichorionic (N=8)			Monochorionic (N=38)		
		N (%)	OR [95%CI]	aOR	N (%)	OR [95%CI]	aOR
Maternal morbidity composite*	25 (21.6)	1 (12.5)	0.52 [0.01-4.39]	0.70 [0.08-6.29]	3 (7.9)	0.32 [0.06-1.13]	0.31 [0.08-1.17]
Hypoglycemia	39 (33.6)	4 (50)	1.97 [0.34-11.14]	3.97 [0.72-21.74]	23 (60.5)	3.03 [1.33-6.95]	4.16 [1.79-9.65]
Phototherapy	26 (22.4)	2 (25)	1.15 [0.11-6.05]	2.88 [0.33-25.13]	23 (60.5)	5.31 [2.26-12.55]	8.09 [2.94-22.27]
NICU Admission	51 (44.0)	3 (37.5)	0.76 [0.11-4.15]	1.21 [0.20-7.24]	29 (76.3)	4.11 [1.69-10.68]	4.63 [1.82-11.79]
Respiratory support	39 (33.6)	1 (12.5)	0.28 [0.01-2.34]	0.34 [0.04-3.24]	21 (55.2)	2.44 [1.08-5.52]	2.88 [1.24-6.72]
Neonatal morbidity composite^	70 (60.3)	4 (50)	0.66 [0.12-3.73]	1.04 [0.21-5.17]	32 (84.2)	3.50 [1.30-10.99]	6.01 [1.89-10.12]

*PPH, transfusion, retained POC, endometritis, sepsis, ICU admission, wound infection, hospital readmission <6 weeks postpartum, VTE, death

^Sepsis, meningitis, hypoglycemia, surfactant use, RDS, meconium aspiration, necrotizing enterocolitis, asphyxia, seizure, intraventricular hemorrhage, periventricular leukomalacia, neonatal demise

748 | The Effect of Glucose Challenge and Oral Glucose Tolerance Tests Timing on Tests' Results

Enav Yefet[1]; Zohar Nachum[2]
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10:30 AM - 12:30 PM

Objective: The usual time for performing glucose challenge test (GCT) and oral glucose tolerance test (OGTT) is between 24-28 gestational weeks. After which, it is not known whether GCT or OGTT act in the same manner.

In the present study we compared the results of GCT and OGTT when the tests were done between 24-28 gestational weeks or later.

Study Design: A population-based retrospective cohort study of women who performed GCT between June 2013 and December 2021. In our institution GCT is recommended even after 28.6 weeks to women who did not perform it before. Women with large for gestational age fetus or polyhydramnios were excluded, since OGTT is performed in those cases. The rates of abnormal GCT (≥140 mg%) and gestational diabetes mellitus (GDM) were compared. GDM was defined as GCT≥200 mg% or at least 2 abnormal OGTT values according to the Carpenter and Coustan criteria.

Results: Data were collected for 20,485 women with GCT between 24-28.6 weeks and 1,806 with GCT thereafter. GCT results for every gestational week are presented in the figure. The rate of abnormal GCT and GDM were similar between the groups (abnormal GCT: 3797 (18.5%) versus 323 (17.9%), respectively; P = 0.49, and GDM: 1063 (5.2%) versus 86 (4.8%), respectively; P = 0.43)

Conclusion: In low risk women, GCT values and the rate of GDM are similar from 24 weeks and thereafter.

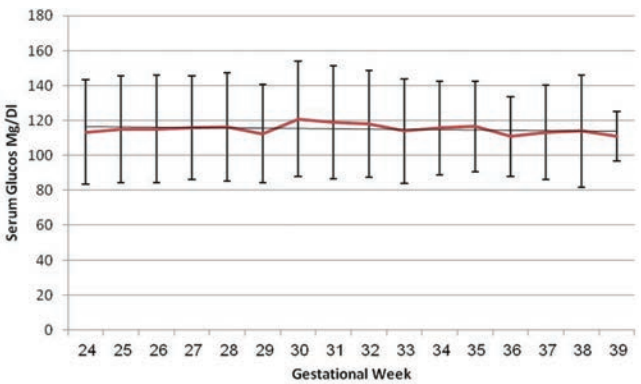

Figure. Mean serum glucose ± SD following GCT from 24 gestational weeks and thereafter

749 | Time from Decision to Execution of Manual Exploration of the Uterus and Postpartum Hemoglobin Drop

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10:30 AM - 12:30 PM

Objective: Manual exploration of the uterus is performed in women with postpartum hemorrhage to remove blood clots, retained placenta and to repair obstetrical tears. There is very limited data to evaluate the time from when the decision of conducting the manual exploration is made to the actual procedure to avoid complications.

Study Design: A retrospective cohort study conducted between 2013 and 2019. The data was collected from women in the maternity ward who underwent a manual exploration of the uterus after a vaginal birth. A comparison was made between women in whom the time from making the decision of performing manual exploration to the time of the procedure was more than 20 minutes (>20 minutes cohort) versus up to 20 minutes (≤20 minutes cohort). The primary outcome was the rate of women with hemoglobin (Hb) decrease of at least 3 g/dL after delivery.

Results: Among 696 women who were analyzed, 224 and 472 women underwent manual exploration >20 minutes and ≤20 minutes, respectively. Characteristics and outcomes are presented in tables 1 and 2. Mean time from decision to performing manual exploration was 45±54.8 and 9.5±5.6 minutes in the >20 minutes and ≤20 minutes cohorts, respectively (P< .0001). Mean Hb

decrease was greater in the >20 minutes cohort versus ≤20 minutes cohort (3.4 ±1.7 gr\dl versus 1.8±3.0 gr\dl, respectively; P = 0.02). The rate of Hb decrease≥3 g/dL was 59% and 50% in the >20 minutes and ≤20 minutes cohorts, respectively (P = 0.06). No other significant differences were observed. The cutoff for performing manual exploration to predict Hb decrease of at least 3 g/dL was 19 minutes (47% sensitivity, 54% specificity)

Conclusion: While it seems that the medical staff is skilled in managing the optimal time to perform manual exploration of the uterus, the time from decision to procedure should be up to 20 minutes in order to avoid excessive blood loss.

Table 1. Patients' characteristics

	20 minutes or less from decision to manual exploration of the uterus N=472	more than 20 minutes from decision to to manual exploration of the uterus N=224	P-value
Age	28.3 (5.3) [27,24-32]	29.2 (5.4) [28,25-33]	0.09
BMI	24.5 (5.3) [23.3,20.8-27.6]	24 (5) [23.2,20.5-26.2]	0.43
Smoking	8 (4%)	9 (5%)	0.71
Vaginal delivery	236 (96%)	209 (93%)	0.29
Vacum delivery	11 (4%)	15 (7%)	0.29
Retained placenta	140 (57%)	108 (48%)	0.07
PPH	107 (43%)	116 (52%)	0.07

Values are presented as mean (standard deviation)[median, IQR] or number (percent)
Abbreviations: BMI, body mass index; PPH, postpartum hemorrhage

Table 2. Effect of time from decision to manual exploration of the uterus on post-partum outcomes

	20 minutes or less from decision to manual exploration of the uterus N=472	more than 20 minutes from decision to revision N=224	P value
Number of minutes from decision until revision	9.5 (5.6) [10,5-14]	45 (54.8) [34,25-47]	<.0001
Decrease of Hb from baseline	3 (1.8) [3,1.7-4.2]	3.4 (1.7) [3.5,2-4.7]	0.02
Hb≤9.5 g/dL	166 (67%)	165 (74%)	0.13
Hb≤10 g/dL	186 (75%)	175 (78%)	0.47
Hb≤8 g/dL	88 (36%)	94 (42%)	0.16
Hb≤7 g/dL	36 (15%)	32 (14%)	0.93
Decrease of Hb by 2 g/dl	173 (70%)	169 (75%)	0.19
Decrease of Hb HB by 3 g/dl	124 (50%)	132 (59%)	0.06
Endometritis	8 (3%)	4 (2%)	0.32
Postpartum fever	13 (5%)	6 (3%)	0.15
Postpartum blood transfusion	43 (17%)	43 (19%)	0.61

Values are presented as mean (standard deviation)[median, IQR] or number (percent)
Abbreviations: Hb, hemoglobin

750 | Gestational Diabetes Mellitus in Pregnancies with Suspected Growth Restriction: Blessing or Curse?

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10:30 AM - 12:30 PM

Objective: Fetal growth restriction (FGR) is a condition that occurs when a fetus fails to achieve its growth potential. Gestational diabetes mellitus (GDM) is another common complication during pregnancy associated with accelerated fetal growth. This study aims to evaluate the impact of GDM on perinatal outcomes in pregnancies with suspected fetal growth impermanent.

Study Design: This retrospective cohort study enrolled singleton pregnancies without fetal genetic or structural abnormalities and EFW and/or AC below the 10th centile for gestational age on the last sonographic assessment within 14 days from delivery. The study compared pregnancies with GDM to those without GDM. The primary outcome of interest was the o ccurrence of composite adverse perinatal outcomes. Multivariable logistic regressions were performed, adjusting for relevant covariates.

Results: A total of 1,583 patients were included in the study, with 234 (14.8%) diagnosed with GDM, while 1,349 (85.2%) did not . Patients with GDM were found to be older, had a higher body weight, and had higher rates of hypertensive disorders compared to those without GDM. Patients with GDM experienced longer pregnancies, with a difference of approximately one week, but there were no significant differences in the rates o f preterm labor (< 37 weeks). The rates of labor induction and mode of delivery were comparable between the GDM and non-GDM groups. Neonates born to mothers with GDM had higher birthweight and lower adverse perinatal outcome rates than neonates of normoglycemic pregnancies (45.2% vs. 52.2%; p = 0.04). In the multivariate analysis, which controlled for maternal age, parity, oligohydramnios, hypertensive disorders of pregnancy, gestational age at delivery, and birthweight, it was found that GDM was significantly and independently associated with lower adverse perinatal outcome (adjusted odds ratio = 0.65, 95% confidence interval 0.47-0.9) (Table).

Conclusion: GDM significantly impacts perinatal outcomes in pregnancies with suspected fetal growth impairment and can potentially improve the overall outcome in such cases.

Association between GDM in pregnancies with suspected fetal growth impairment and adverse perinatal outcomes – a multivariate analysis.

	Crude odds ratio (95% CI)	Adjusted odds ratio (95% CI) *
Composite adverse outcome	0.75 (0.57-1)	0.65 (0.47-0.9)
Antepartum fetal death	N/A	N/A
Cesarean delivery for fetal distress	1.18 (0.83-1.68)	1.17 (0.8-1.71)
5-minute Apgar < 7	0.59 (0.35-1.01)	0.67 (0.36-1.24)
Arterial cord pH < 7.1	0.98 (0.51-1.9)	0.66 (0.31-1.42)
Need for ventilation	1.08 (0.8-1.46)	1.1 (0.77-1.56)
Respiratory distress syndrome	0.8 (0.53-1.19)	0.75 (0.38-1.46)
Necrotizing enterocolitis	1.26 (0.27-5.86)	2.03 (0.38-10.69)
Sepsis	0.35 (0.11-1.14)	0.27 (0.06-1.17)
Intracranial hemorrhage	N/A	N/A
Prolong length of stay at NICU	0.78 (0.58-1.06)	0.65 (0.45-0.94)
Neonatal Death	N/A	N/A

*Adjusted for maternal age, parity, oligohydramnios, hypertensive disorders of pregnancy, gestational age at delivery, and birthweight.
AC – abdominal circumference; EFW – estimated fetal weight; PI – pulsatility index; UA – umbilical artery; NICU – neonatal intensive care unit

751 | Addressing Medical Mistrust Among Black Birthing People Through Community-Based Doulas

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10:30 AM - 12:30 PM

Objective: Structural and systematic barriers within healthcare systems are associated with medical mistrust between Black birthing people and healthcare providers. This study explored how partnership with community-based doulas can address medical mistrust between Black birthing people and obstetric healthcare teams.

Study Design: A prospective qualitative study that included focus groups and in-depth interviews using a semi-structured interview guide with OBGYNs (n = 7), Maternal-Fetal Medicine

specialists (n = 2), certified nurse midwives (n = 2), a perinatal psychologist (n = 1), a prenatal care coordinator (n = 1), clinical and inpatient nurse supervisors (n = 3), birth center nurses (n = 2), an OB-Anesthesiologist (n = 1), and community-based doulas (n = 11). Interviews and focus groups were recorded, transcribed verbatim, coded using MAXQDA software, and analyzed using thematic content analysis to understand how community-based doulas can contribute to improving patient-clinician relationships specifically for Black birthing people.

Results: Analysis yielded the following themes: 1) Doulas have a unique opportunity to sustain patient trust through continuous social support and continuity of care; 2) Doulas serve as liaisons and advocates between Black birthing people and healthcare teams to assist with navigating conflict and facilitating communication; and 3) Doulas of color provide a unique perspective and shared experience that can foster trust and understanding for both patients and healthcare teams. As a result, patient-clinician communication can be improved by community-based doulas facilitating bidirectional understanding to reduce healthcare mistrust.

Conclusion: Our results highlight the vital role of community-based doulas in mitigating medical mistrust between healthcare professionals and Black birthing people. Data obtained from this qualitative analysis will inform the design of a collaborative community-based doula-clinician model focused on improved communication and meaningful engagement to foster trust.

752 | Pregnancy Health Information-Seeking Behaviors and Knowledge of Pregnancy Risks among Male Partners of Pregnant Patients

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10:30 AM - 12:30 PM

Objective: Partners play an active role in supporting pregnant patients with prenatal and perinatal decisions, yet there are few studies on this population. This study examines the information seeking behavior and pregnancy risk knowledge of male partners of pregnant patients.

Study Design: An IRB-approved 45-question survey was administered in 2017 to male partners of pregnant patients at Harbor-UCLA Medical Center prenatal clinics. Men were interviewed one-on-one in private areas of the clinic. Statistical significance was determined using a chi-squared test with $p < 0.05$.

Results: 127 male partners completed the survey. 86.4% of male partners could not name one of the major pregnancy-related health risks in an open-ended question format. When asked about seven specific pregnancy-related health risks from a multiple-choice list, only 5.6% of male partners were able to identify all of them correctly. Noticeably, 41.6% were able to correctly identify the increased risk of the two most common complications: diabetes and hypertension. These findings were not associated with higher education ($P = 0.5055$) or fathering a prior pregnancy ($P = 0.4831$). When asked whether they would like more education about pregnancy, 82.1% responded yes, 40.2% of whom wanted the information from their partner's healthcare provider. Male partners who were not interested in learning more about pregnancy had a significantly lower score of correctly reporting the seven specific pregnancy risks ($P = 0.0003$).

Conclusion: Our study highlights that a large percentage of male partners of pregnant women are unaware of the health risks associated with pregnancy. Additionally, male partners who are less information-seeking about pregnancy also have lower knowledge levels of pregnancy risks, underscoring the need for improved pregnancy education.

753 | Conversion to Telehealth During COVID-19 and Depression Symptom Response in a Perinatal Collaborative Care Model

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10:30 AM - 12:30 PM

Objective: We aimed to assess the association between conversion to telehealth and depression symptom response in a perinatal collaborative care model-based treatment (PCCM).

Study Design: This was a retrospective study of pregnant and postpartum people from 2017-2022 who engaged in a PCCM for perinatal mental health care. Outcomes were analyzed by epoch, defined as pre-telehealth (preT) (2017-2020) and post-telehealth (postT) (2020-2022) cohorts, based on when PCCM converted to telehealth as a result of the COVID-19 pandemic. Sociodemographic (age, race/ethnicity, parity, substance use) and perinatal data (gestational age at delivery, delivery route) and all PHQ-9 scores were abstracted from the EHR. Bivariate and multivariate analyses were performed to compare depressive symptom response over time between preT and postT cohorts in three ways: change in PHQ-9 score from initial to final, dichotomized PHQ-9 score improvement from initial to final, and as a linear mixed effects model to analyze trajectories of PHQ-9 scores adjusting for random effects within each person.

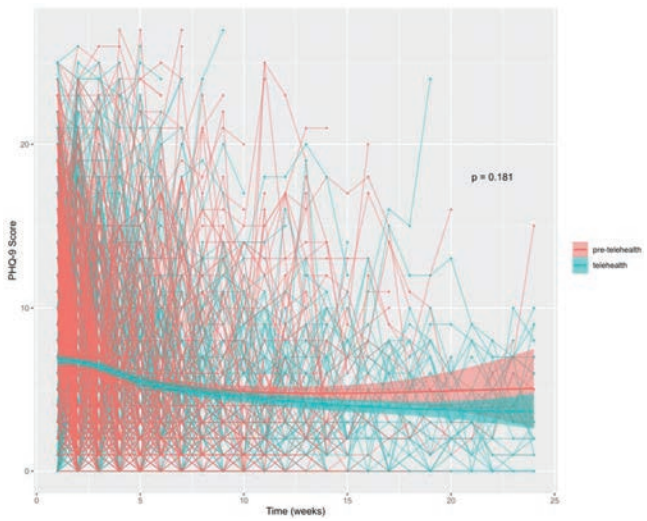
Results: Of 1422 people who met eligibility criteria, 679 (48%) engaged in PCCM postT. There were no differences in age, race/ethnicity, parity, tobacco use, gestational age at delivery, and delivery route between cohorts. People in preT were less likely to have prior substance use, but more likely to have medical comorbidities and prior mental health diagnoses compared to postT. Both groups had decreases in PHQ-9 scores, consistent with improvement in depressive symptoms, but preT had greater mean decreases and were more likely to have an improvement in scores than postT, after adjusting for potential confounders (Table). There was no difference in PHQ-9 trajectories between the cohorts (Figure).

Conclusion: Overall, we observed improvements in depression symptoms in PCCM with greater improvements in mean PHQ-9 scores in preT compared to postT, but no differences in scores

when accounting for random effects in each person, suggesting that mental health services via telehealth offers similar outcomes compared to in-person visits.

	Pre-Telehealth n=743	Post-Telehealth n=679	p-value	aβ / aOR	CI
Prior substance use	36 (4.85%)	53 (7.9%)	**0.018**		
Medical comorbidities (n,%)	374 (50.34%)	299 (44.23%)	**0.021**		
Prior mental health diagnoses (n,%)	494 (66.49%)	306 (45.54%)	**<0.001**		
Change in PHQ-9 score	-4.28 (6.1)	-0.39 (6.0)	**<0.001**	-2.30[a]	-2.8 - -1.8
Improved PHQ-9 (n,%)	552 (74.3%)	350 (51.6%)	**<0.001**	1.94[b]	1.5 - 2.5

Data presented as n (%) or mean (standard deviation)
[a]Adjusted for covariates (i.e. age, initial PHQ-9 score, and time interval between initial and final PHQ-9 scores)
[b]Adjusted for covariates (i.e. initial PHQ-9 score and time interval between initial and final PHQ-9 scores)



754 | Pregnancy During Wartime is Associated with Increased Preterm Rupture of Membranes

Esther Maor-Sagie[1]; Coral Danenberg[2]; Dima Shabita[3]; Amir Naeh[4]; Rinat Gabbay-Benziv[3]
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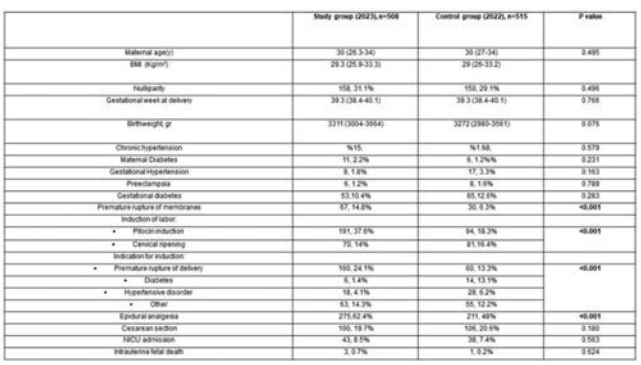
10:30 AM - 12:30 PM

Objective: Anxiety, depression, and stress during pregnancy negatively impact birth outcomes, including infant weight, head circumference, and APGAR scores. These effects are linked to physiological changes like catecholamine and cortisol secretion, leading to high blood pressure, maternal tachycardia, and increased risk of fetal growth restriction and preterm birth. The Iron Sword war, declared by Israel against Hamas, following the October 7, 2023 attack, has created tremendous psychological stress in the Israeli population. This study aims to assess the consequences of the Iron Sword war on obstetric outcomes related to stress and psychological distress, including preterm labor, premature rupture of membranes, preeclampsia, and preterm births.

Study Design: A retrospective cohort analysis was conducted at a single university-affiliated medical center in Israel. The study included deliveries from October 7, 2023, to November 19, 2023, compared to deliveries during the same period in 2022. Univariate and regression analyses were used to adjust for confounders. Categorical variables were compared using χ^2 tests, and continuous variables were analyzed with the Mann-Whitney test. Significance was set at $p< 0.05$.

Results: Overall, 508 women in the study group were compared to 515 women in the control group. There was no difference in gestational age at delivery or neonatal birth weight. Women who delivered during the Iron Sword war experienced a nearly threefold increase in preterm rupture of membranes and 1.5 times more labor inductions, mainly due to rupture of membranes (14.8% vs. 6.3% and 51.4% vs. 34%, respectively, $p< 0.001$ for both). Women during the war used more epidural anesthesia (62.4% vs. 48%, $p< 0.001$) . Results remained significant after adjusting for maternal age, BMI, nulliparity, and fetus number. No other differences were noted in delivery mode or other perinatal outcomes.

Conclusion: The prevalence of premature rupture of membranes increased significantly during the Iron Sword War, potentially linked to maternal stress and anxiety. Further studies are needed to evaluate these outcomes better.



755 | Evaluating the Association Between Eczema in Pregnancy and Maternal and Fetal Outcomes

Ethan Bendayan[1]; Andrea R. Spence[2]; Haim A. Abenhaim[3]
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10:30 AM - 12:30 PM

Objective: Eczema is a common skin condition on which little literature exists regarding its association in pregnancy and pregnancy-related outcomes. Our study served to evaluate the association between various obstetric and newborn outcomes and pregnancies affected by eczema.

Study Design: Using the Nationwide Inpatient Sample's 2016-2021 records, a population-based retrospective cohort study was conducted. To extract pregnancy and delivery records, both affected by eczema and unaffected, ICD-10 codes were used. ICD-10 codes were also used to identify baseline characteristics, obstetric outcomes and neonatal outcomes. Adjusting for age and race, multivariate logistic regression models were performed in order to compute odds ratios and p-values.

Results: The sample contained 8634 deliveries affected by eczema and 4,337,612 total deliveries, for an overall prevalence of 199 cases per 100,000 deliveries. Eczema was associated with adverse maternal outcomes, such as sepsis, OR 2.5 (95% CI 2.1-3.1); need for blood transfusions, 1.8 (1.5-2.0); pulmonary

embolism, 3.2 (1.04-10.08); length of stay greater than 3 days, 3.0 (2.9-3.1); preeclampsia, 1.6 (1.4-1.7); gestational diabetes, 1.1 (1.02-1.18); anemia, 1.6 (1.5-1.7); placental abruption, 1.6 (1.4-1.9); placenta previa, 1.5 (1.2-1.9); preterm premature rupture of membranes, 1.4 (1.3-1.5); preterm labor, 1.3 (1.2-1.4); chorioamnionitis, 2.1 (1.9-2.3); spontaneous vaginal delivery, 0.53 (0.51-0.55); caesarean section, 2.1 (2.0-2.2); instrumental vaginal delivery, 0.69 (0.60-0.78); and disseminated intravascular coagulation, 3.3 (1.6-6.5). In newborns, eczema was associated with congenital abnormalities, 2.3 (2.0-2.7); and intrauterine growth restriction, 1.3 (1.2-1.5).

Conclusion: Pregnancies affected by eczema appear to be at higher risk for various obstetric and neonatal outcomes. Consideration should be given to monitor and manage pregnancies with eczema. Additional research should be conducted on the topic and on potential management.

756 | Evaluating the Incidence and Risk Factors of Melanoma and History of Melanoma in Pregnancy

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10:30 AM - 12:30 PM

Objective: Melanoma is a common form of skin cancer, the incidence of which is uncertain in pregnancy. Previous reports estimated melanoma to be one of the most prevalent cancers in pregnancy. We sought to find the incidence of melanoma or a history of melanoma in pregnancy in a population-based study.

Study Design: The Nationwide Inpatient Sample's 2016-2021 records were used in order to conduct a retrospective cohort study. To identify pregnancy and delivery records, both affected by melanoma or a history of melanoma and unaffected, ICD-10 codes were used. ICD-10 codes were used to isolate the baseline characteristics, as well.

Results: The cohort contained 213 admissions with melanoma or a history of it, out of 4,337,612 total delivery admissions. The incidence was calculated to be 4.9 cases per 100,000 deliveries. Of the records with melanoma or history of melanoma, 64% were between 25 and 35 years old and 74% were at, or past, the 50th income percentile.

Conclusion: The results suggest that the incidence of melanoma or history of melanoma in pregnancy is extremely low and, unlike previously reported, melanoma is likely one of the least prevalent cancers in pregnancy. Age and income appear to be risk factors for developing melanoma, or having a history of melanoma, in pregnancy. Larger scale studies should be conducted in order to verify the degree of association.

757 | The Correlation Between Extent of Invasion in Placenta Accreta Spectrum and Units of Blood Transfused

Eva Hoffmann; Brian Z. Druyan; Carolyn Wheeler; Anna K. Sfakianaki; Paloma Toledo; Michael J. Paidas; Rodrigo Ruano; Pouya Abhari
University of Miami, Miami, FL

10:30 AM - 12:30 PM

Objective: The primary objective of this study is to determine if there is an association between the extent of invasion in Placenta Accreta Spectrum (PAS) as identified on pre-operative imaging and transfusion of packed red blood cells (pRBCs). By establishing this correlation, the study aims to enhance preoperative preparation for patients with PAS and reduce the waste of healthcare resources by avoiding the preparation of unnecessary blood products.

Study Design: This was a retrospective cohort study, approved by the Institutional Review Board. The study was conducted at a single accreta center of excellence from April 1, 2010 through January 9, 2023. All patients diagnosed pre-operatively with PAS via ultrasound were included. We excluded patients who did not have clear ultrasound diagnosis of PAS with extent of invasion documented. Data was collected from electronic medical records, including maternal demographics, pre-operative ultrasound findings, pre-operative hemoglobin level, blood loss and pRBCs.

Descriptive statistics were used to summarize maternal demographics and clinical outcomes as well as parametric and non-parametric statistics to compare groups. Data analysis was performed using SPSS version 29.0.2.0. P-values < 0.05 was statistically significant.

Results: Prenatal ultrasound was used to identify 160 patients with PAS with extent of invasion identified as focal accreta (N = 9), accreta (N = 97), increta (N = 29), and percreta (N = 25). There were no differences across demographic, age, race, BMI, number of prior cesarean deliveries and preoperative hemoglobin. There were no differences found in units of pRBCs between groups or estimated blood loss.

Conclusion: In conclusion we found no differences in units of pRBCs transfused and blood loss despite differences in preoperative diagnosis. This may be related to overall increased preparedness at a placenta accreta center of excellence with multi-disciplinary care. This study supports standard protocols and uniformity in available blood despite differences in preoperative diagnosis.

Table 1: Patient Demographics

	Preoperative Diagnosis Based on Ultrasound				
	Focal Accreta N= 9	Accreta N= 97	Increta N= 29	Percreta N=25	p-valve
Age, y	36.78± 4.41	33.74± 5.29	33.69± 3.97	33.24± 4.59	0.31
BMI, m/kg2	34.78± 6.91	30.36± 5.49	31.39± 5.76	32.96± 7.80	0.07
Hemoglobin on admission	10.48± 1.8	10.98± 1.21	11.09± 1.57	10.82± 1.09	0.61
Gestational age at delivery, weeks	34.97± 1.50	33.10± 4.22	33.8± 1.79	31.97± 4.58	0.09
pRBCs Transfused	1.89± 3.22	4.84± 10.46	9.24± 24.5	7.79± 12.22	0.35
EBL, ml	1450± 633.44	2974± 5627.06	4706± 11150.61	3864.58± 4558.35	0.51

Continuous variables expressed mean Mean±Standard deviation and categorical variables are expressed as number (percentage).

pRBCS, packed red blood cells; EBL, estimated blood loss

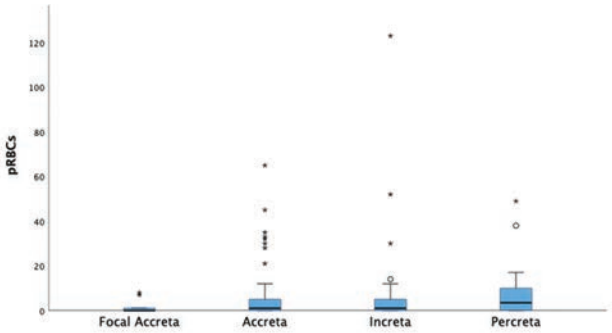

Figure 1: Independent samples Kruskal Wallis Test comparing extent of invasion based on pre-operative diagnosis (x-axis) and units of transfused packed red blood cells (y-axis).

758 | Changes in Fetal Heart Rate Baseline For Deliveries 22 to 31.6 Weeks and Adverse Outcomes

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10:30 AM - 12:30 PM

Objective: The significance of a change in baseline fetal heart rate tracing (FHRT) is unclear. We aim to estimate the incidence of change in FHR baseline in deliveries at 22.0 to 31.6 weeks gestational age (wga) and associated neonatal morbidity or mortality.

Study Design: A retrospective review of all deliveries from Jan to Dec 2023 at a tertiary care referral hospital. The inclusion criteria included delivery at 22-31 wga, of a non-anomalous singleton, where at least 40 minutes of a FHRT was available, and neonatal resuscitation was initiated. A physician—blinded to maternal characteristics and peripartum outcomes—reviewed the FHRT (0-120 min proximal to delivery, at 20 min epochs). FHR baseline variation was assessed by calculating a delta (D) between the last and the first epoch. Neonatal outcomes were abstracted. The primary outcome was long term neonatal morbidity or mortality (LTNMM); the secondary outcomes were Apgar score of 4-6 at 5-min and short-term neonatal morbidity or mortality (STNMM). Descriptive statistics with 95% confidence intervals (CI) were calculated, and non-overlapping CI was considered significant.

Results: Among the 6,521 deliveries, 169 (2%) occurred at 22-31.6 wga, of which 97 (57%) met the inclusion criteria. Magnesium sulfate was administered in 97% of the newborns and antenatal corticosteroids in 98%. A positive variation (+ D) in baseline occurred in 26/97 (26%) patients, and the likelihood of LTNMM in this cohort was 9/26 (34%; 95% CI 18.4-55.3). A negative variation (-D) in baseline occurred in 29/97 patients (29%), and the likelihood of LTNMM in this cohort was 11/29 (37%; 95% CI 21-57).

A neutral variation (D = 0) occurred in 42/97 (43.3%) of cases with a LTNM rate of 18/42 (42%; 95% CI 2858. Each analyzed cohort, even when stratified for discreet changes, had overlapping CI for all outcomes examined (Table 1).

Conclusion: Among newborns delivered at 22.0 to 31.6 weeks, change in baseline was noted in the majority and, irrespective of direction, it was not associated with adverse fetal outcome.

Table 1. Change in fetal heart rate tracing baseline within 2 hours of delivery of newborns at 22.0 to 31.6 weeks

		Apgar 4-6 at 5 min			Short Term Neonatal Outcome*			Long Term Neonatal Outcome**		
		N	%	95%CI	N	%	95%CI	N	%	95%CI
	>20 Increase	0/1	0	-	1/1	100	-	1/1	100	-
	10-20 Increase	0/2	0	-	0/2	0	-	0/2	0	-
	0-10 Increase	3/23	13.0	3.9-35.1	8/23	34.8	17.7-56.9	8/23	43.8	17.7-56.9
	Positive Delta	3/26	11.5	3.5-31.6	9/26	34.6	18.4-55.3	9/26	34.6	18.4-55.3
	Unchanged	8/42	19.0	9.6-34.2	21/42	50	34.9-65.0	18/42	42.8	28.5-58.4
	Negative Delta	4/29	13.7	5.0-32.5	11/29	37.9	21.8-57.2	11/29	37.9	21.8-57.2
	0-10 Decrease	4/24	16.6	6.0-38.3	8/24	33.3	16.7-55.0	8/24	33.3	16.7-55.0
	10-20 Decrease	0/4	0	-	3/4	75	7.0-99.2	3/4	75	7.0-99.2
	>20 Decrease	0/1	0	-	0/1	0	-	0/1	0	-

*APGAR </= 3 at 5 minutes, NICU pH < 7.00 or BE > 12, chest compression or intubation in delivery room, or death in delivery room
**Bronchopulmonary dysplasia grade 1, 2, 3, intraventricular hemorrhage grade III or IV, mortality during hospitalization

759 | Income-Level and Regional Variations and the Impact of Cesarean Delivery Rates on Maternal Mortality

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10:30 AM - 12:30 PM

Objective: To investigate the relationship between cesarean delivery (CD) and maternal mortality ratio (MMR) across different income levels and UNICEF regions.

Study Design: We conducted a cross-sectional analysis from 157 countries pooled from UNICEF database. To analyze interactions, we utilized a linear regression model. The model was built to account for variations due to income classifications by including dummy variables for each income level -Low Income (LI), Lower Middle Income (LMI), Upper Middle Income (UMI), and High Income (HI) as defined by the World Bank. We controlled for the impact of income on MMR while isolating the effect of CD rates. Descriptive statistics and correlation analysis were used.

Results: Most UNICEF regions exhibit a negative correlation between CD rates and MMR, with the strongest correlations in Sub-Saharan Africa (-0.84) and South Asia (-0.68). In contrast, Eastern Europe and Central Asia show a weak positive correlation (0.43), indicating a slight increase in MMR with higher CD rates. When stratified for income group, CD rates were negatively correlated with MMR across all income groups but HI. The strongest negative correlation (-0.61) in LI countries indicates a significant decrease in MMR with higher CD rates. HI countries show a weak positive correlation (0.14), suggesting a slight increase in MMR with higher CD rates (Table 1). The regression analysis revealed that each % increase in CD rates corresponds to a reduction of approximately 4.4 units in MMR ($p < 0.001$). MMR was significantly higher in LI countries (coefficient: 370.18, $p < 0.001$) and LMI countries (coefficient: 159.06, $p < 0.001$) compared to HI countries. UMI countries had a coefficient of 61.84 with a p-value of 0.079, indicating no clear association with MMR (Table 2).

Conclusion: Increasing the rate of CD was associated with a significant reduction in MMR in LI countries. In HI countries the correlation is weakly positive. This suggests that in LI countries an increase in CD rate may lower MMR; conversely in HI

countries an increase in CD may be associated with increased MMR.

Table 1: Descriptive Statistics and Correlation Analysis

UNICEF REGION	N of countries	Maternal Mortality Ratio[1]		Cesarean Delivery		r *
		Median	IQR (5th-95th pc)	Median	IQR (5th-95th pc)	
East Asia and Pacific	22	90	10-243	15.3	3.5-34.5	**-0.57**
Eastern Europe and Central Asia	20	14	2-40	24.4	6.5-40	0.43
Eastern and Southern Africa	20	334	138-894	6.95	1.15-894	-0.48
Latin America and Caribbean	27	70	22-161	31.35	16.1-58.4	-0.40
Middle East North Africa	12	34.5	10-164	25.8	4.8-54.5	-0.48
North America	2	12	11-13	28.7	26.3-31.1	-
South Asia	8	120	30-620	22.3	6.6-40	**-0.68**
Sub Saharan Africa	3	392	259-464	5.4	2.5-14.9	**-0.84**
West and Central Africa	23	443	146-1047	4.1	1.4-12.9	**-0.65**
Western Europe	21	7	4-11	24.4	15.9-31.2	0.30
World Bank Income Groups						
High Income	35	10	4-49	24.6	15.9-39.7	0.14
Upper Middle Income	42	43	5-193	26.3	13.6-46.9	-0.22
Lower Middle Income	53	146	20-530	12.1	3.5-51.8	-0.46
Low Income	28	442	108-1060	3.95	1.1-14.9	**-0.61**

1: Number of maternal deaths/ 100,000 livebirths
*** Pearson Correlation Coefficient:** A negative coefficient indicates that higher CD rates are associated with lower MMR, while a positive coefficient indicates that higher CD rates are associated with higher MMR.
Correlation strength interpretation:
- **± 0.00-0.29:** Weak
- **± 0.30-0.49:** Moderate
- **± 0.50-1.00:** Strong (Bolded)

Table 2: Regression Analysis of MMR by Cesarean Delivery and Income Levels

	Coefficient	95% CI	Standard Error	P-Value
Cesarean Delivery	-4.42	-6.31, -2.52	0.959	**<0.001**
World Bank Income Groups *				
• Low Income	370.1754	285.13, 455.21	43.04	**<0.001**
• Lower Middle Income	159.0578	92.24, 225.88	33.81	**<0.001**
• Upper Middle Income	61.84407	-7.21, 30.91	34.96	0.079

MMR: Maternal Mortality Ratio (Number of maternal deaths/ 100,000 livebirths)

* High-income group was used as the reference group for income classifications.

760 | Perioperative Risk Factors for Amniotic Band Sequence Following Fetoscopic Laser Photocoagulation for Twin-Twin Transfusion Syndrome

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10:30 AM - 12:30 PM

Objective: Observational studies have suggested associations between perioperative characteristics such as gestational age (GA) at fetoscopic laser photocoagulation FLP, chorioamnion separation (CAS), and iatrogenic septostomy (IS) and amniotic band sequence (ABS) after FLP for twin-twin transfusion syndrome (TTTS). We aim to evaluate the relationship between perioperative factors and ABS in monochorionic, diamniotic (MCDA) twins undergoing FLP for TTTS treatment.

Study Design: A secondary analysis of a prospective cohort study involving 816 cases of FLP (2011-2024) was conducted. Detailed ultrasound evaluation before FLP showed absence of ABS for all cases. ABS was either identified by post-FLP imaging and confirmed postnatally or identified on postnatal exam. Perioperative factors were compared using t-test, $\chi 2$ test, and Fisher's exact test, where applicable. Multivariate logistic regression was performed to adjust for the following covariates: intertwin discordance, GA at FLP, CAS diagnosed on post-op day 1 scan, amnioinfusion, and trocar size.

Results: 11 cases (1.3%) were complicated by ABS. Prenatal suspicion of ABS prompted prenatal lysis without amputation in 3/11 cases (27.3%; Table 1). Digital amputation occurred in 3/11 cases (27.3%). There was no difference in maternal characteristics. Significant differences in intertwin weight discordance prior to FLP (12.9% ± 8.7% versus 23.2% ± 13%, $p < 0.05$), GA at FLP (17.9 ± 1.1 weeks versus 20.6 ± 2.8 weeks, $p < 0.05$), CAS (63.6% (7/11) versus 10.6% (85/805), $p < 0.05$), and trocar size ($p = 0.04$) were demonstrated between cases with and without ABS (Table 2). Amnioinfusion (aOR 0.17, 95% CI 0.02-0.76, $p = 0.04$), smaller intertwin weight discordance (aOR 0.90, 95% 0.83-0.96), and earlier GA at FLP (aOR 0.56, 95% CI 0.34-0.82) decreased the risk of ABS. Conversely, CAS increased the risk of ABS (aOR 11.90, 95% CI 3.15-52.30, $p < 0.05$).

Conclusion: ABS is a rare complication post-FLP for TTTS, yet, is associated with significant neonatal sequelae. Perioperative factors, particularly CAS, should prompt detailed post-FLP evaluation for development of ABS.

Table 1. Cases of amniotic band sequence (ABS) identified following fetoscopic laser photocoagulation (FLP) for treatment of twin-twin-transfusion syndrome (TTTS) in monochorionic, diamniotic twin gestations.

ID	TTTS Stage	GA at FI†	CAS	Septostomy	PPROM	GA at Delivery†	Affected Twin	Anatomic location	Prenatal lysis of ABS
1	3	16.9	Yes	No	Yes	30	R	Arm	No
2	1	19.9	No	No	No	33.3	R	Arm	No
3	3	16.6	Yes	Yes	Yes	30.4	R	Arm	Yes
4	3	18.9	Yes	No	No	30	R	Arm, Toes	No
5	3	16.7	Yes	No	No	32	R	Arm, finger	Yes
6	3	17.6	Yes	No	Yes	24.7	R	Arm	Yes
7	2	18.4	No	No	No	32	D	Toes (amputated)	No
8	2	19	No	No	Yes	26.7	D	Toes (amputated)	No
9	2	16.9	Yes	Yes	No	31.3	D	Shoulder, chest*	No
10	3	18.1	Yes	No	No	29	D	Toes (amputated)	No
11	2	17.7	No	No	Yes	33	R	Arm	No

* Affected fetus with intrauterine demise at approximately 28 weeks.
† Gestational age provided in weeks.
GA- gestational age; D- Donor twin; R- recipient twin

Table 2. Multiple logistic regression to evaluate the relationship between perioperative factors and ABS confirmed by postnatal diagnosis.

	Adjusted OR (aOR)	95% CI	*p* value
Fetal weight discordance (%)	**0.90**	**(0.83, 0.96)**	**0.005**
GA at procedure (weeks)	**0.56**	**(0.34, 0.82)**	**0.009**
Amnioinfusion	**0.17**	**(0.02, 0.76)**	**0.04**
CAS	**11.90**	**(3.15, 52.3)**	**< 0.001**
Trocar size	0.69	(0.38, 1.17)	0.19

Abbreviations: GA- gestational age, CAS- chorioamnion separation

761 | Risk Factors for Delivery Less Than 34 Weeks' Gestation Following Fetoscopic Spina Bifida Repair

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10:30 AM - 12:30 PM

Objective: Preterm delivery (PTD) is a persistent complication of in-utero spina bifida repair despite the transition to a minimally-invasive, fetoscopic approach. We aimed to evaluate the relationship between maternal and perioperative characteristics and PTD < 34 weeks gestation among pregnancies that underwent fetoscopic spina bifida repair.

Study Design: A secondary analysis of a prospective cohort study was conducted of 79 completed cases of fetoscopic spina bifida repair between 2020 and 2024 [NCT#04243889 & #06042140]. Maternal and perioperative factors were compared between cases with delivery at < 34 and ≥ 34 weeks' gestation using the Wilcoxon rank sum test, Welch's *t*-test, χ^2 test, and Fisher's exact test, where applicable. Multiple logistic regression was performed to adjust for maternal and perioperative factors. Sub-group univariate analysis of maternal and perioperative factors between cases with and without placental abruption (PA) were compared using the appropriate comparative statistics.

Results: Twenty-five (31.6%) cases resulted in delivery at < 34 weeks. Maternal age was greater in cases that resulted in delivery < 34 weeks (Table 1). Maternal and perioperative characteristics were, otherwise, similar between the groups. PPROM and placental abruption occurred more frequently among cases with delivery < 34 weeks (Table 1). Multiple logistic regression demonstrated that event of delivering at < 34 weeks was significantly associated with lesion surface area, PPROM, and placental abruption (Table 2). Sub-group univariate analysis comparing cases with and without PA demonstrated only a smaller lateral ventricular size among cases with PA (10.3 ± 2.8mm) versus cases without PA (12.76 ± 3.8mm, $p = 0.035$).

Conclusion: PPROM and placental abruption are significant predictors of PTD before 34 weeks. Further research is needed to elucidate the relationship between PPROM and placental abruption in the context of fetoscopic intervention.

Table 1. Univariate analysis comparing maternal and perioperative characteristics between pregnancies with delivery < 34 weeks' and ≥ 34 weeks' gestation.

Variable	GA at Delivery		*p* value[2]
	< 34 weeks, N = 25[1]	≥ 34 weeks, N = 54[1]	
Maternal age	31 ± 5	28 ± 4	**0.048**
Lesion upper level			0.211
L2 and above	4 (16%)	6 (11%)	
L3-L4	9 (36%)	31 (57%)	
L5-S1	12 (48%)	17 (31%)	
Largest pre-operative ventricular size (mm)	12.0 ± 3.8	12.7 ± 3.7	0.404
Lesion type			0.688
MMC	20 (80%)	41 (76%)	
Myeloschisis	5 (20%)	13 (24%)	
Lesion surface area (cm²)	6.2 ± 5.0	4.4 ± 2.5	0.106
Pre-operative cervical length (cm)	4.0 ± 0.7	4.1 ± 0.6	0.340
MgSO4 receipt post-op	18 (72%)	29 (54%)	0.123
Total surgery time	241.9 ± 49.2	236.0 ± 41.8	0.606
Fetal skin patch utilized	7 (28%)	11 (20%)	0.452
Partial skin closure performed	5 (25%)	6 (18%)	0.728
Membrane separation	4 (17%)	8 (15%)	>0.999
Placenta abruption	9 (36%)	2 (3.8%)	**<0.001**
PPROM	12 (50%)	9 (17%)	**0.003**
Amniotic fluid removed (mL)	240 (100, 840)	300 (102, 920)	0.227
Type of fluid infused			0.854
Amniotic fluid only	2 (8.0%)	5 (9.3%)	
LR/saline only	15 (60%)	26 (48%)	
Both amniotic fluid and LR/saline	3 (12%)	9 (17%)	
Neither amniotic fluid nor LR/saline	5 (20%)	14 (26%)	

[1]Mean ± SD; n (%); Median(Range)
[2]Welch Two Sample t-test; Fisher's exact test; Pearson's Chi-squared test; Wilcoxon rank sum test

Table 2. Multiple logistic regression to evaluate the relationship between maternal and perioperative factors and preterm delivery at < 34 weeks' gestation.

	Crude OR[1] (95% CI[1])	Adjusted OR[1] (95% CI[1])	*p* value
Age	1.11 (0.99, 1.24)	1.12 (0.96, 1.3)	0.16
Male fetal sex	2.13 (0.8, 5.69)	3.81 (0.91, 15.96)	0.22
Lesion surface area (cm²)	**1.16 (1, 1.35)**	**1.19 (1.01, 1.42)**	**0.04**
Cervical length (cm)	0.63 (0.3, 1.33)	0.49 (0.18, 1.33)	0.16
Receipt of MgSO4[2] postop	2.17 (0.77, 6.09)	1.98 (0.49, 7.99)	0.34
AF[2] removed (mL)	1.00 (1.00, 1.00)	1.00 (0.99, 1.00)	0.06
Placental abruption	**15.3 (2.98, 78.62)**	**10.21 (1.45, 71.63)**	**0.02**
PPROM[2]	**4.89 (1.67, 14.32)**	**5.8 (1.37, 24.67)**	**0.02**

[1] OR = odds ratio, CI = confidence interval
[2] MgSO4 = magnesium sulfate, AF = amniotic fluid, PPROM = preterm prelabor rupture of membranes

762 | TTTS on Tiktok: News Or Noise?

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10:30 AM - 12:30 PM

Objective: Patients are increasingly looking to TikTok for health information. We evaluated content and quality of TikTok videos related to twin-twin transfusion syndrome (TTTS) and fetoscopic laser surgery (FLS).

Study Design: The top 50 TikTok videos (TikToks) related to TTTS were identified using search terms "TTTS", "twin-twin transfusion", and "fetal laser surgery". Data were gathered on video metrics. Three independent reviewers evaluated videos using three standardized quality scales: a modified 5-point DISCERN scale, the Patient Education Maternal Assessment Tool for Audiovisual Materials (PEMAT A/V), and a 5-point Likert Global Quality Scale (GQS). TikToks were also graded on creator type, content, tone, and outcomes. Exclusion criteria included non-English, unrelated, or duplicate videos.

Results: 50 TikToks created by 42 users were evaluated. Total views for all TikToks were 63.3 million. The most viewed TikTok had 2.5 million views, the most liked had 537,000 likes, and the most shared had 22,100 shares. 66% of content was created by patients and 14% was created by medical professionals. 26% of videos contained educational content. 34% of videos reported a good fetal outcome and 8% noted a complication or poor outcome. The mean mDISCERN score was 0.8 (SD 0.7). The mean PEMAT A/V understandability score was 56.3% (SD 28.9%), and the mean actionability score was 2.4% (SD 7.5%). The median GQS was 1 [IQR 1- 1.6]. TikToks posted by medical professionals had higher quality scores ($p< 0.001$). Of the 10 videos with highest GQS, 6 were posted by medical professionals. Of the 10 most-liked videos, 3 were posted by medical professionals.

Conclusion: TikToks related to TTTS and FLS are highly viewed, liked, and shared, yet of overall poor quality. A majority of content was posted by patients and related to individual pregnancy experiences, and was more likely to detail good outcomes than poor outcomes. Medical professionals posted higher-quality content, much of which was highly viewed and liked. These data support a need and demand for more high-quality content related to TTTS and FLS on TikTok.

Table 1: Metrics for selected TikTok videos

Video metrics (n=50)	Average
Length (seconds), median [IQR]	33 [13; 90]
Views, median [IQR]	15,050 [2380; 419,975]
Likes, median [IQR]	517 [97; 6351]
Comments, median [IQR]	13 [2; 63]
Saves, median [IQR]	21 [4; 181]
Shares, median [IQR]	8 [1; 118]

Table 2: Evaluation data for selected TikTok videos

Evaluation criteria	Videos (n=50)
Source/Creator, n (%)	
Medical	7 (14%)
Patient/ personal	33 (66%)
Other/ unclear	10 (20%)
Type of content, n (%)	
Pregnancy experience	24 (48%)
Child experience	5 (10%)
Educational	13 (26%)
Combination of pregnancy/ child experience	3 (6%)
Other	5 (10%)
Tone, n (%)	
Positive	11 (22%)
Negative	6 (12%)
Neutral/ mixed/ not applicable	33 (66%)
Mentions possible risks or complications of TTTS, n (%)	17 (34%)
Mentions fetoscopic laser surgery, n (%)	23 (46%)
Fetal outcome, n (%)	
Good	17 (34%)
Any complication or poor fetal outcome	4 (8%)
Not specified	10 (20%)
Not applicable	19 (38%)
mDISCERN (0-5), mean (SD) *	0.8 (0.7)
PEMAT A/V understandability score (0-100%), mean (SD) †	56.3% (28.9%)
PEMAT A/V actionability score (0-100%), mean (SD) †	2.4% (7.5%)
Global Quality Scale score (1-5), median [IQR] §	1 [1; 1.6]

* Modified DISCERN (mDISCERN): Assesses aims, sources, bias, resources, and uncertainty. Scale 0-5, with 5 the highest rating
†PEMAT A/V score: Assesses understandability of content in terms of language, narration, readability, as well as actionability. For each score, scale 0-100%, with 100% the highest rating
§ Global Quality Scale score (GQS): Assesses overall quality of content and usefulness to patients. Scale 1-5, with 5 the highest rating

763 | Implementation of a New Rolling Circle Replication Assay for Universal Non-Invasive Prenatal Screening

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10:30 AM - 12:30 PM

Objective: To evaluate the uptake and performance of non-invasive prenatal aneuploidy screening (NIPS) using a new rolling circle replication assay.

Study Design: We conducted a prospective observational study of patients receiving prenatal care at a large county hospital. Patients with singleton pregnancies ≥ 10 weeks gestation were offered NIPS for trisomy 13, 18, and 21 using a non-sequencing based rolling circle replication assay (Vanadis system, PerkinElmer, Waltham, MA, USA) with analysis performed on-site. Individuals with abnormal screening results were offered diagnostic testing. We recorded results of invasive diagnostic testing and postnatal genetic testing if performed. Samples with diagnostic confirmation available were used to calculate predictive values.

Results: Among 14,127 patients who received prenatal care at our institution between August 2023 to July 2024, 11,631 (82.3%) elected NIPS. The mean BMI in this population was 29.5 ± 6.6 kg/m^2. There were 106 (0.9%) positive screening results, of which 46 had increased risk for trisomy 21, 32 for trisomy 18, and 28 for trisomy 13. There were 18 no-call results, with a no-call rate of 0.15%. Of patients with diagnostic results available, abnormal screening results were confirmed in 16/19 (84.2%) patients who screened positive for T21, in 11/15 (73.3%) patients who screened positive for T18, and in 2/8 (25.0%) patients screened positive for T13. There were no false negative screens identified for any of these three aneuploidies.

Conclusion: Non-invasive prenatal screening using a rolling circle replication assay offers high sensitivity and specificity for aneuploidy screening with a low rate of no-call results. Positive predictive values for trisomy 21 and trisomy 18 far exceeded that for trisomy 13 screening.

Table 1: Outcomes of the rolling circle replication non-invasive prenatal screening assay

	Number of positive screens*	Prevalence	Sensitivity	Specificity	Positive predictive value	Negative predictive value
Trisomy 21	46	0.1%	100%	99.97%	84.2%	100%
Trisomy 18	32	0.02%	100%	99.97%	73.3%	100%
Trisomy 13	28	0.01%	100%	99.95%	25%	100%

*Number of positive screens out of n = 11,631 screening assays performed during the study period.

764 | Assessing Prioritized Groups Referenced in 2019-2024 Maternal Mortality Review Committees' Summaries

Genevieve Kitts[1]; John J. Byrne[2]; Brenda Berumen-Flucker[3]
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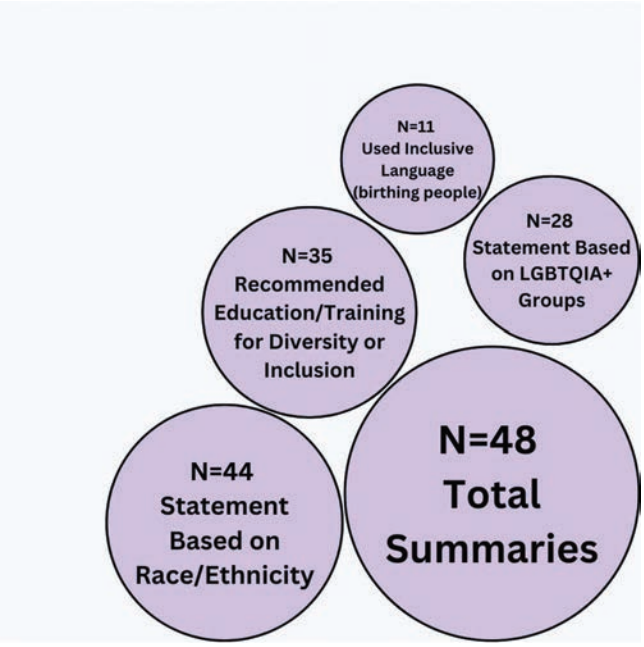
10:30 AM - 12:30 PM

Objective: Maternal mortality review committees are encouraged to define populations at risk of maternal morbidity and mortality. Summaries should work to include the most recent data among racial/ethnic, socioeconomic, rural, and LGBTQIA+ groups. We investigated states' most recent summaries to identify which disproportionately affected groups they prioritized.

Study Design: We utilized publicly available data from maternal mortality review committees or similar organizations' summaries online in June 2024. Using Prisma 2020, we established inclusion and exclusion criteria. We compared their priority populations to the CDC's 2022 data set for maternal mortality. We evaluated the utilization of inclusive and gender-neutral language for LGBTQIA+ individuals. Commonly used phrases within the summaries were birthing people, persons, or individuals.

Results: Of the 48 summaries that met inclusion criteria, 91.7% included an excerpt of their priority population based on race or ethnicity. Black, Hispanic, and Native American groups were the most commonly reported minority groups prioritized. Recommendations for diversity training or education were included for 72.9% of reviews, 25.0% did not, and 2.0% were unclear. Evaluating use of inclusive language, 58.3% of summaries explicitly stated intentions to include sexual minority groups using gender-neutral language; 22.9% were unclear but used terms birthing people or individuals.

Conclusion: As of 2024, there continues to be a lack of focus on high-risk groups within the MMRC reports. This study supports the need for health practitioners to focus on improving inclusive language within MMRC reports. Without acknowledging the groups most in need, providers and community health workers will fail to address maternal morbidity and mortality adequately.



765 | Maternal History of Recurrent Pregnancy Loss and the Risk for Offspring Inflammatory Bowel Disease

Gil Gutvirtz[1]; Gali Pariente[2]; Tamar Wainstock[2]; Eyal Sheiner[2]
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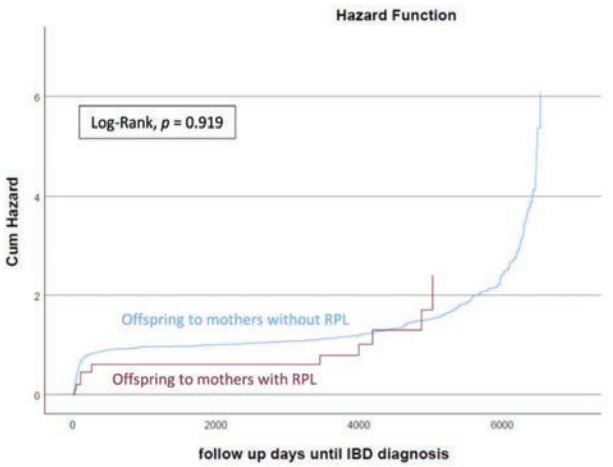
10:30 AM - 12:30 PM

Objective: Women with a history of recurrent pregnancy loss (RPL) may harbor a genetic disposition for inflammatory responses causing pregnancy losses. As altered immune response has been implicated in the pathogenesis of inflammatory bowel disease (IBD), we sought to investigate whether offspring of women with RPL are at an increased risk to develop IBD.
Study Design: A population-based cohort study of singleton deliveries was conducted to evaluate the risk for IBD in children (up to the age of 18 years) born to mothers with and without a history of RPL. Data for the diagnosis of IBD of the offspring were extracted from community-based clinics and hospitalization records. Kaplan-Meier survival curve was used to compare the cumulative incidence of IBD between the study groups. A cox proportional hazards model was used to control for confounders.
Results: During the study period (1991-2021), 356,356 singleton deliveries were included in the study, of them, 14,235 (4%) deliveries were in women with a history of RPL. Comparable rates of IBD were documented in children born to mothers with and without a history of RPL (0.1% vs. 0.1%, $p = 0.104$, **Figure**). The Kaplan-Meier survival curve demonstrated a comparable incidence of IBD in offspring of both groups (Log Rank, $p = 0.919$, **Figure**). Likewise, using a Cox proportional hazards model, adjusted for maternal age and gestational age at birth, maternal history of RPL was not associated with IBD of the offspring (adjusted hazard ratio (HR) = 1.11, 95%CI 0.60-2.05, $p = 0.731$).
Conclusion: Maternal history of recurrent pregnancy loss is not a risk factor for IBD in the offspring.

Figure. The association between RPL and IBD of the offspring: Univariate analysis, Kaplan Meier survival curve and results from a Cox proportional hazards model

	History of RPL (n=14,235)	No RPL (n=342,121)	Odds Ratio (95% CI)	Adjusted* HR (95% CI)
Inflammatory bowel disease	11 (0.1%)	432 (0.1%)	0.61 (0.33 – 1.11)	1.11 (0.60 – 2.05)

* Adjusted for maternal age and gestational age at birth



766 | Maternal Age at First Delivery and Long-term Ophthalmic Morbidity of the Mother

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10:30 AM - 12:30 PM

Objective: Advanced maternal age has been associated with adverse pregnancy outcomes. Complications such as hypertensive disorders, preterm delivery and low birthweight suggest that maternal age is a crucial determinant of vascular adaptation to pregnancy. Few studies have examined these associations with mothers long-term outcome. We investigated the impact of maternal age at first delivery on long-term ophthalmic morbidity
Study Design: A population-based retrospective cohort study of women who delivered between the years 1991-2021 at a tertiary center was conducted. Maternal age at first delivery was divided into 4 categories (< 30 years, between 30-35, 35-40 and >40 at first delivery). The long-term ophthalmic morbidity was compared based on data from both community and hospitalization records involving an ophthalmic morbidity. A Kaplan–Meier survival curve was used to compare the cumulative incidence of ophthalmic morbidity and a Cox regression model was constructed to control for confounders, comparing the groups of maternal age over 30 to a reference group of women under 30
Results: A total of 76,131 women were included in the study. 69,530 (91.3%) were under 30 years in their first delivery, 5,066 (6.7%) were between 30-35, 1,231 (1.6%) were between 35-40 and 304 (0.4%) were over 40 years old. The cumulative incidence of ophthalmic morbidity over time was higher as maternal age was older in the first delivery (**Figure**). A trend of increased

ophthalmic morbidity was noted as maternal age was older but it did not reach a statistical significance (3.7%, 3.6%, 4.1% and 6.3%, $p = 0.08$). The Cox regression model, controlling for fertility treatments and ethnicity, found a dose dependent effect as maternal age in the first delivery was an independent risk factor for long-term ophthalmic morbidity of the mother as compared with women under 30 years old (**Table**)

Conclusion: Advanced maternal age at first delivery is an independent risk factor for long-term ophthalmic morbidity of the mother. The risk tends to increase in a dose-response manner over age 30, and specifically for patients over 40 in their first delivery

Figure. Kaplan-Meier survival curve demonstrating the cumulative incidence of ophthalmic morbidity among study groups divided by maternal age in the first pregnancy

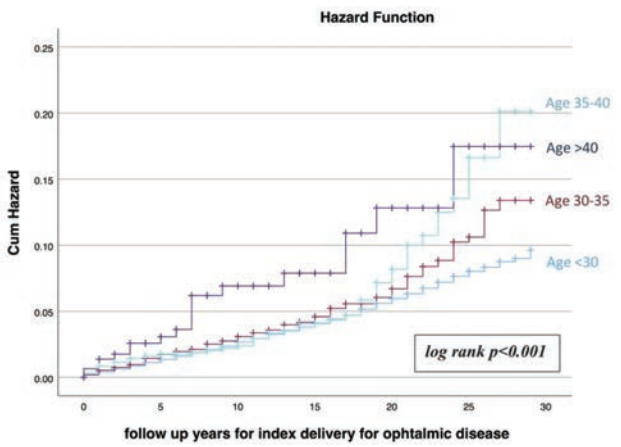

Table. Cox regression model for the association between maternal age in the first pregnancy and the mother's long-term ophthalmic morbidity

	aHR	95%CI	p value
Maternal age < 30 years	1 (reference)		
30-35 vs. under 30	1.21	1.03 – 1.41	0.016
35-40 vs. under 30	1.37	1.04 – 1.82	0.027
Over 40 vs. under 30	2.18	1.38 – 3.45	<0.001

- The model controlled for ethnicity and fertility treatments

767 | Normotension is not Predictive of Duration of Expectant Management of Preterm Preeclampsia with Severe Features

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10:30 AM - 12:30 PM

Objective: To identify the optimal blood pressure range during expectant management of preterm preeclampsia with severe features.

Study Design: Multicenter retrospective cohort study of pregnant people with preterm (< 34 weeks gestation) preeclampsia with severe features by severe hypertension criteria who underwent a period of expectant management >48 hours from 2017-2022. People were excluded if they had chronic hypertension, fetal anomaly, or underwent pregnancy termination. Primary outcomes were completed percentage of maximum potential duration of expectant management until goal of 34 weeks and attainment of 34 weeks gestation. ANOVA, Kruskal-Wallis test, t-test, Wilcoxon rank-sum test, and multivariate regression were performed with $p < 0.05$ considered statistically significant.

Results: 186 people met inclusion criteria. Antepartum blood pressures were normal (< 140/90) 0-33% of measurements in 36 people (19.4%), 34-66% in 94 people (50.5%), and 67-100% in 56 people (30.1%). Percentage of normal blood pressures was not associated with completed percentage of maximum potential duration of expectant management (Figure 1), but increasing percentage of blood pressures in the severe range was associated with lower completed percentage of maximum potential duration of expectant management (Figure 2). Multivariate analysis demonstrated that percentage of blood pressures in the severe range (OR 0.91, CI 0.86-0.96) and diagnosis of fetal growth restriction (OR 0.41, CI 0.23-0.74) were associated with a lower completed percentage of maximum potential duration of expectant management while maintenance antihypertensive medication (OR 2.45, CI 1.06-5.67) was associated with a higher completed percentage. Neither the percentage of normal blood pressures ($p = 0.7$) nor the percentage of blood pressures in the severe range ($p = 0.9$) were associated with attaining 34 weeks gestation.

Conclusion: Percentage of normal as opposed to elevated blood pressures was not predictive of the duration of expectant management of preterm preeclampsia with severe features.

Figure 1

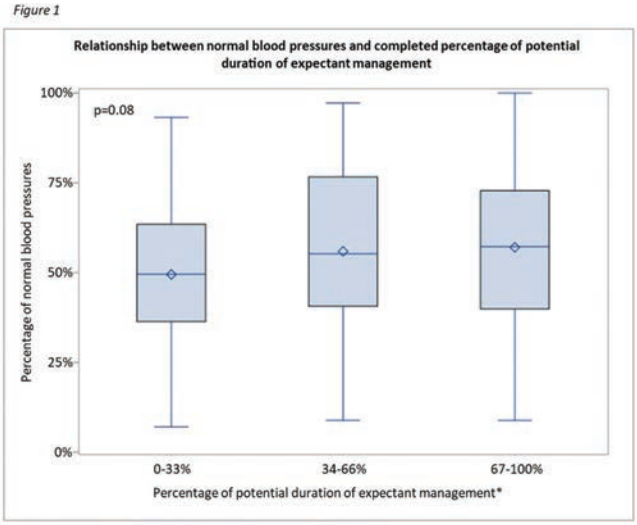
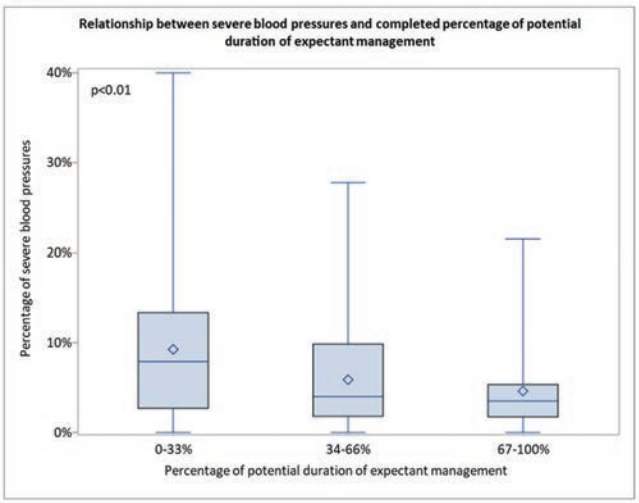


Figure 2



768 | Neonatal outcomes following rescue Antenatal Corticosteroids given after 34 weeks of gestation

Hadel Watad[1]; Keren Ofir[2]; Michal Fishel Bartal[3]; Rakefet Yoeli-Ullman[2]; Shali Mazaki-Tovi[4]
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10:30 AM - 12:30 PM

Objective: We aimed to determine neonatal outcomes following administration of rescue antenatal corticosteroid (ACS) at late preterm (>34 weeks) after completion of initial cycle of ACS during early preterm period.

Study Design: A retrospective cohort study including all pregnant individuals who delivered singleton late preterm infants and received first dose of ACS before 34 weeks of gestation. Individuals were divided to two groups:1. study group: Received rescue ACS >34 weeks and 2. control group: no rescue ACS after 34 weeks. Data were collected from medical records. Parametric and non-parametric statistical methods were used for analysis.

Results: A total of 757 pregnant individuals met the inclusion criteria. Among them, 21.3% (n = 161) received rescue ACS after 34 weeks of gestation, while 78.7 % (n = 596) did not. Individuals who received rescue ACS had a higher median maternal age, gravidity and parity and received first course earlier during pregnancy compared to individuals without rescue dose (table 1). Neonates born to individuals who received rescue ACS had a significantly lower rates of composite neonatal outcomes compared to those who did not receive ACS (27.6% vs. 39.9%, p = 0.05), lower rates of NICU admission (26.9% vs. 39.7%, P = 0.003), and higher rates of neonatal fever (3.2% vs. 0.7%, P = 0.027). However, rates of RDS (1.3% vs. 3.2 %, P = 0.274) and composite respiratory adverse outcomes (10.3% vs. 13.8%, P = 0.298) were comparable between the groups. Additionally, rates of neonatal hypoglycemia were comparable (11.8% vs. 17.4%, p = 0.085 respectively). Following logistic regression and adjustment for gestational age at first ACS course, maternal age, and gravidity; those not receiving rescue ACS at late preterm had a higher rate of adverse composite neonatal outcomes [aOR 1.13, 95% CI 1.044-1.186].

Conclusion: Rescue ACS administration in late preterm was associated with reduced composite neonatal outcomes and NICU admission. However, it was not associated with a reduced rates of RDS or composite respiratory outcomes. Importantly, there was no significant difference in the prevalence of hypoglycemia.

Table 1. Demographic and baseline characteristics of pregnant individuals who received Antenatal Corticosteroids

Variable	Rescue dose at late preterm (N=161)	Without rescue dose (N=596)	P value
Maternal age (years)	36.4 (33-40.8)	32.4 (28.2-37.9)	**<0.001**
Smoking	11 (6.8)	50 (8.4)	0.513
Gravidity	5 (3.5-8.5)	3 (1-5)	**<0.001**
Parity	4 (3-7)	1 (0-2)	**<0.001**
Primiparous	34 (21.1)	19 (32.9)	**0.004**
Gestational age at first ACS dose (weeks)	28.8 (26.5-30.8)	32.6 (30.6-30.1)	**<0.001**
Diabetes (Gestational and pre-gestational)	39 (24.2)	127 (21.3)	0.428

Data are presented as median (interquartile range) and n(%)
ACS -Antenatal Corticosteroids

Table 2. Neonatal outcomes

Variable	Rescue dose at late preterm (N=161)	Without rescue dose (N=596)	P value
Gestational age at delivery (weeks)	35.5 (35.1-36.25)	36 (34.6-36.5)	0.261
Birth weight (grams)	2720 (2443-3139)	2420 (2055-2657)	**0.008**
RDS	2 (1.3)	18 (3.2)	0.274
Mechanical Ventilation	9 (5.8)	31 (5.5)	0.914
Oxygen supplement	11 (7.1)	48 (8.6)	0.538
TTN	4 (2.6)	17 (3)	1
Apnea	2 (1.3)	7 (1.3)	1
Neonatal pneumonia	1 (0.6)	0 (0)	0.218
Resuscitation	1 (0.6)	1 (0.2)	0.389
Composite respiratory outcome	16 (10.3)	77 (13.8)	0.248
IVH	2 (1.3)	10 (1.8)	1
Neonatal fever	5 (3.2)	4 (0.7)	**0.027**
Neonatal sepsis	0 (0)	1 (0.1)	1
Hyperbilirubinemia	17 (10.9)	94 (16.8)	0.071
NICU admission	42 (26.9)	222 (39.7)	**0.003**
Hypoglycemia	19 (11.8)	104 (17.4)	0.085
Apgar 5 min <7	5 (3.2)	17 (3)	0.798
Arterial pH <=7.1	1 (0.9)	7 (2)	0.688
Composite neonatal outcome	43 (27.6)	223 (39.9)	**0.005**

Data are presented as median (interquartile range) and n (%)
Composite respiratory outcome includes: RDS, Mechanical Ventilation, non-invasive ventilation, Oxygen supplement, Apnea, Pneumonia, TTN and neonatal resuscitation.
Composite neonatal outcome includes: NICU admission, hypoglycemia, IVH, NEC, neonatal Fever, Neonatal sepsis, hyperbilirubinemia, RDS, Mechanical Ventilation, non-invasive ventilation, Oxygen supplement, Apnea, Pneumonia, TTN and neonatal resuscitation.
RDS- Respiratory Distress Syndrome, TTN- Transient Tachypnea of the Newborn, IVH-intraventricular Hemorrhage, NICU- Neonatal Intensive Care Unit

769 | Did Increasing Postpartum Oxytocin Infusion to 30 Units Decrease Postpartum Hemorrhage(PPH) at a University Hospital?

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10:30 AM - 12:30 PM

Objective: Postpartum hemorrhage is a common occurrence affecting approximately 5% of all pregnancies and 11% of all pregnancy associated mortalities in the U.S. In January of 2024 we changed our institutional protocol to increase the routine use of Oxytocin from 10 units to 30 units immediately after delivery. The primary aim of our study was to see if this protocol decreased PPH at a university hospital. Our secondary aim was to determine if PPH was associated with population characteristics such as BMI.

Study Design: We performed a retrospective cohort study of PPH before and after the implementation of the new Oxytocin protocol on 1/16/2024. We initially implemented the change in vaginal deliveries only, but on 5/22/2024 we instituted the

higher oxytocin dose at all deliveries. Secondary analysis involved patient demographics such as BMI.

Results: The patient demographics were similar between groups with high rates of obesity, cesarean sections, multiparity, and hypertension. The rate of PPH was the same at 14% both before and after the increase in oxytocin postpartum.

Conclusion: In an attempt to decrease the high rate of PPH at our institution we implemented a protocol to increase the postpartum dose of Oxytocin to 30 units. We did not find any change in the rate of PPH. Of note, our rate of PPH of 14% both before and after the change is higher than the national reported average of 5%. This may be because of our tertiary care center, our high rate of obesity, or that we routinely use quantitative measurement of postpartum blood loss. Further interventions are needed to address the high rate of PPH seen at our university hospital.

Table 1. Demographics of patients with PPH

	Preintervention[1]	Postintervention[2]	p-value[3]
Obese (BMI≥30)	114 (30%)	163 (39%)	.06
Cesarean Section	209 (55%)	252 (61%)	.35
Multiparity	247 (65%)	251 (62%)	.58
Hypertension	129 (34%)	153 (38%)	.51

1.7/1/23-1/15/24
2.1/16/24-8/2/24
3.<.05

Table 2. Rate of PPH

	Preintervention[1]	Postintervention[2]	p-value[3]
# of deliveries	2686	2878	-
PPH	377 (14%)	408 (14%)	.9

1.7/1/23-1/15/24
2.1/16/24-8/2/24
3.<.05

770 | The Efficacy of Deep Learning Based Automated Cervical Length Measurement for Predicting Preterm Birth

Hayan Kwon; Ju-hee yoon; Yun Ji Jung; Ja-Young Kwon; Suhra Kim
Yonsei University College of Medicine, Seoul, Seoul-t'ukpyolsi

10:30 AM - 12:30 PM

Objective: Cervical length measurement of less than 2.5 cm in pregnant women between 16 weeks 0 days and 24 weeks 6 days is commonly used to predict preterm labor. However, conventional measurements are highly operator-dependent and often underestimate actual cervical length, which can lead to overtreatment. This study aimed to compare conventional cervical length measurement with deep learning-based automated measurement to determine any differences in preterm prediction.

Study Design: The study included 197 women out of 1270 who received antenatal care and delivery at Severance Hospital from 2019 to 2023. Participants had cervical lengths measured conventionally as 2.5 cm or less within the specified gestational period. Those with preterm labor, multiple pregnancies, or who underwent cerclage were excluded. Cervical length was measured using traditional and deep learning methods. Deep learning program utilized a semantic image decomposition network to divide images into pre-cervix, cervix, and post-cervix regions for cervical canal identification. The canal was assessed at six points for distance calculation. Participants were divided into Group A (cervical length of 2.5 cm or less by both methods) and Group B (less than 2.5 cm by conventional but more than 2.5 cm by deep learning). The primary endpoint was preterm birth, defined as delivery before 37 weeks.

Results: Group A had an average cervical length of 2.32 cm (+-0.159), while Group B's average was 2.73 cm (+-0.317). The preterm birth rate was 16.2% (9/152) in Group A and 4.8% (21/197) in Group B. Group B had a significantly lower preterm birth rate ($P < 0.05$), suggesting that cervical tracing provides longer cervical length measurements, improving preterm birth prediction accuracy.

Conclusion: Cervical length measurement through tracing offers more accurate preterm birth predictions than conventional methods. Deep learning for CL measurement can also reduce patient discomfort, shorten examination times, and provide operator independence. Integrating deep learning AI for cervical length measurement has important implications for future practices.

Chart 1- Incidence of Cerclage Placement by Race and Ethnicity Groups, Language, Insurance and Cervical Length <10mm

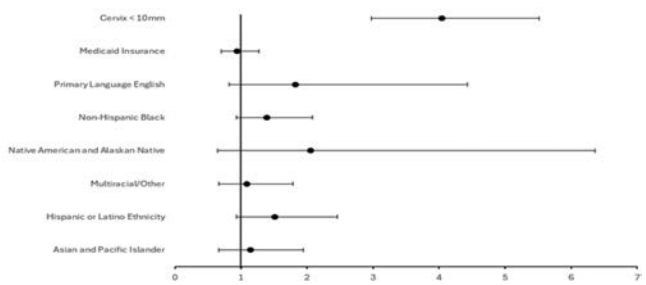

Table 1- Incidence of Cerclage Placement by Race and Ethnicity Groups, Language, Insurance and Cervical Length <10mm

	Cerclage Placed	Total	% Cerclage Placed	OR	95% CI
Race/Ethnicity					
Asian and Pacific Islander	34	111	30.63%	1.14	(0.66-1.94)
Hispanic or Latino	56	163	34.36%	1.51	(0.93-2.46)
Multiracial/Other	40	141	28.37%	1.09	(0.66-1.79)
Native American and Alaskan Native	7	15	46.67%	2.05	(0.65-6.36)
Non-Hispanic Black	116	347	33.43%	1.39	(0.93-2.08)
Primary Language English	298	959	31.07%	1.82	(0.82-4.34)
Medicaid Insurance	124	398	31.16%	0.94	(0.7-1.27)
Cervix <10mm	133	242	54.96%	4.04	(2.97-5.51)

771 | Outcomes in Vaginal versus Cesarean Periviable Breech Delivery: A 5-year, Propensity Score–Matched Study

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[1]Columbia University Irving Medical Center, New York, NY; [2]Department of Obstetrics and Gynecology, Columbia University Irving Medical Center, New York, NY; [3]Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ; [4]Columbia University, New York, NY

10:30 AM - 12:30 PM

Objective: To determine maternal and neonatal outcomes associated with vaginal versus cesarean breech delivery at periviability.

Study Design: This study analyzed non-anomalous, singleton, breech live births at 22w0d to 25w6d gestational age identified in the CDC Linked Birth/Infant Death Records data from 2016 to

2021. Multiple imputation was used to account for missing data. A propensity score (PS) analysis was conducted to establish pseudo-randomization based on the mode of delivery matching vaginal to cesarean deliveries at a ratio of 1:2 using greedy nearest-neighbor matching. The balance diagnostic was measured using standardized mean difference. In the outcome model, we estimated the risk difference (RD) and risk ratios (RR) and associated 95% CIs based on generalized estimation equation framework, using log-linear models with binomial distribution and a log/ identity link, respectively, after re-adjusting for gestational age (GA).

Results: Of 21,461 periviable breech singleton births, 34% (N = 7,289) delivered vaginally. Vaginal delivery was more common in earlier GA. After PS matching, the distributions of baseline factors were balanced between the delivery arms. A composite of adverse neonatal outcomes occurred among 99.0% (N = 7,213) of vaginal and 96.8% (N = 13,716) of cesarean breech births (RD 1.85, 95% CI -1.77 to 5.46; RR 1.02, 95% CI 0.98 to 1.06). Neonatal mortality was significantly higher for vaginal than cesarean breech births (73% versus 36%; RD 28.29 95% CI 25.50 to 31.07; RR 1.70, 95% CI 1.61 to 1.79). A composite of adverse maternal outcomes occurred in 1.6% of vaginal breech and 3.1% of cesarean births (RD -1.58, 95% CI -2.20 to -0.96, RR 0.48, 95% CI 0.36 to 0.65).

Conclusion: Vaginal breech birth between 22w0d and 25w6d gestation is associated with lower risk of adverse maternal outcomes but higher risk of neonatal mortality.

Risks of Adverse Maternal and Neonatal Outcomes by Mode of Delivery in Periviable Breech Presentation: Singleton Live Births in the United States, 2016-2021

	Vaginal delivery Number (%) (N=7,289)	Cesarean delivery Number (%) (N=14,172)	Adjusted risk difference (95% confidence interval)*	Adjusted Risk Ratio (RR) (95% confidence interval)*
Adverse neonatal outcomes				
Composite	7213 (99.0)	13716 (96.8)	1.85 (-1.77, 5.46)	1.02 (0.98, 1.06)
Neonatal mortality	5294 (72.6)	5128 (36.2)	28.29 (25.50, 31.07)	1.70 (1.61, 1.79)
5-min Apgar score <4	5615 (77.0)	3554 (25.1)	40.92 (38.15, 43.69)	2.43 (2.29, 2.57)
Neonatal intensive care unit admission	2739 (37.6)	12587 (88.8)	-41.06 (-44.00, -38.11)	0.53 (0.51, 0.56)
Assisted ventilation >6 hours	1081 (14.8)	5790 (40.9)	-20.13 (-22.13, -18.14)	0.49 (0.46, 0.53)
Adverse maternal outcomes				
Composite	115 (1.6)	440 (3.1)	-1.58 (-2.20, -0.96)	0.48 (0.36, 0.65)
Uterine rupture^	4 (0.1)	24 (0.2)	-0.15 (-0.29, -0.01)	0.36 (0.12, 1.09)
Maternal transfusion	78 (1.1)	237 (1.7)	-0.81 (-1.27, -0.35)	0.57 (0.40, 0.82)
Intensive care admission	29 (0.4)	206 (1.5)	-0.91 (-1.27, -0.56)	0.29 (0.16, 0.51)
Unplanned hysterectomy^	6 (0.1)	20 (0.1)	-2.01 (-19.30, 15.28)	0.33 (0.04, 2.68)
			1.85 (-1.77, 5.46)	1.02 (0.98, 1.06)

Parameter estimates were derived from 25 multiply-imputed datasets after propensity score matching. The propensity score calculation included year of delivery, maternal age, liveborn parity, marital status, maternal education, smoking before/during pregnancy, race/ethnicity, insurance status, attendant at delivery, pre-pregnancy body mass index, hypertensive disorders, diabetes mellitus, gestational age, induction of labor, and trial of labor attempted. The outcome model was re-adjusted for gestational age, using it as a categorical variable with 22 weeks of gestation as the reference group for all the outcomes, except for uterine rupture and unplanned hysterectomy. For these two outcomes, gestational age was re-adjusted as a continuous variable for better model fitting.

772 | Gestational Diabetes Mellitus in the 3RD Trimester After Diagnosing Large for Gestational Age And/Or Polyhydramnios

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10:30 AM - 12:30 PM

Objective: To evaluate outcomes of patients who rescreen for gestational diabetes mellitus (GDM) in the 3rd trimester based on a diagnosis of large for gestational age (LGA) and/or polyhydramnios.

Study Design: This is a retrospective cohort study from 1/1/11-3/1/24 of term, singleton pregnancies who were rescreened for GDM after being diagnosed with LGA and/or polyhydramnios. Patients with fetal growth restriction, or fetal anomalies were excluded. We compared outcomes in those that passed and failed rescreening using a logistic regression model where birthweight was adjusted for gestational age. Odds ratios and respective 95% confidence intervals and p-values are reported.

Results: We identified 348 pregnancies that completed GDM rescreening: 48 (13.8%) were diagnosed with GDM of which 10 (20.8%) required medication (A2GDM). When comparing patients that passed vs. failed rescreening, there were no statistically significant differences for birthweight (BW), BW ≥4000g, shoulder dystocia, preeclampsia or cesarean delivery. Patients that failed rescreen were more likely to have a newborn with neonatal hypoglycemia (7.0% vs. 22.9%, p< 0.01) and develop GDM in future pregnancies (1.3% vs. 10.4%, < 0.01).

Conclusion: The rate of diagnosis of GDM in the 3rd trimester after rescreening is low at only 14%, and similarly the rate of A2GDM is exceedingly low at 3% of all patients that were rescreened. Except for neonatal hypoglycemia, outcomes for patients diagnosed with GDM did not differ from those that passed rescreening. Despite making the diagnosis of GDM, there does not appear to be utility in rescreening due to the lack of improvement in perinatal outcomes.

Table: Maternal and neonatal outcomes for all patients who completed rescreening by results (pass/fail)

	Results of Completed Rescreen		Odds Ratio[1] (95% CI)	P-value[1]
	Pass (N=300)	Fail (N=48)		
Birthweight (grams), mean (std)	3809.4 (461.9)	3840.9 (562.2)	N/A	0.21[2]
Birthweight <4000 grams	199 (66.6)	30 (62.5)	0.74 (0.39-1.41)	0.36[3]
3rd degree tear	5 (2.6)	0 (0.0)	Not Estimable	
Shoulder dystocia	19 (6.4)	4 (8.0)	1.34 (0.44-4.14)	0.61
GDM	0 (0.0)	48 (100)	Not Appropriate	---
A1GDM		38		
A2GDM		10		
Uterotonic	49 (16.3)	5 (10.4)	0.60 (0.22-1.58)	0.30
Maternal blood transfusion	3 (1.0)	0 (0.0)	Not Estimable	---
Wound complications	0 (0.0)	0 (0.0)	Not Estimable	---
Preeclampsia	16 (5.3)	1 (2.1)	0.38 (0.05-2.92)	0.35
Induction of labor	172 (57.3)	25 (52.1)	0.81 (0.44-1.49)	0.50
Cesarean delivery	133 (44.5)	22 (45.8)	1.06 (0.57-1.95)	0.86
NICU admission	22 (7.4)	3 (6.3)	0.84 (0.24-2.92)	0.78
Neonatal hypoglycemia	21 (7.0)	11 (22.9)	3.95 (1.76-8.84)	<0.01
Future GDM	4 (1.3)	5 (10.4)	8.61 (2.22-33.30)	<0.01
Future type II diabetes	4 (1.3)	3 (6.3)	4.93 (1.07-22.77)	0.04

Data is described using frequencies and percents unless otherwise noted, n (%).
std: standard deviation
CI: confidence interval
NICU: Neonatal intensive care unit
GDM: Gestational diabetes mellitus
[1]Odds Ratio with respective 95 Confidence Intervals and P-value from a logistic regression model.
[2]Mixed regression model adjusted for gestational age, P-value reported.
[3]Birthweight has been adjusted for gestational age at delivery.

773 | Clinical Utility of Various Growth Factors in Preeclampsia

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10:30 AM - 12:30 PM

Objective: This study aimed to compare the levels of various growth factors in maternal serum and umbilical vein serum between individuals with preeclampsia (PE) and those with normotensive pregnancies.

Study Design: One hundred eight pregnant women were enrolled in this prospective study. 67 serum samples of preeclampsia and 41 normotensive mothers were collected. Umbilical

vein serum samples of 27 PE and 38 normotensive pregnancies were collected. Serum levels of BDNF, EGF, FGF-2, HGF, LIF, NGF-beta, PDGF-BB, PlGF-1, SCF, and VEGF-A and D were measured.

Results: EGF, HGF, LIF, PDGF-BB and SCF levels were significantly higher in PE compared to normotensive group. After adjustment for gestational age, EGF, HGF, LIF and SCF remained significantly high in PE. There were no differences in growth factors in umbilical vein serum between two groups. EGF, NGF-beta and SCF were associated with the elevation of systolic and diastolic blood pressure, while EGF was negatively correlated with birthweight and positively with protein/creatinine ratio. SCF showed a positive correlation with ALT and creatinine and a decreasing trend as gestational age advances.

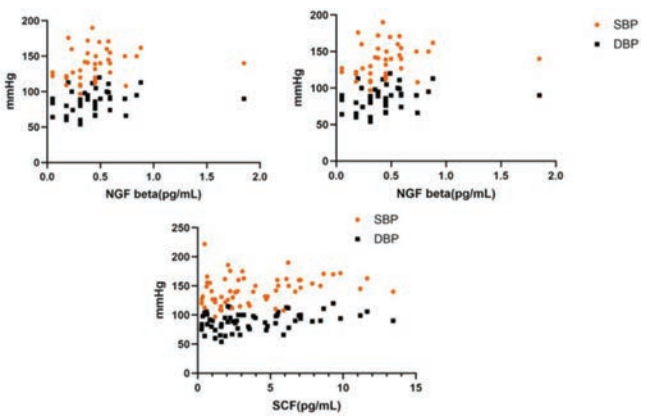
Conclusion: Circulating growth factors in PE, especially elevated levels of EGF, HGF, LIF, and SCF, may be responsible for the development or consequences associated with the pathogenesis of PE, with evidence demonstrating an association with severe features. These hormones in placenta appear to have different patterns compared to those in the maternal blood, suggesting that the placenta may regulate these factors to prevent them from reaching the fetus. Further experiments are need to explain this phenomenon.

	Maternal blood serum (pg/mL)				Umbilical vein serum (pg/mL)		
	Preeclampsia (n=67)	Normotensive (n=41)	*p*-value[b]	*p*-value [a,b]	Preeclampsia (n=27)	Normotensive (n=38)	*p*-value[b]
BDNF	5.5(3.2-11.2)	4.7(2.7-8.0)	0.195	0.730	3.5(2.6-6.5)	5.5(2.4-10.6)	0.075
EGF	30.5(15-60)	14.3(6.5-28.9)	<0.001	0.041	60.9(39.7-142.8)	50.4(25.3-86.4)	0.445
FGF-2	2.3(1.3-4)	1.3(1-1.6)	0.240	Not available	2(1.2-3.8)	3.1(1.5-5.0)	0.858
HGF	56.6(28.1-98.3)	23.5(16.8-71.3)	0.013	0.036	132.9(53.9-322.1)	206.9(147.9-301.8)	0.203
LIF	3(1.2-5.0)	1.5(0.9-2.4)	0.002	0.009	3.1(2.6-5)	3.6(2.6-5.2)	0.680
NGF-beta	0.42(0.2-0.6)	0.31(0.2-0.45)	0.103	0.097	0.9(0.11-1.0)	0.9(0.6-1.3)	0.853
PDGF-BB	28.8(11.5-44.9)	9.6(7.4-14.5)	0.001	0.341	113.9±259.4	192.3.6±420.2	0.600
PlGF-1	40.5(30.7-51)	36.4(31.6-77.9)	0.890	0.343	29.6(19-51)	25.4(23.8-39.8)	>.999
SCF	4.6(2.3-6.9)	2.2(1.2-3.6)	<0.001	<0.001	19.4(10.7-28.0)	23.1(12.8-34.8)	0.578
VEGF-A	19.6 (12-34.7)	16.8(9.4-27)	0.256	0.421	455.3(166-1006)	693.3(481.6-1193.6)	0.445
VEGF-D	4.7(2.9-6.5)	2.0(1.2-4.4)	0.009	0.187	6(3.6-8.6)	5.9(3.2-11.9)	>0.999
sFlt-1/PlGF ratio	62.6(30.4-180.4)	7.4(6.1-25.1)	0.114	Not available	127.2(54.7-154.4)	157.8(78.4-292.8)	0.524

growth factor, FGF-2 fibroblast growth factor-2, HGF hepatocyte growth factor, LIF leukemia inhibitory factor, NGF-beta nerve growth factor-beta, PDGF-BB platelet derived growth factor-BB, SCF stem cell factor, VEGF-A vascular endothelial growth factor-A, VEGF-D vascular endothelial growth factor-D

[a] Adjusted for gestational age

[b] *P*-values calculated by student t-test or Mann-Whitney Wilcoxon test



774 | Sonographic Features of Placenta Accreta Spectrum with and Without Placenta Previa

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10:30 AM - 12:30 PM

Objective: To evaluate sonographic features of placenta accreta spectrum (PAS) with placenta previa compared to those without placenta previa.

Study Design: Prospective, single referral center study of pregnancies undergoing a standardized, ultrasound protocol for PAS risk assessment in the second and third trimesters. Protocol was applied to pregnancies with placenta previa or request of the obstetric provider based on risk factors. Transvaginal ultrasound was performed if placenta previa was present. Loss of hypoechoic zone (LHZ), retroplacental myometrial thinning (RMT), placental lacunae (PL), placental extension (PE), hypervascularity (HV) and overall PAS risk were assessed. Delivery at $\geq$23 weeks gestation from 1/1/2023 to 7/15/2024 with clinical and/or histologic PAS were included. PAS with placenta previa (PAS-PP) included those with placenta covering the cervical os at the time of delivery. PAS without placenta previa (PAS-NP) excluded those with low-lying placenta even if they resolved.

Results: Two hundred nineteen patients underwent the PAS ultrasound protocol and 37 diagnosed with PAS, 24 PAS-PP and 13 PAS-NP. PAS-NP was more likely than PAS-PP to have history of PAS (38% vs 0%, $p < 0.01$) and less likely to have LHZ, RMT, and HV. There was also a difference in number and size of PL. PAS-PP was more likely to have sonographic suspicion for PAS (78% vs 33%, $p = 0.02$) with a PPV and NPV of 76% and 82%, respectively. Among PAS-NP, PPV and NPV was 44% and 81%, respectively. Twenty-three cases were non-invasive, 10 PAS-PP (42%) and 13 PAS-NP (100%). Sonographic suspicion for PAS was noted in 60% PAS-PP and 33% PAS-NP in the non-invasive subgroup, however, we were not powered to detect a difference ($p = 0.39$).

Conclusion: Standard ultrasonographic signs of PAS are less likely to be present in PAS without placenta previa resulting in lower detection rates. Larger studies are needed to determine whether these differences persist in non-invasive PAS. Alternative PAS risk assessment tools should be investigated in non-previa PAS to improve antenatal detection.

Table 1. Sonographic features of PAS with and without placenta previa

(N=37)	PAS with previa (n=24)	PAS without previa (n=13)	p-value[#]
Loss of hypoechoic zone (LHZ)	17 (71%)	3 (23%)	<0.01
Retroplacental myometrial thinning (RMT)	16 (67%)	3 (23%)	0.02
Placental extension (PE)	4 (17%)	0 (0%)	0.28
Retroplacental hypervascularity (HV)	17 (71%)	1 (8%)	<0.01
Placental lakes (PL)			
None	2 (8%)	5 (38%)	<0.01
1-3, small lakes	8 (33%)	7 (54%)	
4-6, medium lakes	11 (46%)	0 (0%)	
Many, irregular lakes	3 (13%)	1 (7.7%)	
Sonographic suspicion for PAS (n=35)	18 (78%)	4 (33%)	0.02

[#]Fisher's test

775 | Universal Or Selected Policy Of Tranexamic Acid For Preventing Blood Loss After Cesarean Delivery?

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10:30 AM - 12:30 PM

Objective: Prophylactic tranexamic acid has been shown to reduce postpartum blood loss in cesarean deliveries, but its effectiveness may vary based on individual factors and cesarean management. Identifying the women who would benefit most could optimize treatment and minimize unnecessary exposure.
We reanalyzed data from the TRAAP2 trial to determine if the effect of tranexamic acid on postpartum hemorrhage (PPH) varies with women and management of the cesareans' characteristics.
Study Design: We included all women in the modified intention-to-treat population of TRAAP2 who received tranexamic acid or placebo. The primary outcome was PPH, defined as blood loss over 1000 ml or a red-cell transfusion within two days post-delivery. Predictors for PPH included baseline characteristics and cesarean management details. Both logistic regression with lasso penalization (LRL) and random forest (RF) were used to estimate associations between PPH and predictors. Prediction accuracy was assessed using the area under the ROC curve (AUROC) and the precision-recall curve (AUPRC).
Results: The study included 4,367 women (2,190 in the tranexamic acid group and 2,177 in the placebo group). Lasso logistic regression outperformed random forest, with an AUROC of 0.72 (95% CI: 0.70-0.74) (Figure 1). The most important predictors of PPH were multiple pregnancy, number of cesareans, body mass index at the end of pregnancy, hemoglobin within 7 days before delivery, gestational age at delivery and cesarean during labor because of protracted labor. Model had poor calibration for benefit of tranexamic acid with an observed benefit almost constant across the quintile of predicted benefit with a discrimination for benefit of 0.04 (95%CI: -0.07; 0.15) (Figure 2).
Conclusion: Although tranexamic acid is effective for the prevention of calculated blood loss at population level, its individual efficacy is difficult to forecast accurately. This suggests that a targeted prophylactic approach, rather than universal use, may not be appropriate for preventing blood loss in cesarean deliveries.

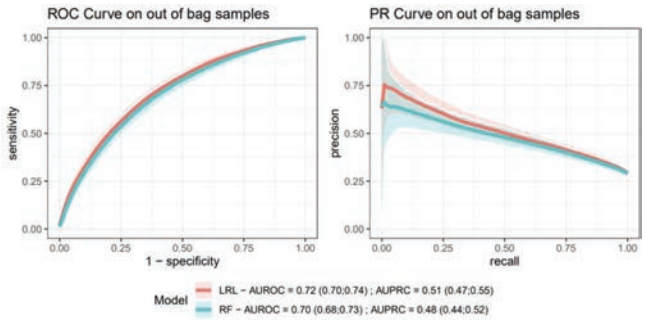

Figure 1: Receiving Operator Curve (ROC) and Precision Recall (PR) curve of models to predict PPH. Area under both ROC (AUROC) and PR (AUPRC) curves are presented with bootstrapped 95% confidence intervals.

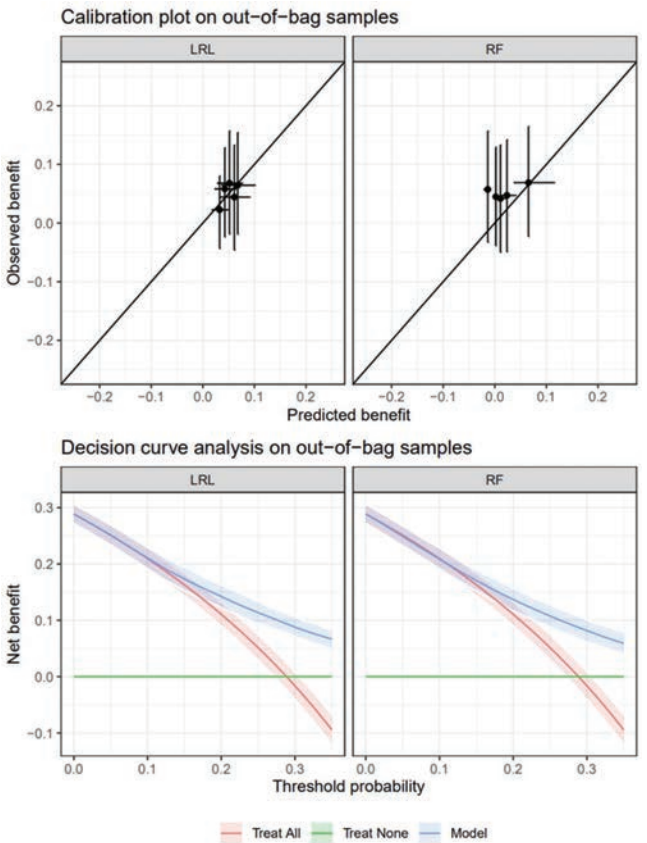

Figure 2: Calibration plot of the predicted benefit compared to the observed benefit and decision curve analysis.

776 | Assessment of the Impact of Hemodynamic-aligned Antihypertensive Therapy in Postpartum Management of Preeclampsia

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10:30 AM - 12:30 PM

Objective: Labetalol and nifedipine are first line antihypertensive agents for hypertensive disorders of pregnancy. There's limited research on selecting medication based on hemodynamic profiles in preeclampsia (PEC), such as high cardiac output (CO) and high systemic vascular resistance (SVR). Our objective was to assess if concordance of antihypertensive treatment with the hemodynamic status on echocardiography (echo) optimizes blood pressure (BP) control in PEC patients.

Study Design: This is a retrospective cohort study of patients with PEC with severe features who delivered at our institution and received a postpartum echo, excluding patients with cardiomyopathy. Antihypertensive choice and decision to order echo were provider dependent. CO and SVR were calculated retrospectively from the echo in collaboration with cardiology. Concordance was defined as patients with high CO (>6L/min) initiated on labetalol and high SVR (>1200 dyn.s.cm^5) initiated on nifedipine. Patients initiated on the opposite medication were grouped as discordant. The primary outcome was time to optimal BP control, defined as the period from the start of BP medication to when no titration was needed. Chi-squared & Fisher's exact tests were used for categorical variables, and Mann-Whitney U test for continuous variables.

Results: Of the 145 patients, 83 (58%) received concordant therapy. Maternal demographics were similar between groups (Table 1). No patients were on magnesium sulfate during the echo. Most patients had high SVR (74%) vs high CO (26%). Of those with high SVR, 56% were on nifedipine. Overall, 51% of patients received Labetalol and 48% received Nifedipine. There was no difference in the median time to optimal BP control (2 days for both groups, p = 0.4). The median postpartum length of stay was 3 days for both groups (p >0.9) (Table 2).

Conclusion: Our study revealed majority of patients with PEC had high SVR, with Nifedipine initiation aligning with most hemodynamic profiles. Although time to optimal BP control did not differ, prospective studies are needed to explore the benefits of hemodynamic aligned therapy in PEC.

Table 1 - Baseline Characteristics of the Patients

Characteristics	Concordant therapy (N=85)	Discordant therapy (N=62)	P value
Age, years	33.0 [30.0, 38.0]	34.0 [31.0, 36.0]	0.9
Race/ethnicity			
Asian	7 (8.4%)	6 (9.7%)	0.6
Black	16 (19%)	12 (19%)	
Hispanic	12 (14%)	14 (23%)	
Non-Hispanic White	32 (39%)	17 (27%)	
Not reported	17 (27%)	13 (21%)	
Pre-pregnancy BMI, kg/m^2	29.0 [25.0, 32.6]	28.2 [24.5, 35.3]	0.9
Nulliparous	49 (59%)	32 (52%)	0.4
Medical comorbidities			
Chronic hypertension	13 (16%)	12 (19%)	0.6
Preexisting diabetes mellitus	9 (11%)	4 (6.5%)	0.4
Gestational diabetes	12 (14%)	9 (15%)	>0.9
Thyroid disease	12 (14%)	3 (4.8%)	0.06
Autoimmune disease	2 (2.4%)	0 (0%)	0.5
History of preeclampsia in prior pregnancy	12 (14%)	13 (21%)	0.3
Fetal growth restriction	5 (6.0%)	2 (3.2%)	0.7
Gestational age at delivery			
≥37.0 weeks	49 (60%)	39 (63%)	0.6
34.0-36.6 weeks	21 (26%)	17 (27%)	
28.0-33.6 weeks	9 (11%)	6 (9.7%)	
<28.0 weeks	3 (3.7%)	0 (0%)	
Antenatal onset of PEC	38 (46%)	32 (52%)	0.5
Postpartum onset of PEC	43 (52%)	29 (47%)	
Readmitted for PEC	31 (37%)	23 (37%)	>0.9
Lasix use	17 (20%)	15 (25%)	0.6

Data presented as median [interquartile range] and n (%)
PEC, preeclampsia with severe features

Table 2 – Outcomes & echocardiogram findings

Outcomes	Concordant therapy (N=85)	Discordant therapy (N=62)	P value
Time to optimal BP control, days	2 [1, 3]	2 [1, 3]	0.4
Length of postpartum stay, days	3 [2, 4]	3 [2, 4]	>0.9
Discharged on ≥2 BP meds	26 (31%)	26 (42%)	0.2
Hemodynamic profile			
High cardiac output	24 (29%)	13 (21%)	0.3
High systemic vascular resistance	59 (71%)	49 (79%)	0.3
Stroke volume, mL/beat	66 [54, 77]	63 [54, 73]	0.3
Cardiac output, L/min	5.29 [4.21, 6.27]	4.99 [4.20, 5.67]	0.14
Systemic vascular resistance, dyn.s.cm^5	1,429 [1,140, 1,751]	1,497 [1,309, 1,760]	0.3
Ejection fraction, %	60 [55, 60]	60 [58, 61]	0.15

Data presented as median [interquartile range] and n (%)

777 | Effect of Social Drivers of Health on Screening for Type 2 Diabetes During Delivery Hospitalization

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10:30 AM - 12:30 PM

Objective: To estimate the effect of social and structural drivers of health on completion of screening for type 2 diabetes during the delivery hospitalization in patients with gestational diabetes mellitus (GDM).

Study Design: The American College of Obstetricians and Gynecologists updated guidance in May 2024 to offer a 2-hour oral glucose tolerance test (OGTT) in patients with GDM during the immediate delivery hospitalization. Subsequently, our institution began to offer all patients with GDM this option. Patients with recent (7 days) administration of antenatal corticosteroids and those with out of state follow-up were excluded. Demographic, social and structural drivers of health were prospectively collected on all patients with GDM. A comparison of variables was performed between those who did versus those who did not complete the OGTT in the immediate delivery hospitalization. P < 0.05 was considered statistically significant.

Results: From June 24 through August 1, 2024, 694 deliveries occurred with 40 (5.8%) patients having GDM. 38 patients were offered inpatient OGTT, 1 was not eligible, and 1 was excluded from analysis. 53.8 % (21/39) completed and 46.2% (18/39) did not complete screening (Figure 1). 84.6% (11/13) with medication controlled GDM (A2GDM) and 38.5% (10/26) with diet controlled GDM (A1GDM) completed screening; (OR = 8.8, 95% CI: 1.87-65.09). Social and structural drivers of health were similar between the two groups (Table 1).

Conclusion: A greater proportion of patients with GDM accept screening for type 2 diabetes via the OGTT during delivery hospitalization compared to traditional rates reported at 4 to 12 weeks postpartum (< 30% receive recommended screening with OGTT). Patients with A2GDM were more likely to complete inpatient screening than those with A1GDM. Social and structural drivers of health were similar between groups. Further studies will be needed to identify variables that may increase screening uptake for type 2 diabetes in patients with GDM in the immediate postpartum delivery hospitalization.

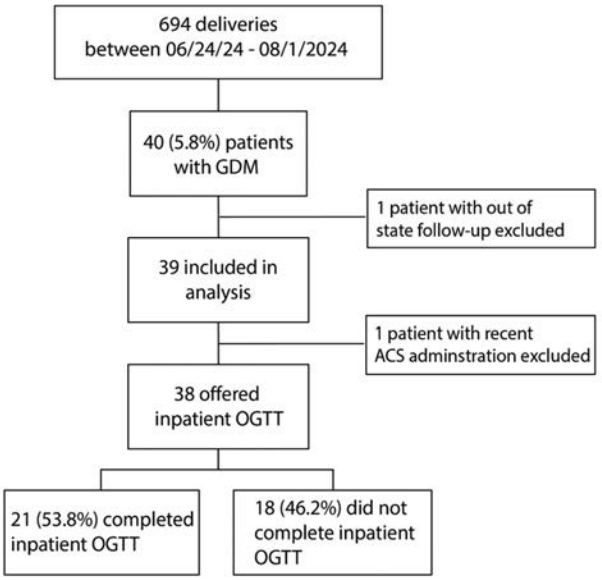

Figure 1: Schematic of prospective review of patients with GDM and completion of OGTT

Table 1: Maternal demographic, social and structural drivers of health information by completion of OGTT

	Completed OGTT (n= 21)	Did not complete OGTT (n=18)	P
Age	31.4 ± 5.25	32.6 ± 5.07	0.48
BMI	32.0 ± 5.47	34.2 ± 7.41	0.30
Parity			0.34
Nulliparous	7 (33.3%)	9 (50.0%)	
Multiparous	14 (66.7%)	9 (50.0%)	
Mode of Delivery			0.10
Vaginal	10 (47.6%)	14 (77.8%)	
Cesarean	11 (52.4%)	4 (22.2%)	
Type of GDM			0.01
A1GDM	10 (47.6%)	16 (88.9%)	
A2GDM	11 (52.4%)	2 (11.1%)	
Ethnicity			0.11
Hispanic	5 (23.8%)	9 (50.0%)	
Non-Hispanic	16 (76.2%)	9 (50.0%)	
Race			0.37
Asian	8 (38.1%)	3 (16.7%)	
Black/African American	3 (14.3%)	4 (22.2%)	
White	10 (47.7%)	10 (55.6%)	
Other	0 (0.0%)	1 (5.6%)	
SVI (Overall)	0.476	0.467	0.93
Socioeconomic Status	0.465	0.467	0.99
Household and Disability	0.473	0.414	0.55
Racial/Ethnic Minority Status	0.583	0.667	0.26
Housing/Transportation	0.486	0.538	0.58
Distance from hospital (miles)	18.7 ± 25.3	15.7 ± 7.9	0.61
Mean Income	$115,695	$117,356	0.93
Median Income	$90,671	$96,226	0.77

Race and ethnic group were reported by patient electronic health records.
Data are presented as mean ± SD (range) and number (percent) where applicable.
The body-mass index is the weight in kilograms divided by the square of the height in meters.
Independent t-test or Mann Whitney U test were used for continuous variables and Fisher Exact test for binomial variables. Linear regression analysis was used for analysis of GDM types.
SVI (social vulnerability index) and income are based on 2022 Census Tract Data from the CDC.

778 | Which Cutoff of the 50-Gram Gct Has a Higher Predictive Value for Gestational Diabetes Mellitus?

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10:30 AM - 12:30 PM

Objective: The 50-gram glucose challenge test (GCT) is used as the initial step in screening for gestational diabetes mellitus (GDM). If the GCT result exceeds the institutional threshold, a 100-gram oral glucose tolerance test (OGTT) is performed. The objective of this study was to determine which GCT result is high enough to predict a diagnosis of GDM

Study Design: The study included all pregnant women who underwent a GCT in in a large Health Maintenance Organization. The study included all pregnant women who underwent a GCT between July 2002 and July 2024. We analyzed various GCT values to determine the percentage of women with at least one abnormal value in the subsequent OGTT. GCT was performed if the value was 140 mg/dL or higher. Normal results for OGTT were defined as follows: fasting < 95 mg/dL, 60 minutes < 180 mg/dL, 120 minutes < 155 mg/dL, and 180 minutes < 140 mg/dL

Results: During the study period, 95,562 GCTs were performed, of which 20,797 (21.7%) resulted in a value of 140 mg/dL or higher. Overall, 3,068 women (15%) exhibited at least one abnormal value in the OGTT. The incidence of women with abnormal OGTT results for each GCT group ranged from 24% to 80% (Table 1). The incidence of abnormal OGTT results in each GCT group increased with age, with older women having a higher incidence of these results (Table 2)

Conclusion: In this large cohort, even significantly elevated GCT values could be followed by normal OGTT results, especially in young pregnant women. Therefore, it is recommended to perform an OGTT for every GCT result above the institutional cutoff

Table 1

GCT Result (mg/dL)	Percent of Women with Abnormal OGTT
140-149	24%
150-159	31%
160-169	43%
170-179	59%
180-189	63%
Above 190	80%

Percent of women with a pathological value in OGTT, by GCT results

Table 2

Age / GCT	20-29 y	30-39y	40-49 y
140-149	21%	25%	%36
150-159	27%	34%	%39
160-169	40%	45%	%51
170-179	49%	52%	%67
180-189	57%	65%	%71
190-199	65%	76%	%89

Percent of women with a pathological value in OGTT, by GCT results and age

779 | Clinical Chorioamnionitis is a Major Risk Factor for Failed Vacuum-Assisted Deliveries

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10:30 AM - 12:30 PM

Objective: We aimed to determine the impact of clinical chorioamnionitis during labor and the risk of failed vacuum-assisted delivery (VAD).

Study Design: A retrospective cohort study at a single university-affiliated tertiary medical center with approximately 12,000 deliveries annually from 2011-2023. The study group included singleton pregnancies at ≥36 weeks' gestation undergoing a trial of vacuum delivery. The study group, comprising cases of failed vacuum extraction (defined by extraction duration over 20 minutes, more than two cup detachments, or the operator's decision to switch to urgent cesarean delivery), and the control group, consisting of successful vacuum extractions. Clinical chorioamnionitis was diagnosed with an intrapartum fever of ≥38°C and the presence of either a white blood cell count ≥15,000 or documentation of a commonly used broad-spectrum antibiotic regimen for clinical chorioamnionitis.

Results:

1. Vacuum extraction was attempted in 9,402 out of 111,878 vaginal deliveries (8.4%).
2. The rate of failed VAD was 197/9402 deliveries (2.1%).
3. Multivariate logistic regression analysis identified clinical chorioamnionitis as the major independent risk factor for failed VAD (OR = 3.65, 95% CI 2.3-5.8, p < 0.001).
4. Additional risk factors for failed VAD included: Occiput posterior position (OR = 2.45, 95% CI 1.6-3.7, p < 0.001); Fetal head station less than 2 cm below the ischial spine (OR = 1.92, 95% CI 1.4-2.7, p < 0.001); duration of the second stage of delivery > 3.5 hours (OR = 1.92, 95% CI 1.4-2.7, p < 0.001); birth weight > 3,500 grams (OR = 1.77, 95% CI 1.3-2.5, p < 0.001); induction of labor (OR = 1.95, 95% CI 1.4-2.7, p < 0.001); meconium stained amniotic fluid (OR = 1.52, 95% CI 1.1-2.2, p = 0.018); Male gender (OR = 1.18, 95% CI 1.0-2.0, p = 0.042).

Conclusion: In addition to well-known risk factors for failed VAD, clinical chorioamnionitis was found to be the main factor associated with an increased risk of vacuum failure.

TABLE 1. Obstetrical & Labor characteristics of the study population during labor

Characteristic	Study group (n=169)	Control group (n=9208)	*P*-value
Maternal age at delivery (y), IQR (25%-75%)	31.8 (29.3-34.8)	31.7 (29.5-34.1)	0.195
Maternal age <35 years, n (%)	162 (82.2%)	6985 (75.9%)	**0.039**
Nulliparity, n (%)	174 (88.3%)	8079 (87.8%)	0.819
Pregnancy via IVF, n (%)	25 (12.7%)	851 (9.2%)	0.100
Pregestational BMI kg/m^2, IQR (25%-75%)	21.9 (20.0-24.4)	21.6 (19.8 (24.1)	0.311
Pregestational BMI ≥30, n (%)	9 (4.6%)	390 (4.2%)	0.807
GWG (kg), IQR (25%-75%)	14.0 (10.0-16.0)	13.0 (10.0-16)	0.477
GWG ≥15 Kg, n (%)	80 (40.8%)	3134 (34.0%)	**0.048**
Maternal height (m), IQR (25%-75%)	1.63 (1.59-1.69)	1.64 (1.6-1.68)	0.786
Maternal height <160 cm, n (%)	53 (27.0%)	1996 (21.7%)	0.072
Pregestational diabetes, n (%)	0 (0%)	44 (0.5%)	0.331
Gestational diabetes, n (%)	19 (9.6%)	830 (9.0%)	0.897
Smoking, n (%)	6 (3.0%)	474 (5.1%)	0.184
Previous CD, n (%)	13 (6.6%)	480 (5.2%)	0.378
Clinical chorioamnionitis, n (%)	26 (13.2%)	478 (5.2%)	**<0.001**
Epidural analgesia, n (%)	162 (89.8%)	8436 (91.6%)	0.368
Induction of labor, n (%)	69 (45.4%)	2673 (29.5%)	**<0.001**
Length of second stage of labor (min) IQR (25%-75%)	178 (122-230)	148 (79-190)	**<0.001**
Head station compared to ischial spine <2 cm, n (%)	75 (38.1%)	2498 (27.1%)	**<0.001**
AROM, n (%)	64 (32.8%)	2638 (28.7%)	0.213
Meconium, n (%)	66 (33.5%)	2388 (25.4%)	**0.010**
Second stage >3.5 h, n (%)	50 (25.4%)	1302 (14.1%)	**<0.001**
Occiput posterior, n (%)	41 (20.8%)	865 (9.4%)	**<0.001**
Gestational age (weeks), IQR (25%-75%)	40.0 (39.2-41.0)	40.0 (39.1-40.5)	**0.001**
Gestational age >40 (weeks), n (%)	115 (58.4%)	4408 (47.9%)	**0.004**
Birthweight (gr), mean (±SD)	3386 (393)	3242 (409)	0.467
Birthweight >3750 gr, n (%)	32 (16.2%)	964 (10.5%)	**0.009**

IQR=interquartile range; SD=standard deviation; *IVF*=in vitro fertilization; *BMI*=body mass index; *GWG*=gestational weight gain; *CD*=cesarean delivery.
AROM=artificial rupture of membranes
Significant differences (*P* < .05) are presented in **BOLD**.

Table 2. Multivariate Analysis

	OR	95% CI	P-value
Clinical Chorioamnionitis	**3.65**	**2.3-5.8**	**<0.001**
Occiput posterior	**2.45**	**1.6-3.7**	**<0.001**
palpated fetal head station less than 2 cm below the ischial spine	**1.92**	**1.4-2.7**	**<0.001**
Second stage > 3.5 hours	**2.00**	**1.4-2.9**	**<0.001**
Medical induction of labor	**1.95**	**1.4-2.7**	**<0.001**
Birthweight > 3500 gr.	**1.77**	**1.3-2.5**	**<0.001**
Meconium	**1.51**	**1.1-2.2**	**0.018**
Male gender	**1.42**	**1.0-2.0**	**0.042**
Gestational age > 40 weeks' gestation	1.18	0.8-1.7	0.334
Maternal age < 35	1.34	0.9-2.0	0.188

780 | is Prenatal Bisphenol and Phthalate Exposure Associated with Fetoplacental Ratio?

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10:30 AM - 12:30 PM

Objective: Fetoplacental ratio (FPR), the ratio of birthweight (BW) to placental weight (PW), is a well-described indicator of placental efficiency that is linked to future health risks. Bisphenols (BPs) and phthalates are endocrine-disrupting chemicals found in plastics, household products, and vinyl medical tubing. There is no strong evidence that prenatal exposure to BPs or phthalates is associated with neonatal BW, and yet studies show associations with pregnancy complications and adverse child health outcomes. We analyzed prenatal exposure to BPs and phthalates in relation to FPR, BW, and PW as a possible novel explanation.

Study Design: 401 participants in the [institution redacted] Children's Health and Environment Study with data on prenatal chemical exposure, BW, and PW from singleton births were included. Chemical concentrations were log-transformed and adjusted for creatinine. Molar sums of metabolites represented exposure to low and high molecular weight (LMW, HMW) phthalates, diethylhexyl phthalate (DEHP), antiandrogenic phthalates, and BPs; trimester concentrations were averaged. Linear regression models were adjusted for gestational age, fetal sex, maternal demographics, and chemical batch (Table 1). Analyses were stratified by fetal sex.

Results: We found no significant associations between chemical exposure and FPR in the combined sample. Among female fetuses, BPs and HMW phthalates were linked with higher FPR, the former association driven by BPS and the latter driven by DEHP. In models with BW and PW as outcomes, we observed no association with BW in combined or stratified models. We found significant negative associations for the same chemical groups and PW among female infants.

Conclusion: Among female fetuses, exposures to HMW phthalates and BPs are significantly associated with higher FPR due to reduced PW. The BP findings were driven by exposure to BPS, a recent BPA substitute in many consumer products. Our results suggest that BPs and phthalates may affect placental efficiency, with potential implications for pregnancy complications and child health outcomes.

Table 1. Associations of bisphenol and phthalate exposure with fetoplacental ratio, birthweight, and placental weight.

Combined Fetal Sex						
	Fetoplacental Ratio		Birthweight (grams)		Placental Weight (grams)	
Exposure	beta [95% CI]	p-value	beta (95% CI)	p-value	beta (95% CI)	p-value
Low molecular weight phthalates	-0.03 [-0.18, 0.12]	0.73	-32.93 [-77.65, 11.79]	0.15	-2.72 [-16.68, 11.23]	0.70
High molecular weight phthalates	0.16 [-0.03, 0.36]	0.10	5.65 [-53.83, 65.13]	0.85	-14.13 [-32.14, 3.88]	0.12
Diethylhexyl phthalate (DEHP)	0.19 [-0.00, 0.38]	0.06	3.41 [-55.62, 62.44]	0.91	-15.99 [-33.92, 1.93]	0.08
Antiandrogenic phthalates	0.07 [-0.12, 0.27]	0.45	-11.96 [-70.95, 47.03]	0.69	-5.57 [-23.54, 12.40]	0.54
Bisphenols	-0.04 [-0.23, 0.16]	0.70	-6.39 [-65.67, 52.88]	0.83	-4.51 [-22.77, 13.77-	0.63
Male Fetus Only						
	Fetoplacental Ratio		Birthweight (grams)		Placental Weight (grams)	
Exposure	beta [95% CI]	p-value	beta (95% CI)	p-value	beta (95% CI)	p-value
Low molecular weight phthalates	-0.15 [-0.39, 0.09]	0.23	-39.32 [-105.24, 26.60]	0.24	9.08 [-10.33, 28.48]	0.36
High molecular weight phthalates	0.11 [-0.18, 0.41]	0.45	39.56 [-41.47, 120.60]	0.34	1.01 [-23.05, 25.08]	0.93
Diethylhexyl phthalate (DEHP)	0.1 [-0.19, 0.39]	0.50	19.18 [-61.61, 99.97]	0.64	-1.67 [-25.53, 22.19]	0.89
Antiandrogenic phthalates	-0.0 [-0.3, 0.28]	0.96	0.67 [-78.22, 79.56]	0.99	10.34 [-12.98, 33.67]	0.38
Bisphenols	-0.28 [-0.58, 0.02]	0.07	26.37 [-56.1, 108.84]	0.53	18.56 [-5.81, 42.93]	0.13
Female Fetus Only						
	Fetoplacental Ratio		Birthweight (grams)		Placental Weight (grams)	
Exposure	beta [95% CI]	p-value	beta (95% CI)	p-value	beta (95% CI)	p-value
Low molecular weight phthalates	0.12 [-0.06, 0.30]	0.20	-32.82 [-95.32, 29.68]	0.30	-17.36 [-38.50, 3.77]	0.10
High molecular weight phthalates	**0.26 [0.02, 0.51]**	**0.04**	-36.79 [-127.57, 53.99]	0.42	**-35.09 [-63.37, -6.81]**	**0.02**
Diethylhexyl phthalate (DEHP)	**0.30 [0.06, 0.55]**	**0.02**	-12.75 [-102.77, 77.27]	0.78	**-33.30 [-61.93, -4.67]**	**0.02**
Antiandrogenic phthalates	0.24 [-0.01, 0.5]	0.06	-13.51 [-107.37, 80.36]	0.78	-27.78 [-57.50, 1.95]	0.07
Bisphenols	**0.29 [0.04, 0.54]**	**0.02**	-48.76 [-137.88, 40.37]	0.28	**-34.72 [-63.74, -5.69]**	**0.02**

All exposure concentrations adjusted for creatinine and natural-log transformed
Combined results adjusted for maternal body mass index, age, insurance status, race/ethnicity, parity, fetal sex, gestational age and chemical batch
Sex-stratified results adjusted for maternal body mass index, age, insurance status, race/ethnicity, parity, gestational age and chemical batch
Low molecular weight phthalates: molar sum of miBP, mEP, mBP
High molecular weight phthalates: molar sum of mEOHP, mEHHP, mECPP, mCPP, mCMHP, mCIOP, mCINP, mBzP, mEHP
DEHP: molar sum of mEOHP, mEHHP, mECPP, mCMHP, mEHP
Antiandrogenic phthalates: molar sum of miBP, mEOHP, mEHHP, mECPP, mCIOP, mBZP, mBP, mEHP
Bisphenols: molar sum of BPA, BPS

781 | a Just Start: a Mixed-Methods Analysis of Obstetric Health-Harming Legal Needs Among Low-Income Pregnant People

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10:30 AM - 12:30 PM

Objective: Health-harming legal needs (HHLN) comprise social barriers to health best addressed through medical-legal collaboration. The objective of this analysis was to understand patient perspectives and experiences with HHLN in pregnancy and postpartum.

Study Design: In this mixed-methods study, we conducted validated surveys and semi-structured interviews in English or Spanish with obstetric patients in a public hospital in Chicago, Illinois. Surveys included the Medical-Legal Partnership Legal Needs Screening Tool and a demographic survey. We applied community-engaged strategies to collaborate with patients, advocates, physicians, nurses, and social workers to design obstetric HHLN interviews. Interviews focused on four HHLN domains: employment, public benefits, housing, and safety. We applied iterative transcript-based coding to develop and refine a codebook, assess interrater reliability (Cohen's kappa >0.85), and analyze themes.

Results: Forty-eight obstetric patients (94% pregnant, 6% postpartum), aged 19-39 years, participated. Twenty participants (42%) identified as Black, 26 as Latine (54%), and 2 as white (4%). All but two participants had public insurance (67%) or were uninsured (27%). In interviews, when asked generally, 92% of participants denied having HHLN. However, 70% of all participants screened positive in the HHLN survey, and when queried about HHLN domains, 95% described obstetric-specific HHLN (Figure). The majority of participants (77%) experienced two or more HHLN, while few faced only an isolated HHLN or none (Figure). The most prevalent obstetric HHLN related to employment (e.g. pregnancy-related workplace discrimination), poor access to public benefits, or substandard housing (Table). Participants described limited options for recourse when HHLN negatively affected their pregnancies (Table).

Conclusion: HHLN burdened nearly all low-income obstetric patients in this study, but most did not realize they had unmet legal needs. Evidence-based interventions are needed to increase awareness of obstetric HHLN and protect pregnant people from the obstetric consequences of HHLN.

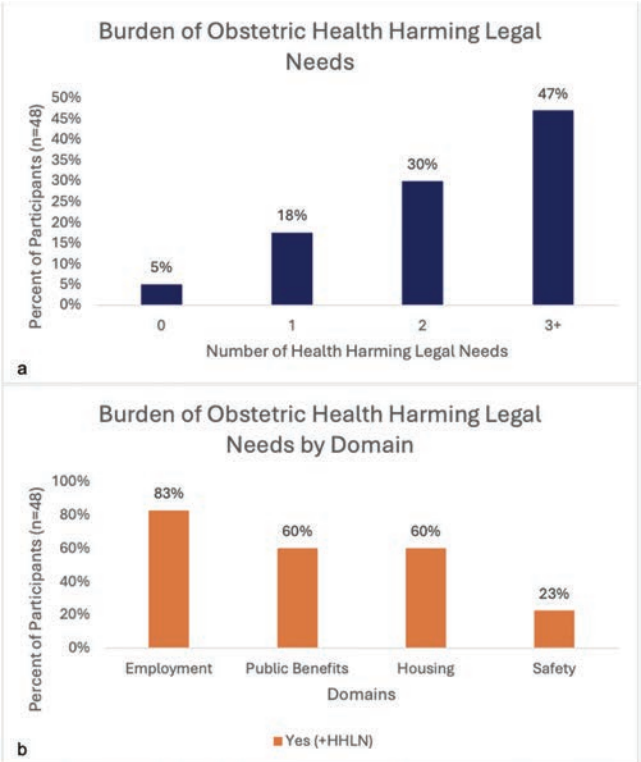

Figure. Obstetric health harming legal needs (HHLN) in pregnancy and postpartum.

Table. Obstetric health harming legal needs: themes and representative quotations
Employment
Unjustified pregnancy-related job terminations "I was feeling very lightheaded. I felt like throwing up, and the employer said they couldn't keep me on." *Difficulty finding work due to pregnancy* "It's difficult because employers are reluctant to hire me because I'm pregnant, and it's very noticeable. They fear taking the risk something might happen to me, that's why." *Lack of accommodations* "I have epilepsy, and I also had frequent seizures during pregnancy…My employer was supportive by allowing me to work for as long as I wanted...I had to resign because the high-risk pregnancy became overwhelming…The employer never offered or spoke to me about any benefits I could get [during pregnancy]."
Public Benefits
"They try to say, 'Get into programs,' but it's hard to get into certain programs or it's hard for other programs to call you back because there's so many people that need help. So you have to wait. And by the time you get help, it's a little bit too late."
Housing
"[The landlord] doesn't keep up the maintenance of the building…It's molding or open spaces … it's rodents and stuff throughout the building… There's been a couple of times the heat went off throughout the whole building for a month or so... Our wall that's half missing or not all the way done…I've sent letters to her, have mentioned to her plenty of times about the maintenance."
Safety
"Safety over there because the vehicle I have, they stole the vehicle before, but not from that location particularly. So I know it's dangerous over there. Then it's right there in the city and the area will mow a lot of shooters and stuff going there. But I don't be outside. And since I just moved out, I don't try to be nobody by the window."

782 | Transcerebellar Diameter in Fetal Growth Restriction - Does Concordance with Estimated Fetal Weight Matter?

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10:30 AM - 12:30 PM

Objective: Fetal growth restriction (FGR) is a significant risk factor for perinatal morbidity and mortality. Differentiating pathologic FGR due to placental insufficiency from a benign constitutionally small fetus remains challenging. We evaluated whether discordance between transcerebellar diameter (TCD) and estimated fetal weight (EFW) was associated with signs of pathologic FGR.

Study Design: We conducted a multi-center prospective study of singleton pregnancies with FGR (EFW < 10th%) diagnosed between 16 and 37.6 weeks gestation. We excluded those without confirmed first trimester dating, or with identifiable anatomic, genetic, or infectious etiologies of FGR. Cerebellum measurement was planned at each growth scan. Concordance between measures was defined as TCD < 25th% and EFW < 10th% and discordance TCD ≥ 25th% and EFW < 10th%. The primary outcome was a composite of signs of placental insufficiency (abnormal umbilical artery Dopplers, oligohydramnios, and/or abnormal antepartum testing). Secondary outcomes included gestational age (GA) at delivery, FGR resolution prior to delivery, neonatal outcomes, and hypertensive disorders of pregnancy (HDP). Associations between discordance and outcomes was estimated by the adjusted relative risk (95% confidence interval) through modified Poisson regression.

Results: Of the 128 participants enrolled, 68 had complete data on cerebellar measurements. Pregnancies with discordant measures were more likely to have signs of placental insufficiency compared to those with concordant measures (41.8% vs. 23.1%; aRR 1.63 (95% CI [0.57, 4.69])). Concordant pregnancies were diagnosed with FGR earlier and were more likely to resolve prior to delivery. Groups did not differ in GA at delivery, birthweight, rates of medically-indicated preterm birth, rates of SGA, other neonatal outcomes, and HDP.

Conclusion: FGR pregnancies with discordant TCD and EFW may be associated with signs of placental insufficiency, but due to high variability in the association, further confirmation of these findings is warranted. TCD discordance may be a tool for differentiating pathologic from benign FGR.

	Concordant TCD and EFW (n=13)	Discordant TCD and EFW (n=55)
Mean maternal age – years (SD)	32.2 (4.2)	32.8 (5.9)
Race		
American Indian or Alaskan	0	1 (1.8)
Asian or Pacific Islander	2 (15.4)	12 (21.8)
Black or African American	2 (15.4)	5 (9.1)
White	4 (30.8)	22 (40)
Unknown/Other/Not reported	5 (38.5)	15 (27.3)
Ethnicity		
Hispanic/Latino	4 (30.8)	11 (20)
Not Hispanic/Latino	8 (61.5)	36 (65.5)
Unknown/Not reported	1 (7.7)	8 (14.6)
Private Insurance	7 (53.9)	40 (72.7)
Nulliparous	5 (38.5)	37 (67.3)
Mean Pre-pregnancy BMI (SD)	27.5 (7.9)	25.9 (5.9)
Maternal medical comorbidities	7 (53.9)	25 (45.5)
Asthma	2 (15.4)	6 (10.9)
Autoimmune condition	0	2 (3.6)
Type 1 Diabetes	0	1 (1.8)
Type 2 Diabetes	1 (7.7)	2 (3.6)
Gestational Diabetes	0	5 (9.1)
Chronic Hypertension	2 (15.4)	8 (14.6)
Sickle trait	0	1 (1.8)
Chron's disease	0	1 (1.8)
Ulcerative colitis	0	1 (1.8)
Seizure disorder	1 (7.7)	0
Medication Use		
Aspirin	6 (46.2)	28 (50.9)
Medications associated with FGR	2 (15.4)	7 (12.7)
Gestational age at onset of FGR (weeks)	17.9 (4.4)	26.7 (6.0)
Onset of FGR		
Early (before 32 weeks)	12 (92.3)	36 (65.5)
Late (after 32 weeks)	1 (7.7)	19 (34.6)

Table 1. Baseline characteristics of the cohort

	Concordant TCD and EFW (n=13)	Discordant TCD and EFW (n=55)	Risk Ratio or Mean Difference (95% CI)
Composite of placental insufficiency	3 (23.1)	23 (41.8)	1.16 (0.93, 1.45)
Abnormal APT	0	7 (12.7)	1.27 (1.12, 1.45)
Oligohydramnios	0	2 (3.6)	1.25 (1.11, 1.40)
Abnormal UAD	3 (23.1)	18 (32.7)	1.09 (0.87, 1.37)
Elevated	3 (23.1)	17 (30.9)	1.07 (0.85, 1.36)
Absent	2 (15.4)	5 (9.1)	0.87 (0.54, 1.41)
Reversed	1 (7.7)	3 (5.5)	0.92 (0.52, 1.65)
Perinatal Outcomes			
Resolution of FGR	6 (46.2)	17 (30.9)	0.88 (0.67, 1.15)
Gestational age at delivery (weeks)	35.7 (3.8)	36.0 (3.8)	0.27 (-2.09, 2.63)
Small for gestational age (SGA) at birth	6 (46.2)	29 (52.7)	1.05 (0.83, 1.33)
Birthweight (grams)	2157 (824)	2228 (795)	71.4 (-421, 564)
LBW (< 2500g)	8 (61.5)	35 (63.6)	1.02 (0.80, 1.30)
VLBW (< 1500g)	3 (23.1)	10 (18.2)	0.94 (0.68, 1.30)
Medically indicated preterm delivery	5 (38.5)	19 (34.6)	0.97 (0.76, 1.24)
Composite of neonatal morbidity (preterm delivery, APGAR < 7 at 5 minutes, need for respiratory support, neonatal hypoglycemia, neonatal death	7 (53.9)	28 (50.9)	0.98 (0.78, 1.23)
Preterm delivery	5 (38.5)	19 (34.6)	0.97 (0.76, 1.24)
APGAR < 7 at 5 minutes	0	1 (1.8)	1.24 (1.10, 1.40)
Need for respiratory support	6 (46.2)	21 (38.2)	0.94 (0.73, 1.20)
Neonatal hypoglycemia	3 (23.1)	11 (20)	0.96 (0.71, 1.30)
Neonatal death	0	1 (1.8)	1.24 (1.10, 1.40)
Maternal outcomes			
Hypertensive disorder of pregnancy	3 (23.1)	13 (23.6)	0.98 (0.31, 3.12)
Gestational HTN	1 (7.7)	2 (3.6)	0.82 (0.36, 1.84)
PEC without SF	1 (7.7)	4 (7.3)	0.99 (0.63, 1.56)
PEC with SF	0	4 (7.3)	1.25 (1.11, 1.42)
Chronic HTN with siPEC w/ SF	2 (15.4)	7 (12.7)	0.96 (0.66, 1.38)

Data presented as n (%) and mean (SD) or median (IQR)
Abbreviations and definitions:
Abnormal APT = Abnormal antepartum testing (biophysical profile ≤ 6/10)
Oligohydramnios = (maximum vertical pocket < 2cm at < 37 weeks gestation AND/OR amniotic fluid index < 5cm at ≥ 37 weeks gestation)
Abnormal UAD = Abnormal umbilical artery dopplers
SGA = Small for gestational age (< 10th percentile birthweight)
Preterm birth = birth before 37 weeks 0 days gestation
Need for respiratory support = continuous positive airway pressure >2 hours, Intubation, extracorporeal membrane oxygenation
Neonatal hypoglycemia = < 30mg/dL at <24hrs of life, < 45mg/dL thereafter during birth admission

Table 2. Prevalence of placental insufficiency markers during pregnancy, perinatal outcomes, and maternal outcomes

783 | Delayed Oral Misoprostol Dosing for Cervical Ripening: association with perinatal outcomes

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10:30 AM - 12:30 PM

Objective: To examine dosing characteristics for misoprostol used as a cervical ripening agent in a large integrated health care system and evaluate association between dosing delay and perinatal outcomes.

Study Design: Retrospective study of all deliveries without prior cesarean that underwent induction of labor (IOL) from 2011-2023 at Kaiser Permanente Northern California. For the proportion of patients undergoing IOL who received misoprostol for cervical ripening, dosing characteristics were examined. Delayed dosing among patients who received >1 misoprostol dose was defined as >4.5 hours between doses. Associations between delay characteristics and outcomes including cesarean delivery, chorioamnionitis, postpartum hemorrhage, time to vaginal delivery, and length of stay were examined in unadjusted and multivariable analyses.

Results: Among 126,864 induced labors without prior cesareans, 91,776 (72%) received misoprostol and of those 53,734 (58.6%) received >1 dose. Most misoprostol was dosed orally (96.7%) starting with an initial dose of 50mcg (98.8%), and subsequent doses of 100mcg (95%). Delayed dosing was present in 55.6% (29,863), and of those with delays 41% were delayed within 1 hour, 19% from 1-2 hours and 40% >2 hours. Delay in misoprostol dosing was associated in a dose response manner with perinatal outcomes (Figure 1), with higher degrees of delay associated with higher rates of cesarean delivery, chorioamnionitis, and postpartum hemorrhage, lower rate of achieving vaginal delivery within 24 hours, and longer length of stay. In multivariable analysis, presence and degree of dosing delays were associated with increased adjusted risks of all adverse outcomes examined (Table 1).

Conclusion: Delayed oral misoprostol dosing was common in a large diverse cohort of induced labors. Frequency and degree of dosing delay was associated with adverse perinatal outcomes. This presents a potential opportunity to improve quality of intrapartum care and outcomes of labor.

Figure 1. Delivery outcomes associated with degree of Misoprostol dosing delay during induced labors at Kaiser Permanente Northern California 2011-2023

Table 1. Adjusted model of delivery outcomes associated with degree of Misoprostol dosing delay during induced labors at Kaiser Permanente Northern California 2011-2023

	Cesarean delivery[1]		Vaginal delivery w/in 24 hours[1]		Chorioamnionitis[1]		Postpartum hemorrhage[1]		Total length of stay (days)[1]	
Degree of delayed dosing	RR (CL)	P-value	RR (CL)	P-value	RR (CL)	P-value	RR (CL)	P-value	Average difference in LOS, days (CL)	P-value
Reference (no delay)[2]										
Delay w/in 1 hour[3]	1.07 (1.03-1.11)	0.0004	0.82 (0.80-0.84)	<.0001	1.07 (1.02-1.13)	0.0071	1.14 (0.84-1.56)	0.4042	0.16 (0.13, 0.20)	<.0001
Delay 1-2 hours[4]	1.12 (1.07-1.18)	<.0001	0.65 (0.63-0.68)	<.0001	1.16 (1.08-1.24)	<.0001	1.19 (0.79-1.78)	0.3985	0.34 (0.30, 0.39)	<.0001
Delay >2 hours[5]	1.36 (1.31-1.41)	<.0001	0.34 (0.33-0.36)	<.0001	1.25 (1.19-1.31)	<.0001	1.39 (1.01-1.83)	0.0437	0.75 (0.71, 0.79)	<.0001

[1]Methods: adjusted for age, BMI, race/ethnicity, NDI, parity, insurance type, preterm delivery, and delivery facility; modified Poisson regression for binary outcomes (Cesarean delivery, vaginal birth w/in 24 hours, chorioamnionitis, and postpartum hemorrhage); linear regression for continuous outcome (length of stay)
[2] interval dosing ≤4.5 hours
[3] interval dosing 4.5 – 5.5 hours
[4] interval dosing 5.5 – 6.5 hours
[5] interval dosing >6.5 hours

784 | The Impact of Pregnancy and Obesity on Glucose Metabolism in Mouse Skeletal Muscle

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10:30 AM - 12:30 PM

Objective: Obesity affects over 40% of reproductive-aged women in the United States. This study aimed to examine the interactive effects of diet-induced obesity and pregnancy on oral glucose tolerance and skeletal muscle insulin-stimulated glucose uptake in a mouse model of diet-induced obesity.
Study Design: C57/BL6/NJ mice (4 weeks old) were fed a low-fat diet (LFD; 10% of calories from fat) or high-fat diet (HFD; 60% of calories from fat) for 6 weeks before mating. An oral glucose tolerance test (OGTT; 2 g/kg) was conducted in late pregnancy (LP, E12.5-17.5) or in age-matched non-pregnant (NP) mice. Skeletal muscle glucose uptake was assessed using a radiolabeled 2-deoxyglucose (2DG) approach in paired soleus muscle, with and without a physiological insulin concentration (60 μU/mL). Statistical analysis was performed using 2-way ANOVA with appropriate post-hoc analysis and significance of $P < 0.05$.
Results: NP HFD-fed mice weighed significantly more than LFD-fed controls (30.20 vs. 19.97 g, $P < 0.0001$). Oral glucose tolerance as measured by area under the curve (AUC) was significantly different between LFD-fed and HFD-fed animals (NP: LFD 18,055 vs. HFD 24,089 mg · min/dL, $P < 0.01$) but was not between NP and LP within each diet (LFD: NP 18,055 vs. LP 16,074 mg · min/dL, $P = 0.66$; HFD: NP 24,089 vs. LP 21,311 mg · min/dL, $P = 0.32$). Specific to skeletal muscle, insulin-stimulated glucose uptake (insulin 2DG uptake minus basal 2DG uptake) was decreased by HFD-feeding (NP: LFD 0.69 vs. HFD 0.29 μmol/20 min/g, $P = 0.09$; LP: LFD 0.98 vs. HFD 0.19 μmol/20 min/g, $P < 0.001$), but not by pregnancy (LFD: NP vs. LP, $P = 0.28$; HFD: NP vs. LP, $P = 0.90$).
Conclusion: Diet-induced obesity, but not pregnancy, significantly impairs oral glucose tolerance and insulin-stimulated glucose uptake in skeletal muscle. This study provides valuable insights into the interactive effects of pregnancy and obesity on glycemia and skeletal muscle insulin resistance.

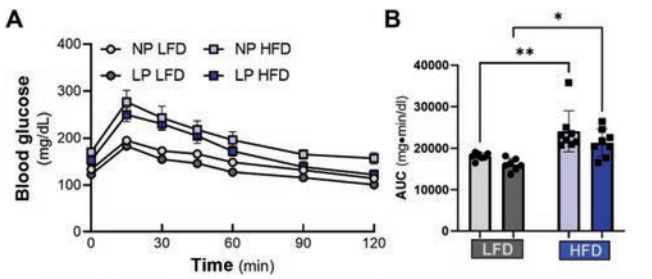

Figure 1. A. Blood glucose concentrations during an oral glucose tolerance test (2 g/kg dextrose load) for non-pregnant low-fat diet fed (NP LFD, n=7), late pregnant low-fat diet fed (LP LFD, n=7), non-pregnant high-fat diet fed (NP HFD, n=8), and late pregnant high-fat diet fed (LP HFD, n=8) animals and B. area under the curve (AUC) during OGTT. 2-way ANOVA with Tukey's multiple comparisons test. *P<0.05, **P<0.01.

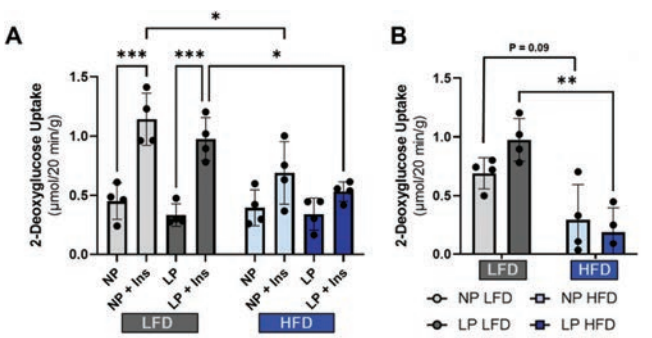

Figure 2. A. 2-deoxyglucose uptake in the presence (+Ins, 60 μU/mL) or absence of insulin and B. insulin-stimulated glucose uptake (calculated as +Ins 2-deoxyglucose uptake minus basal 2-deoxyglucose uptake) in mouse soleus muscle, n=4 for all groups. 2-way ANOVA with Tukey's multiple comparisons test. *P<0.05, **P<0.01, ***P<0.005.

785 | Influence of Group Prenatal Care Participation on Attendance at the Postpartum Visit

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10:30 AM - 12:30 PM

Objective: The 6 week postpartum visit (PPV) is an opportunity for family planning, evaluation of physical and mental health, and a link to follow-up for chronic health conditions. Many patients miss this visit, with attendance averaging 61%. Participation in group prenatal care (GPNC) encourages patient engagement dur-

ing pregnancy and may improve PPV attendance. We compared rates of PPV attendance between GPNC and individual prenatal care (IPNC).

Study Design: Secondary analysis of a prospective clinical trial comparing GPNC vs IPNC on birth outcomes. The primary outcome variable was PPV attendance. Comparisons were made using 3 analytic approaches: intent-to-treat (ITT) including all randomized participants, modified ITT (mITT) including participants attending ≥1 visit in the assigned study arm, and a per compliance (PC) including those receiving ≥5 visits in the assigned study arm. Comparisons with χ-square and t-test were performed for mITT and PC groups and logistic regression was used to control for differences between groups.

Results: 2348 participants were enrolled with 1175 in GPNC and 1173 in IPNC. Participants were 40% Black, 36% White, and 21% Hispanic. Compared with IPNC, GPNC did not have higher rates of PPV attendance in ITT (61% GPNC vs 61% IPNC, RR 1.01, 95% CI 0.942-1.07). However, with increasing participation, GPNC had significantly higher PPV attendance in mITT (70% vs 64%, RR 1.10, 95% CI 1.03-1.17) and PC (76% vs 66%, RR 1.14,95% CI 1.07-1.21). Adequacy of Prenatal Care Utilization Index ≥ 3 was associated with PPV attendance (RR 2.52,95% CI 2.16-2.94) regardless of prenatal care type. Participants with 1+ living children had significantly less PPV attendance compared to participants with no living children (58% vs 65%, RR 0.892, 95% CI 0.84-0.95).

Conclusion: There were no significant differences in PPV attendance between GPNC and IPNC in ITT, but increased participation in GPNC was associated with increased PPV attendance. Efforts to improve adequacy of prenatal care will be beneficial to all patients. Innovation in prenatal care delivery is needed to improve overall PPV attendance.

Table 1. PPV follow up based on prenatal care participation and maternal factors: Relative Risk (95% CI)

	PPV Follow Up		
	GPNC Number/Total (%)	**IPNC Number/Total (%)**	**RR (95% CI)**
ITT	717/1175 (61.0%)	712/1173 (60.7%)	1.01 (0.94-1.07)
mITT	579/824 (70.3%)	711/1111 (64.0%)	1.10 (1.03-1.17)
PC	471/624 (75.5%)	683/1032 (66.2%)	1.14 (1.07-1.21)
	1+, Number/Total (%)	**0, Number/Total (%)**	**RR (95% CI)**
N, Living Children	747/1294 (57.7%)	682/1054 (64.7%)	0.89 (0.84-0.95)
	Index < 3, Number/Total (%)	**Index ≥ 3, Number/Total (%)**	**RR (95% CI)**
APNCU Index†	123/451 (27.2%)	1306/1897 (68.9%)	2.52 (2.16-2.94)

† Adequacy of Prenatal Care Utilization Index; Index ≥ 3 is defined as **adequate prenatal care** (received 80% or greater of expected prenatal visits)

CI, confidence interval; GPNC, group prenatal care; IPNC, individual prenatal care; PPV, postpartum visit; RR, relative risk; N, number of; ITT, intent-to-treat; mITT, modified intent-to-treat; PC, per compliance

786 | Interdisciplinary Pregnancy Hypertension Alert System to Reduce Morbidity Associated with Hypertensive Disorders of Pregnancy (HDP)

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10:30 AM - 12:30 PM

Objective: To create a Pregnancy-Related Hypertension Alert to trigger a timely assessment, diagnosis, and management of hypertensive disorders of pregnancy (HDP) in the Emergency Department (ED).

Study Design: Emergency Medicine (EM) and Obstetrics (OB) teams collaborated to develop and implement the Pregnancy-Related Hypertension Alert. Patients with an elevated blood pressure (BP) defined as a systolic BP of ≥ 150 mmHg and or a diastolic of ≥ 100 mmHg at ≥ 20 weeks gestational age or within 6-weeks postpartum met criteria for the alert. When triggered, an OB resident, OB nurse and EM team immediately evaluated patient using a standardized HDP care pathway. Treatment according to the pathway includes the use of oral IR nifedipine, IV labetalol, IV hydralazine, and patients with mild elevated BP received oral antihypertensive.

Results: 80 patients (17 pre-alert; 63 post-alert) were included in the study. BP recheck within 15 minutes was noted in 41% of patients' pre-alert and increased to 86% post-alert. Median time for patients to receive antihypertensives was 72 minutes [IQR 37.5-195.5] in the pre-alert period and improved to 23.5 minutes [IQR 15- 67 minutes] with the alert . Pre-alert the ED median length of stay was 219 minutes [IQR 182-297 minutes] and reduced to 147 minutes [IQR 73-231 minutes] with the alert. Patient disposition was to Inpatient Obstetrics Unit (pre-alert: 41%; post-alert: 52%), IR/SICU (pre alert: 0%; post alert: 3%), Labor & Birth/Triage (pre alert: 6%; post-alert:13%), transfer from satellite ED to main ED for additional management (5%), home (pre-alert: 53%; post-alert: 25%), other (2%).

Conclusion: After alert implementation, more patients achieved guideline recommended care including BP check and delivery of antihypertensives. Future directions include ongoing optimization of the HDP alert and expanding coverage of the program across the health care system.

Table 1: Demographics of Target Patient Population (with pre- alert data included)

Location	**York Street Campus (main ED)**	**Saint Raphael Campus (satellite ED)**	**Shoreline Medical Center (satellite ED)**
Pregnant (20%)	**14 (17.5%)**	**1 (1.25%)**	**1 (1.25%)**
Postpartum (80%)	**62(77.5%)**	**2 (2.5%)**	**0 (0%)**
Age			
18-25 (9.5%)	**8**	**0**	**0**
26-34 (51%)	**36**	**1**	**1**
≥35 (40%)	**32**	**2**	**0**

787 | The Association Between Maternal Immune Thrombocytopenia Purpura (ITP) and Adverse Perinatal Outcomes

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Oregon Health & Science University, Portland, OR

10:30 AM - 12:30 PM

Objective: Immune thrombocytopenia purpura (ITP) is a common cause of thrombocytopenia in pregnancy, however, limited data exist on perinatal complications associated with maternal ITP. This study aimed to evaluate the impact of maternal ITP on adverse perinatal outcomes.

Study Design: This is a retrospective cohort study of linked vital statistics and hospital discharge data among singleton, non-anomalous births delivered between 23-42 weeks in California (2008-2020). Patients were stratified by diagnosis of ITP. Maternal outcomes included gestational hypertension, preeclampsia, gestational diabetes (GDM), preterm delivery < 37 weeks, postpartum hemorrhage, and severe maternal morbidity (SMM). Neonatal outcomes included cephalohematoma, intraventricular hemorrhage, and congenital thrombocytopenia. We utilized chi-squared tests for univariate analyses and multivariable logistic regression analyses to evaluate the association of ITP with outcomes.

Results: Among 5,061,386 patients in our final sample, 4,346 (90 cases per 1000 deliveries) had a diagnosis of ITP. Compared to patients without ITP, individuals with ITP had increased rates of gestational hypertension (4.21% vs 3.44%, aOR = 1.18, 95% CI: 1.02-1.37), preeclampsia (7.23% vs 3.80%, aOR = 1.74, 95% CI: 1.56-1.95), GDM (11.99% vs 9.58%, aOR = 1.98, 95% CI: 1.10-1.31), preterm delivery < 37 weeks (10.47% vs 6.39%, aOR = 1.69, 95% CI: 1.54-1.86), postpartum hemorrhage (9.27% vs 3.37%, aOR = 2.63, 95% CI: 2.38-2.91), and SMM (11.64% vs 1.18%, aOR = 9.21, 95% CI: 8.42-10.07) (Table 1). Neonates born to mothers with ITP had higher rates of intraventricular hemorrhage and congenital thrombocytopenia, compared to those without ITP. These associations remained in sub-analyses of vaginal versus cesarean deliveries only (Table 2).

Conclusion: Maternal ITP was associated with increased rates of gestational hypertension, preeclampsia, GDM, preterm delivery < 37 weeks, postpartum hemorrhage, and SMM. Further research to elucidate specific aspects of patients with ITP and perinatal complications will be important to identify those that may benefit from more aggressive interventions.

Table 1. Unadjusted rates of perinatal outcomes associated with ITP

	ITP, n (%) (N=4,346)	No ITP, n (%) (N=5,061,386)	P-Value
Maternal Outcomes			
Gestational Hypertension	183 (4.21)	174,046 (3.44)	0.005
Preeclampsia	314 (7.23)	192,428 (3.80)	<0.001
Gestational Diabetes	521 (11.99)	484,803 (9.58)	<0.001
Preterm Delivery <37 weeks	455 (10.47)	323,333 (6.39)	<0.001
Postpartum Hemorrhage	403 (9.27)	170,807 (3.37)	<0.001
Severe Maternal Morbidity	506 (11.64)	59,652 (1.18)	<0.001
Neonatal Outcomes			
Cephalohematoma	90 (2.07)	112,233 (2.22)	0.512
Intraventricular Hemorrhage	14 (0.32)	3,544 (0.07)	<0.001
Congenital Thrombocytopenia	21 (0.48)	898 (0.02)	<0.001

Table 2. Multivariable analyses associated between ITP diagnosis and perinatal outcomes among all deliveries, vaginal deliveries only, and cesarean deliveries only (Reference: no ITP diagnosis)

	All (aOR*, 95% CI)	Vaginal Deliveries (aOR*, 95% CI)	Cesarean Deliveries (aOR*, 95% CI)
Maternal Outcomes			
Gestational Hypertension	1.18 (1.02-1.37)	1.36, 1.14-1.63	0.94, 0.74-1.19
Preeclampsia	1.74, 1.56-1.95	1.63, 1.38-1.93	1.70, 1.47-1.97
Gestational Diabetes	1.20, 1.10-1.31	1.17, 1.05-1.31	1.20, 1.06-1.35
Preterm Delivery <37 weeks	1.69, 1.54-1.86	1.67, 1.47-1.89	1.62, 1.43-1.83
Postpartum Hemorrhage	2.63, 2.38-2.91	2.78, 2.48-3.11	2.44, 2.05-2.91
Severe Maternal Morbidity	9.21, 8.42-10.07	9.69, 8.46-11.10	8.03, 7.20-8.95
Neonatal Outcomes			
Cephalohematoma	0.98, 0.79-1.21	0.96, 0.74-1.23	1.15, 0.79-1.67
Intraventricular Hemorrhage	3.45, 2.04-5.83	3.86, 1.74-8.54	3.07, 1.43-6.62
Congenital Thrombocytopenia	24.04, 15.41-37.49	25.21, 12.51-50.81	21.37, 11.91-38.34

*Adjusted for maternal age, race/ethnicity, body mass index, parity, smoking status, insurance status, and education attainment

788 | Elevated Middle Cerebral Artery Peak Systolic Velocity and Donor Twin Demise in Twin-Twin Transfusion Syndrome

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10:30 AM - 12:30 PM

Objective: To determine the association of elevated donor middle cerebral artery peak systolic velocity (MCA-PSV) without twin anemia polycythemia sequence (TAPS) and fetal demise among pregnancies complicated by twin-to-twin transfusion syndrome (TTTS).

Study Design: This prospective cohort study included TTTS cases that underwent laser surgery between 2006 and 2023 at two referral centers. The study was designed to: 1) explore the association of elevated donor MCA-PSV (>1.5 multiples of the median) without TAPS with fetal demise of the donor twin; 2) to evaluate if donor or recipient MCA-PSV is associated with an increased risk for their corresponding fetal death using receiving operator characteristic curve analysis. TAPS was defined as donor MCA-PSV >1.5 MoM and recipient MCA-PSV < 1.0 MoM or inter-twin MCA PSV difference >0.5. Uni- and multivariable as well as Poisson (Zou's method) regression models were used to estimate odd ratios and relative risks (RR) of elevated donor MCA-PSV without TAPS for donor demise, adjusted for TAPS, TTTS stage, intertwin size discordance >25%, low donor MCA pulsatility index, gestational age at surgery, and other confounders.

Results: Of 1,602 TTTS cases, 3.3% (n = 53) had elevated donor MCA-PSV without TAPS and comprised our cases, which were compared to the other 1,549 cases (controls). Clinical characteristics are shown in Table 1; donor demise rate was higher among cases than controls [45.3% (23/53) vs. 13.2% (205/1549), p< 0.001]. 1) Elevated donor MCA-PSV without TAPS was an independent risk factor for donor fetal demise (RR: 2.86; 95 % CI: 1.78-4.59; p< 0.001), and conferred the highest relative risk for demise of the

donor twin (Table 2). 2) Donor MCA-PSV was associated with donor fetal demise (AUC: 0.61; p< 0.001), but recipient MCA-PSV was not associated with recipient fetal demise (AUC: 0.54; p = 0.2).

Conclusion: 1) Isolated elevated donor MCA-PSV prior to laser is an important risk factor for donor fetal demise, adjusted for confounders including TAPS; 2) The association of TAPS with fetal death may be driven by elevated donor MCA-PSV, not by recipient twin MCA-PSV.

Table 1. Clinical characteristics of the study population according to elevation of donor twin MCA-PSV without TAPS (cases)

	Cases (n=53)	Controls (n=1,549)	p
GA at Laser Surgery (Weeks)	20.43 (16.1-29.4)	20.1 (15.6-29.9)	0.610
GA at delivery (Weeks)	32.57 (19.6-39.4)	32.86 (16.7-40.4)	0.169
Donor UA absent or Reversed EDF (%)	49.1 (26/53)	32.2 (499/1549)	0.036
Donor DV absent or Reversed EDF (%)	17 (9/53)	9.6 (148/1549)	0.050
Chorioamniotic membrane separation (%)	14.9 (7/47)	16 (238/1492)	0.845
PPROM (%)	45.8 (22/48)	36.3 (551/1516)	0.179
TAPS (%)	0	16.9 (260/1539)	<0.001
Placental abruption (%)	8 (4/50)	8.3 (125/1515)	0.949
Donor fetal death (%)	45.3 (24/53)	13.2 (205/1549)	<0.001
Recipient fetal death (%)	11.3 (6/53)	5.7 (88/1549)	0.086
Survival of at least one fetus to 30 days*	86.5 (45/52)	92.2 (1389/1506)	0.136
Survival of both fetuses to 30 days*	46.2 (24/52)	76.6 (1153/1506)	<0.001

Variables expressed as median and range or proportion and percentages GA: gestational age; MCA: middle cerebral artery; UA: umbilical artery; DV: ductus venosus; EDF: end-diastolic flow; PPROM: preterm prelabor rupture of membranes at less than 37 weeks; PSV: peak systolic velocity; TAPS: twin anemia polycythemia sequence (donor MCA-PSV >1.5 MoM and recipient MCA-PSV <1.0 MoM or intertwin MCA PSV difference >0.5). *Different denominators are displayed because patients lost to follow-up to 30 days were excluded from these proportions.

Table 2. Regression analyses to identify variables determining donor fetal death in TTTS

Predictor Variables	Crude Odds Ratio (95% CI)	p	Adjusted Odds Ratio (95% CI)	p	Relative Risk (95% CI)	p
Maternal age (years)	0.99 (0.96-1.01)	0.251	1.01 (0.97-1.03)	0.972	0.99 (0.98-1.02)	0.931
Cervical length (mm)	1.00 (0.99-1.01)	0.907	1.00 (0.99-1.01)	0.983	1.00 (0.97-1.01)	0.846
Participating center	1.08 (0.81-1.43)	0.601	2.61 (0.85-8.04)	0.094	0.56 (0.26-1.21)	0.142
GA at surgery (weeks)	0.83 (0.78-0.88)	<0.001	0.85 (0.78-0.92)	<0.001	0.89 (0.84-0.95)	<0.001
Male fetal sex	1.21 (0.91-1.62)	0.187	1.48 (1.02-2.14)	0.039	0.78 (0.60-1.05)	0.104
Solomonization	1.01 (0.76-1.34)	0.946	3.14 (1.02-9.65)	0.046	0.50 (0.24-1.06)	0.072
Placental abruption	1.04 (0.62-1.73)	0.888	1.02 (0.48-2.16)	0.964	0.99 (0.59-1.64)	0.964
GA at delivery (weeks)	0.94 (0.91-0.97)	<0.001	0.95 (0.91-0.99)	0.024	0.96 (0.93-0.99)	0.043
Intertwin size discordance >25%	2.99 (2.22- 4.02)	<0.001	1.98 (1.34- 2.92)	0.001	1.67 (1.22- 2.30)	0.002
Anterior placenta	1.07 (0.81-1.42)	0.633	1.23 (0.85-1.76)	0.274	1.19 (0.91-1.56)	0.193
Chorioamniotic membrane separation (%)	1.36 (0.94-1.97)	0.104	1.11 (0.67-1.83)	0.683	1.10 (0.79-1.53)	0.584
Preterm PROM	1.23 (0.92-1.65)	0.156	1.02 (0.68-1.54)	0.909	0.97 (0.71-1.31)	0.833
TAPS	1.31 (0.92-1.88)	0.134	2.26 (1.39-3.67)	0.001	1.67 (1.23-3.35)	0.001
Donor velamentous umbilical cord insertion	2.77 (2.02-3.79)	<0.001	2.18 (1.46-3.26)	<0.001	1.70 (1.26-2.30)	0.001
Donor MCA-PSV >1.5 MoM without TAPS	5.43 (3.10-9.50)	<0.001	5.69 (2.51-12.89)	<0.001	2.86 (1.78-4.59)	<0.001
Donor MCA PI <10th percentile	2.71(1.97-3.74)	<0.001	2.88 (1.92-4.30)	<0.001	2.02 (1.52-2.67)	0.001
TTTS Quintero stage						
Stage 1	Reference		Reference		Reference	
Stage 2	1.05 (0.44- 2.52)	0.918	1.03 (0.34-2.93)	0.996	0.92 (0.45-1.81)	0.803
Stage 3	1.12 (0.50- 2.52)	0.786	0.87 (0.32-2.37)	0.785	2.09 (1.19-3.69)	0.011
Stage 4	3.54 (1.67-7.40)	0.001	2.55 (1.03-6.29)	0.043	1.02 (0.40-2.58)	0.964

TTTS: twin-to-twin transfusion syndrome; CI: confidence interval; GA: gestational age; MCA: middle cerebral artery; PSV: peak systolic velocity; TAPS: twin anemia polycythemia sequence.

789 | Does Premature Rupture of Membranes Affect Adverse Health Outcomes in Second Trimester Medical Abortion

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10:30 AM - 12:30 PM

Objective: Previable and peri-viable preterm rupture of membranes are frequently managed with medication abortion (MAB). Little is known about how ruptured membranes affect labor duration or maternal or health outcomes in MAB when compared to intact membranes.

Study Design: This retrospective cohort study examined patients undergoing second-trimester (2T) MAB of a singleton pregnancy at 4 academic health centers from 2009-2019. Patients who received a diagnosis of preterm labor or advanced cervical exam prior to MAB were excluded. The primary exposure was rupture of membranes (ROM) or intact membranes (IM) prior to MAB. Patients with infection diagnosed at the start of induction were included. The primary outcome was duration of labor in hours. Secondary outcomes were composite morbidity (uterine rupture, blood transfusion, intensive care unit admission, or readmission) and its components, estimated blood loss (EBL) ^{3}500 mL and clinical chorioamnionitis (CC) Bivariate analyses were performed for composite morbidity and its components due to low frequency of outcome occurrence. Multivariate analyses were performed for EBL >500ml and CC. For the primary outcome, a survival analysis, censoring at the time of delivery, was performed.

Results: 1,341 patients were included, 344 (25.7%) with ROM and 997 (74.3%) with IM. On bivariate analyses, there were significant differences in baseline characteristics between groups (Table1). ROM was associated with decreased labor duration compared to IM (HR 2.5, 95% CI 2.1-2.9); this was significant after adjusting for age, race, body mass index, parity and site of delivery (aHR 2.4, 95% CI 2.1-2.8), (Figure1). There were no significant differences in secondary outcomes, with the exception of a higher likelihood of EBL ^{3}500 (aRR 1.54, 95% CI 1.1-2.2) and CC (aRR 1.9, 95% CI 1.3-2.7).

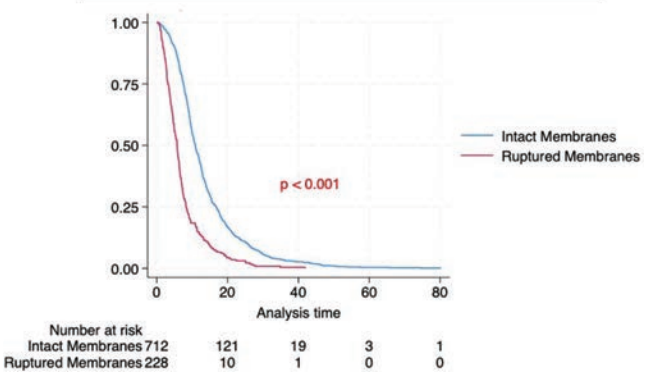
Conclusion: ROM prior to 2T MAB is associated with shorter labor duration labor than IM. There was an increased likelihood of CC and higher blood loss without need for blood transfusion among people with ROM. These findings can be used in counseling patients undergoing 2T MAB.

Table 1. Demographic and Outcome Data of Patients Undergoing Second Trimester Medication Abortion by Membrane Status

	Ruptured Membranes (n=344)	*Intact Membranes (n=997)*	*p-value[a]*
Age, in years	29 (24-35)	32 (27-35)	**<0.001**
Gestational age, in weeks	19 (17-21)	21 (19-23)	**<0.001**
Self-reported race/ethnicity			
NHW	42 (18.4)	254 (35.7)	**<0.001**
NHB	109 (47.8)	180 (25.3)	
Latinx	35 (15.4)	133 (18.7)	
AAPI	12 (5.26)	40 (5.62)	
Other or not defined	30 (13.2)	105 (14.8)	
Body mass index (kg/m²)[b]	29.58 (24.9-35.8)	27.11 (23.7-32.6)	**0.001**
Nulliparous	96 (42.1)	245 (34.4)	**0.03**
History of uterine scar[c]			
No uterine scarring	203 (89.0)	579 (81.3)	**0.03**
1 prior scar	18 (7.9)	88 (12.4)	
2 prior scars	4 (1.8)	36 (5.1)	
3 or more prior scars	3 (1.3)	9 (1.3)	
Site of delivery			
Site #1	34 (14.9)	117 (16.4)	**<0.001**
Site #2	62 (27.2)	299 (42.0)	
Site #3	85 (37.3)	160 (22.5)	
Site #4	47 (20.6)	136 (19.1)	
Mifepristone administered	11 (4.8)	213 (29.9)	**<0.001**
Method of induction of labor			
Misoprostol	221 (96.9)	629 (88.3)	**0.001**
Intracervical balloon catheter	0 (0.0)	12 (1.7)	
Oxytocin	6 (2.6)	21 (2.9)	
Artificial rupture of membranes	1 (0.4)	41 (5.8)	
Laminaria	0 (0.0)	9 (1.3)	
Total misoprostol administered, in mcg[d]	800 (800-1200)	1600 (1200–2000)	**<0.001**
Outcomes			
Duration of labor, in hours	6 (3-8)	11 (8-17)	**<0.001**
Secondary composite outcome[e]	14 (6.1)	45 (6.3)	0.92
Components of composite outcome			
Uterine rupture	0 (0.0)	2 (0.3)	
Need for blood transfusion	8 (3.5)	21 (2.9)	0.66
Intensive care unit admission	4 (1.8)	7 (1.0)	0.48
Need for hospital readmission	5 (2.2)	20 (2.8)	0.82
Estimated blood loss >500ml[f]	59 (25.9)	123(17.3)	**0.01**
Clinical chorioamnionitis[f]	73 (32.0)	110 (15.5)	**<0.001**

Data are median (IQR) or n (%) unless otherwise specified. Bold indicates statistical significance < 0.05
[a]Chi-squared or Fisher's exact test for categorical variables, Wilcoxon rank-sum test for continuous variables.
[b]Available for 922 participants
[c]Prior uterine scar includes prior low transverse; classical, t-shaped, or unknown hysterotomy
[d]Available for 937 participants
[e]Defined as one or more of the following: need for a blood transfusion, intensive care unit admission, uterine rupture, and need for readmission. Participants could meet one or more of the outcomes associated with the primary composite outcome. Therefore, frequencies may not summate to the total sample size meeting the primary composite outcome.
[f]Secondary outcomes not included in composite morbidity
AAPI = Asian-American/Pacific Islander; m=meter; mcg = micrograms; kg = kilogram; NHB = Non-Hispanic Black; NHW = Non-Hispanic White

Figure. The relationship between membrane status and duration of labor, in hours



790 | Can We Train A.I. Chatbots to Replace Physicians for Counseling on Soft Markers?

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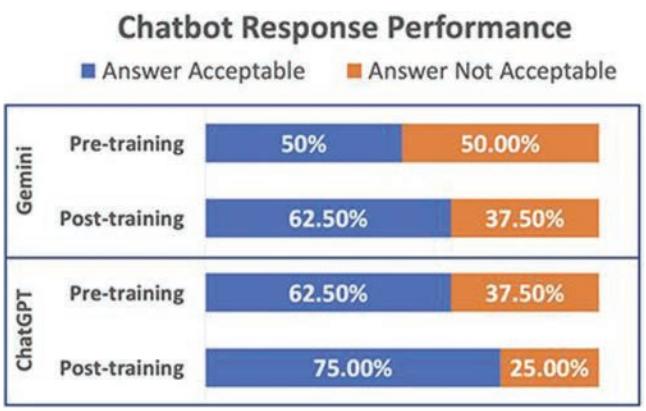
10:30 AM - 12:30 PM

Objective: Chatbots offer a user-friendly source of information. Recent studies have raised concerns about their accuracy. The World Health Organization (WHO) has warned that untested AI systems could harm patients and erode trust. The detection of soft markers for aneuploidy on ultrasound can cause significant anxiety. The accuracy and completeness of chatbot responses regarding soft markers are unknown. We sought out to evaluate chatbot performance on answering questions regarding soft markers for aneuploidy and whether training improves performance.

Study Design: A qualitative analysis was performed. ChatGPT Version 4o and Google Gemini 1.5 pro were queried on 8 isolated soft markers both prior to and after training using Society for Maternal-Fetal Medicine (SMFM) Consult Series #57: evaluation and management of isolated soft ultrasound markers for aneuploidy in the second trimester. Queries were conducted in July of 2024. Query responses were graded as "acceptable" or "not acceptable" based on accuracy and completeness. Grading of responses were performed by the MFM co-authors individually and then as a group to formulate a consensus.

Results: Pre-training, 37.5% of ChatGPT responses and 50% of Gemini responses were graded as 'not acceptable.' For ChatGPT, all 'not acceptable' responses (3/3) were incomplete, with none incorrect. For Gemini, all 'not acceptable' responses (4/4) were incomplete, with one response also being incorrect. Post-training, 25% of ChatGPT responses and 37.5% of Gemini responses were graded as 'not acceptable.' For ChatGPT, all 'not acceptable' responses (2/2) were incomplete, with none incorrect. For Gemini, all 'not acceptable' responses (3/3) were incomplete, with none incorrect.

Conclusion: While generative AI chatbots like ChatGPT and Google Gemini show potential as supplementary information sources on soft markers for aneuploidy, their responses often lack completeness, which limits their effectiveness. Training with specific medical publications improves performance, but these chatbots should not replace physician counseling.



791 | Alternative Payment Models for Pregnancy Care: a Difference-In-Difference Analysis Among State Medicaid Programs

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10:30 AM - 12:30 PM

Objective: There is growing interest in using payment model design to improve pregnancy care delivery and reduce morbidity and mortality, particularly within Medicaid. Despite this, data on alternative payment models (i.e., those that establish a budget for a care episode, coupled with quality incentives) in pregnancy are sparse. The objective of this study is to evaluate whether the introduction of a mandatory Medicaid bundled payment program for pregnancy care was associated with changes in antenatal care delivery and maternal morbidity.

Study Design: This is a quasi-experimental difference-in-difference (DiD) analysis comparing two states that implemented mandatory Medicaid bundled payment programs for pregnancy care (TN in 2011 and OH in 2014) to control states (GA, KS, KY, OK). Demographic variables and pregnancy outcomes were collected from birth certificate records between 2009 and 2019. Inclusion criteria were births reimbursed by Medicaid in intervention or control states with concordance between state of residence and state of birth. A DiD analysis was conducted for co-primary outcomes—gestational age at entry into prenatal care and maternal transfusion at time of delivery. These were chosen as proxies for modifiable aspects of pregnancy care within the domains of antenatal care delivery and maternal morbidity. The extended two-way fixed effects estimator was used with the heterogenous DiD regression to account for staggered rollout in the intervention group.

Results: Between 2009 and 2019, we identified 2,227,136 births that met inclusion criteria. 55% were in the control group and 45% were in the intervention group. The pre-intervention parallel trends assumption was satisfied between groups. In the heterogenous DiD regression model, no significant difference-in-differences were identified for the specified outcomes between the two groups (see table).

Conclusion: Mandatory Medicaid bundled payment programs did not have a significant effect on gestational age at entry into prenatal care or maternal transfusion rates. Additional studies are needed to further evaluate the impact of these models.

Hetergenous difference-in-difference for primary outcomes, intervention states vs. controls

Outcome	Difference in average treatment effect on treated (95% confidence interval)	p-value
GA at entry into prenatal care*	-0.010 (0.07 -0.05)	0.665
Maternal transfusion	0.001 (-0.002 - 0.004)	0.636

*Binary, first trimester versus other

792 | Missed Connections: Exploring the Gap in Patient Awareness of Hypertensive Disorders of Pregnancy Diagnoses

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10:30 AM - 12:30 PM

Objective: To evaluate patients' awareness of a hypertensive disorder of pregnancy (HDP) diagnosis following their most recent pregnancy.

Study Design: A 24-question survey was given to patients with a recent HDP diagnosis who delivered at a tertiary care center in 2022-2024. HDP was defined as gestational hypertension or preeclampsia. Descriptive statistics and bivariate analyses compared demographics, clinical characteristics, and survey responses stratified by ability to recall an HDP diagnosis.

Results: Of the 1,072 survey recipients, 355 (33.1%) responded and were included in analysis. The mean interval between childbirth and survey distribution was 11.2 months (±7.7m) and was not significantly different between study groups ($p = 0.29$). Among respondents, 87 (24.5%) were unaware of or could not recall their HDP diagnosis. 96.1% of patients who recalled their diagnosis recalled discussing blood pressure during their birth admission compared to only 71.6% of patients who did not recall their diagnosis. Patients who were less likely to be aware or were unable to recall a diagnosis of HDP were more likely to be Hispanic ($p = 0.02$), not college educated ($p = 0.01$), publicly insured ($p = 0.02$), WIC-eligible ($p = 0.05$), diagnosed during the intra- or postpartum period ($p = 0.001$), and deliver at full term ($p < 0.001$). Patients with gestational hypertension were less likely to recall their diagnosis compared to those diagnosed with preeclampsia with severe features ($p < 0.001$).

Conclusion: Awareness and recall of a prior HDP diagnosis was influenced by demographic factors and clinical characteristics indicative of disease severity. Since history of HDP is a significant risk factor for future pregnancies and lifelong cardiovascular health, further research exploring this gap in awareness is needed to optimize patient education during the index pregnancy.

Table 1. **Demographics, clinical characteristics, and survey responses (N=355)**

	Do not recall having HDP n = 87 (24.5)	Recall having HDP n = 268 (75.5)	*p*
Age (y)	31.6 ± 5.0	32.6 ± 4.5	0.09
Race			0.08
American Indian/Alaska Native	0 (0.0)	2 (0.8)	
Asian	2 (2.4)	6 (2.3)	
Black/African American	12 (14.6)	24 (9.1)	
White	68 (80.0)	232 (87.5)	
Multiracial	3 (3.5)	1 (0.4)	
Hispanic or Latino ethnicity	8 (9.2)	11 (4.1)	0.02
Married/significant other	60 (85.7)	225 (92.2)	0.10
Education level of some college or higher	71 (85.5)	246 (94.6)	0.01
Private insurance	54 (77.1)	217 (88.2)	0.02
Employed	62 (89.9)	216 (88.5)	0.76
WIC-SSNP eligible during index pregnancy	13 (15.5)	21 (8.1)	0.05
Nulliparous for index pregnancy	38 (53.5)	136 (55.1)	0.82
Vaginal delivery	59 (67.8)	157 (58.6)	0.13
Gestational age at delivery (weeks)	39.1 (38.3-39.9)	37.5 (37.0-39.1)	< 0.001
Hypertensive disorder of pregnancy			< 0.001
Gestational hypertension	75 (86.2)	183 (68.3)	
Preeclampsia without severe features	9 (10.3)	27 (10.1)	
Preeclampsia with severe features	3 (3.4)	58 (21.6)	
Antepartum diagnosis of HDP	2 (2.3)	26 (9.8)	0.03
HDP-related postpartum readmission	2 (2.3)	33 (12.3)	0.01
History of HDP in prior pregnancy	13 (14.9)	58 (21.6)	0.18
Interval between survey distribution and most recent pregnancy with HDP (months)	7.8 (5.1-17.5)	11.1 (4.9-17.3)	0.30
Self-reported confidence in recall accuracy (Scale 0-10)	10 (7-10)	10 (8-10)	0.09
Recall discussing BP with clinical staff during inpatient stay (n=340)	58 (71.6)	249 (96.1)	< 0.001
Self-reported attendance at PP visit (n=324)	67 (91.8)	238 (94.8)	0.39
Recall discussing BP at PP visit (n=303)	32 (48.5)	199 (84.0)	< 0.001
Self-reported attendance at PCP visit since birth (n=322)	34 (47.2)	148 (59.2)	0.07
Recall discussing BP at PCP visit (n=181)	13 (38.2)	99 (67.3)	0.002

Data presented as N (%), mean ± standard deviation, or median (interquartile range).
HDP, hypertensive disorder of pregnancy; WIC-SSNP, Women, Infants, and Children Special Supplemental Nutrition Program; BP, blood pressure; PP, postpartum; PCP, primary care provider.

793 | Evaluating the Potential Relationship between sFlt-1:PIGF and Hypertension Across Pregnancy and early Postpartum

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10:30 AM - 12:30 PM

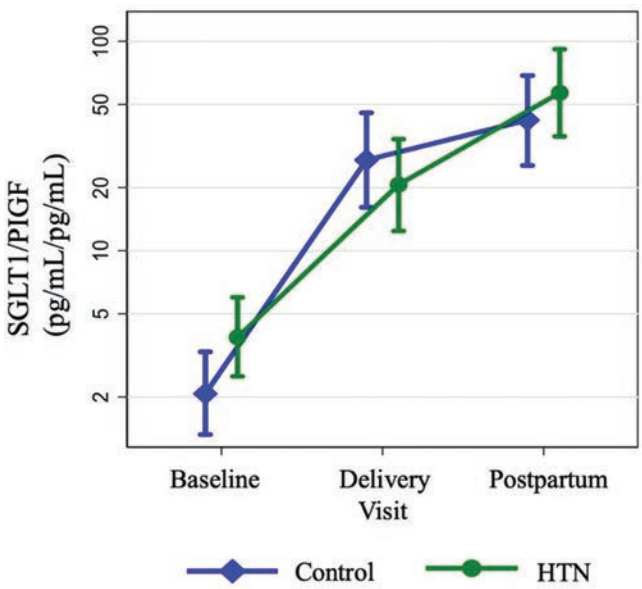
Objective: Hypertensive disorders of pregnancy are major contributors to adverse maternal outcomes including stroke, cardiovascular disease, and death. Vascular biomarkers, including the ratio of soluble fms-like tyrosine kinase 1 and placental growth factor (Sflt-1: PIGF) are independent predictors of gestational hypertension and preeclampsia. The aim of this study is to examine the trend in Sflt-1: PIGF in pregnancy and post-partum in women with and without hypertension (HTN).

Study Design: In a prospective, 1:1 case-control design, we enrolled pregnant women with HTN and without HTN (control group) between 24-32 weeks gestation from 2019-2022. HTN was defined by a clinical diagnosis or baseline blood pressure (BP) ≥140/90 mm Hg. The control group had a systolic BP < 120 mm Hg and no HTN diagnosis. Serum was collected at baseline, at delivery admission, and postpartum day 1. Mixed effects tobit models were used to compare Sflt-1:PIGF across HTN groups and over time, adjusted for age and BMI.

Results: At baseline, the HTN group had higher sFLT-1(pg/mL): PIGF (pg/mL) (mean (SD): 3.9 (0.9)) versus the control group (2.1 (0.5)). Both groups had a significant increase in mean sFLT-1:PIGF at the delivery admission (HTN: 20.7 (5.3); Control: 27.0 (7.2)) and postpartum (HTN: 56.7 (13.9); Control: 42.0 (10.6)); however, no significant difference was seen between these groups (see Figure 1). Across pregnancy and the early postpartum period, there was no significant difference in the mean sFLT-1: PIGF ratio between the HTN and control groups (HTN: 13.06 (2.73); Control: 10.44 (2.24)).

Conclusion: While women with HTN had greater baseline sFLt-1: PIGF than controls, no significant differences were found during delivery admission or postpartum. All women demonstrated a significant increase in sFLt-1:PIGF during pregnancy with elevations continuing postpartum.

Future studies examining the impacts of HTN on subclinical cardiovascular injury and long-term maternal outcomes are needed.



794 | The Screening Accuracy of Betke-Kleihauer Test for Fetal-Maternal Hemorrhage in the Antepartum and Postpartum Period

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10:30 AM - 12:30 PM

Objective: Accurate detection of fetomaternal hemorrhage (FMH) is important both antenatally (e.g., cases of abdominal trauma) and postpartum (to guide the RhIg dosage in RhD-negative patients). Betke-Kleihauer (BK) is the most commonly used quantitative screening test for FMH, but data on its screening accuracy in specific circumstances and the optimal screening threshold are conflicting. The current study aimed to estimate the screening accuracy of the BK test for large FMH and identify the optimal screening threshold in the antepartum and postpartum periods.

Study Design: A retrospective cohort study of patients who had a BK test at a single center (2014-2022). The definitive diagnosis of large FMH (≥ 15 mL) was done by flow cytometry that was sent in cases of a positive BK test (≥ 2 mL). The screening accuracy

of the BK test for large FMH was described using the area under the ROC curve (AUC), detection rate (DR), and false-positive rate (FPR), and was stratified by the timing of testing (antepartum vs. postpartum).

Results: A total of 4,628 patients underwent BK testing during the study period, 2217 (47.9%) antenatally and 2,411 (52.1%) postpartum. The incidence of a positive BK was 9.1%. The discriminative accuracy of the BK for large FMH was high in the entire cohort (AUC 0.97 [95%-CI 0.94-0.99]) but was lower during the antepartum vs. postpartum period (0.88 [0.80-0.96] vs. 0.997 [0.94-1.00], p = 0.02). The highest BK threshold providing a DR of 100% for large FMH was 2.0 mL (FPR of 67% [58%-76%]). A higher BK threshold of 7.5 mL was associated with a reduced DR (81% [85%-97%) and lower FPR (9% [3%-15%]). This threshold (7.5 mL) maintained a DR of 100% in the postpartum period (DR 100%, FPR 8% [3%-14%]) but performed poorly antepartum (DR 57% [47%-67%], FPR 14% [7%-20%]).

Conclusion: The BK test is associated with a high FPR when using a conservative threshold of 2 mL that provides a 100% DR. Its screening accuracy is higher during the postpartum period, where a less strict threshold of 7.5 mL maintains the same DR of 100% with a lower FPR.

795 | Association of Body Mass Index with Adverse Pregnancy Outcomes When Stratified by Cardiovascular Health

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10:30 AM - 12:30 PM

Objective: High body mass index (BMI) is associated with adverse pregnancy outcomes, but it is not a direct measure of cardiovascular health (CVH) and misclassifies many. We aimed to evaluate the association between BMI≥30 and adverse pregnancy outcomes stratified by CVH.

Study Design: Secondary analysis of nuMoM2b multicenter cohort of nulliparas, excluding pregestational diabetes and chronic hypertension. We used American Heart Association's Life's Simple 7 to assess CVH. Metrics included smoking, physical activity, healthy diet pattern, total cholesterol, and blood pressure. We omitted BMI given our objective, and we added triglycerides as these are a marker of CVH in pregnancy. We assigned 0 points for Poor category, 1 for Intermediate, and 2 for Ideal for each metric, with maximum total score of 14. Total score was categorized as Poor (1-7), Intermediate (8-11), or Ideal (12-14). Outcomes included adverse perinatal outcomes previously linked to BMI (Table 1). Association between exposures and outcomes were calculated via logistic regression.

Results: 2462 participants were included. 473 had BMI≥30, 134 (5.4%) had Poor CVH, 1740 (70.7%) had Intermediate CVH, and 517 (21.0%) had Ideal CVH. Overall, BMI≥30 was associated with increased HDP (38.7 vs 19.6%, OR 2.6, 95% CI 2.1-3.2), severe preeclampsia (8.3 vs 3.1%, OR 2.8, 95% CI 1.9-4.3), LGA (10.6 vs 4.3%, OR 2.6, 95% CI 1.8-3.8), GDM (7.4% vs 2.6%, OR 3.0, 95% CI 1.9-4.6), and CB (37.0 vs 22.4%, OR 2.0, 95% CI 1.6-2.5). However, when stratified by CVH category, these associations were altered. In the Ideal CVH category, BMI≥30 was only associated with LGA and GDM (Table 1). For some outcomes, like HDP, OR was higher in those with poor CVH and low BMI than those with Ideal CVH and high BMI (Figure 1).

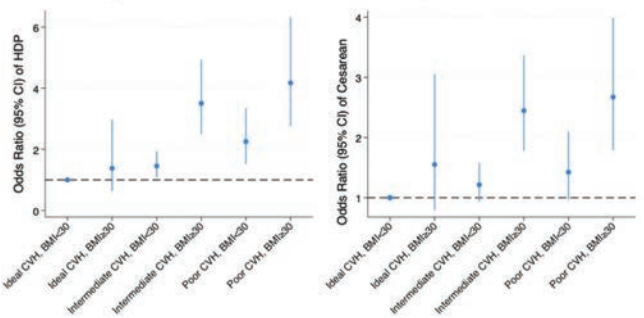
Conclusion: Relying on BMI alone to assess pregnancy risk appears to overestimate risk of BMI≥30 in those with otherwise Ideal CVH and underestimate in those with BMI 18.5-29.9 but Poor CVH. More comprehensive assessment of CVH could result in more accurate risk stratification.

Table 1. Association of BMI ≥30 and adverse pregnancy outcomes stratified by cardiovascular health (CVH).

Adverse Pregnancy Outcome	Poor CVH Score (1-7)		Intermediate CVH Score (8-11)		Ideal CVH Score (12-14	
	BMI 18.5-29.9 N (%) OR N=70	BMI ≥30 N (%) OR N=64	BMI 18.5-29.9 N (%) OR N=1,374	BMI ≥30 N (%) OR N=366	BMI 18.5-29.9 N (%) OR N=472	BMI ≥30 N (%) OR N=45
Hypertensive disease of pregnancy	17 (24.3) Ref	29 (45.3) 2.58 (1.24-5.39)	288 (21.1) Ref	146 (40.0) 2.50 (1.95-3.20)	69 (14.7) Ref	8 (18.2) 1.29 (0.57-2.89)
Preeclampsia with severe features	4 (5.7) Ref	10 (15.6) 3.06 (0.91-10.29)	39 (2.9) Ref	26 (7.1) 2.61 (1.57-4.35)	16 (3.4) Ref	3 (6.8) 2.07 (0.58-7.41)
Preterm birth	4 (5.7) Ref	5 (7.8) 1.40 (0.36-5.45)	89 (6.5) Ref	35 (9.6) 1.53 (1.01-2.30)	39 (8.3) Ref	2 (4.4) 0.52 (0.12-2.21)
SGA	5 (7.3) Ref	6 (9.4) 1.32 (0.38-4.57)	117 (8.6) Ref	25 (6.9) 0.79 (0.50-1.23)	41 (8.8) Ref	3 (7.0) 0.77 (0.23-2.61)
LGA	13 (6.4) Ref	18 (12.3) 2.06 (0.97-4.34)	51 (4.1) Ref	29 (9.1) 2.35 (1.46-3.77)	18 (3.9) Ref	7 (14.9) 4.35 (1.71-11.03)
Gestational diabetes	8 (11.4) Ref	6 (9.4) 0.80 (0.26-2.45)	41 (3.0) Ref	26 (7.1) 2.49 (1.5-4.1)	1 (0.2) --	3 (6.7) p<0.001*
Cesarean	20 (28.6) Ref	27 (42.2) 1.82 (0.89-3.74)	316 (23.1) Ref	136 (37.3) 1.98 (1.55-2.53)	92 (19.6) Ref	12 (27.3) 1.54 (0.76-3.10)

SGA = small for gestational age, birthweight <10th %ile
LGA = large for gestational age, birthweight ≥90th %ile
OR = odds ratio, *=cannot calculate OR and Fisher's exact p-value listed instead

Figure 1. Odds of adverse outcomes by CVH and BMI



CVH=Cardiovascular health category; BMI=Body Mass Index; HDP=Hypertensive disease of pregnancy

796 | Impact of Fetal Head Station on Maternal and Neonatal Outcomes in Second-Stage Cesarean Delivery

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10:30 AM - 12:30 PM

Objective: We hypothesized that second-stage cesarean delivery with fetal head station below the ischial spine increases adverse maternal and neonatal outcomes.

Study Design: A retrospective cohort study of term pregnant women who underwent cesarean delivery at full cervical dilatation was assessed for adverse maternal and neonatal outcomes. The study was conducted in a tertiary medical center between 2012-2023. Patients were categorized based on fetal head station in a manual examination: at or above ischial spines and below ischial spines. Maternal outcomes analyzed included cesarean section duration, need for push assistance, uterine extension, postpartum fever, hemoglobin drop, postpartum hemorrhage, blood transfusion, puerperal endometritis, and rehospitalization. Neonatal outcomes evaluated were 5-minute APGAR scores, arterial pH levels, and NICU admissions.

Results: Of the 418 patients studied, fetal head station was at or above ischial spines in 276 patients and below spines in 142 patients. The below ischial spines group had a higher incidence of failed vacuum attempts (50.7% vs. 13.0%, P< 0.001) and required more blood transfusions (16.2% vs. 7.6%, P = 0.011). Additionally, neonatal arterial pH levels < 7.2 were significantly more common in the below ischial spines group (21.8% vs. 13.0%, P = 0.013). The composite neonatal outcomes were more common in the below ischial spines group (16.9% vs. 9.8%, P = 0.041, Table 1). However, in a subgroup analysis excluding cases with failed vacuum attempts, no significant differences in maternal and neonatal adverse outcomes were found, except for differences in surgery duration (Table 2).

Conclusion: Fetal head station per se is not associated with adverse maternal and neonatal outcomes in second-stage cesarean delivery.

Table 1 Maternal and neonatal outcomes of all cohort

Characteristics	At or above Ischial Spines (S-3-S0) (n=276)	Below Ischial Spines (S+1-S+3) (n=142)	*P* value
Maternal outcomes			
C/S duration (m)			**0.028**
Mean (SD)	46.21 (17.79)	46.18 (27.85)	
Median (IQR)	43.5 (20.0)	39.0 (22.0)	
N/A	22 (7.0%)	11 (2.9%)	
Push assistance, n (%)	114 (41.3%)	57 (40.1%)	0.916
Uterus extension, n (%)	76 (27.5%)	45 (31.7%)	0.426
Postpartum fever, n (%)	9 (3.3%)	3 (2.1%)	0.758
Drop in HB >3 g/dL, n (%)	84 (30.4%)	51 (35.9%)	0.271
Postpartum hemorrhage, n (%)	17 (6.2%)	14 (9.9%)	0.174
Blood transfusion, n (%)	21 (7.6%)	23 (16.2%)	**0.011**
Puerperal endometritis, n (%)	9 (3.3%)	2 (1.4%)	0.346
Rehospitalization, n (%)	22 (8.0%)	5 (3.5%)	0.094
Neonatal outcomes			
5 min APGAR score <7 , n (%)	12 (4.3%)	10 (7.0%)	0.254
pH <7.2, n (%)	36 (13.0%)	31 (21.8%)	**0.013**
N/A	68 (25.0%)	39 (27.1%)	
NICU admission, n (%)	22 (8.0%)	20 (14.1%)	0.059
Composite adverse outcomes			
Composite maternal outcome[a], n (%)	196 (71.0%)	105 (73.9%)	0.566
Composite neonatal outcome[b], n (%)	27 (9.8%)	24 (16.9%)	**0.041**

C/S Cesarean Section, *HB* Hemoglobin, *NICU* Neonatal Intensive Care Unit, *N/A* Not Applicable

Statistical analysis performed was Wilcoxon for continuous variables and Fisher exact test for discrete variables.
[a] Defined as need for push assistance, occurrence of puerperal endometritis, post partum fever, uterine extension or postpartum hemorrhage, HB difference larger than 3 mg/dL, need for blood transfusion or rehospitalization.
[b] Defined as 5 minute APGAR score below 7 and NICU admission.

Table 2 Maternal and neonatal outcomes after exclusion of failed vacuum

Characteristics	At or above Ischial Spines (S-3-S0) (n=240)	Below Ischial Spines (S+1-S+3) (n=70)	*P* value
Maternal outcomes			
C/S duration (m)			**0.002**
Mean (SD)	45.84 (16.93)	40.85 (18.8)	
Median (IQR)	43.0 (19.0)	35.5 (16.0)	
N/A	17 (7.0%)	2 (2.9%)	
Push assistance, n (%)	99 (41.2%)	25 (35.7%)	0.488
Uterus extension, n (%)	67 (27.9%)	19 (27.1%)	1
Postpartum fever, n (%)	9 (3.7%)	1 (1.4%)	0.466
Drop in HB >3 g/dL, n (%)	67 (27.9%)	19 (27.1%)	1
Postpartum hemorrhage, n (%)	14 (5.8%)	3 (4.3%)	0.771
Blood transfusion, n (%)	16 (6.7%)	6 (8.6%)	0.690
Puerperal endometritis, n (%)	7 (2.92%)	0 (0%)	0.356
Rehospitalization, n (%)	17 (7.1%)	1 (1.4%)	0.086
Neonatal outcomes			
5 min APGAR score <7 , n (%)	10 (4.2%)	4 (5.7%)	0.527
pH <7.2, n (%)	25 (10.4%)	9 (12.9%)	0.506
N/A	60 (25.0%)	19 (27.1%)	
NICU admission, n (%)	15 (6.2%)	7 (10.0%)	0.294
Composite adverse outcomes			
Composite maternal outcome[a], n (%)	170 (70.8%)	48 (68.6%)	0.766
Composite neonatal outcome[b], n (%)	20 (8.3%)	9 (12.9%)	0.250

C/S Cesarean Section, *HB* Hemoglobin, *NICU* Neonatal Intensive Care Unit, *N/A* Not Applicable

Statistical analysis performed was Wilcoxon for continuous variables and Fisher exact test for discrete variables.
[a] Defined as need for push assistance, occurrence of puerperal endometritis, post partum fever, uterine extension or postpartum hemorrhage, HB difference larger than 3 mg/dL, need for blood transfusion or rehospitalization.
[b] Defined as 5 minute APGAR score below 7 and NICU admission.

797 | Genome Sequencing Versus Exome Sequencing for Fetal Anomalies

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10:30 AM - 12:30 PM

Objective: Genomic sequencing is increasingly recommended when fetal anomalies are detected. Exome (ES) and genome sequencing (GS) are both options; there are limited data comparing the two technologies. Our laboratory transitioned from ES to GS in July 2023; our objective was to compare ES versus GS in the setting of fetal anomalies.

Study Design: Prospective study of pregnancies with fetal anomalies undergoing ES or GS after non-diagnostic microarray. ES was performed in our laboratory from 1/2018 to 7/2023, and GS from 7/2023 to 7/2024. Rapid testing was performed in ongoing pregnancies to prioritize turnaround time (TAT) when management might be impacted. The primary outcome was diagnostic yield, defined as a pathogenic or likely pathogenic variant consistent with the presentation. Secondary outcomes were TAT, diagnostic yield in cases of multiple vs single anomalies, and frequency of variants of uncertain significance (VUS) and secondary findings.

Results: A total of 384 patients underwent fetal sequencing, 54 with multiple anomalies and 330 with a single anomaly. In all, 294 had ES and 90 had GS. Patients undergoing ES were more likely to undergo trio sequencing (69% vs 42%; p< 0.01). Multiple anomalies were present in 15% undergoing ES and 10% of GS cases (p = 0.21). Diagnostic yield was higher with multiple versus a single anomaly (31% vs 12%; p< 0.01) but did not differ by sequencing approach (14% for trio, 15% for duo or proband first; p = 0.7). The diagnostic yield was 16% with ES versus 10% with GS (p = 0.16). TAT with rapid sequencing was 30 days for ES vs 13 days for GS and was 51 vs 25 days for ES vs GS with routine (p< 0.01). The detection rate of VUS and secondary findings did not differ (Table).

Conclusion: GS for fetal anomalies was not associated with higher diagnostic yield or more VUS results when compared to ES, but was associated with shorter TAT. When decision making and care plans may be impacted by results, GS may be preferred for this reason.

Table. Exome versus genome sequencing

	Exome sequencing n=294	Genome sequencing n=90	p value
Indication			0.21
Isolated Anomaly	249 (85)	81 (90)	
Multiple Anomalies	45 (15)	9 (10)	
Maternal Age	33.5 (30-37)	34 (31-37)	0.25
Paternal Age	35 (31-38)	36 (32-40)	0.09
Maternal Race/Ethnicity			0.28
Asian	69 (23)	25 (28)	
Black	11 (4)	4 (4)	
Hispanic/Latina	39 (13)	6 (7)	
White	119 (40)	36 (40)	
Other	1 (<1)	0 (0)	
More than one race	41 (14)	18 (20)	
Unknown	14 (5)	1 (1)	
Diagnostic Yield (P/LP)	47 (16)	9 (10)	0.16
Trio	31 (15)	3 (8)	0.23
Duo	1 (1)	0 (0)	0.74
Proband first	15 (18)	6 (12)	0.32
VUS	16 (5)	6 (7)	0.64
Secondary findings	10 (3)	3 (3)	0.99
Turnaround time (days)	37 (25-57)	15 (10-24)	<0.01
Rapid	30 (23-42)	13 (9-16)	<0.01
Routine	51 (34-70)	25 (12-36)	<0.01

Data presented as n (%) or median (IQR).
P/LP = pathogenic or likely pathogenic variant(s) identified in gene related to the indication for testing

798 | Severe Maternal Ehlers-Danlos Diagnoses Among Patients Referred for Hypermobility

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10:30 AM - 12:30 PM

Objective: Joint hypermobility may indicate multiple conditions, including hypermobile, vascular, and classic Ehlers Danlos syndromes (hEDS, vEDS, cEDS). While hEDS is associated with generally low risks and good pregnancy outcomes, vEDS carries a 5% risk of maternal mortality and cEDS an increased risk of spontaneous preterm birth. Our objective was to describe the prevalence of vEDS and cEDS in a cohort of preconception and pregnant individuals with hypermobility.

Study Design: Retrospective cohort study of individuals presenting for maternal genetic evaluation for hypermobility between 2023-2024. Individuals were offered gene panel testing that includes the genes associated with vEDS and cEDS (COL3A1, COL5A1, COL5A2). A diagnosis of hEDS or hypermobility spectrum disorder (HSD) was made clinically as the genes associated with this condition are poorly understood. Primary outcome was genetic diagnosis of vEDS or cEDS. Secondary outcomes were clinical features with each of these diagnoses.

Results: 26 individuals were evaluated for hypermobility. Genetic testing was pursued in 19 patients; an additional 2 patients had already undergone testing with nondiagnostic results and a clinical history consistent with hEDS. Among those tested, 2/19 (11%) were identified to have pathogenic or likely pathogenic variants in COL3A1 consistent with a diagnosis of vEDS, and were managed with cardiac surveillance and cesarean section. One of these two individuals had previously been diagnosed with hEDS by a primary care physician. No individuals were clearly identified with cEDS, though one patient had a variant of uncertain significance in COL5A2. The remaining individuals were clinically diagnosed with hEDS or HSD and had routine obstetric management (Figure). The Table shows clinical features across diagnoses.

Conclusion: vEDS was diagnosed in 11% of individuals tested after referral for hypermobility. Genetic evaluation should be considered in individuals with hypermobility due to overlapping features across disorders, as well as significant implications for clinical management of when vEDS or cEDS are identified.

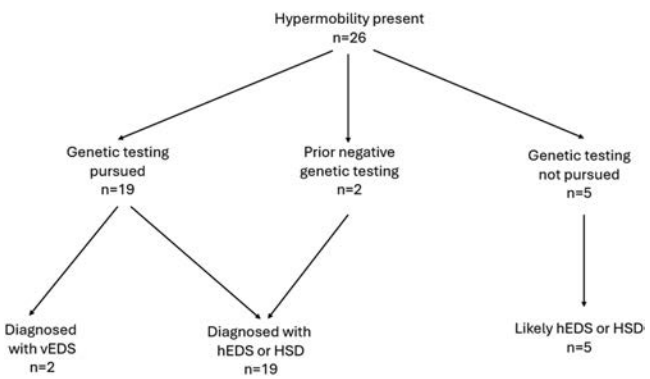

Table. Clinical features in pregnant or preconception individuals with hypermobility

	Diagnosis of vEDS n=2	Diagnosis of hEDS or HS n=19	No genetic evaluation n=5
Pregnant	2 (100)	16 (84)	2 (40)
Parous	0 (0)	6 (32)	2 (40)
Maternal age	32 (31-33)	34 (31-36)	33 (33-34)
Beighton score	6.5 (6-7)	5 (5-8)	5 (4-5)
Soft/velvety skin	1 (50)	14 (74)	4 (80)
Doughy skin	0 (0)	7 (37)	2 (40)
Skin fragility	1 (50)	8 (42)	0 (0)
Skin hyperextensibility	1 (50)	14 (74)	2 (40)
Atrophic scarring	1 (50)	11 (58)	0 (0)
Striae	1 (50)	10 (53)	4 (80)
Recurrent hernia	0 (0)	1 (5)	2 (40)
Pelvic organ prolapse	0 (0)	0 (0)	0 (0)
Dental crowding	1 (50)	11 (58)	2 (40)
Poor wound healing	1 (50)	9 (47)	1 (20)
Easy bruising	2 (100)	16 (84)	5 (100)
Muscle cramps	1 (50)	14 (74)	2 (40)
Tendon rupture	1 (50)	0 (0)	0 (0)
Hypotonia	0 (0)	1 (5)	1 (20)
Congenital hip dislocation	0 (0)	1 (5)	1 (20)
Congenital clubfoot	0 (0)	0 (0)	0 (0)
Mitral valve prolapse	0 (0)	1 (5)	0 (0)
Aortic dilation	0 (0)	0 (0)	0 (0)
Arterial aneurysm or dissection	1 (50)	0 (0)	0 (0)
Intestinal rupture	0 (0)	0 (0)	0 (0)
Uterine rupture	0 (0)	0 (0)	0 (0)
Varicose veins	1 (50)	5 (26)	0 (0)
Hypermobile small joints	2 (100)	12 (63)	2 (40)

Data presented as n (%) or median (IQR)
vEDS vascular Ehlers Danlos; hEDS - hypermobile Ehlers Danlos; HS - hypermobility syndrome

799 | Association of Maternal Body Mass Index with Longitudinal Fetal Growth Assessed by Three-Dimensional Ultrasonography

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10:30 AM - 12:30 PM

Objective: The current obesity epidemic is a major public health concern; from 2016-2019, there was an 11% increase in women entering pregnancy with obesity. Maternal obesity is associated with fetal overgrowth as assessed by two-dimensional (2D) ultrasonography. However, 3D ultrasonography can characterize fetal lean and fat tissue and organ volumes, which may provide additional insight into fetal metabolic programming than 2D. Therefore, we evaluated fetal 3D measures across pregnancy by maternal pre-pregnancy BMI.

Study Design: In the NICHD Fetal 3D Study (2015-2019), fetal body composition and organ volumes were measured at up to five ultrasound scans from 15-40 weeks by certified sonographers. BMI (kg/m^2), based on self-reported pre-pregnancy weight and height, were categorized as normal (18-< 25; n = 1567), overweight (25-< 30; n = 767), or obese (≥30; n = 468). Trajectories of fetal 3D measurements were modeled using linear mixed effect models. Overall and weekly mean differences in fetal growth were tested by BMI group, adjusted for covariates.

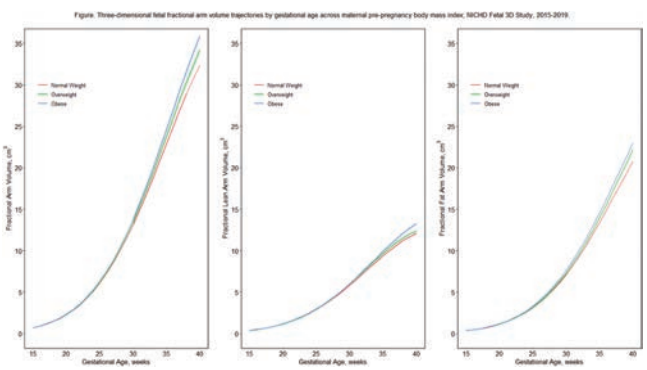
Results: Fetuses of women with overweight or obesity, compared to women with normal BMI, had significantly larger fractional arm and thigh volumes, starting at 25-26 weeks and continuing through gestation. Proportional to fractional limb volume, fetuses of women with obesity had significantly smaller lean but larger fat limb volumes. Additionally, for overweight and obese groups, fetuses had significantly larger abdominal area and maximum abdominal subcutaneous tissue thickness (SCTT) from 29 weeks onward. Fetuses of women with overweight BMI had significantly larger lung volume from 22-31 weeks, while those with obesity had significantly smaller lung volume from 17-20 weeks, compared to those with normal BMI. No overall differences were observed among limb SCTT or other organs.

Conclusion: Fetuses of mothers with obesity had relatively smaller lean tissue but greater fat tissue accumulation throughout gestation, compared to normal BMI. Future research should examine whether fetal soft tissue differences may relate to metabolic dysfunction across the life course.

Table. Summary of overall and weekly comparisons of fetal 3D body composition and organ volumes across maternal pre-pregnancy BMI; NICHD Fetal 3D Study, 2015-2019.

	Global Comparison	Weekly Comparisons			
		Overweight vs. Normal		Obese vs. Normal	
Outcome	Adjusted p-value	Gestational Weeks	Direction of Association	Gestational Weeks	Direction of Association
Body Composition					
Fractional arm volume (AVol), cm³	<0.0001	28-40	Larger	24-40	Larger
Fractional lean arm volume (FLAVol), cm³	0.004	29-36	Larger	30-40	Larger
FLAVol to AVol, %	0.06	15-19	Smaller	27-34	Smaller
Fractional fat arm volume (FFAVol), cm³	0.0001	30-40	Larger	23-40	Larger
FFAVol to AVol, %	0.06	15-17	Larger	26-33	Larger
Maximum arm SCTT, cm	0.18	20-26	Larger	35-37	Larger
Abdominal area, mm²	<0.0001	27-40	Larger	28-40	Larger
Maximum abdominal SCTT, mm	0.002	30-40	Larger	30-37	Larger
Fractional thigh volume (TVol), cm³	0.0001	26-40	Larger	23-38	Larger
Fractional lean thigh volume (FLTVol), cm³	0.0001	27-40	Larger	25-37	Larger
FLTVol to TVol, %	0.05	-	-	15-20	Smaller
Fractional fat thigh volume (FFTVol), cm³	0.002	31-40	Larger	21, 31-40	Larger
FFTVol to TVol, %	0.13	-	-	15-19	Larger
Maximum thigh SCTT, cm	0.17	33-40	Larger	-	-
Organ Volumes					
Cerebellar volume, cm³	0.38	-	-	-	-
Average lung volume, cm³	0.03	22-31	Larger	17-20	Smaller
Liver volume, cm³	0.06	37-40	Larger	30-36	Larger
Average kidney volume, cm³	0.35	15-18	Larger	-	-

Linear mixed models were adjusted for: maternal age, race/ethnicity, parity, education, full-time employment status, marital status, insurance, and infant sex.
Dashes indicate no gestational age for which weekly pairwise comparisons were different.



800 | Prenatal Clinic Management of High-Risk Pregnant Patients

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10:30 AM - 12:30 PM

Objective: To describe how prenatal clinics in the state of Michigan manage patients with high-risk conditions in pregnancy.

Study Design: Prenatal care providers were identified and recruited through a systematic web search and snowball sampling. Semi-structured surveys assessed prenatal care practices for birthing people with high-risk conditions (e.g. pre-existing diabetes, chronic hypertension). Clinics reported whether they managed, co-managed, or referred patients. We assessed differences in practice by clinic type: Federally Qualified Health Centers, outpatient clinics linked to hospitals, and private practices using basic tests of comparison. Qualitative content analysis was used to summarize free-response answers about additional services offered to medically complex patients. Funding provided by Blue Cross Blue Shield of Michigan.

Results: In total, 19 clinics representing 8/10 regions, with an average of 408 (range 20-1700) patients per site, were included.

Of the 19 clinics, 9/19 (47.4%) manage, 6/19 (31.6%) co-manage, and 4/19 (21.1%) refer pregnant patients with pre-existing type 2 diabetes. More outpatient clinics linked to hospitals managed patients with pre-existing type 2 diabetes. For patients with chronic hypertension, 11/19 (57.9%) clinics manage, 6/19 (31.6%) co-manage, and 2/10 (10.5%) refer patients. Management practices for chronic hypertension did not differ by clinic type. Additional services offered to medically complex patients included nurse navigators; care coordination by nurses, faculty, and trainees; support from social workers, therapists, doulas, or community health workers; and access to maternal fetal medicine physicians.

Conclusion: Many patients with type 2 diabetes or chronic hypertension require referrals or management from multiple providers. Future work is needed to understand the effects of varying management practices for chronic conditions on care access and outcomes, and the effects of additional services such as care coordination.

Table 1. Management of Pregnant Patients with Type 2 Diabetes by Clinic Type

Clinic Type	Pregnant Patients with Type 2 Diabetes			p value*
	Manage	Co-Manage	Refer	
Federally Qualified Health Center (n = 9)	3	5	1	p = 0.023
Outpatient Clinic linked to Hospital (n = 7)	6	0	1	
Private Practice (n = 3)	0	1	2	
Total	9	6	4	

*Tests of comparison completed using chi square analysis

Table 2. Management of Pregnant Patients with Chronic Hypertension by Clinic Type

Clinic Type	Pregnant Patients with Chronic Hypertension			p value*
	Manage	Co-Manage	Refer	
Federally Qualified Health Center (n = 9)	4	4	1	p = 0.299
Outpatient Clinic linked to Hospital (n = 7)	6	1	0	
Private Practice (n = 3)	1	1	1	
Total	11	6	2	

*Tests of comparison completed using chi square analysis

801 | Adjunctive Quadratus Lumborum Block to Reduce Opioid Use after Cesarean Delivery

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10:30 AM - 12:30 PM

Objective: Peripheral nerve blockade in addition to neuraxial morphine (NM) and enhanced recovery protocols may improve analgesia following cesarean delivery (CD). We assessed if adjunctive quadratus lumborum (QL) block will reduce the oral morphine equivalent (OME) consumption for the first 24 and 48 hours after CD.

Study Design: Retrospective cohort comprising patients enrolled in a single tertiary center RCT of reduced NM dose (50mcg NM+QL block vs 150mcg NM+QL block) aimed at minimizing OME use and NM adverse effects after scheduled CD; and a historical cohort who received 150mcg of NM without a QL block. Patients in the RCT were excluded for preeclampsia, insulin-treated diabetes, placental abnormalities or history of opioid use disorder. Intervention groups were 50mcg NM+QL, 150mcg NM+QL, and 150mcg NM without QL block. Comparison groups were 150mcg NM+QL vs. 150mcg NM without QL and 50mcg NM+QL vs. 150mcg NM without QL. Primary outcomes were total OME on postoperative days 1 and 2 and opioid use 24hr prior to discharge. Secondary outcomes included total OME, opioid adverse effects, and pain scores. Linear regression and log-binomial models were used to calculate risk differences and 95% confidence intervals between groups.

Results: Of 243 patients were included, 43 were in the 50mcg NM+QL arm, 42 in the 150mcg NM+QL arm, and 158 in the 150mcg NM without QL arm. Patients in the 150mcg NM without QL arm delivered earlier and had higher rates of preeclampsia, pregestational diabetes and ASA class. There were no significant differences in the primary outcomes between all comparison groups. QL block was associated with lower parenteral opioid use and lower pain scores in the first 6 hours after surgery for patients receiving 150mg NM. There were no other significant differences in secondary outcomes.

Conclusion: Routine QL block in addition to multimodal pain management and NM did not significantly reduce total OMEs after scheduled CD however, it reduces parenteral opioid use and improve pain control in the immediate post cesarean period. Larger studies may be needed to confirm.

Table: Outcomes for Participants in the Reduced Neuraxial Dose Morphine Randomized Trial and a Historical Institutional Cohort

	50mcg NM + QL (n=43)	150mcg NM + QL (n=42)	150mcg NM + no QL (n=158)	50mcg NM + QL vs 150mcg NM + no QL RD (95% CI)	150mcg NM+ QL vs 150mcg NM + no QL RD (95% CI)
Primary Outcome					
Opioid use 24hrs prior to discharge	20.5 ± 13.3	22.2 ± 12.7	24.3 ± 15.6	-3.79 (-10.19 - 2.62)	-2.16 (-8.33 - 4.02)
Total OME	88.4 ± 77.3	82.0 ± 81.9	91.2 ± 78.7	-2.82 (-29.41 - 23.77)	-9.28 (-36.43 - 17.88)
First 24hrs	29.1 ± 26.6	16.6 ± 21.2	24.8 ± 27.1	4.32 (-4.83 - 13.47)	-8.19 (-17.09 - 0.71)
Day 1	31.7 ± 25.3	25.7 ± 24.0	31.2 ± 26.4	0.50 (-8.36 - 9.37)	-5.23 (-14.39 - 3.33)
Day 2	19.0 ± 22.0	25.4 ± 27.7	24.3 ± 25.1	-5.32 (-13.61 - 2.98)	-1.03 (-7.75 - 9.80)
Day 3	8.6 ± 16.9	14.3 ± 21.4	10.9 ± 19.9	-2.33 (-8.89 - 4.23)	3.41 (-3.52 - 10.35)
Secondary Outcomes					
OME Oral	71.7 ± 65.3	73.9 ± 74.1	76.9 ± 69.8	-5.21 (-28.58 - 18.16)	-2.97 (-27.18 - 21.24)
OME IV	16.7 ± 18.7	8.0 ± 13.3	14.3 ± 18.8	2.39 (-1.45 - 3.35)	**-6.31 (-12.39 - -0.22)***
Average Pain score	2.5 ± 1.7	2.0 ± 1.5	2.2 ± 1.6	0.29 (-0.27 - 0.84)	-0.25 (-0.79 - 0.30)
0-6hrs	2.1 ± 2.2	1.0 ± 1.4	1.7 ± 1.9	0.45 (-0.21 - 1.11)	**-0.70 (-1.32 - -0.08)***
POD0	2.4 ± 1.8	1.6 ± 1.5	2.0 ± 1.7	0.34 (-0.25 - 0.93)	-0.46 (-1.04 - 0.11)
6-12hrs	2.4 ± 2.3	1.9 ± 2.6	2.2 ± 2.4	0.25 (-0.60 - 1.10)	-0.34 (-1.21 - 0.53)
12-24hrs	2.7 ± 2.5	1.9 ± 2.1	2.3 ± 2.3	0.33 (-0.47 - 1.13)	-0.48 (-1.26 - 0.30)
24-48hrs	2.7 ± 2.0	2.9 ± 2.1	2.60 ± 2.15	0.06 (-0.68 - 0.79)	0.30 (-0.45 - 1.04)
48-72hrs	2.8 ± 2.4	2.4 ± 1.9	2.4 ± 2.1	0.39 (-0.39 - 1.17)	0.05 (-0.72 - 0.81)

Data are mean ± standard deviation; OME- Oral morphine equivalent; QL- Quadratus Lumborum; NM – Neuraxial Morphine; PACU- Post anesthesia care unit; RR- Relative risk; RD- Risk difference; CI- Confidence intervals; *p<0.05; OME Oral- Oxycodone OME; OME IV-Fentanyl, Morphine, Hydromorphone OMEs

802 | Cost Effectiveness Analysis of Outpatient Versus Inpatient Antibiotic Treatment for Syphilis in Pregnancy

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10:30 AM - 12:30 PM

Objective: Inadequate treatment and inequitable access to care contribute to the rising incidence of congenital syphilis in the US. In pregnancy, inpatient treatment is offered due to increased risk of Jarisch-Herxheimer reaction (JHR) and other adverse outcomes. Our objective is to determine the cost-effectiveness of admissions averted by comparing inpatient versus outpatient treatment for initial antibiotic dose in pregnant patients with syphilis.

Study Design: We performed a cost effectiveness analysis using a decision tree, for viable (≥23 weeks), pregnancies with syphilis, to compare initial treatment in two settings: (1) inpatient and (2) outpatient. Input parameters included the probability of JHR resulting in a 3-day admission to the hospital among outpatient treatment, the total cost of treatment in each setting, and the total cost of subsequent admissions. Costs were estimated using a cost-to-charge ratio obtained from charges at a US, tertiary, academic hospital in 2024 USD, while the probability of admission was equated to the JHR incidence obtained from the literature (1.72%). An incremental cost-effectiveness ratio (ICER) was calculated using the ratio of differential total costs and admission probabilities between the two settings from a healthcare system perspective. A probabilistic sensitivity analysis using 100 Monte Carlo simulations was conducted to assess parameter uncertainty.

Results: The average treatment cost of pregnant women with syphilis was estimated at $2,720 and $170 in an inpatient and outpatient setting respectively, while the cost of a 3-day admission following JHR in the outpatient settings was around $9,000. The ICER was estimated at $134,463 (95% Confidence Interval: $121,874-$149,052) per admission averted.

Conclusion: Initial antibiotic treatment in an outpatient setting for syphilis in pregnancy is cost-effective compared to patient treatment in terms of admissions averted. Future work should explore whether the costs of treating women with syphilis in an inpatient setting are justified by exploring birth-related health outcomes (e.g. still-births averted).

Figure 1: Syphilis Treatment Decision Tree

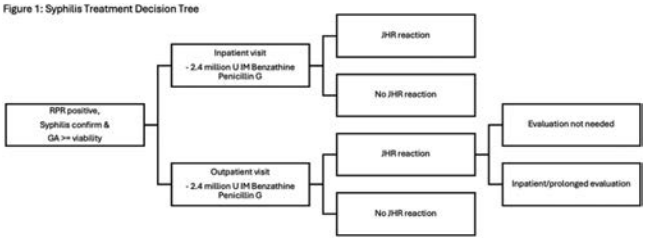
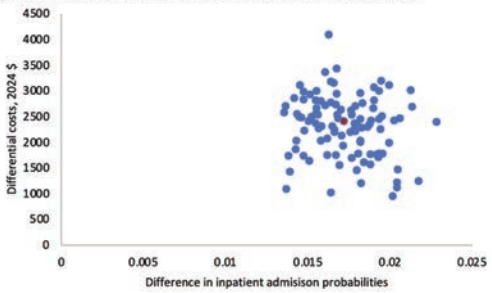


Figure 2: Incremental cost-effectiveness ration scatterplot



Notes: Red point indicates average ICER estimate; blue points indicate estimates from the Monte Carlo simulations

803 | Impact of Iron Deficiency in Pregnancy on Childhood Neurodevelopmental Outcomes

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10:30 AM - 12:30 PM

Objective: Iron deficiency in pregnancy is common and associated with perinatal morbidity. Retrospective studies suggest an association between prenatal iron deficiency and worsened long term childhood neurodevelopmental outcomes. The objective of this study was to evaluate childhood neurodevelopment from infancy to two years of age and perinatal outcomes associated with iron deficiency in pregnancy.

Study Design: Prespecified secondary analysis of a prospective cohort study evaluating the influence of prenatal exposures on child neurodevelopmental outcomes. Patients were recruited prior to 24 weeks gestation. Pregnancy and health information was extracted from medical health records. Prenatal iron deficiency was defined as serum ferritin <30ng/mL. Childhood neurodevelopment was assessed through the Ages and Stages Questionnaire (ASQ) at 1, 6, 12,18 and 24 months of age. Mean ASQ subscale scores and their 95% confidence intervals were graphed across 1-24 months.

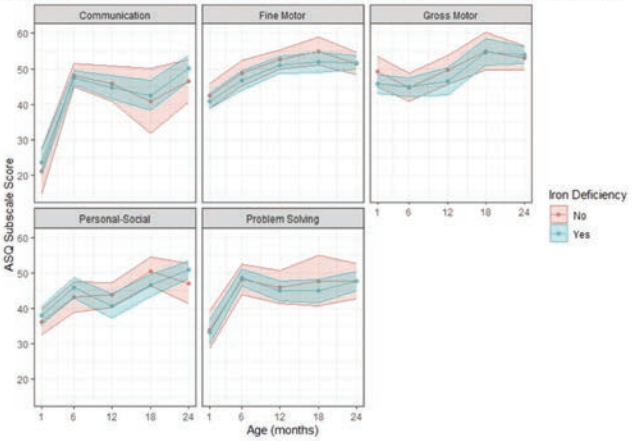
Results: A total of 147 maternal-child dyads met inclusion criteria; 104 (70.7%) had prenatally diagnosed iron deficiency, 43 (29.3%) did not have iron deficiency. These groups had similar baseline characteristics (Table 1). The mean ferritin in pregnancy in the iron deficient group was 23.8 ng/mL, compared to 64.9 ng/mL in those without iron deficiency. There was a trend towards lower ASQ fine motor skills, persisting from 1 to 18 months of age, in children with maternal prenatal iron deficiency as compared to those without, however, this did not achieve significance (Figure 1). Otherwise, other ASQ scores were similar across the timepoints.

Conclusion: Although prenatal iron deficiency was not associated with significant differences in childhood neurodevelopmental outcomes via the ASQ, larger studies are warranted to evaluate the relationship between iron deficiency and diminished motor skills as this trend has been previously described in retrospective studies.

Table 1. Baseline Characteristics of Patients with Prenatal Iron Deficiency and Without (N= 147)

	With Iron Deficiency (n = 104)	Without Iron Deficiency (n = 43)	p-value
Ferritin Level (ng/mL)	23.8 ± 38.7	64.9 ± 37.7	
Maternal Age (years)	33.0 ± 4.4	32.9 ± 3.7	0.89
Gravidity			0.15
1	35 (33.7)	20 (46.5)	
1+	69 (66.3))	23 (53.5)	
Parity			0.11
0	52 (50.0)	31 (72.1)	
1	52 (50.0)	12 (26.9	
2	10 (9.6)		
3+	4 (3.8)	1 (2.4)	
Mode of Delivery			0.35
Vaginal	70 (67.3)	33 (76.7)	
C-Section	34 (32.7)	10 (23.3)	
GA Delivery	39.2 ± 1.5	38.7 ± 1.5	0.05
Race			0.72
American Indian/Alaska Native/Eskimo	1 (1.0)	1 (2.3)	
Asian/East Indian	10 (9.6)	5 (11.6)	
Black	2 (1.9)	2 (4.7)	
Native Hawaiian/Pacific Islander	0 (0.0)	0 (0.0)	
White/Middle Eastern	75 (72.1)	28 (65.1)	
Multiracial	14 (13.5)	7 (16.3)	
Other	2 (1.9)	0 (0.0)	
Ethnicity			0.23
Hispanic	13 (12.5)	2 (4.7)	
Non-Hispanic	91 (87.5)	41 (95.3)	
Pre-pregnancy BMI	24.7 ± 5.0	25.3 ± 5.4	0.53
Education Level			0.12
Grade School	0 (0.0)	0 (0.0)	
Some High School	1 (1.0)	1 (2.3)	
High School Equivalent	1 (1.0)	0 (0.0)	
Regular High School	2 (1.9)	3 (7.0)	
Some College	4 (3.8)	2 (4.7)	
Associate's Degree	10 (9.6)	0 (0.0)	
Bachelor's Degree	38 (36.5)	21 (48.8)	
Master's, JD/Law/2-3-year grad degree	26 (25.0)	11 (25.6)	
Doctorate, Ph.D, M.D., or Medical Degree	18 (17.3)	4 (9.3)	

Figure 1. Prenatal Iron Status and Associations with Childhood Neurodevelopmental ASQ Scores by Age



804 | Impact of Infant Gestational Age at Birth on Postpartum Healthcare Receipt

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10:30 AM - 12:30 PM

Objective: Up to 40% of obstetric patients do not attend postpartum visits. Birthing parents of preterm infants are often sicker than those of full-term infants. Yet parents of preterm infants may forgo postpartum visits to be present in the neonatal intensive care unit (NICU). We evaluated whether parents of preterm infants were less likely to receive postpartum care than parents of full-term infants.

Study Design: Retrospective cohort study of births in Epic Systems' Cosmos research platform (2018-2023), a US-based electronic health record database with anonymized, de-identified, patient-level data. We explored bivariate associations of infant gestational age with postpartum visits. Logistic regression models estimated the odds of missing postpartum visits among parents of infants of varying gestational ages compared to parents of full-term infants (39-40 weeks). Models first adjusted for patient characteristics (age, parity, body mass index, race and ethnicity, insurance, smoking, year, and CDC Social Vulnerability Index), and then adjusted for morbidities (diabetes, hypertension, and cesarean birth) (Table 1).

Results: In bivariate analyses, parents of infants < 24 weeks' gestation missed postpartum visits significantly more often than parents of full-term infants (37% vs. 32%, respectively, OR 1.26 [1.13–1.40]) (Table 2). Adjustment for patient characteristics did not meaningfully change estimates. However, with adjustment for morbidities, parents of preterm infants in every gestational age category had significantly higher odds of missing postpartum visits compared to parents of full-term infants; adjusted odds ratios ranged from 1.11 (1.06–1.17) to 1.20 (1.08–1.33) among parents of infants 24-27 and < 24 weeks' gestation, respectively.

Conclusion: Parents of preterm infants are at higher risk for not receiving postpartum healthcare than parents of full-term infants.

Interdisciplinary, innovative approaches to deliver care to this high-risk group, potentially in the NICU, are needed.

Table 1. Patient characteristics by postpartum care receipt in Epic Cosmos, 2018-2023 (n= 2,245,270)

	Postpartum Care n=1,528,800		No Postpartum Care n=716,470		
Characteristic	**n**	**(row %)**	**n**	**(row %)**	**P**
Age (years)					<0.001
<25	262,789	(65)	144,335	(35)	
25-<35	917,709	(70)	399,084	(30)	
35+	348,302	(67)	173,051	(33)	
Parity					<0.001
Parous	911,461	(66)	466,348	(34)	
Nulliparous	617,339	(71)	250,122	(29)	
Pre-pregnancy body mass index (kg/m²)#					<0.001
<25	528,864	(70)	221,588	(30)	
25-<30	424,104	(70)	182,860	(30)	
30+	575,832	(65)	312022	(35)	
Race and ethnicity					<0.001
Asian	67,626	(69)	30,117	(31)	
Hispanic	179,921	(66)	92,901	(34)	
Non-Hispanic Black	225,165	(65)	120,558	(35)	
Non-Hispanic White	850,477	(70)	356,674	(30)	
Multiracial/Other/Unknown*	205, 611	(64)	116,220	(36)	
Insurance*					<0.001
Private	1,211,785	(69)	549,606	(31)	
Public/self-pay/other	317,015	(66)	166,864	(34)	
Smoking					<0.001
Never	1,426,882	(68)	657,304	(32)	
Smoked Before Pregnancy	34,065	(68)	16,215	(32)	
Smoked During Pregnancy	14,736	(39)	23,420	(61)	
Unknown Smoking History	53,117	(73)	19,531	(27)	
SVI, median (IQR)§	0.60 (0.31, 0.83)		0.64 (0.34, 0.86)		<0.001
Method of birth					<0.001
Vaginal	1,018,708	(66)	517,481	(34)	
Cesarean	510,092	(72)	198,989	(28)	
Hypertension (preexisting and gestational)					<0.001
No	1,089,476	(67)	534,183	(33)	
Yes	439,324	(71)	182,287	(29)	
Diabetes (preexisting and gestational)					<0.001
No	1,131,788	(67)	562,146	(33)	
Yes	397,012	(72)	154,324	(28)	

IQR, interquartile range; #Body mass index was missing for 1.7% of patients; *Ethnicity was missing for 4% of patients §SVI, Centers for Disease Control and Prevention Social Vulnerability Index, missing for 0.3% of patients; *Insurance was missing for 1% of patient

Table 2. Associations of gestational age at birth with missing postpartum care in Epic Cosmos, 2018-2023 (n= 2,245,270)

Gestational age at birth (weeks)	n	(% missing postpartum care)	Model	aOR (95% CI)
20-23	1,536	36.8	M0. Unadjusted	1.26 (1.13 – 1.40)
			M1. Adjusted for patient characteristics[a]	1.16 (1.05 – 1.30)
			M2. Further adjusted for morbidities[b]	**1.20 (1.08 – 1.33)**
24-27	8,219	32.1	M0. Unadjusted	1.02 (0.98 – 1.07)
			M1. Adjusted for patient characteristics[a]	0.96 (0.91 – 1.00)
			M2. Further adjusted for morbidities[b]	**1.11 (1.06 – 1.17)**
28-31	18,673	31.3	M0. Unadjusted	0.99 (0.96 – 1.02)
			M1. Adjusted for patient characteristics[a]	0.93 (0.90 – 0.96)
			M2. Further adjusted for morbidities[b]	**1.13 (1.10 – 1.17)**
32-34	57,986	32.8	M0. Unadjusted	1.06 (1.04 – 1.08)
			M1. Adjusted for patient characteristics[a]	1.01 (0.99 – 1.03)
			M2. Further adjusted for morbidities[b]	**1.20 (1.18 – 1.22)**
35-36	134,169	33.0	M0. Unadjusted	1.06 (1.05 – 1.08)
			M1. Adjusted for patient characteristics[a]	1.02 (1.00 – 1.03)
			M2. Further adjusted for morbidities[b]	**1.14 (1.13 – 1.16)**
37-38	663,161	32.2	M0. Unadjusted	1.03 (1.02 – 1.03)
			M1. Adjusted for patient characteristics[a]	0.99 (0.99 – 1.00)
			M2. Further adjusted for morbidities[b]	**1.06 (1.05 – 1.06)**
39-40	1,257,320	31.6	Reference	–
				–
				–
41-43	104,206	31.4	M0. Unadjusted	0.99 (0.98 – 1.00)
			M1. Adjusted for patient characteristics[a]	1.07 (1.06 – 1.09)
			M2. Further adjusted for morbidities[b]	**1.03 (1.02 – 1.05)**

[a]Patient characteristics included: age; parity; body mass index; race and ethnicity; insurance; smoking; CDC social vulnerability index at residential address, year.
[b]Morbidities included: diabetes mellitus (gestational and pre-existing); hypertension (gestational and pre-existing); and cesarean (vs. vaginal) birth.

805 | Maternal Fetal Medicine Fellow Experience with Placenta Accreta Spectrum Care

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10:30 AM - 12:30 PM

Objective: Evaluate MFM fellows' experience with PAS management and their desire to perform PAS surgeries post-fellowship.

Study Design: A 43 question IRB approved survey regarding PAS exposure was validated with experts and novice learners. The survey was distributed via REDCap to fellowship program directors for dissemination from June-July 2024. Baseline demographics: fellowship year, region, number of fellows in the program, and if home program was a PAS center of excellence. Primary outcome: fellows' desire to participate in PAS post-fellowship. Secondary outcomes: various aspects of PAS participation. Chi square and pearson's t-test analyzed outcome variables.

Results: 42 MFM fellows responded, distributed evenly by year (PGY5-7+: 33.3%, 28.6%, 38.1%) and region (Northeast 38.1%, South 31%, Midwest 19%, West 11.9%). Most programs (52.4%) had 5+ fellows, and 64.3% identified as PAS center. Prior to fellowship, 90.5% of fellows participated in some aspect of PAS care, with 52% performing 1-5 cases. 60% of fellows previously in OBGYN practice had performed PAS cases as primary surgeons. 64.3% of fellows reported training in a PAS program influenced their fellowship ranking. During fellowship, all respondents participated in ultrasound and intrapartum PAS management, with 95.2% involved in surgical management. Over one-third (35.7%) performed 1-5 PAS cases during fellowship and there was no difference in the number of hysterectomies performed per fellowship year ($p = 0.916$). Two-thirds (66.7%) expressed a desire to perform PAS cases post-training and those who desired felt more confident managing the entire surgery for PAS ($p = < 0.001$) as well as managing the routine post-operative care ($p = 0.025$) and showed a trend toward training at a PAS center of excellence ($p = 0.08$).

Conclusion: 2/3 of fellows intend to perform PAS cases post-training and felt confident managing the entire surgery for PAS patients and had a trend to have trained a PAS center of excellence. A solid foundation in PAS identification, management, and care coordination during training is essential for fellows' future participation in PAS care.

806 | MEWS Due to Severe Hypertension Prior to Delivery: Clinical Characteristics and Outcomes

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10:30 AM - 12:30 PM

Objective: Maternal early warning systems (MEWS) are used to identify individuals at risk for adverse outcomes related to severe hypertension (HTN). We aimed to describe the frequency, demographics, management, and adverse outcomes of MEWS for severe HTN.

Study Design: A retrospective cohort study on the pragmatic management of MEWS for severe HTN from March to Dec 2022 at a level IV center. Individuals that triggered a MEWS antenatally or intrapartum for systolic BP $\geq$ 160 or diastolic BP $\geq$ 110 mm Hg were included and any subsequent MEWS were collected. Those with MEWS exclusively postpartum were excluded. MEWS were triggered after two sustained severe BPs prompting a provider to bedside within 30 minutes. Composite maternal adverse outcomes (CMAO) included eclampsia, stroke, pulmonary edema, acute kidney injury, myocardial ischemia, placental abruption, or

death. Descriptive statistics were performed using N (%), mean (standard deviation [± SD]) and median (interquartile range [IQR]). 95% confidence intervals (CI) were calculated for CMAO.
Results: There were 3933 deliveries during the study period and 100 individuals (2.5%) who met inclusion criteria with a total of 541 MEWS—a median of 4 (IQR 2-8) per person. 52% were nulliparous, 21% had preeclampsia in a previous pregnancy, and 54% had chronic hypertension. Mean systolic BP and diastolic BP were 172 ± 12 and 98 ± 13 mm Hg, respectively. Symptoms occurred in only 15% of MEWS. The rate of CMAO was 8% (95% CI; 3-15%). In response to MEWS, acute antihypertensives were given in 41%, both acute and oral in 20%, and oral only in 7% of cases. 31% of all MEWS (n = 170) were not treated. When evaluating adverse outcomes, only one (acute kidney injury) occurred after an untreated MEWS.
Conclusion: In our population, the likelihood of developing MEWS for severe HTN before delivery was 2.5% and adverse outcomes occurred in approximately 1 in 10. The majority of cases had no symptoms other than elevated BP. BPs were not treated in 31% of MEWS and only 1 out of 170 were associated with the development of CMAO.

Table 1: Characteristics and management of hypertensive maternal early warning systems

	N (total # of MEWS) = 541
Number of MEWS per person (median, IQR)	4 (2-8)
Location (n, %)	
Triage	63 (12)
Intrapartum	108 (20)
Antepartum	258 (48)
Postpartum	112 (21)
Time of day (n, %)	
Day Shift	281 (52)
Night Shift	260 (48)
Blood pressure (mean, ± SD)	
1st Systolic	172 ± 12
1st Diastolic	98 ± 13
Symptoms (n, %)	
Headache	58 (10)
Vision changes	8 (2)
Shortness of breath	9 (2)
Chest pain	11 (2)
Right upper quadrant/epigastric pain	10 (1)
Nausea/vomiting	7 (1)
Workup (n, %)	
Preeclampsia blood tests	186 (34)
Troponins	21 (4)
EKG	14 (3)
Imaging studies	31 (6)
Hypertension Medication Management (n, %)	
Acute antihypertensive only	222 (41)
Oral maintenance antihypertensive only	39 (7)
Acute and oral antihypertensive	106 (20)
No antihypertensive	170 (31)
Magnesium started at time of MEWS	79 (15)
Acute antihypertensive given (n, %)	
IV labetalol	218 (40)
IV hydralazine	89 (16)
IR Procardia	41 (8)
Addition or increase of oral maintenance medication (n, %)	
Procardia	85 (16)
Labetalol	59 (11)
Hydralazine	2 (0.4)
Hydrochlorothiazide	12 (2)
ACE inhibitor	8 (2)

MEWS, maternal early warning system; IQR, interquartile range; SD, standard deviation; EKG, electrocardiogram; ACE, Angiotensin-converting enzyme

Table 2: Composite maternal adverse outcomes

	N (total # individuals) = 100
Composite maternal adverse outcomes (n, %)	8 (8%; 4 to 15%)
Placental abruption	2 (2%; 0.2 to 7%)
Pulmonary edema	3 (3%; 0.6 to 9%)
Acute kidney injury >1.5	4 (4%; 1 to 10%)

Data presented as N (% with 95% confidence intervals). MEWS, maternal early warning system
1 person had both pulmonary edema and acute kidney injury (identified during 2 different MEWS)
There were no cases of eclampsia, stroke, myocardial ischemia or maternal death

807 | Improving Understanding of Macrosomia With Graphics-Based Educational Tool: A Randomized Clinical Trial (MATE)

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10:30 AM - 12:30 PM
Objective: Our pilot study noted that in our population, understanding of risk factors/complications (RF/C) and management options (MO) for macrosomia (birthweight ≥ 4,000 g) was poor. We hypothesized that a graphics-based education tool (GBET) would improve knowledge about macrosomia.
Study Design: Inclusion criteria for our randomized clinical trial (NCTO6281301) comprised of individuals at 18-55 years, with singleton pregnancy delivering at ≥ 36 weeks. After consent, participants were randomized to either routine care or GBET (Fig 1). To assess the knowledge about macrosomia, a questionnaire consisting of 17 questions relating to the RF/C and MO of suspected macrosomic fetuses was administered to eligible candidates. The primary outcome was the overall score on the questionnaire. Secondary outcomes were individual scores on the RF/C (n = 11) and MO (n = 6). We estimated a priori that 100 participants in each group would provide 90% power to detect a 10% difference in the mean macrosomia questionnaire score (baseline score 56% ± SD of 12, alpha = 0.05). Descriptive statistics were used for baseline characteristics. Chi-squared test was used to compare categorical variables and Student's t-test for continuous variables.
Results: During the study period from Jan to July 2023, 230 eligible individuals were approached and 200 (87%) agreed to participate; of them, 103 received the GBET. Baseline demographics were similar. The majority (42%) of respondents self-identified as Black, 60% were employed, 56% had some level of college education, and 30% lived below the poverty line. There were 41% nulliparous, 67% with a BMI ≥ 30 kg/m^2 and 16% with diabetes. The primary outcome was significantly higher in those who received the GBET (70% versus 63%, $p < 0.01$). The RF/C score was also higher in the GBET group (71% versus 63%, $p = 0.01$); however, the MO score was similar between the groups (64% versus 67%, $p = 0.12$).
Conclusion: In our population, a graphics-based education tool improved patient knowledge on the risk factors / complications for macrosomia, but not their management options.

Figure 1: Graphics-based education tool

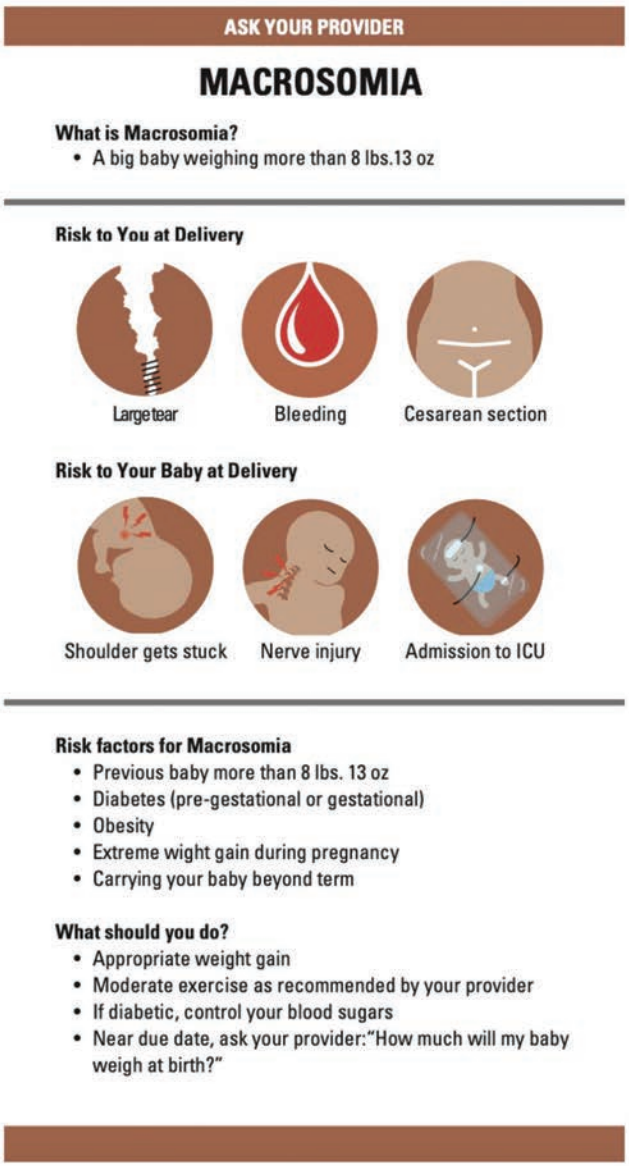

Table 1: Demographics and outcomes

	Routine care (n=97)	GEBT (n=103)	P
Demographics			
Age, mean (SD)	30 (6)	29 (7)	-
BMI ≥30, n (%)	71 (69)	62(64)	-
Ethnicity			-
Black	45 (44)	39 (40)	
White	17 (17)	19 (20)	
Hispanic	19 (19)	21 (22)	
Asian	10 (10)	9 (9)	
Other	12 (12)	9 (9)	
Diabetes (pre and gestational), n (%)	16 (16)	16 (17)	-
Level of education, n (%)			-
Less than college	42 (41)	47 (49)	
College or above	61 (59)	50 (52)	
Employed (n, %)	68 (66)	52 (54)	-
Outcomes mean (SD)			
Primary outcome			
Overall score	63 (11)	70 (10)	**<0.01**
Secondary outcomes			
RF/C score	63 (16)	71 (15)	**<0.01**
MO score	64 (13)	67 (11)	0.12

Data presented as N (%) and mean (SD)
GEBT, graphics-based education tool; SD, standard deviation; RF/C, risk factors/complications; MO, management options
Bolded, if significantly different

808 | Effects of Co-Occurring Opioid Use and Mood Disorders on Neonatal Outcomes in Pregnancy

Kristin C. Prewitt; Bharti Garg; Kimberly Ryan; Sarena Hayer; Ashley E. Benson; Aaron B. Caughey; Jamie O. Lo
Oregon Health & Science University, Portland, OR

10:30 AM - 12:30 PM

Objective: Co-occurring prenatal mood disorders and opioid use disorders are the leading cause of pregnant-related mortality, but the combined effect on neonatal morbidity is poorly understood. Thus, the objective of this study is to better understand associations between co-occurring prenatal opioid use and mental health diagnoses on neonatal outcomes.

Study Design: This retrospective cohort study used California linked vital statistics and hospital discharge data (2008-2020). Patients were categorized into opioid-users, mental health disorders, both, or neither. We included singleton gestations delivered between 23-42 weeks and excluded individuals using other substances. Exposure (opioid use and mental health disorders) and outcomes were identified using birth certificate and ICD-9/10 codes. Results were analyzed by chi-square tests and multivariable Poisson regression models. Adjusted risk ratios (aRR) with 95% confidence intervals (CI) were estimated.

Results: A total of 5,423,898 pregnancies were included, and of those,6,285 (0.12%) had opioid-related diagnosis, 165,121 (3.04%) had mental health disorders and 1,599 (0.03%) had a dual diagnosis. The impact of opioid use and mental health disorders (3.4%; aRR = 3.39 (2.59-4.43)) appears to have an additive effect compared to either opioid use (2.3%; aRR = 2.62 (2.21-3.12)) or mental health disorders (1.4%; aRR = 1.48 (1.42-1.54)) on rates of preterm birth < 32 weeks. Compared to no opioid use or mental health disorders, the risk of neonatal respiratory distress syndrome was higher with dual diagnosis (13.8%; aRR = 4.14 (3.65-4.68)), opioid use (9.1%; aRR = 3.13 (2.89-3.39)) and mental health disorders (5.8%; aRR = 1.79 (1.76-1.83)). Similarly, the risk of NICU admissions was significantly higher in individuals with both opioid use and mental health disorders.

Conclusion: Our study suggests that co-occurring psychiatric disorders with opioid use is associated with worse neonatal outcomes. As the opioid epidemic continues, our findings can shape clinical management.

Table 1: Proportions of adverse neonatal outcomes in California, 2008-2020

	No opioid or mental health disorders	Opioid only	Mental health disorders only	Both opioid and mental health disorders	p-value
	N=5,250,893	N=6,285	N=165,121	N=1,599	
Preterm birth<37 weeks	347,444 (6.6%)	1,048 (16.7%)	15,258 (9.2%)	318 (19.9%)	<0.001
Preterm birth<32 weeks	43,350 (0.8%)	144 (2.3%)	2,262 (1.4%)	55 (3.4%)	<0.001
Respiratory distress syndrome	143,009 (2.7%)	572 (9.1%)	9,582 (5.8%)	221 (13.8%)	<0.001
NICU admission	528,418 (10.1%)	2,510 (39.9%)	18,651 (11.3%)	654 (40.9%)	<0.001
Small for gestational age	453,374 (8.6%)	920 (14.6%)	13,209 (8.0%)	190 (11.9%)	<0.001
Infant deaths	14,637 (0.3%)	57 (0.9%)	664 (0.4%)	9 (0.6%)	<0.001
Hypoglycemia	90,873 (1.7%)	303 (4.8%)	5,807 (3.5%)	115 (7.2%)	<0.001
Newborn's abstinence syndrome	3,426 (0.1%)	1,615 (25.7%)	474 (0.3%)	395 (24.7%)	<0.001

*Chi-square test

Table 2: Multivariable Poisson regression analyses showing adjusted risk ratios for adverse neonatal outcomes in California 2008-2020

	No opioid or mental health disorders	Opioid only	Mental health disorders only	Both opioid and mental health disorders
	N=5,250,893	N=6,285	N=165,121	N=1,599
Preterm birth<37 weeks	Reference	2.43 (2.29-2.58)	1.31 (1.28-1.33)	2.57 (2.32-2.85)
Preterm birth<32 weeks	Reference	2.62 (2.21-3.12)	1.48 (1.42-1.54)	3.39 (2.59-4.43)
NICU admission	Reference	3.82 (3.70-3.95)	1.12 (1.11-1.14)	3.79 (3.56-4.03)
Respiratory distress syndrome	Reference	3.13 (2.89-3.39)	1.79 (1.76-1.83)	4.14 (3.65-4.68)
Hypoglycemia	Reference	2.74 (2.45-3.07)	1.69 (1.65-1.74)	3.53 (2.94-4.23)
Small for gestational age	Reference	1.78 (1.67-1.89)	1.01 (0.99-1.03)	1.48 (1.29-1.70)
Infant death	Reference	2.85 (2.17-3.76)	1.43 (1.32-1.56)	1.90 (0.99-3.63)

All models adjusted for maternal race and ethnicity, age, education, pre-pregnancy BMI, insurance, parity, alcohol use, nicotine use, and pre-existing diabetes

809 | The Fetal Membrane Metabolome: Arachidonic Acid and Sex Steroid Metabolism Perturbations Associated with Preterm Rupture

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10:30 AM - 12:30 PM

Objective: Fetal membranes serve critical immune and mechanical functions in pregnancy, as well as provide signals initiating term and preterm labor. Despite these roles, this feto-maternal interface is often overlooked in reproductive research. Metabolomics has emerged as a powerful tool to understand biochemical footprints of cellular function. We sought to identify differences in the fetal membrane metabolome from cases of preterm premature rupture of membranes (PPROM) compared to term controls.

Study Design: Untargeted metabolomics was performed on amnion and chorion from cases of PPROM (n = 25) and term controls (n = 25) matched by race, nulliparity, age, and fetal sex from a prospective pregnancy cohort. Log_2 transformed batch-normalized data were analyzed by two-way ANOVA ($p < 0.05$) with calculation of false discovery rates ($q < 0.1$).

Results: Demographic characteristics were similar between groups (Table 1). Amnion from PPROM had higher abundance of eicosanoid, endocannabinoid, phosphatidylcholine, phosphatidylethanolamine, and fatty acid metabolites compared to term (Table 2). Amnion and chorion from PPROM had lower abundance of sex steroid metabolites, including pregnenolone, progestin, estrogenic, and androgenic metabolites compared to term (Table 2).

Conclusion: Our study is the first to report a fetal membrane metabolome. We detect evidence of increased metabolism in the arachidonic acid/phospholipid pathway and relative sex steroid deficiency in fetal membranes that rupture preterm. Whether differences in sex steroid metabolites are attributable to PPROM pathophysiology versus advancing gestational age warrants future investigation. Hormonal therapeutics, including local progesterone repletion, may carry potential to mitigate inflammation and fortify membrane integrity, thus reducing preterm birth risk. University of Pennsylvania Research Foundation Award (KG)

Table 1. Descriptive characteristics of participants

Characteristic	Term (n=25)	PPROM (n=25)
	range (mean)	
Age (years)	20 – 40 (29)	18 – 37 (30)
Gestational age at delivery (weeks)	39 – 40 (40)	24 – 35 (32)
	n (column %)	
Race		
Black	12 (48)	12 (48)
White	12 (48)	12 (48)
Other	1 (4)	1 (4)
Nulliparous	11 (44)	11 (44)
Male fetal sex	11 (44)	11 (44)

Table 2. Fold change in metabolite abundance in fetal membranes from preterm premature rupture of membranes (PPROM) (n=25) compared to term controls (n=25)

Pathway	Metabolite	PPROM amnion / Term amnion	*p-value	PPROM chorion / Term chorion	*p-value
Cell Membrane Phospholipids	1-stearoyl-2-docosapentaenoyl-GPC	1.99	1.10E-06	1.2	3.80E-01
	1-stearoyl-2-arachidonoyl-GPC	1.47	4.76E-05	0.96	4.57E-01
	1-stearoyl-2-docosahexaenoyl-GPC	1.53	4.81E-05	1.03	9.78E-01
	1-stearoyl-2-docosapentaenoyl-GPC	1.53	6.92E-05	0.97	6.42E-01
Eicosanoid/Endocannabinoids	13,14-dihydro-15-keto-prostaglandin A2	0.37	1.68E-06	0.42	3.00E-04
	13,14-dihydro-15-keto-prostaglandin F2alpha	0.53	2.00E-04	0.57	6.40E-03
	palmitoyl ethanolamide	1.21	1.62E-02	0.85	2.81E-01
	N-stearoyltaurine	2.53	3.51E-02	0.94	6.82E-01
Pregnenolone Steroids	pregnenetriol sulfate	0.22	1.19E-11	0.27	2.88E-07
	21-hydroxypregnenolone disulfate	0.11	2.75E-11	0.16	2.54E-10
	pregnenetriol disulfate	0.13	1.01E-10	0.19	3.12E-10
	21-hydroxypregnenolone monosulfate	0.19	1.25E-09	0.17	4.74E-11
Progestin Steroids	5alpha-pregnan-3beta,20beta-diol disulfate	0.3	4.26E-05	0.32	7.00E-04
	5alpha-pregnan-3beta,20alpha-diol disulfate	0.4	4.84E-05	0.33	5.01E-05
	5alpha-pregnan-3beta,20alpha-diol monosulfate	0.65	6.80E-03	0.43	4.00E-04
	5alpha-pregnan-3beta-ol,20-one sulfate	0.26	8.90E-03	0.31	1.02E-01
Androgenic Steroids	androsterone sulfate	0.09	1.11E-12	0.1	1.04E-12
	androstenediol (3beta,17beta) disulfate	0.13	6.22E-12	0.17	1.16E-11
	androstenediol (3alpha, 17alpha) monosulfate	0.16	4.78E-11	0.18	9.11E-12
	16alpha-hydroxy DHEA 3-sulfate	0.21	5.14E-09	0.24	3.88E-09
Estrogenic Steroids	estriol-3-glucuronide	0.13	8.70E-12	0.16	1.54E-10
	estriol 3-sulfate	0.15	6.84E-11	0.17	3.59E-10
	estriol 16-glucuronide	0.14	8.45E-11	0.15	1.96E-10
	estrone 3-sulfate	0.6	2.40E-03	0.4	4.29E-02

*Presenting top 4 metabolites within top metabolomic pathways by amnion p-value that met $q < 0.1$

Green: Indicates statistically significant difference ($p \leq 0.05$) between the groups shown and a metabolite ratio of < 1.00.

Red: Indicates statistically significant difference ($p \leq 0.05$) between the groups shown and a metabolite ratio of ≥ 1.00.

810 | Vaginal Polyamines Modify Gardnerella Vaginalis-Induced Alterations in the Mucosal Transcriptome

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University of Pennsylvania Perelman School of Medicine, Philadelphia, PA

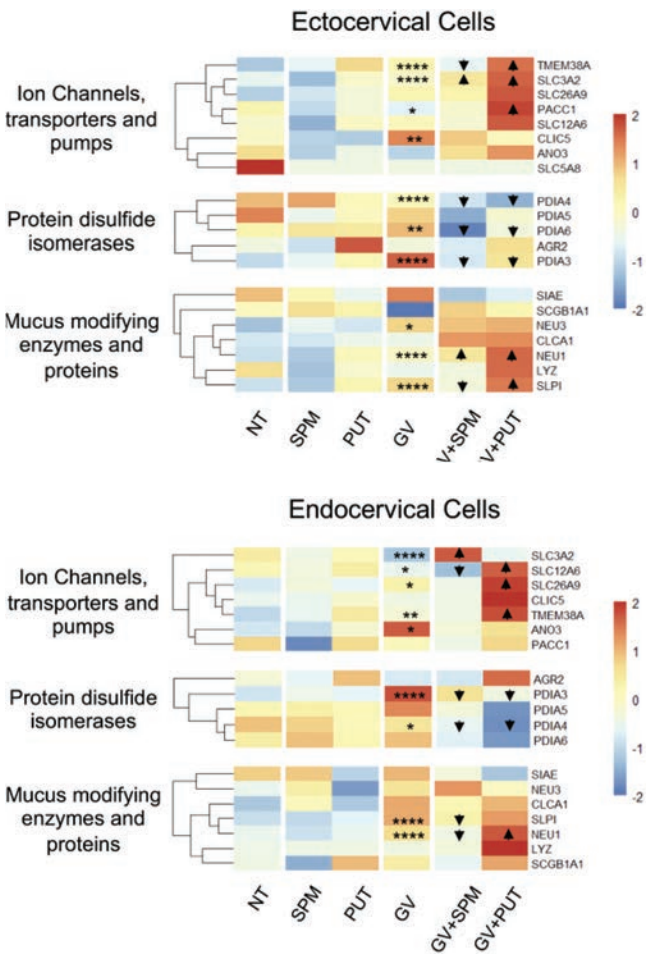
10:30 AM - 12:30 PM

Objective: Anaerobe-dominant cervicovaginal (CV) microbial communities increase risk of preterm birth. Mucus production, a key part of the host defense system, protects the CV epithelial barrier against anaerobes, including *Gardnerella vaginalis*(GV). Vaginal anaerobes modify mucus properties though molecular mechanisms remain unclear. We previously showed that vaginal metabolites, specifically polyamines, regulate GV-induced host immune responses. This study aimed to 1) elucidate effects of GV on genes involved in mucus biosynthesis, and 2) determine whether polyamines modify GV-altered mucosal gene expression.

Study Design: Human ectocervical (Ecto), endocervical (Endo) and vaginal (VK2) epithelial cells were treated for 4h +/- polyamines, spermine (SPM, 400uM) or putrescine (PUT, 4mM) prior to GV (10^7 CFU/well) exposure for 24h (n = 3/treatment). RNA-sequencing was performed. Data were analyzed using DESeq2 to study mucus genes of interest. For genes altered by GV, analysis of polyamine exposure was performed by one-way ANOVA with Tukey's test for multiple comparisons.

Results: Among the 40 mucus-associated genes studied, GV modified expression of 10 genes in Ectos, 13 genes in Endos, and 6 genes in VK2s ($p < 0.05$ for all). Genes clustered into functional pathways including mucins, ion channels, protein disulfide isomerases, glycosyl-transferases, and mucus modifying enzymes (select pathways shown for Ecto in Fig. 1 and Endo in Fig 2.). Among genes altered by GV, SPM partially mitigated these effects in select cells for TMEM38A, SLC12A6, PDIA3, PDIA4, PDIA6, GALNT5, SLPI and NEU1, while PUT potentiated these effects in select cells for TMEM38A, SLC12A6, SLC26A9, PACC1, SLPI, NEU1 ($p < 0.05$ for all).

Conclusion: GV modifies expression of genes in the CV epithelium responsible for increased mucus hydration, formation, and breakdown (sialidases). These alterations in the mucosal transcriptome likely compromise mucus properties, rendering mucus thinner and more penetrable. SPM confers protection against some of these GV-induced effects and may carry potential as a postbiotic therapeutic to restore mucus function.



811 | Association of Prenatal Care Attendance on Perinatal Outcomes with Amphetamine Exposure

Kristin C. Prewitt; Alyssa R. Hersh; Bharti Garg; Bradley M. Buchheit; Ximena A. Levander; Aaron B. Caughey

Oregon Health & Science University, Portland, OR

10:30 AM - 12:30 PM

Objective: Prenatal amphetamine use is known to be associated with increased risk of pregnancy-related morbidity and mortality. Pregnancy can make it difficult to access treatment leading to more limited prenatal care. The purpose of this study is to assess how the number of prenatal care visits impacts perinatal outcomes with amphetamine-related exposure.

Study Design: In this retrospective cohort study of singleton, non-anomalous births between gestational ages 23-42 weeks in California (2008-2020), we assessed the association between amphetamine use identified using ICD-9/10 codes and a variety of perinatal outcomes. We divided patients into two groupings based on WHO recommendations for minimum number of visits to impact perinatal outcomes - 1) more prenatal care ($>= 5$ visits) or 2) less prenatal care (< 5 visits). Chi-squared and multivariable logistic regression were utilized for statistical analyses.

Results: There were 21,827 pregnant persons with an amphetamine-related diagnosis that met our inclusion criteria, with the majority attending more prenatal care (64.2%). Those with less prenatal care were more likely to have placental abruption (3.3% vs 6.5%, aOR 1.32, 95% CI: 1.21-1.44), preterm premature rupture of membranes (4.1% vs 8.3%; aOR 2.08, 95% CI: 1.83-2.37), preterm delivery < 37 weeks (16.8% vs 34.0%; aOR 2.45, 95% CI: 2.28-2.63), and severe maternal morbidity (3.7% vs 7.2%; aOR 1.97, 95% CI: 1.72-2.25). Fewer visits were associated with worse neonatal outcomes, including respiratory distress (2.2% vs 3.8%; aOR 1.82, 95% CI: 1.52-2.17), neonatal withdrawal (2.0% vs 6.43%; aOR 1.85, 95% CI: 1.60-2.14), and NICU admission (24.9% vs 40.4%; aOR 1.89, 95% CI: 1.77-2.02).

Conclusion: Our findings demonstrate an association with adverse perinatal outcomes in individuals with amphetamine-related diagnoses who attend fewer prenatal care visits. Our results call for efforts to improve prenatal care access in individuals with amphetamine use.

Table 1. Maternal outcomes among patients with amphetamine use during pregnancy by number of prenatal care visits attended

	≥5 visits (N=14,021)	<5 visits (N= 7,806)	P*	aOR (95% CI)
Hypertensive disorders	1,992 (14.2%)	1,250 (16.0%)	<0.001	1.32 (1.21-1.44)
Placental abruption	469 (3.3%)	509 (6.5%)	<0.001	1.77 (1.54-2.03)
Preterm premature rupture of membranes	579 (4.1%)	651 (8.3%)	<0.001	2.08 (1.83-2.37)
Preterm delivery				
<37 weeks	2,361 (16.8%)	2,655 (34.0%)	<0.001	2.45 (2.28-2.63)
<32 weeks	250 (1.8%)	443 (5.7%)	<0.001	3.44 (2.88-4.09)
Cesarean delivery				
Nulliparous	1,311 (33.5%)	372 (28.4%)	<0.001	0.74 (0.63-0.86)
Multiparous without prior CD	952 (13.9%)	670 (15.3%)	0.665	1.03 (0.91-1.16)
Multiparous with prior CD	2,907 (89.5%)	1,779 (86.4%)	0.008	0.78 (0.65-0.94)
Operative vaginal delivery*	537 (6.1%)	334 (6.7%)	0.226	1.10 (0.94-1.29)
Severe maternal morbidity	523 (3.7%)	561 (7.2%)	<0.001	1.97 (1.72-2.25)
Non-transfusion severe maternal morbidity	209 (1.5%)	183 (2.3%)	<0.001	1.65 (1.32-2.07)

Analyses adjusted for race/ethnicity, age, educational attainment, body mass index, insurance type, parity, chronic hypertension, pre-existing diabetes, mental health conditions, polysubstance use (nicotine, alcohol, opioids, cocaine)
**Only among vaginal deliveries*
**Chi-square test.*

Table 2. Neonatal outcomes among patients with amphetamine use during pregnancy by number of prenatal care visits attended

	≥5 visits (N=14,021)	<5 visits (N= 7,806)	P*	aOR (95% CI)
APGAR <7 at 5 minutes	301 (2.2%)	308 (4.0%)	<0.001	1.95 (1.63-2.33)
Small for gestational age	1,698 (12.1%)	1,025 (13.1%)	0.139	1.07 (0.98-1.17)
Respiratory distress syndrome	303 (2.2%)	300 (3.8%)	<0.001	1.82 (1.52-2.17)
Neonatal withdrawal syndrome	469 (2.0%)	492 (6.43%)	<0.001	1.85 (1.60-2.14)
Neonatal ICU admission	3,497 (24.9%)	3,154 (40.4%)	<0.001	1.89 (1.77-2.02)
Stillbirth**	26 (0.52%)	34 (0.93%)	0.051	1.81 (0.99- 3.29)
Neonatal death	41 (0.3%)	57 (0.73%)	<0.001	2.56 (1.61-4.07)
Infant death	73 (3.37%)	91 (1.17%)	<0.001	2.20 (1.56-3.11)

Analyses adjusted for race/ethnicity, age, educational attainment, body mass index, insurance type, parity, chronic hypertension, pre-existing diabetes, mental health conditions, polysubstance use (nicotine, alcohol, opioids, cocaine)
***Between years 2016-2020 as stillbirth data unavailable prior*
**Chi-square test*

812 | Amniotic Fluid Volume and Perinatal Outcomes in Women with Preeclampsia in a Low Resource Country

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10:30 AM - 12:30 PM

Objective: To determine:
1. The prevalence of oligohydramnios in women with preeclampsia
2. The adverse perinatal outcomes associated with preeclampsia
3. The association between oligohydramnios and preeclampsia disease severity
4. The association between oligohydramnios and adverse perinatal outcomes in women with preeclampsia

Study Design: A cross-sectional study at the Korle Bu Teaching Hospital which assessed a total of 130 pregnant women from 28 weeks to 42 weeks gestation: 10 had preeclampsia and oligohydraamnios on one arm, and the rest had preeclampsia but no oligohydramnios on the other arm. All participants had their amniotic fluid index assessed by ultrasound. This assessment was repeated weekly and the last measurement taken before delivery was used for the analysis of amniotic fluid volume data. The perinatal outcomes were also recorded.

Results: The prevalence of oligohydramnios in women with preeclampsia was 7.7%. Adverse perinatal outcomes associated with preeclampsia were preterm delivery(50%), stillbirth(10%), poor APGAR scores at one and five minutes (36.1% and 17.7%), low birth weight (46.1%), and NICU admission (40.0%). There was no association between pre-eclampsia disease severity and oligohydramnios in women with preeclampsia and there was no association between oligohydramnios and adverse perinatal outcomes in women with preeclampsia. Male sex ($p = 0.02$), gestational age at delivery ($p = 0.010$) and birth weight ($p = 0.042$) were the factors associated with adverse perinatal outcomes in women with preeclampsia.

Conclusion: Adverse perinatal outcomes associated with preeclampsia were preterm birth, stillbirth, poor APGAR scores, low birth weight and NICU admission. The lack of association between oligohydramnios and adverse perinatal outcomes; as well as the lack of association between oligohydramnios and severe preeclampsia suggests that it may not be beneficial for clinicians in low resource countries to use amniotic fluid volume as a marker for determining when preeclampsia is severe enough to warrant delivery or less severe enough to allow conservative management

Logistic Regression Analysis of Predictors of Adverse Perinatal Outcome in preeclampsia

VARIABLE	AOR	95% C.I. for AOR		P-VALUE
		Lower	Upper	
Parity	0.86	0.70	1.04	0.125
Sex (male)	0.50	0.28	0.90	**0.020**
Gestational age at delivery	0.82	0.71	0.95	**0.010**
Oligohydramnios	2.03	0.84	4.88	0.114
Birth weight (grams)	0.99	0.98	1.00	**0.042**

AOR=adjusted odds ratio

813 | Abdominal Circumference versus Estimated Fetal Weight in Fetal Growth Restriction Surveillance and Outcomes

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10:30 AM - 12:30 PM

Objective: To compare the incidence of abnormal umbilical artery Doppler (UAD), obstetric and neonatal outcomes in pregnancies affected by fetal growth restriction (FGR) when diagnosed by abdominal circumference (AC) and estimated fetal weight (EFW).

Study Design: This is a retrospective cohort study of patients with a singleton pregnancy with FGR who delivered at a tertiary urban academic center between January 2020 and December 2023.The primary outcome was abnormal UAD. Secondary outcomes were obstetric outcomes and Composite Neonatal Outcomes (CNO) including RDS, IVH, ROP, NEC, HIE, TTN, neonatal seizures, sepsis, hypoglycemia. Fisher's exact, chi square, parametric and non-parametric tests were used.

Results: Among 178 patients, 104 (58%) were diagnosed by AC only (Group 1) and 74 (42%) by EFW (Group 2). Abnormal UAD was more frequent in patients with FGR diagnosed by EFW [3(3%) vs 11(15%) in Groups 1 and 2 respectively, $p = 0.004$]. Gestational age at FGR diagnosis was significantly lower in Group 1 (32w4d vs 35w6d in Groups 1 and 2 respectively, $p = 0.008$). The incidence of cesarean delivery was similar between the groups[47(37%) vs 30(45%) in Groups 1 and 2 respectively, $p = 0.35$]. The median GA at delivery was lower in Group 2 [39w0d in Group 1 vs 38w1d in Group 2, $p< 0.0001$]. Resolution of FGR was more likely when initially diagnosed by AC only [27 (21%) vs 1(1%) in Groups 1 and 2 respectively, $p< 0.0001$]. Neonatal weight was lower in group 2 (median 2705g vs 2405g in Groups 1 and 2 respectively, $p< 0.0001$); and incidence of small for gestational age (SGA) and low birth weight (LBW) were higher in group 2 [SGA: 41(39%) vs 51(69%), $p = 0.0001$; LBW: 27(26%) vs 50(68%), $p< 0.0001$, respectively]. Incidence of CNO was higher in Group 2 [18(17%) vs 23(31%), $p = 0.04$].

Conclusion: Abnormal UAD was rarely seen in FGR fetuses diagnosed by AC and adverse neonatal outcomes were also seen less frequently in this group. FGR fetuses diagnosed by AC should be followed closely, although different surveillance frequency could be considered.

814 | The Association Between Diabetes Mellitus During Pregnancy and Retinopathy of Prematurity

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10:30 AM - 12:30 PM

Objective: We aimed to evaluate the association between diabetes mellitus (DM) during pregnancy and retinopathy of prematurity (ROP) in preterm infants younger than 32 gestational weeks or infants with low birthweight (< 1500 grams).

Study Design: We conducted a retrospective nested case-control study of all premature infants who were born alive and survived the post-delivery hospitalization period in Soroka Medical Center, with either gestational age younger than 32 weeks or birthweight less than 1,500 grams, during the years 2013-2021. The infants were divided into two groups according to ROP status. Multivariable logistic regression was used to analyze the association between ROP and DM.

Results: During the study period, there were 881 pairs of women and newborns who met the inclusion criteria. The ROP group included 345 infants (39.1%). 22 (6.4%) of the mothers in the ROP group were diagnosed with DM during pregnancy compared with 52 of 536 (9.7%) in the control group (P = 0.082). ROP was associated with oxygen treatment (OR 1.05; 95% CI, 1.03-1.08; P< .001), birthweight < 1250 g‘ (OR 2.70; 95% CI, 1.93-3.80; P< 0.001) and advanced maternal age (OR 1.03; 95% CI, 1.01-1.06; P = .01). Steroid treatment (OR 0.73; 95% CI, 0.60-0.89; P = .002) and advanced gestational age (OR 0.92; 95% CI, 0.85-1.00; P = 0.05) were found as protective factors for ROP. Using multivariable logistic regression analysis and adjusting for multiple risk factors, it was found that there is no significant association between maternal DM and the development of ROP.

Conclusion: The presence of maternal diabetes mellitus does not increase the likelihood of ROP in pre-term infants.

Chart 1: Exclusion criteria

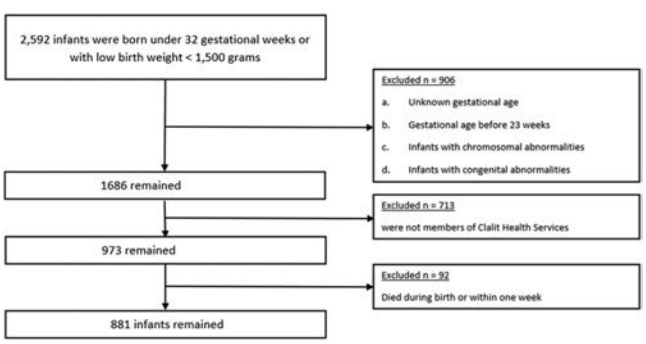

Table 4: Multivariable Logistic Regression (N = 881)

Characteristic	OR[1]	95% CI[1]	p-value
Diabetes	0.59	0.32, 1.05	0.080
Maternal age (years)	1.03	1.01, 1.06	**0.010**
Birth weight < 1250g	2.70	1.93, 3.80	**<0.001**
Days of O2 Treatment	1.05	1.03, 1.08	**<0.001**
Gestational age (weeks)	0.92	0.85, 1.00	0.054
Steroids doses	0.73	0.60, 0.89	**0.002**

[1]OR = Odds Ratio, CI = Confidence Interval

815 | Cost-Effectiveness of Atosiban Versus Placebo in the Treatment of Threatened Preterm Birth (APOSTEL 8 TRIAL)

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10:30 AM - 12:30 PM

Objective: Tocolytics such as atosiban as treatment for threatened preterm birth (PTB) is part of routine care in many countries. However, overall costs and benefits of atosiban compared to placebo have not been evaluated. We assessed the cost-effectiveness of atosiban compared to placebo in improving neonatal outcomes for threatened PTB between 30 and 34 weeks gestation.

Study Design: This was an economic analysis from societal perspective alongside the international randomized placebo controlled APOSTEL 8 study, conducted in 26 hospitals in the Netherlands, England and Ireland. Women with threatened PTB from 30 to 34 weeks of gestation were randomized to atosiban or placebo. We included costs based on data from the case record form (CRF) and additional iMTA questionnaire sent three months after due date. Primary outcome was the difference in total mean costs per child between groups. Health outcome was the prevalence of composite adverse neonatal outcome. Complementary incremental cost-effectiveness ratio (ICERs) was calculated. Analyses were by intention to treat.

Results: In our complete case analysis, we included costs based on the CRFs of 752 mothers with 884 children and 376 completed questionnaires (198 atosiban, 178 placebo). Total mean costs did not significantly differ between groups: €37280 in the atosiban group (449 children) versus €37120 in the placebo group (435 children) (mean difference €160, 95% CI -€3936 to €4257). In pre- and postnatal costs no significant differences were observed. With an estimated difference of 1% in adverse neonatal outcome in favour of atosiban, the ICER was €16783. However, there was high uncertainty as a substantial distribution was located in the top left

quadrant of the ICER plane, indicating scenarios where atosiban is both more expensive and less effective.

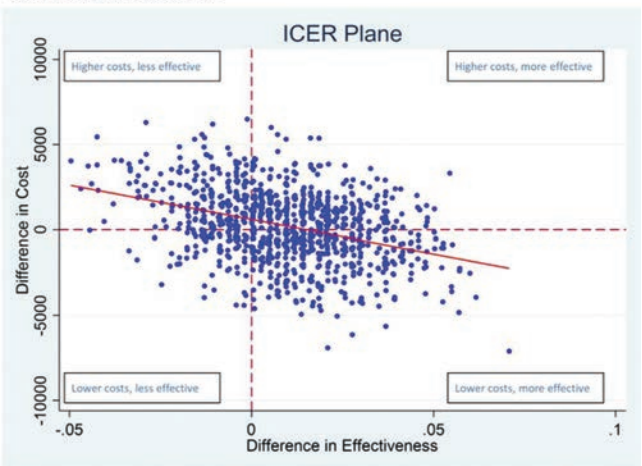
Conclusion: We observed high uncertainty of cost-effectiveness of atosiban compared to placebo as treatment for threatened PTB. As the main trial demonstrated that atosiban is not superior to placebo in improving neonatal outcomes, both clinical and economical findings should be considered in future guidelines.

Table 1. Effect and costs

	Atosiban n=449	Placebo n=435	MD (95% CI)
Composite neonatal outcome	37 (8.2%)	40 (9.2%)	0.90 (0.58 to 1.40)*
Total costs, (mean, SD)	37280 (31725)	37120 (30967)	160 (-3936 to 4256)
Total prenatal costs (mean, SD)	4807 (3594)	4958 (4764)	-150 (-697 to 396)
Total postnatal costs (mean, SD)	32473 (31691)	32162 (31401)	311 (-3857 to 4479)
Total neonatal costs (mean, SD)	27147 (29525)	26801 (30328)	345 (-3625 to 4316)

All costs are in euros. MD, mean difference; CI, confidence interval; SD, standard deviation.
*Risk ratio with 95% CI.

Figure 1. ICER plane of total costs



816 | Mediation of Socioeconomic Disparities and Preterm Birth by Class-Based Discrimination and Financial Strain

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10:30 AM - 12:30 PM

Objective: Various measures of low socioeconomic status (SES) have been associated with elevated preterm birth (PTB) risk. To inform intervention strategies, we sought to identify which SES markers were most predictive of PTB, and identify whether psychosocial factors mediated SES-related PTB disparities.

Study Design: Stress, Pregnancy and Health study participants completed psychosocial and demographic assessments during 2nd and 3rd trimesters. An SES "status" composite was calculated with standardized measures of occupational prestige and highest degree earned in the household; a "financial resources" composite included standardized measures of self-reported household savings relative to cost of living, household income to poverty ratio, and total savings and assets. Psychosocial mediators included lifetime, daily, and perceived class-based discrimination (CBD), and subjective financial strain (SFS). PTB was defined as delivery < 37'0 weeks gestation. Multiple regressions tested the association of PTB with the composites and their individual components, as well as potential mediators. Mediation models estimated the proportion of the association mediated by CBD and SFS. Analyses were adjusted for maternal age, race/ethnicity, and marital status.

Results: Among 599 participants, about half had the highest educational attainment and IPR. 11.5% delivered preterm. Participants with higher status had lower risk of PTB (RR: 0.72, 95%CI 0.54,0.96), whereas self-reported financial resources were not associated with PTB (Table 1). In unadjusted models, higher SFS was associated with PTB risk (RR: 1.38, 95%CI 1.13,1.68), but CBD was not. Approximately 20% of the relationship between status and PTB was mediated by SFS, though this was not statistically significant (p = 0.28).

Conclusion: Status-based SES measures were significantly associated with PTB whereas financial resource-based measures were not. Our results suggest that the experience of being lower SES (i.e. social status/capital and the lived reality that these facilitate) may bear more significantly on pregnancy outcomes than self-identified monetary resources.

Table 1. Associations between Status and Financial Resource composite and PTB. Associations reflect a 1 standard deviation increase (e.g., higher income-to-poverty ratio).

	Unadjusted		Adjusted	
	RR	95% CI	RR	95% CI
Exposures of interest				
Financial resource composite	0.82	0.62, 1.09	0.91	0.69, 1.20
Income to Poverty Ratio (IPR)	0.85	0.63, 1.13	0.93	0.70, 1.25
Savings amount	0.70	0.40, 1.22	0.75	0.44, 1.28
Savings length	0.89	0.71, 1.12	0.95	0.76, 1.19
Status composite	**0.69**	**0.56, 0.86**	**0.72**	**0.54, 0.96**
Household education	**0.73**	**0.59, 0.90**	**0.75**	**0.57, 0.98**
Household occupational prestige	**0.77**	**0.64, 0.93**	0.83	0.66, 1.04
Mediators of interest				
Class-based discrimination – Daily Life Experiences	1.10	0.67, 1.83	0.94	0.56, 1.57
Class-based discrimination – Perceived Ethnic Discrimination	1.21	0.66, 2.24	1.18	0.64, 2.16
Class-based discrimination – Major Lifetime Unfair Treatment	0.60	0.20, 1.84	0.45	0.15, 1.37
Subjective Financial Strain	1.38	1.13, 1.69	1.19	0.94, 1.52

*Adjusted models include age, race/ethnicity, and marital status. Models of mediators of interest additionally include the status composite

817 | A Machine Learning Approach to Intrapartum FHRT Analysis To Identify Neonates Requiring Therapeutic Hypothermia

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10:30 AM - 12:30 PM

Objective: Examine a "sliding window time frame" as a ML approach to fetal heart rate tracing (FHRT) analysis to identify neonates that developed moderate to severe neonatal encephalopathy (NE) and underwent therapeutic hypothermia.

Study Design: Retrospective observational case-control involving neonates born at a single academic institution and admitted to the NICU with cord pHs ≤ 7.15. The study group included

neonates meeting both physiologic (low cord pH) and neurologic criteria for moderate to severe NE, making them eligible for therapeutic hypothermia. The control group comprised neonates who, despite having low cord pHs, did not show evidence of moderate or severe NE and thus did not undergo therapeutic hypothermia.

The entire intrapartum FHRT for eligible neonates was analyzed to develop a ML-based model incorporating an embedded sliding time window. Isolation Forest was used to identify and cluster windows with unusual patterns as anomalies or typical patterns as normal. A Random Forest classifier was then trained to predict abnormal pattern labels. After the optimal sliding time window size was determined, its impact on the ML model's anomaly detection performance was evaluated by calculating the percentage of anomalous time windows during the entire intrapartum course for both subject groups and compared by student t-test.

Results: There were 22 study and 22 control cases with similar clinical characteristics and cord pH values. Using a 90-minute sliding time window, the ML-based model identified a significant difference in the proportion of windows with abnormal patterns between the control and study cases (4.7 % vs 73.3%, $p < 0.001$). The ML classifier applied to these 90-minute windows achieved 100% accuracy in distinguishing between study and control cases.

Conclusion: The ML-based model incorporating an embedded sliding time window accurately identified neonates with moderate to severe NE. This is a promising approach to intrapartum FHRT assessment with the potential to identify fetuses at risk for neurologic injury and allow for timely intervention.

Table 1. Characteristics of the control and study groups.

Perinatal Clinical Characteristics			
	Control Group (n = 22)	Study Group (n = 22)	P value
Age (years)	28.5 [25.75,30.75]	29 [23.75,31.25]	0.89
Number of prior deliveries	0 [0;1]	0 [0;1]	0.69
Race/ethnicity			0.15
White	15 (68.2)	14 (63.6)	
Black	6 (27.7)	4 (18.2)	
Hispanic	0	4 (18.2)	
Asian	1 (4.55)	0	
Insurance Status			0.76
Private	12 (54.6)	10 (45.5)	
Public/self-pay	10 (45.5)	12 (54.6)	
Preexisting medical conditions			
Chronic hypertension	3 (13.6)	4 (18.2)	1.00
Type 1 diabetes mellitus	0	0	
Type 2 diabetes mellitus	1 (4.6)	1 (4.6)	1.00
Pregnancy complications			
GHTN/preeclampsia	4 (18.2)	4 (18.2)	1
Gestational diabetes	1 (4.6)	1 (4.6)	1
Substance use			
Tobacco	2 (9.1)	4 (18.2)	0.66
Alcohol	1 (4.6)	1 (4.6)	1
Illicit drugs	2 (9.1)	3 (13.6)	1
Optimal pregnancy dating	19 (86.4)	21 (95.5)	0.61
GA at delivery (weeks)	39.2 [37.8,0.07]	39.4 [37.6,40.0]	0.87
Birthweight (grams)	3335 [2987,3700]	3590 [2980,3855]	0.28
Small for gestational age	5 (22.7)	2 (9.1)	0.22
Sex			0.13
Female	14 (63.6)	8 (36.4)	
Male	8 (36.4)	14 (63.6)	

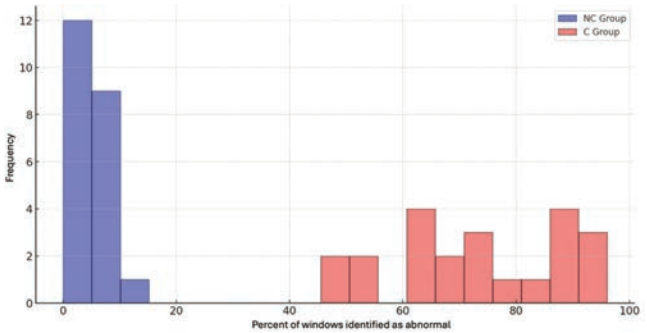

Figure 1. Histogram showing percentage of windows identified as abnormal for the control (NC, no cooling) and study (C, cooling) groups.

818 | The Association Between Excessive Gestational Weight Gain in Obese Patients and Intrapartum and Postpartum Outcomes

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10:30 AM - 12:30 PM

Objective: Obese women have a longer duration of labor, particularly those undergoing induction of labor (IOL), and higher rates of adverse outcomes. This study aimed to determine the length of the latent phase, total induction time, and frequencies of cesarean delivery and adverse outcomes in obese patients with excessive weight gain (EWG) compared to those with appropriate weight gain (AWG) undergoing IOL.

Study Design: Retrospective cohort study including nulliparous patients with a BMI $\geq$ 30 kg/m2 that underwent IOL at a single academic institution between June 2018 and December 2022. Gestational weight gain was calculated based on the difference between pre-pregnancy or first trimester weight and weight at delivery, then categorized as AWG or EWG based on recommendations by the Institute of Medicine. The IOL lengths and frequencies of the outcomes of interest (Table 2) were extracted from the electronic medical record. Chi square, t-test, and Wilcoxon rank sum test were performed where appropriate.

Results: Of 469 obese patients, 105 (22.4%) had AWG and 364 (77.6%) had EWG. The median pregravid BMI for patients with AWG was significantly higher than in those with EWG (38.6 vs 35.5 kg/m2, $p < 0.001$). There were no significant differences in the latent phase lengths, total induction times, or frequencies of cesarean delivery and adverse outcomes.

Conclusion: EWG in obese patients undergoing IOL is not associated with increased latent phase lengths, total induction times, or frequencies of cesarean delivery or adverse outcomes. The significantly higher pregravid BMI in the AWG group may have influenced our findings by diminishing the difference in IOL lengths and frequencies of adverse outcomes when compared to the EWG group. Further investigation is necessary to account

for this difference in pregravid BMIs and to determine whether EWG is independently associated with higher intrapartum and postpartum adverse outcomes in obese patients undergoing induction of labor.

Table 1. Characteristics of the AWG and EWG groups.

Patient Demographics	AWG (n=105)	EWG (n=364)	P value
Maternal age (years)	26 [23,32]	25 [21,30]	0.04
Pregravid BMI (kg/m2)	38.6 [34.3,43.0]	35.5 [32.2,39.5]	<0.001
Total weight gain (pounds)	16 [14,18.5]	33 [26.1,44]	0
BMI at delivery (kg/m2)	41.6 [37.1,46.4]	41.7 [38.3,46.3]	0.25
Race/ethnicity			
White	62 (59.0)	198 (54.4)	
Black	24 (22.9)	80 (22.0)	
Hispanic	13 (12.5)	52 (14.3)	
Asian	1 (1.0)	4 (1.1)	
Other	3 (2.9)	23 (6.3)	
Not available	2 (1.9)	7 (1.9)	
Pregravid comorbidities			
Chronic hypertension	19 (18.1)	66 (18.1)	1.00
Type 1 diabetes mellitus	2 (1.2)	4 (1.1)	0.52
Type 2 diabetes mellitus	6 (5.7)	11 (3.0)	0.19
Pregnancy complications			
GHTN/preeclampsia	51 (48.6)	204 (56.0)	0.18
Gestational diabetes	11 (10.5)	32 (8.8)	0.60
Gestational age (weeks)	39.3 [38.6,40.4]	39.4 [38.3,40.3]	0.92

Table 2. IOL lengths and frequency of adverse outcomes.

Outcomes	AWG (n=105)	EWG (n=364)	P value
Length of Labor			
Total induction time (hours)	28.1 [16.7,40.2]	26.9 [18.6,38.3]	0.60
Length of latent phase (hours)	8.8 [5.08,15.2]	8.96 [4.7,15.2]	0.88
Maternal Adverse Outcomes			
Cesarean delivery	43 (40.95)	147 (40.38)	0.92
Chorioamnionitis	17 (16.2)	53 (14.6)	0.68
Postpartum hemorrhage	19 (18.1)	65 (17.9)	0.96
3rd or 4th degree laceration	2 (3.2)	15 (6.9)	0.28
Blood transfusion	3 (2.9)	15 (4.1)	0.55
Endometritis	4 (3.8)	15 (4.1)	0.89
Surgical site infection	5 (11.6)	8 (5.4)	0.15
Hysterectomy	0	0	
Venous thromboembolism	0	0	
Death	0	0	
Neonatal Adverse Outcomes			
Neonate birthweight (grams)	3330 [2973.5,3721]	3410 [3052.5,3730]	0.33
Small for gestational age	17 (16.2)	48 (13.2)	0.43
Large for gestational age	6 (5.7)	18 (4.9)	0.75
NICU admission	22 (21.0)	70 (19.2)	0.69
NICU length of stay (days)	3 [1,7.3]	4 [1,8]	0.59
UA pH <7*	1 (1.2)	2 (0.7)	0.62
5-min APGAR <7**	8 (7.7)	15 (4.2)	0.14
Respiratory support	12 (11.4)	41 (11.3)	0.96
Shoulder dystocia	3 (2.9)	6 (1.6)	0.43

819 | Safety of Prostaglandins in the Peripartum Period in Case of Sickle Cell Disease

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10:30 AM - 12:30 PM

Objective: To assess the tolerance of peripartum prostaglandin use in women with sickle cell disease (SCD).

Study Design: A retrospective cohort study in 10 centers in France. Among all women with SCD (S/S, S/C or S/β-thalassemia), we compared pregnancies with and without exposure to prostaglandins, overall and specifically according to whether prostaglandins were used for labor induction or for post-partum hemorrhage (PPH). The main outcome was the occurrence of acute SCD complications, defined as any vaso-occlusive crisis (VOC) or thromboembolic event, within 7 days after delivery.

Results: Prostaglandins were used in 114/411 pregnancies (27.7%). In 106/411 (25.8%), prostaglandins were used to induce labor, with PGE2 (dinoprostone gel or pessary) for 95 patients and misoprostol for 11 patients. The incidence of PPH was 60/411 (14.6%), and 11 cases required second-line therapy with prostaglandins; sulprostone was used as per French practice guidelines. The incidence of acute complications did not differ between patients exposed and not exposed to prostaglandins (14/114 (12.2%) vs 34/293 (11.6%), respectively, p = 0.87, nor did the incidence of severe VOC (7.0% vs 7.8%, respectively; p = 0.78) or other secondary outcomes. Among patients undergoing labor induction, acute complications occurred in 12/106 (11.6%) exposed to prostaglandins vs 6/77 (7.6%) unexposed (p = 0.46). Among patients with PPH, rates were respectively 2/11 (18.2%) vs 9/49 (18.4%; p = 0.99).

Conclusion: The use of prostaglandins in patients with SCD for labor induction or for PPH appeared safe, within the limitations of a retrospective study.

820 | Associations Between Non-Communicable Diseases and Obstetric Complications at a Tertiary Referral Hospital in Southwestern Uganda

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10:30 AM - 12:30 PM

Objective: Non-communicable diseases (NCDs) increasingly contribute to maternal morbidity, accounting for 15% of indirect maternal deaths worldwide. We determined the association between NCDs and obstetric complications at Mbarara Regional Referral Hospital (MRRH) in southwestern Uganda.

Study Design: We conducted a retrospective cross-sectional study, and randomly selected records of women admitted for delivery at MRRH each month from January to December 2022, extracting their socio-demographic and clinical characteristics. We performed multivariable robust Poisson regression analysis to assess the association between NCDs and obstetric complications. Models were adjusted for maternal age, gravidity, referral status, employment status, and HIV serostatus.

Results: We abstracted data for 2,336 women with a mean age of 26±5.9 years. At least one NCD was present in 6.4% (n = 149) including anemia (n = 77, 3.3%), chronic hypertension (n = 35, 1.5%), pre-gestational diabetes (n = 16, 0.7%), asthma (n = 9, 0.4%) and cardiac disease (n = 6, 0.3%). Overall, 542 (23.2%) women had obstetric complications, including pre-eclampsia (n = 265, 11.3%); preterm labor (n = 67, 2.9%); placental abruption (n = 29, 1.2%); PPH (n = 54, 2.3%); and gestational diabetes (n = 5, 0.2%). Women with NCDs had increased likelihood of having an obstetric complication compared to women without (overall proportion 33.6% vs 22.5% respectively; adjusted prevalence ratio (aPR): overall, 1.8, 95% CI: 1.4-2.3; pre-eclampsia (1.8, 95%CI: 1.2-2.8), gestational diabetes (12.0, 95%CI: 2.0-72.7), deep venous thrombosis (6.0, 95%CI: 1.3-27.1), placenta abruption (4.4, 95%CI: 1.5-12.6) and postpartum hemorrhage (4.3, 95%CI: 2.2-8.3).

Conclusion: We found that NCDs were associated with a nearly two-fold increased risk of obstetric complications. Our findings highlight the need for further research to understand the impact of this risk, particularly on maternal and fetal outcomes. Additionally, these findings suggest strengthened NCD surveillance, as means to increased preparedness, and management for potential obstetric complications among pregnant women in Uganda.

821 | a Comparative Study of Stillbirth Classification Schemes

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10:30 AM - 12:30 PM

Objective: Stillbirth, defined as fetal death at ≥20 weeks' gestation, complicates ~1 in 160 pregnancies and causes vary widely. The most helpful tests in determining cause of stillbirth are fetal autopsy, placental pathology, and genetic testing, yet uptake is often low or incomplete. Several methodologies exist to classify stillbirth into phenotypic groups based on pathologic and clinical findings, each varying in complexity and ease of use. Our objective was to determine the agreement between three published classification systems (PASS, INCODE, and ReCoDe) using a cohort of patients who had complete diagnostic evaluation after stillbirth.

Study Design: Retrospective cohort study was conducted examining stillbirths occurring at two tertiary care centers from 2016 to 2022 with completed genetic and pathologic evaluation (n = 85). Three independent reviewers examined the cases according to selected classification schemes. Descriptive statistics were calculated and reliability analysis using Fleiss' kappa was performed to determine agreement.

Results: Leading cause of stillbirth among the classification schemes was placental in origin followed by fetal (μ = 48%, μ = 33%) (Table 1). Each scheme had low rate of unclassified cases (μ = 3%). Agreement between the three classification schemes was fair ($\kappa = 0.38$, CI 0.30-0.46; p< 0.001). 26% had positive genetic findings on diagnostic testing. Sub-analysis of cases with a genetic diagnosis did not demonstrate increased agreement ($\kappa = 0.33$, CI 0.14-0.53; p< 0.001).

Conclusion: Findings demonstrate tested classification schemes perform similarly on most stillbirth cases regarding minimization of unclassified diagnoses, but incompletely agree on all classifications. This highlights the diagnostic imprecision of stillbirth. These classification systems are limited by the user's interpretation of findings as well as failure to account for pathophysiologic interactions in cases affected by multiple clinical, genetic, or pathologic factors. Future work should be aimed at using tools such as machine-learning to develop classification algorithms to address these limitations.

Table 1. Comparison of stillbirth classification scheme agreement in determination of primary cause of death.

	PASS (%)	ReCoDe (%)	INCODE (%)	Average (%)
Fetal	33 (0.39)	27 (0.32)	25 (0.29)	28.3 (0.33)
Placenta/Umbilical cord	48 (0.56)	42 (0.49)	33 (0.39)	41(0.48)
Maternal	2 (0.02)	9 (0.11)	16 (0.19)	9 (0.11)
Obstetric	0 (0.0)	0 (0.0)	7 (0.08)	2.3 (0.03)
External	1 (0.01)	1 (0.01)	0 (0.0)	0.6(0.01)
Infection	0 (0.0)	0 (0.0)	3 (0.04)	1 (0.01)
Other	1 (0.01)	6 (0.07)	1 (0.01)	2.6 (0.03)

822 | Evaluating an Artificial Intelligence Platform Answering Common Pregnancy Questions: Satisfactory but Inconsistent

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10:30 AM - 12:30 PM

Objective: The availability of artificial intelligence platforms is rapidly increasing. We assessed the platform ChatGPT 3.0 and its ability to answer questions about common pregnancy conditions. This study analyzed the appropriateness of responses, the consistency of responses over multiple iterations, and the presence of misinformation within the responses.

Study Design: Seven questions were generated for each of the following pregnancy conditions to yield a total of 28 questions: Gestational Diabetes, Preeclampsia, Fetal Growth Restriction, and Oligohydramnios. Questions were entered into ChatGPT 3.0 in an identical manner three separate times, generating 84 total responses. Since ChatGPT forms a unique response even when exposed to the same prompt, each set of responses was reviewed by one of three board-certified MFM physicians. The accuracy of responses to each specific question was rated 1) Satisfactory, 2) Incomplete, or 3) Inadequate. ChatGPT responses contain information beyond the scope of the question. This additional information was evaluated for the presence or absence of misinformation by each reviewer.

Results: The responses of 13 out of 28 questions received consistent Satisfactory ratings over the three separate iterations (47%). 26 out of 28 questions had at least one response that was satisfactory (93%). When assessing the total 84 responses for misinformation, 22 out of 84 contained misinformation (27%). 51 out of 84 were rated as both Satisfactory and did not contain

misinformation (61%). Only 7 out of the 28 questions generated consistent answers by the reviewers, receiving both satisfactory ratings and also not containing misinformation (25%).

Conclusion: Our results suggest that Chat GPT 3.0 is able to generate satisfactory responses to common pregnancy questions. However, we found it to be inconsistent over multiple iterations of the same question. This platform should be used with caution, and the presence of misinformation should be noted when counseling patients on the use of AI.

Frequency of ChatGPT 3.0 Response Ratings	Percent (95% Confidence Interval*)
59 of 84 responses rated as Satisfactory**	70.2 (56.5, 81.3)
51 of 84 responses rated as both Satisfactory and Does not contain misinformation+	60.7 (48.4, 71.8)
22 of 84 responses contained misinformation, regardless of rating	26.2 (16.6, 38.7)
7 of 28 questions had consistent Satisfactory responses without misinformation across all three iterations	25.0 (10.7, 44.9)
13 of 28 questions had consistent Satisfactory responses across all three iterations	46.4 (27.5, 66.1)
26 of 28 questions had responses with at least one satisfactory response	92.9 (76.5, 99.1)

* Confidence intervals were computed using the exact binomial method for percentages based on 28 observations and using Generalized Estimating Equations (GEE) for percentages based on 84 observations.
**Satisfactory ratings were based on the ability of the response to comprehensively and accurately answer the specific question being asked
+ Misinformation was based on the entirety of the AI generated response and the presence of misinformation in the additional information

823 | Inflammatory Lesions in Placentas of Endometriosis Patients and Their Relation to Maternal and Neonatal Outcomes

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10:30 AM - 12:30 PM

Objective: This study aimed to investigate the relationship between endometriosis and placental pathology, aiming to elucidate potential mechanisms behind adverse pregnancy outcomes associated with endometriosis.

Study Design: This retrospective cohort study analyzed data of patients with endometriosis who delivered at a single tertiary center between 2008-2023. Inclusion criteria were singleton term deliveries with placentas sent for histopathological examination. Maternal characteristics, pregnancy outcomes, and placental histopathology were compared between patients with endometriosis (n = 50) and a control group without endometriosis (n = 150) matched for maternal and gestational age.

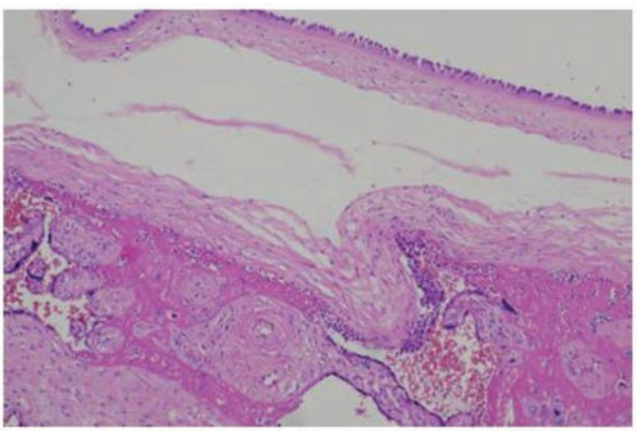
Results: The demographic characteristics and labor outcomes did not differ significantly between the groups. Patients with endometriosis exhibited higher rates of placental lesions, including placental hemorrhage (10% vs. 2.6%, p = 0.045), maternal inflammatory response lesions (16% vs. 6%, p = 0.039), fetal inflammatory response lesions (8% vs. 1.3%, p = 0.035), chronic villitis (8% vs. 1.3%, p = 0.035), and chronic deciduitis (14% vs. 2.6%, p = 0.006). Moreover, composite adverse neonatal outcomes were significantly higher in the endometriosis group (16% vs. 4%, p = 0.007). Multivariable regression analyses confirmed significant associations between endometriosis and all inflammatory placental lesions, both acute and chronic. Additionally, endometriosis was significantly and independently associated with adverse neonatal outcomes.

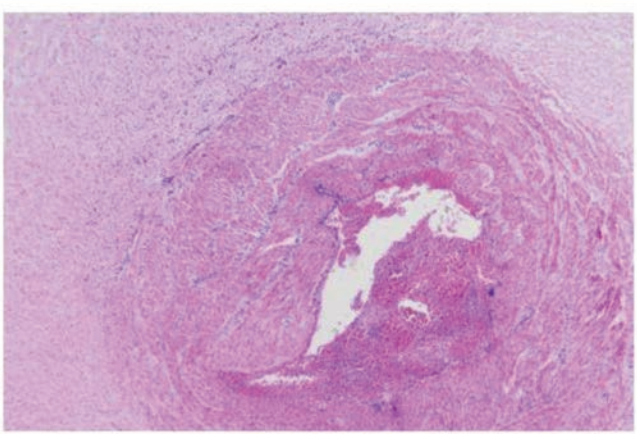
Conclusion: The presence of endometriosis is associated with increased placental pathology and adverse neonatal outcomes. The findings suggest that inflammatory lesions in the placenta may play a significant role in the pregnancy complications observed in women with endometriosis, highlighting the need for targeted monitoring and management strategies in this population.

Logistic regression analyses examining the association between endometriosis, placental inflammatory lesions and adverse neonatal outcomes

	aOR*	95% CI	p-value
Maternal inflammatory response lesions	3.56	1.23-10.33	**0.019**
Fetal inflammatory response lesions	8.45	1.42-50.25	**0.019**
Chronic villitis	9.07	1.50-54.54	**0.016**
Chronic deciduitis	9.01	2.24-36.14	**0.002**
Composite adverse neonatal outcomes	5.66	1.65-19.47	**0.006**

Values reflect the results of multivariate logistic regression analyses adjusted for maternal age, gestational age at birth, smoking, any diabetes during pregnancy, any hypertension during pregnancy, cesarean section and vaginal delivery. aOR- adjusted odds ratio; CI- confidence interval.





824 | Machine Learning-based Pregnancy and Pregnancy Trimesters Prediction Using Electrocardiogram

Lihong Mo[1]; Shantanu Milind Joshi[2]; Sonul Gupta[1]; Vivian Pae[1]; Ijeoma Uche[1]; Hana Shaik[3]; Chen-Nee Chuah[3]; Philip Strong[1];

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10:30 AM - 12:30 PM

Objective: Pregnancy is a physiologic high-volume state. Physiologic electrocardiogram (ECG) changes in pregnancy have been reported but not well characterized. We hypothesize that the physiologic cardiac volume and compliance changes in pregnancy will result in changes in ECG features that can be used to distinguish pregnant from non-pregnant state. The objective of this study is to establish a machine learning (ML) model to predict pregnant from non-pregnant state based on ECG.

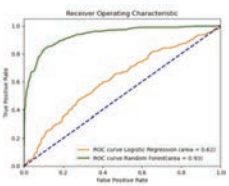
Study Design: This is an analysis of a database that includes 22,034 ECGs on 7,298 individual patients from 18-50 years of age who were pregnant at least once between 2011 to 2024 in a single tertiary medical center. After excluding patients with pre-existing cardiac morbidity, along with those who developed hypertensive disorders of pregnancy, 3,581 ECGs were included (53% negative versus 47% positive label). A supervised ML method (Random Forest) was compared to multiple logistic regression to predict pregnancy state based on four ECG features (QRS interval, QTc interval, PR interval, and heart rate).

Results: Random forest ML model performs better than multivariate logistic regression in the prediction of pregnancy state (Table). From the decision tree display of Random Forest ML model, higher QTc, higher heart rate, and lower QRS duration were associated with the classification of pregnancy state (Figure).

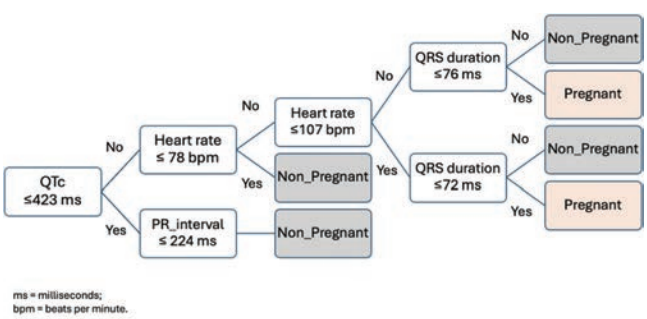
Conclusion: Four features that are commonly reported in clinical assessment of ECG can assist in the prediction of pregnancy state, especially when ML methods are used. By establishing ECG features associated with pregnancy by trimester, we can begin to characterize patterns associated with abnormal pregnancies.

Table. Comparing ML and logistic regression to predict pregnant state from ECG

ML models	Precision	Recall	F1 Score	Accuracy	AUROC
Random Forest	0.87	0.76	0.81	0.87	0.93
Multivariate logistic regression	0.57	0.25	0.35	0.65	0.62



* AUROC = area under the receiver operator curve.



ms = milliseconds;
bpm = beats per minute.

Figure 2. Simplified Decision Tree Diagram from Random Forest ML model.

825 | Using Supervised Machine Learning to Predict Spontaneous Preterm Birth in Patients Presenting with Preterm Contractions

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10:30 AM - 12:30 PM

Objective: Threatened preterm labor with the occurrence of preterm contractions is the most common reason for antepartum hospital admission, encompassing between 44–59% of all antenatal hospitalizations. Only half of the women who present with TPTL ultimately experience spontaneous preterm birth (sPTB). The nature of preterm contractions and sPTB relationship is not fully understood. The objective of this study was to understand what contributes to sPTB when patients present with preterm contraction symptoms using machine learning (ML).

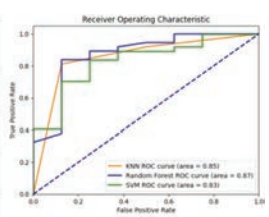
Study Design: A retrospective case-control study of individuals who experienced preterm contractions prior to sPTBs between January 2022 to March 2024 in a single tertiary medical center. A total of 3,245 patients were manually screened. Two hundred twenty-four patients who presented with preterm contractions < 36 weeks were included, with 42 delivering > 37 weeks and 182 delivering < 37 weeks. Three supervised ML methods (Random Forest, Support Vector Machine, and k-Nearest Neighbors) were compared to predict sPTB based on key clinical features (twins versus singleton, gestational age at presentation, body mass index - BMI, smoking history, concurrent PPROM status, history of PTB, and cervical dilation). Missing information in features were imputed from median.

Results: All three ML methods achieved promising AUROC in sPTB prediction (Table 1). The top four features related to the sPTB predictions are cervical dilation (measured in centimeters), BMI, gestational age at presentation, and concurrent PPROM status (Table 2).

Conclusion: Spontaneous PTB can be predicted via clinical information readily available with ML methods. The key clinical features used in the prediction are similar across all three ML methods used. Single center data and rarity of cases were main limitations. A multicenter or state database should be used to further validate findings.

Table 1. Comparing different ML methods in predicting spontaneous preterm birth from clinical features

ML models	Precision	Recall	F1 Score	Accuracy	AUROC
Random Forest	0.86	0.87	0.85	0.87	0.87
SVM	0.86	0.87	0.85	0.87	0.83
kNN	0.79	0.82	0.80	0.82	0.85



ML = machine learning; SVM= Support Vector Machine; kNN = k-nearest neighbors; AUROC= area under the receiver operator curve.

Table 2. Ranking of the feature importance in predicting spontaneous preterm birth in three ML models

Rank	Random Forest		SVM		kNN	
	Features	Importance factor	Features	Importance factor	Features	Importance factor
1	Cervical dilation	0.36	Cervical dilation	0.90	Cervical dilation	0.089
2	BMI	0.25	Concurrent PPROM	0.85	BMI	0.033
3	Gestational age at presentation	0.20	BMI	0.31	Gestational age at presentation	0.022
4	Concurrent PPROM	0.10	Gestational age at presentation	0.17		
5	History of PTB	0.036	History of PTB	0.15		
6	Smoking history	0.034	Smoking history	0.03		
7	Twin versus singleton	0.013	Twin versus singleton	0.03		

ML = machine learning; SVM= Support Vector Machine; kNN = k-nearest neighbors; BMI = body mass index; PTB = preterm birth; PPROM = preterm prelabor rupture of membranes.

826 | Risk Factors for Sexually Transmitted Infection (STI) Partner Management for Pregnant Patients in Southeast Texas

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10:30 AM - 12:30 PM

Objective: Pregnancy provides an opportunity for routine STI testing. However, partner testing and treatment remain challenging, leading to reinfection cycles. Our study sought to evaluate risk factors for incomplete partner treatment for STIs with and without public health surveillance.

Study Design: We performed a retrospective cohort study of all pregnant women who received care at two safety-net hospitals in Harris County, TX between 2019–2022. Record review was performed for all patients who tested positive for chlamydia, gonorrhea, hepatitis B, and/or syphilis during pregnancy. If any gaps were identified in documentation, patients were contacted for a brief interview about partner(s). Reasons for incomplete partner treatment were stratified into lack of education, lack of contact with patient, financial or other barriers to treatment, tested negative, or treatment status unknown. Partner treatment for hepatitis B and syphilis was confirmed with the regional health department. Differences in categorical variables between groups were examined using chi-square test or Fisher's exact test. $P < 0.05$ was considered statistically significant.

Results: Of 20,108 pregnant patients who received care between 2019-2022, 369 patients met inclusion criteria (Table 1). Partner treatment was most successful for patients with chlamydia (53.6%) and gonorrhea (45.5%), followed by syphilis (43.4%) and hepatitis B (1.2%) (Table 2). Lack of ongoing contact was the most common reason for insufficient partner treatment in patients with chlamydia (43.1%) or gonorrhea (75.0%). For syphilis and hepatitis B, the predominant reason remains unknown (42.9%, 72.5%, respectively).

Conclusion: While reasons for partner treatment are well-documented for clinician-monitored STIs, partner STI status remains relatively unknown for syphilis and hepatitis B. Because these infections are subject to public health surveillance, there may be an overreliance on public health authorities for managing these STIs. Increased education for providers for all STIs should be prioritized, and existing gaps in this area should be addressed.

Demographics	Chlamydia		Gonorrhea		Chlam+Gono		Syphilis		Hepatitis B	
	n=110	%	n=22	%	n=20	%	n=136	%	n=81	%
Age										
<25	23	20.9	5	22.7	11	55	19	14.0	1	1.2
25-34	68	61.8	10	45.5	7	35	70	51.5	28	34.6
>=35	19	17.3	7	31.8	2	10	47	34.6	52	64.2
Race/ethnicity										
Hispanic/Latino	90	81.8	10	45.5	15	75	85	62.5	24	29.6
Non-Hispanic black	8	7.3	9	40.9	3	15	47	34.6	34	42.0
Non-Hispanic White	9	8.2	3	13.6	1	5	3	2.2	1	1.2
Non-Hispanic Other	3	2.7	0	0.0	1	5	1	0.7	22	27.2
Marital Status										
Single	66	60.0	17	77.3	16	80	86	63.2	18	22.2
Married/Life Partner	36	32.7	5	22.7	3	15	44	32.4	62	76.5
Divorced/Separated/Widowed/Unknown	8	7.3	0	0.0	1	5	6	4.4	1	1.2
Preferred Language										
English	44	40.0	14	63.6	17	85	76	55.9	33	40.7
Spanish	65	59.1	8	36.4	3	15	59	43.4	22	27.2
Other	1	0.9	0	0.0	0	0	1	0.7	26	32.1
Substance Use										
Alcohol	0	0.0	0	0.0	0	0	0	0.0	0	0.0
Tobacco	9	8.2	3	13.6	0	0	4	2.9	0	0.0
Other Drugs	0	0.0	2	9.1	2	10	0	0.0	0	0.0
Co-morbidities										
Chronic Hypertension	6	5.5	2	9.1	0	0	7	5.2	2	2.5
Gestational Hypertension	3	2.7	1	4.6	1	5	4	2.9	1	1.2
Pre-Eclampsia	4	3.6	1	4.6	0	0	1	0.7	3	3.7
Gestational Diabetes	0	0.0	0	0.0	0	0	12	8.8	15	18.5
Type 1 Diabetes Mellitus	9	8.2	1	4.6	0	0	0	0.0	0	0.0
Type 2 Diabetes Mellitus	0	0.0	0	0.0	0	0	17	12.5	15	18.5
Thyroid	11	10.0	1	4.6	0	0	1	0.7	0	0.0
Cardiac Disease	0	0.0	1	4.6	0	0	1	0.7	0	0.0

Table 1. Characteristics of patients testing positive for chlamydia, gonorrhea, hepatitis B, and/or syphilis during pregnancy, n = 369

	Chlamydia		Gonorrhea		Chlam+Gono		Syphilis		Hepatitis B	
	n=110	%	n=22	%	n=20	%	n=136	%	n=81	%
Partner Treated N (%)	59	53.6	10	45.5	10	50.0	59	43.4	1	1.2
P-value (compared to chlamydia)			0.483		0.764		0.11		<0.001	
Reason for Lack of Treatment										
Lack of Education	6	11.8	1	8.3	0	0.0	4	5.2	0	0.0
Lack of Contact	22	43.1	9	75.0	2	20.0	26	33.8	0	0.0
Financial/Other Barriers	2	3.9	0	0.0	1	10.0	0	0.0	0	0.0
Tested Negative (Syphilis alone)	0	0.0	0	0.0	0	0.0	14	18.2	22	27.5
Unknown	21	41.2	2	16.7	7	70.0	33	42.9	58	72.5

Table 2: Rates of partner treatment and reasons for lack of treatment for chlamydia, gonorrhea, hepatitis B, and/or syphilis during pregnancy, n = 369

827 | Anemia Recovery After Pyelonephritis

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10:30 AM - 12:30 PM

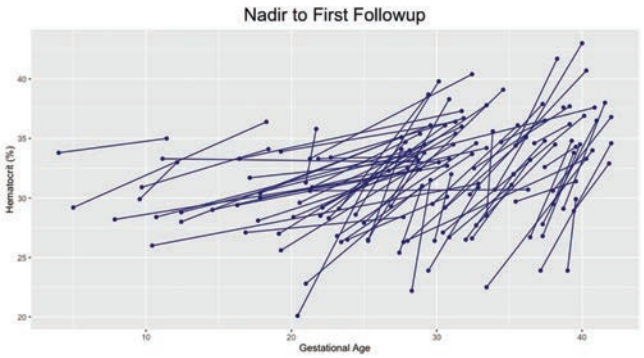
Objective: While pregnant patients with pyelonephritis commonly develop anemia secondary to endotoxin-induced hemolysis, the rate of hematologic recovery is not known. This study aimed to detail the hematologic trajectory during and after antepartum pyelonephritis.

Study Design: Patients with antepartum admissions for pyelonephritis between January 1, 2022 and December 1, 2022 who delivered at our institution at least 7 days following admission for pyelonephritis were included. The primary outcome was change in hematocrit (Hct) from its nadir during admission for pyelonephritis to follow-up. Data collected included hematologic data, patient demographics, medical comorbidities, and characteristics regarding pyelonephritis and delivery admissions. Statistical analysis included t-tests, Kruskal-Wallis, and chi-square tests.

Results: Of 78 patients meeting inclusion criteria, the majority were nulliparous, of Hispanic ethnicity, and had an average age of 25.4. During pyelonephritis admissions, the average admission Hct was 33.2% (32.0-35.2) with an average nadir of 28.8% (26.7-30.6) occurring on hospital day 2 (1-3). 60% of patients had anemia at discharge from pyelonephritis admission. The mean rise in Hct from pyelonephritis admission nadir to first follow-up was 6.0+/-3.3% with an average rise of 1.63+/-2.4% per week (Figure). 6% of patients had anemia at delivery admission, with an average admission Hct of 35.9% (33.8-38.2). Patients with a greater Hct rise were found to have a lower mean nadir, more rapid rise, and

higher Hct at delivery admission ($p < 0.001$), with no difference in initial Hct at pyelonephritis admission.

Conclusion: Following pyelonephritis infection in pregnancy, Hct levels steadily rise by an average of 1.63% per week, resulting in resolution of anemia prior to delivery. Patients with lower Hct during pyelonephritis admission demonstrate faster hematologic recovery and are less likely to be anemic at presentation for delivery.



828 | Postlaser persistent polyhydramnios after resolution of Twin to Twin Transfusion Syndrome

Mackenzie J. Simon-Collins[1]; Camille Shantz[2]; Rachana Tanksali[3]; Maryn Day[3]; Julie Alan[1]; Sarah Millard[1]; Michelle Kush[1]; Jena L. Miller[1]; Ahmet A. Baschat[1]; Mara Rosner[1]
[1]Johns Hopkins Medicine, Baltimore, MD; [2]Johns Hopkins University, Baltmore, MD; [3]Johns Hopkins University, Baltimore, MD

10:30 AM - 12:30 PM

Objective: Fluid abnormalities should resolve after fetoscopic laser surgery (FLS) for Twin to Twin Transfusion Syndrome (TTTS), but polyhydramnios occasionally persists. We sought to compare patients with persistent polyhydramnios (PP) to those with resolved polyhydramnios (RP) after FLS for TTTS.

Study Design: Single-center retrospective review of monochorionic twins who underwent FLS for TTTS from 6/2014 to 1/2024. Patients with PP had a maximum vertical pocket (MVP) > 8 cm in the former TTTS recipient > 14 days after laser. RP patients had resolution of polyhydramnios ≤ 14 days after laser. High order multiples and those with TTTS recurrence were excluded. Pre-treatment characteristics and birth outcomes were compared between PP and RP groups via Pearson or Fischer's Exact Chi Squared and Mann-Whitney U. ROC analysis was performed to explore the relationship between pre-laser MVP and PP.

Results: 377/405 (93%) patients had RP after laser and 28 (7%) patients had PP (Figure 1). PP recipients had higher prelaser MVP (11.3 vs 10.1 cm, $p = 0.013$), higher amnioreduction volumes (1900 vs 1500 cc, $p = 0.034$) and higher post operative day 1 MVPs (7.4 vs 6.0 cc, $p = 0.010$) (Table 1). An ROC analysis demonstrated that a prelaser recipient MVP of 11.0 cm predicted PP with 64% sensitivity and 64% specificity. Model quality Gini Index 0.53, area under the curve 0.64 (95% CI: 0.538-0.753), $p = 0.014$. Remaining pre-treatment and intraoperative findings were not different between groups, though there was a trend towards more pyelectasis in PP recipients (10.7 vs 2.7%, $p = 0.053$). Average time to resolution of polyhydramnios was 35 days in the PP group, versus 3 days in RP ($p < 0.001$), and was documented in 95% of cases. Gestational age at delivery, birth survival, and birthweight discordance were not different between groups.

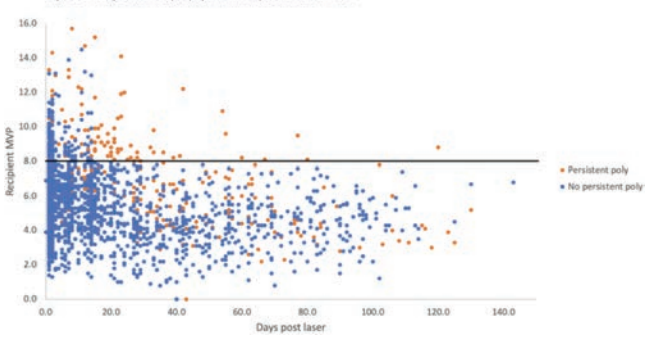
Conclusion: Persistent polyhydramnios occurred in 7% of patients after laser for TTTS, but ultimately resolved in 95% and was not associated with adverse obstetric outcomes. A trend towards more pyelectasis in PP recipients suggests persistent polyuria as a potential etiology of PP.

Table 1. Persistent polyhydramnios after laser for TTTS

		Persistent Polyhydramnios N=28	Resolved Polyhydramnios N=377	P-value
Pre-Treatment Characteristics				
GA at Pre-treatment (weeks)		20.1 [18.4-22.2]	19.6 [17.9-21.9]	0.434
TTTS Stage	I	1 (3.6)	76 (20.2)	
	II	11 (39.3)	122 (32.4)	
	III	12 (42.9)	154 (40.8)	
	IV	4 (14.3)	25 (6.6)	0.097
TAPS		4 (14.3)	42 (11.1)	0.613
sFGR		8 (28.6)	117 (31.0)	0.785
Recipient EFW (grams)		361 [236-542]	294 [220-467]	0.247
Donor EFW (grams)		286 [198-437]	235 [164-377]	0.251
EFW Discordance		20.6 [11.5-27.2]	19.6 [11.4-28.5]	0.978
Cervical Length (mm)		38 [33-44]	38 [32-44]	0.884
Cervical Intervention				
Cerclage		1 (3.6)	29 (7.7)	0.422
Pessary		0 (0)	33 (8.8)	0.102
Recipient MVP (cm)		11.3 [9.7-13.5]	10.1 [8.9-11.8]	0.013
Recipient MVP ≥ 11 cm		18 (64.3)	137 (36.3)	0.003
Recipient Cardiac Dysfunction				
Mitral Regurgitation		4 (14.3)	62 (16.7)	0.743
Tricuspid Regurgitation		15 (53.6)	208 (56.1)	0.798
Fused Mitral E/A		1 (3.6)	35 (9.5)	0.295
Fused Tricuspid E/A		3 (10.7)	87 (23.5)	0.120
Left MPI > 0.6		12 (46.2)	176 (48.5)	0.818
Recipient Pyelectasis		3 (10.7)	10 (2.7)	0.053
Fetoscopic Laser Characteristics				
GA at laser (weeks)		20.3 [18.4-22.2]	19.6 [18.1-22.0]	0.316
Amnioinfusion Volume		225 [0-700]	500 [50-1000]	0.122
Amnioreduction Volume		1900 [1375-2735]	1500 [1110-2100]	0.034
Total Anastomoses		12 [10-18]	15 [10-21]	0.220
Complete Vessel Blanching		27 (96.4)	355 (94.2)	0.617
Clear Visualization		25 (89.3)	317 (84.1)	0.464
Complete Dichorionization		27 (96.4)	344 (91.2)	0.340
Septostomy		4 (14.3)	34 (9.0)	0.356
Post-Operative Course				
Recipient POD1 MVP		7.4 [5.5 -8.3]	6.0 [5.0-7.1]	0.010
Fetal Demise	None	20 (76.0)	312 (83.4)	
	Single	5 (19.2)	54 (14.4)	
	Double	1 (3.8)	8 (2.1)	0.665
Polyhydramnios Resolved		21/22* (95.0)	--	--
Time to Resolution (days)		35.2 [24.2-46.4]	2.7 [2.5-2.9]	<0.001
GA at Delivery		33.4 [30.8-35.4]	32.2 [29.0-34.2]	0.082
Live Births	0	1/28 (3.6)	28 (7.4)	
	1	7/28 (25.0)	55 (14.6)	
	2	20/28 (71.4)	294 (78.0)	0.282
Perinatal Survival		47/56 (83.9)	643/754 (85.2)	0.784
Recipient Birthweight (grams)		1970 [1522-2430]	1830 [1284-2220]	0.172
Donor Birthweight		1745 [1609-2168]	1560 [990-1980]	0.054
Birthweight Discordance		6.2 [3.3-12.9]	9.8 [4.6-21.8]	0.088

Data are presented as number (percent) or median [interquartile range]. Fraction denominator indicates number of patients with available data. GA, gestational age; EFW, estimated fetal weight; TAPS, twin anemia polycythemia sequence; sFGR, selective fetal growth restriction; MVP, maximum vertical pocket; MPI, myocardial performance index; POD, post operative day.

Figure 1. Progression of polyhydramnios post laser for TTTS



829 | Targeted Regulation of Abortion Providers and Infant Mortality

Madeline F. Perry; Joe M. Feinglass; Lynn M. Yee
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10:30 AM - 12:30 PM

Objective: Targeted regulation of abortion providers (TRAP laws) are medically unindicated restrictions limiting the provision of abortion, even in states where abortion is legal.

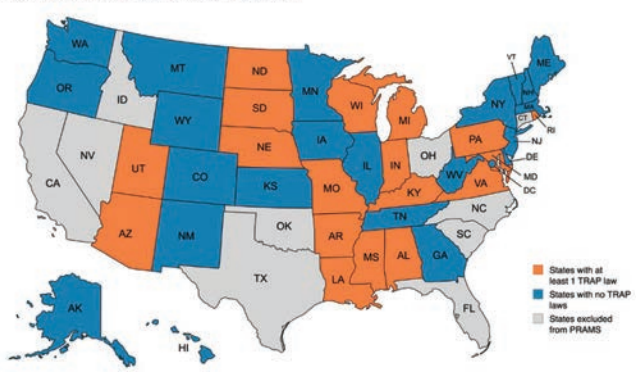
Restrictions on reproductive rights have been associated with adverse maternal and neonatal outcomes. We aimed to evaluate the association of the existence of TRAP laws in a state and state rates of infant mortality.

Study Design: This cross-sectional analysis was performed utilizing 2016-2021 Phase 8 data from the Pregnancy Risk Assessment Monitoring System (PRAMS). PRAMS data were linked with Guttmacher Institute data about state TRAP laws from 2016-2021. Infant death rates were calculated using PRAMS data, which uses respondent self-report. In the PRAMS questionnaire, participants are asked "Is your baby alive now?" If participants answer "no," they are coded as having an infant death. Multivariable Poisson regression testing the association between the existence of TRAP laws in a state and infant mortality was performed, adjusting for individual-level sociodemographic factors from PRAMS.

Results: Among 183,849 participants, representing a weighted population of 9,792,533, 45.2% people lived in states (n = 18) that had at least one TRAP law during the study period (Figure). During the 2016-2021 study period, 0.4% of participants reported an infant death. In adjusted analysis, there was a 29% increased likelihood of infant mortality (aIRR 1.29, 95% CI 1.08, 1.55) in states with TRAP laws in comparison to those without TRAP laws (Table).

Conclusion: TRAP laws are associated with an increased likelihood of infant mortality, even after accounting for individual-level confounders. Restricted access to abortion may result in people with high-risk maternal or fetal health conditions to continue pregnancy rather than receive desired abortion services.

Figure, Map of state TRAP laws from 2016-2021



TRAP, Targeted regulation of abortion providers

TABLE. Poisson regression results for infant mortality by respondent sociodemographic characteristics and state TRAP laws

	Percent reporting infant death (weighted n=9,792,533)	Infant death, aIRR[1]
No TRAP[2] laws	0.33	Reference
At least 1 TRAP law	0.48	1.29 (1.08, 1.55)

TRAP laws, targeted regulation of abortion providers; aIRR, adjusted incident rate ratio; CI, confidence interval; PRAMS, Pregnancy Risk Assessment Monitoring System; BMI, body mass index

PRAMS data is Phase 8 from 2016-2021, states excluded from PRAMS: California, Connecticut, Florida, Idaho, Nevada, North Carolina, Ohio, Oklahoma, South Carolina, Texas. Vermont and Alaska were included in PRAMS but excluded from analysis because of non-reporting of certain sociodemographic data

[1]Percent of PRAMS participants reporting infant death at time of survey completion (generally 2-4 months after delivery) from PRAMS, 183,849 participants representing a weighted population of 9,792,533. Poisson regression, covariates included maternal marital status, maternal age, maternal race and ethnicity, maternal income, year of delivery, Medicaid coverage at time of delivery, preconception uninsurance, neonatal conditions (low birth weight, preterm birth) and maternal conditions (pre-pregnancy diabetes, pre-pregnancy hypertension, diabetes during pregnancy, hypertension during pregnancy, pre-pregnancy BMI)

[2]Trap laws represent author's analysis of Guttmacher data about TRAP laws

830 | Targeted Regulation of Abortion Providers and Intimate Partner Violence Before and During Pregnancy

Madeline F. Perry; Joe M. Feinglass; Lynn M. Yee
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10:30 AM - 12:30 PM

Objective: Targeted regulation of abortion providers (TRAP) laws have been associated with an increased rate of intimate partner violence (IPV)-related homicide. Pregnancy is a uniquely dangerous time for people who experience IPV, yet it is unclear whether abortion restriction on a state level is associated with IPV risk before or during pregnancy. Our objective was to evaluate the association between state-level TRAP laws and IPV before and during pregnancy.

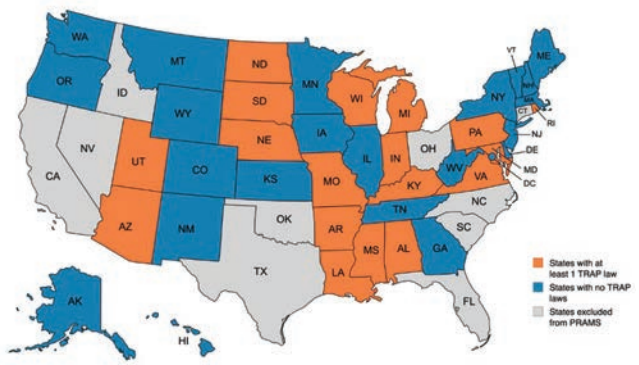
Study Design: We performed a cross-sectional analysis using data from the Pregnancy Risk Assessment Monitoring System (PRAMS) from Phase 8, 2016-2021. PRAMS data were linked to Guttmacher Institute data about TRAP laws from 2016 to 2021. PRAMS asks participants if they were "push[ed], hit, slap[ped], kick[ed], choke[d], or physically hurt in any way?" by their current or ex-partner/husband either in the 12 months before or during pregnancy. IPV before and during pregnancy was defined as answering "yes" to that question. Multivariable Poisson regression analyzing the association between state-level TRAP laws and state percent IPV before and during pregnancy was performed, controlling for individual sociodemographic factors.

Results: In this analysis of 196,451 participants representing a weighted population of 10,267,609 people, 2.5% and 1.7% reported experiencing IPV before and during pregnancy, respectively. Forty-five percent of PRAMS participants lived in states with at

least one TRAP law during the study period (Figure). Multivariable Poisson regression found that participants living in states with TRAP laws had a 14% increased likelihood of IPV before pregnancy and 21% increased likelihood of IPV during pregnancy compared with participants living in states that do not have TRAP laws (aIRR 1.14, 95% CI 1.05, 1.25; aIRR 1.21, 95% CI 1.10, 1.35, respectively; Table).

Conclusion: State restriction to abortion access through TRAP laws is associated with increased rates of reported IPV before and during pregnancy. Further research evaluating how state policies have the potential to both exacerbate and mitigate IPV and maternal health are warranted.

Figure, Map of state TRAP laws from 2016-2021



TRAP, Targeted regulation of abortion providers

TABLE, Poisson regression results for reported IPV before and during pregnancy[1] by respondent sociodemographic characteristics and state TRAP laws

	IPV in 12 months before pregnancy (%)	IPV before pregnancy, aIRR and (95% CI)[1]	IPV during pregnancy (%)	IPV during pregnancy, aIRR and (95% CI)[1]
No TRAP laws[2]	2.21	Reference	1.45	Reference
At least 1 TRAP law	2.89	1.14 (1.05, 1.25)	2.03	1.21 (1.10, 1.35)

PRAMS, Pregnancy Risk Assessment Monitoring System; IPV, intimate partner violence; TRAP laws, targeted regulation of abortion providers; aIRR, adjusted incident rate ratio, CI, confidence interval

PRAMS Phase 8 data from 2016-2021, 196,451 participants representing a weighted n=10,267,609 with births in 39 states and the District of Columbia. Vermont and Alaska excluded due to non-reported sociodemographic characteristics. PRAMS data excludes California, Connecticut, Florida, Idaho, Nevada, North Carolina, Ohio, Oklahoma, South Carolina, Texas

[1]Poisson regression controlling for marital status, age, race and ethnicity, income, education, year of birth, and Medicaid coverage of delivery

[2]TRAP laws represent author's analysis of Guttmacher Institute data about TRAP laws

831 | Quality Improvement Initiative for Respiratory Syncytial Virus Vaccination In Pregnancy- How Can We Do Better?

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[1]Saint Louis University School of Medicine, Webster Groves, MO; [2]Saint Louis University School of Medicine, Saint Louis University / St. Louis, MO; [3]St. Louis University, Saint Louis University School of Medicine/ St. Louis, MO; [4]St. Louis University, St. Louis, MO; [5]Saint Louis University School of Medicine, St. Louis, MO

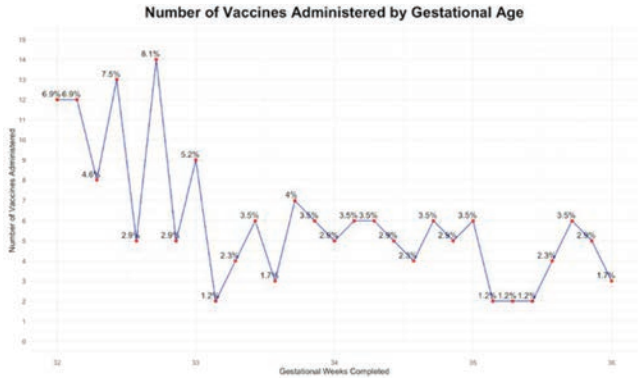
10:30 AM - 12:30 PM

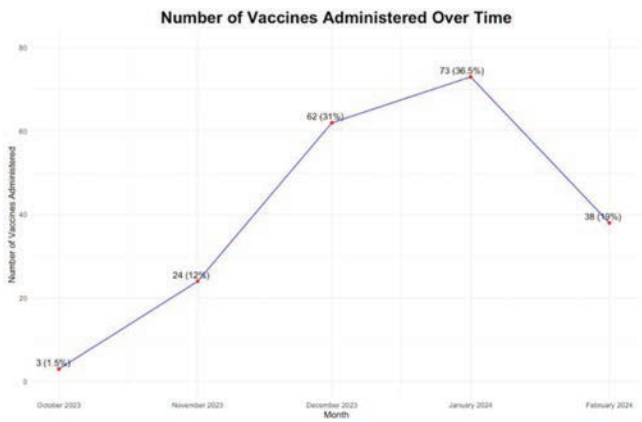
Objective: This study was undertaken to evaluate patterns of perinatal respiratory syncytial virus (RSV) vaccination and to identify strategies to increase vaccine uptake through an institutional quality improvement (QI) initiative.

Study Design: We evaluated rates of perinatal RSV vaccination during the most recent season of vaccine eligibility from October 2023 to February 2024 among patients seeking prenatal care between 32 to 36 weeks gestation at a single academic tertiary medical center. Maternal demographic characteristics, gestational age at vaccination, and number of prenatal visits during eligibility period were abstracted from electronic records and compared across patients who accepted and refused vaccination. Student's t test and chi2 tests were used to compare continuous and categorical data, respectively. We then administered a structured survey at the end of the RSV season among patients who were previously eligible for vaccination to examine reasons for vaccine hesitancy and identify strategies for enhancing vaccine education.

Results: Of 548 eligible patients, 200 (36%) accepted RSV vaccination while 348 (63.5%) did not. Unvaccinated patients were more likely to be Black ($p = .002$), have public insurance ($p = .007$) and attend fewer prenatal visits during eligibility period ($p < .001$). Evaluation of vaccination patterns demonstrated increase in vaccination rates throughout the RSV season with highest rates attained at earlier gestational ages (Figures 1 and 2). Of the 278 patients compliant through postpartum follow up–90 completed the survey (response rate = 32.3%). Primary reasons for vaccine hesitancy were identified as–lack of understanding about vaccine efficacy (40%) and concerns about fetal (30%) and maternal (30%) side effects. Respondents identified handouts (44.1%) and text-based messaging (37.3%) as their preferred approach for receiving vaccine education.

Conclusion: Vaccine education using text-based messaging and handouts with content focused on the clinical benefit and safety of vaccination has the potential to address RSV vaccine hesitancy and enhance perinatal vaccination.





832 | Roll-Over Test as a Screening Tool for Hypertension in Pregnancy - A Prospective Pilot Study

Madhurima K. Keerthy; Vivek Katukuri; Christina Yarrington; Christopher Cox; Conrad Chao; Chloe Fournier-Hall; Mingma Sherpa
University of New Mexico, Albuquerque, NM

10:30 AM - 12:30 PM

Objective: Pre-eclampsia occurs in 3-8% of pregnant patients globally and is more detrimental to rural communities with limited access to care. Early diagnosis and management improve maternal and neonatal outcomes. The screening modalities that are available include mean Blood pressures, uterine artery Dopplers and various angiogenic markers. However, these are not available to rural areas consistently. The aim of our study to evaluate the potential of the low-cost Roll-Over Test to predict hypertensive disease of pregnancies in rural populations.

Study Design: This is a single center pilot prospective cohort study. 56 patients were recruited. Demographic data, Uterine artery Doppler and blood for sflt1/Plgf ratio was obtained between 19wk0d–24w6d. Roll-over Test was conducted by obtaining blood pressures in left lateral and Supine positions, mean change in BP was collected. T-test (continuous) and Chi Square test(categorical) were used for demographic variables.

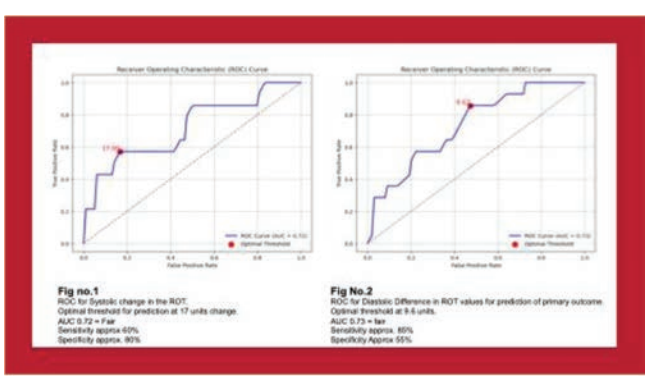
Receiver Operating Characteristic (ROC) curves generated for ROT change in SBP, DBP and HR for prediction of primary outcome. ROC curves generated for UA PI, First SBP (Initial Systolic BP in pregnancy) and First DBP (Initial Diastolic BP in pregnancy).

Sensitivity and specificity calculated for ROT, Ut PI, First SBP and First DBP.

Results: 14 (26.9%) had primary outcome. 5 (9%) had preeclampsia and 9 (17%) had gestational hypertension. Of the 5, one (1.9%) had HELLP syndrome. A 17-point change in systolic BP on ROT had an optimal sensitivity of 60% and specificity of 80% in diagnosing the primary outcome. A mean diastolic change of 9.6 points was identified to provide a sensitivity of 85% and a specificity of 55%. In this population, Uterine artery Dopplers and angiogenic markers did not perform well in predicting primary outcome.

Conclusion: The low-cost Roll-Over Test is a reasonable screening tool to predict hypertensive disease in pregnancy in rural settings.

Variable	Mean in HTN group	95 % CI	Mean in non-HTN. group	95% CI	P- value
Age (years)	29.7	26 – 33.5	28.7	26.8-30.5	0.5900
Gravida	1.9	1.3-2.5	3	1.3-3.7	0.0178
Parity	0.8	0.3-1.3	1.4	1.0-1.9	0.0602
BMI	31	27.6-34.4	29	25.4-32.6	0.3910
SBP first visit	126.71	121.7-131.6	115.7	112.2-119.3	0.0007
DBP First visit	73.1	68.85-77.4	65.4	62.5-68.4	0.0043
Initial Hg	13.9	13.1-14.4	13.7	13.4-14.1	0.6750
GA at delivery	36.8	35.1-38.5	38.8	38.2-39.3	0.0340
Highest SBP	148.8	126.3-168	134.4	116.4-164.2	0.0021
Mean SBP	130.4	114.6-148.05	116.2	102.6 – 127.1	0.0009
Fetal weight at birth	2957.9	1252.6-4035.6	3249.6	2201 - 3984	0.2800
APGAR 1 min	7.1	2.9 -8.0	7.8	5.7 – 9.0	0.1792
APGAR 5 min	8.5	4.6 – 9.6	8.8	7.7 – 9.3	0.5711
QBL	978.6	162.6 – 2843.1	518	55.95-1850	0.1224
Hospital stay in days	3.6	2.2 – 5. 78	3.1	2 – 5	0.2746



833 | Association of Inter-Twin Growth Discordance >25% with Fetosocpic Laser Surgery Outcomes in Twin-Twin Transfusion Syndrome

Manasa G. Rao[1]; Christy Gandhi[1]; Russell S. Miller[1]; Meghan Angley[1]; Rosalie Ingrassia[1]; Lynn L. Simpson[2]; Noelle Breslin[1]
[1]Columbia University Medical Center, New York, NY; [2]Columbia University Irving Medical Center, New York, NY

10:30 AM - 12:30 PM

Objective: Inter-twin growth discordance is associated with adverse pregnancy outcomes in monochrionic-diamniotic (MCDA) twin pregnancies with ≥25% considered a cutoff for pathological discordance. We compared outcomes of fetoscopic

laser surgery (FLS) for twin-twin transfusion syndrome based on presence of absence of discordance ≥25%.

Study Design: Retrospective review of MCDA twins with TTTS that underwent FLS at a single center from 2009-22. Pregnancies with pre-operative inter-twin discordance ≥25% were compared to those < 25%. Primary outcome was donor twin survival at first sonogram after FLS.

Results: 169 MCDA pregnancies underwent FLS and met inclusion criteria. 62 (37%) had discordance ≥25%. Patients with discordance ≥25% were younger (32 ± 5 vs 30 ± 6). GA at TTTS diagnosis and at FLS were similar between groups. Donor twin selective fetal growth restriction (sFGR) was more likely with discordance ≥25% (74.2% vs 23.4%, p< 0.01). Pre-FLS Quintero stage differed between the two groups (p = 0.014), with higher likelihood of stage III and IV in the ≥25% group. Donor twin survival was significantly lower with discordance ≥25% at first post-FLS sonogram (75.8% vs 89.7%, p = 0.02) and at hospital discharge (52.8% vs 73.6%, p = 0.04). After adjusting for age, Quintero stage, and donor FGR, donor twin survival at first sonogram remained lower in patients with discordance ≥25% (p = 0.01). In a subgroup analysis to evaluate discordance in pregnancies with donor sFGR, donor twin survival did not differ at first sonogram post-FLS (78.3% vs 96.0%, p = 0.08) or at hospital discharge (61.5% vs 73.9%, p = 0.3) between the groups. In a subgroup analysis of normally-grown twins, donor twin survival did not differ at first sonogram post-FLS (68.8% vs 87.7%, p = 0.1) but was lower in the ≥25% discordance group at hospital discharge (80.33% vs 45.45%, p = 0.02).

Conclusion: Discordance ≥25% was associated with lower donor twin survival after FLS. While some effect may be attributable to co-existing donor FGR, discordance was associated with survival difference in normally-grown donor twins.

Table 1. Demographics and pregnancy characteristics**

	Discordance<25% (N=107)	N (if ≠ 107)	Discordance >25% (N=62)	N (if ≠ 62)	P-value
Maternal Age at delivery	32 +/- 5		30 +/- 6		0.026
Nulliparous	43 (40.19%)		31 (50.00%)		0.215
BMI at delivery		77		35	0.956
18-24	31 (40.26%)		13 (37.14%)		
25-29	27 (35.06%)		13 (37.14%)		
30-35	15 (19.48%)		6 (17.14%)		
35-40	3 (3.90%)		2 (5.71%)		
>40	1 (1.30%)		1 (2.86%)		
Race—no. (%)					0.520
White	62 (57.94)		31 (50.00%)		
Black	11 (10.28%)		4 (6.45%)		
Other	9 (8.41%)		6 (9.68%)		
Unknown	21 (19.63%)		16 (25.81%)		
Asian	4 (3.74%)		5 (8.06%)		
Ethnicity					
Hispanic	20 (18.69%)		18 (29.03%)		0.121
Not Hispanic	87 (81.31%)		44 (70.97%)		
IVF	13 (12.75%)	102	4 (6.67%)	60	0.223
FGR of donor	25 (23.36%)		46 (74.19%)		<0.01
Quintero Stage		105			0.014
I	21 (20%)		6 (9.68%)		
II	33 (31.43%)		10 (16.13%)		
III	46 (43.81%)		41 (66.13%)		
IV	5 (4.76%)		5 (8.06%)		

**Categorical values were compared using chi-square or Fisher's exact test and continuous variables were compared using the student t-test or Wilcoxon rank-sum test. Multivariable logistic regression was used

Table 2. MCDA twin characteristics and laser outcomes**

	Discordance <25% (N= 107)	N (if ≠ 107)	Discordance >25% (N= 62)	N (if ≠ 62)	p-value
GA at TTTS diagnosis (Median [IQR])	19.00w [17w4d-21w0d]		19w3d[17w6d-21w2d]		0.680
GA at FLS (weeks.days)	19w5d [18w0d-22w1d]		19w5d [18w0d-21w4d]		0.840
Donor twin survival at first sonogram post-FLS	96 (89.72%)		47 (75.81%)		0.016
At least 1 twin survival at first sonogram post-FLS	104 (97.20%)		59 (95.16%)		0.491
Dual twin survival at first sonogram post-FLS	92 (85.98%)		47 (75.81%)		0.095
Post-laser PPROM	29 (34.12%)		14 (28.57%)		0.508
Post-laser TAPS					0.186
no	84 (79.25%)		52 (83.87%)		
yes	6 (5.66%)		0 (0%)		
not assessed	16 (15.09%)		10 (16.13%)		
GA at delivery (weeks.days)	33w0d [30w2d-34w6d]	80	32w2d [27w6d - 34w1d]	40	0.280
Donor twin survival at discharge*	67 (73.63%)		29 (54.72%)		0.042
At least 1 twin survival at hospital discharge*	75 (82.42%)		40 (75.47%)		0.518
Dual twin survival at hospital discharge*	59 (64.84%)		28 (52.83%)		0.342
Mode of delivery		76		36	0.340
C-section	15 (19.74%)		10 (27.78%)		
Vaginal	61 (80.26%)		26 (72.22%)		
Birthweight discordance (%)	15.0 [5.0-27.0]	57	31.0[11.0-49.0]	23	0.010

*Lost to follow-up: 15 patients (10.42%)
**Categorical values were compared using chi-square or Fisher's exact test and continuous variables were compared using the student t-test or Wilcoxon rank-sum test. Multivariable logistic regression was used

834 | Identifying Optimal Discordance Cutoff for Predicting Donor Survival After Fetosocpic Laser for Twin-Twin Transfusion Syndrome

Manasa G. Rao[1]; Christy Gandhi[1]; Noelle Breslin[1]; Meghan Angley[1]; Rosalie Ingrassia[1]; Lynn L. Simpson[2]; Russell S. Miller[1]
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10:30 AM - 12:30 PM

Objective: An optimal inter-twin discordance cutoff for predicting survival outcomes in monochrionic-diamniotic (MCDA) twin pregnancies is unclear. This study aimed to evaluate the association of inter-twin discordance with donor twin survival after fetosopic laser surgery (FLS) for twin-twin transfusion syndrome (TTTS), and to identify an optimal discordance cutoff.

Study Design: Retrospective review of monochorionic diamniotic (MCDA) twins with TTTS that underwent FLS at a single center from 2009-22. Primary outcome was donor twin survival at first sonogram after FLS. Logistic regression models estimated

association between inter-twin discordance and donor survival at different thresholds. Receiver operating characteristic (ROC) curve analysis was performed to assess predictive accuracy and Youden index was used to determine the optimum cut-point for predictive accuracy.

Results: 169 MCDA pregnancies met inclusion criteria. Discordance cutoffs of ≥25% and ≥30% were significantly associated with donor twin survival at first sonogram post-FLS ($p = 0.03$ and $p < 0.001$, respectively) and this was true after adjusting for donor fetal growth restriction and Quintero stage pre-FLS. In fitting a logistic regression model, discordance as a continuous variable was significantly associated with predicting donor twin survival ($p = 0.02$). The AUC for predicting donor twin survival was 0.63 (95% CI: 0.49, 0.74, $p = 0.060$). Based on the Youden index, the optimum cut point is a discordance of 29%, which has a sensitivity of 0.75, specificity of 0.58, positive predictive value of 0.91 and negative predictive value of 0.29 in predicting donor twin survival.

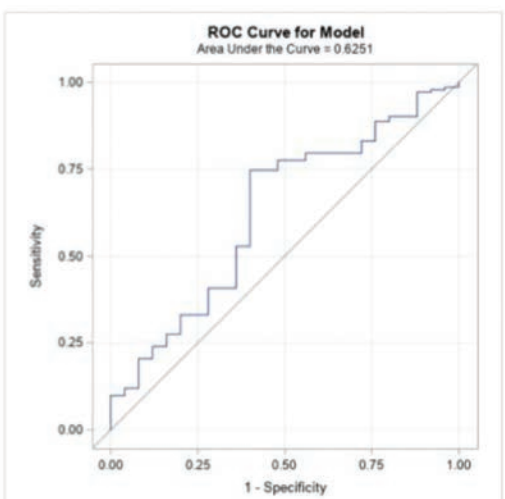
Conclusion: Inter-twin discordance is a poor predictor of donor twin survival after FLS for TTTS. If it is to be considered in clinical practice, a cutoff value of 29% was most predictive of donor twin survival in this cohort.

Table. Performance of different cut-points of discordance as a predictor of donor twin survival

Discordance	Sensitivity	Specificity	PPV	NPV	LR+	LR-
<20% vs. ≥20%	0.43	0.62	0.86	0.16	1.13	0.92
<25% vs. ≥25%	0.66	0.58	0.90	0.23	1.55	0.59
<30% vs. ≥30%	0.78	0.42	0.88	0.26	1.35	0.53
<35% vs. ≥35%	0.89	0.23	0.86	0.27	1.15	0.48

PPV = Positive predictive value
NPV = Negative predictive value
LR = Likelihood ratio

Figure. Model for discordance as a predictor of donor twin survival after FLS



835 | Health System Level Intervention to Decrease Early Screening Rates for Gestational Diabetes: Associated Perinatal Outcomes

Mara Greenberg[1]; Yeyi Zhu[2]; Jun Shan[2]; Amanda Ngo[2]; Monique Hedderson[3]; Charles Quesenberry[2]; Assiamira Ferrara[2]

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10:30 AM - 12:30 PM

Objective: To evaluate a system level intervention intended to decrease rates of gestational diabetes (GDM) screening prior to 24 weeks gestation in relation to perinatal outcomes.

Study Design: Retrospective study of all pregnancies without overt diabetes delivered in Kaiser Permanente Northern California 2018-2022. We performed interrupted time series (ITS) analysis to examine changes in rates of GDM screening and perinatal outcomes in relation to a system-wide intervention to decrease screening < 24 weeks. To reflect the level of exposure to the intervention that started in 4/2020, dates of delivery were categorized in 3 time periods: T1 unexposed (1/2018-3/2020), T2 partially exposed (4/2020-12/2020), and T3 fully exposed (1/2021-12/2022). Primary composite outcome included cesarean delivery, preeclampsia, severe maternal morbidity, large for gestational age neonate, shoulder dystocia, preterm birth, NICU admission, and neonatal hypoglycemia. Patient level factors were examined as potential confounders.

Results: Among 221,068 deliveries, early GDM screening rate decreased from 31.1% in T1, to 20.6% in T2 and 4.3% in T3 (Standardized Mean Difference (SMD) T3 vs T1 -0.75). Patient level characteristics did not vary significantly over time, including measures of social drivers of health and comorbid medical conditions. There was no change in the prevalence of GDM (9.7% in both T1 and T2, 9.0% in T3, SMD T3 vs T1 -0.02). There was no change in the prevalence of the composite primary outcome, which occurred in 43.1% in T1, 44.2% in T2 and 45.2% in T3 (SMD T3 vs T1 0.04). Interrupted time series analysis adjusted for covariates showed no change in risk of the composite outcome during T1 (percent change per 4 weeks [95% CI]): 0.06 [-0.01 to 0.13]), T2 (0.02 [-0.21 to 0.25]), nor T3 (-0.02 [-0.26 to 0.23]). No meaningful changes in prevalence of each individual component of the composite outcome were observed.

Conclusion: A substantial decrease in early GDM screening rate did not impact perinatal outcomes in this large diverse cohort of deliveries within an integrated health care system.

836 | The Illinois Perinatal Syphilis Warmline: A Public Health Initiative to Address the Syphilis Epidemic

Mariana Espinal[1]; Laurie Ayala[2]; Maura Quinlan[3]; Danucha Brikshavana[3]; Irina Tabidze[4]; Helen Cejtin[2]; Nigel Madden[5]; Nkechinyelum Ogu[2]; Stephanie A. Fisher[2]; Lynn M. Yee[2]

[1]for the Eunice Kennedy Shriver National Institute of Child Health and Human Development, Bethesda, MD; [2]Northwestern University Feinberg School of Medicine, Chicago, IL; [3]Illinois Department of Public Health, Chicago, IL; [4]Chicago Department of Public Health, Chicago, IL; [5]Beth Israel Deaconess Medical Center, Boston, MA

10:30 AM - 12:30 PM

Objective: In response to the sharp rise in congenital syphilis (CS) cases in the United States and the complexities of perinatal syphilis management, the Illinois Department of Public Health (IDPH) implemented the first statewide perinatal syphilis clinical support warmline to aid CS prevention. We aimed to evaluate the

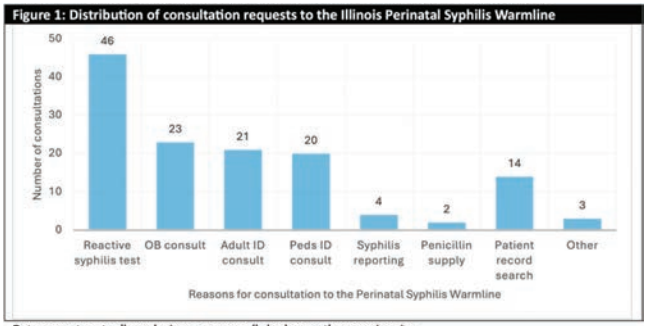
first 9 months of warmline activity and characterize the public health need for perinatal syphilis consultation.

Study Design: The IDPH Perinatal Syphilis Warmline offers remote medical consultation with MFM, adult infectious disease, and pediatric infectious disease experts regarding syphilis diagnosis and treatment during pregnancy and the newborn period, coordinates record searches of prior testing and treatment, and assists in mandatory reporting and linkage to local health department resources. In this prospective cohort study, we performed descriptive analysis of calls to the Warmline from its inception in November 2023 through July 15, 2024.

Results: The Warmline served providers from Chicago (55%), other Illinois areas (40%), and outside Illinois (5%). Of 62 consultations, 53% were from outpatient clinics, 21% from labor and delivery units, and 19% from newborn care units. Consultations were primarily requested by obstetric nurses or nurse practitioners (21%), obstetricians (16%), or pediatricians (16%). Most consultations focused on antepartum (40%) or immediately postpartum (31%) management, mainly due to a reactive syphilis test (Fig. 1). Among 46 consultations for syphilis staging in pregnant or recently postpartum individuals, we identified 2 cases of primary syphilis, 6 early latent, 32 late latent, 4 unknown stage, and 2 false positives (Fig. 2). Among 24 neonatal consultations, by CDC CS surveillance case definitions, 9 were possible CS cases, 8 less likely, 3 unlikely, and 4 unknown (Fig. 2).

Conclusion: This statewide public health initiative has provided critical, timely expertise on diagnosing and managing perinatal syphilis. We offer a blueprint for other public health jurisdictions to adopt this successful model of enhanced public health surveillance and consultation.

Figure 1: Distribution of consultation requests to the Illinois Perinatal Syphilis Warmline



Data are not mutually exclusive, as some calls had more than one inquiry.

Figure 2: Maternal and newborn diagnosis by the Perinatal Syphilis Warmline

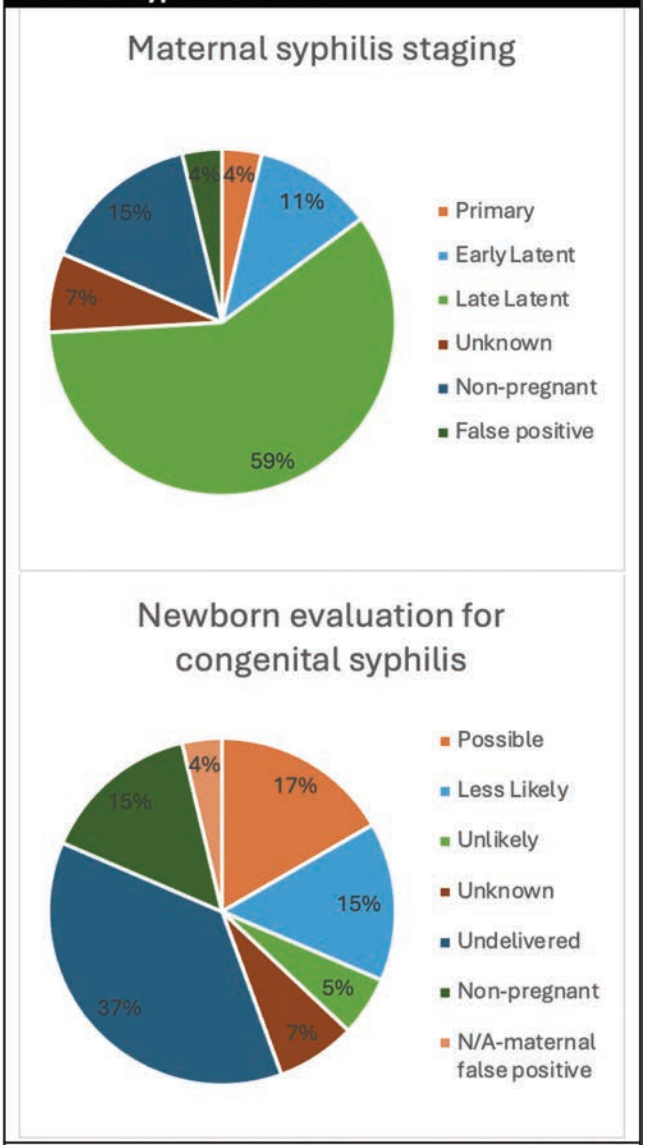


Chart represents 54 consultation requests over a total of 62 calls to the IDPH Perinatal Syphilis Warmline for assistance with maternal syphilis staging and newborn evaluation of CS. Newborn evaluations are described using the Center for Disease Control and Prevention (CDC) Congenital Syphilis scenarios: confirmed proven or highly probable, possible, less likely and unlikely.

837 | Vascular Remodeling of the Maternal Cerebrovascular System

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Université de Sherbrooke, Sherbrooke, PQ

10:30 AM - 12:30 PM

Objective: Pregnancy induces significant changes in the peripheral maternal vasculature, yet whether these changes are also present in the brain is unclear. Magnetic resonance angiography

through Time Of Flight (MRA-TOF) technology allows high-resolution visualization of the cerebral vasculature without the need of contrast agent. The purpose of this study is to investigate maternal intracerebral vessel diameters and intracerebral flow distribution during the third trimester of pregnancy.

Study Design: Five pregnant women experiencing normal pregnancy voluntarily agreed to a MRA-ToF during the third trimester of their pregnancy. The scans took place in 2021 at the Centre Hospitalier Universitaire de Sherbrooke in Fleurimont, Quebec. The images of their main cerebral vasculature were analyzed using an automated software method (eICAB) and compared with 42 non-pregnant women from publicly available database. The mean diameters of each intracerebral vessel forming the Circle of Willis were collected. Statistical standard test was used for comparison.

Results: The mean diameters of the maternal cerebral arteries demonstrated an increase of 23,9% for the internal carotids (4,62 ± 0,2 mm in pregnancy vs 3,73 ± 0,7 mm, p = 0,0001), of 14,8% for the basilar (3,25 ± 0,5 mm vs 2,83 ± 0,6 mm, p = 0,01), of 5,33% for the anterior (2,37 ± 0,1 mm vs 2,25 ± 0,6 mm, p = 0,2) and of 9,4% for the middle cerebral arteries (2,78 ± 0,2 mm vs 2,54 ± 0,7 mm, p = 0,01). However, a decrease of 4,11% was observed in the posterior cerebral artery with diameters of 2,10 ± 0,3 mm vs 2,19 ± 0,4 mm, p = 0,3.

Conclusion: Our preliminary results suggests that most cerebral arteries in the brain slightly dilate during pregnancy. A notable exception is the PCA, which tends to slightly constrict. This may be due to the stimulation of the nervous system in the posterior region, though further study will be needed to confirm these findings.

Overall, these results broaden our understanding of the physiological adaptations of maternal intracerebral vascular flow and distribution during normal pregnancy in the different brain areas.

838 | Financial Benefits of Audacious but Achievable Goals for Improving Maternal and Neonatal Mortality

Mark I. Evans[1]; Gregory F. Ryan[2]; Christian R. Macedonia[3]; David W. Britt[4]; Jaqueline M. Worth[1]; George M. Mussalli[1]; Sean WD Carter[5]; Matthew Kemp[5]; Mahesh A. Choolani[5]; Lawrence D. Devoe[6]

[1]Icahn School of Medicine at Mount Sinai, New York, NY; [2]Ryan Consulting Services, Burlongton, MA; [3]Lancaster MFM, Lancaster, PA; [4]Fetal Medicine Foundation of America, New York, NY; [5]Yong Loo Lin School of Medicine National University of Singapore, Singapore; [6]Medical College of Georgia at Augusta University, Augusta, GA

10:30 AM - 12:30 PM

Objective: The United States has the highest maternal and neonatal mortality rates (MMR, NMR), of High-Income Countries, disproportionately for people of color. Inadequate prenatal care contributes to these outcomes, producing increased neonatal costs and diminished economic contributions having long-term financial consequences < ![if !supportAnnotations] >[MK1]< ![endif] > (FC). Efforts to improve outcomes and reduce disparities have been hampered by laws requiring most states' require balanced budgets. Unfettered economic arguments are required to justify to gov't agencies the long-term benefits of upfront expenditures for better outcomes for mother and babies and resultant financial benefits for individuals and states. We have introduced a new financial metric (DEVELOP score) measuring long-term FC of governmental (gov't) fiscal policies, including the value of maternal and neonatal lives saved vs typical metrics of costs versus social benefits. Herein, we calculated lives saved and FC of even incremental improvements for every US state by improving its MMR and NMR.

Study Design: Using public, vetted national 2021 databases, we ranked MMR and NMR for all US states and DC from best to worst calculating lives saved and FC (by DEVELOP Score) by modeling better care if every state moved up just 1 spot in the state's ranking (i.e., to next highest ranked state's statistics).

Results: Nationally, moving up just 1 spot on a states' rankings saves 451 neonates and 45 mothers generating an annual increased total FC of $504,313,479 (resultant improved economics of $457,149,465 for neonates and $47,164,015 for mothers. Fig 1).

Conclusion: Mixed financial/social benefit constructs have mostly failed to convince the Federal and State gov'ts to invest sufficiently to substantively improve prenatal and neonatal outcomes. By modeling even modest, reachable gains, our approach provides "cover" for bureaucracies to justify a longer- term vision. Instead of focusing exclusively on curbing expenditures, these monies should be considered as investments which will be considerably profitable in the long run.

State (Rank)	NMR Rate per 100	MMR Rate per 100K	Next Best (Rank)	NMR Rate per 100	MMR Rate per 100K	Total Lives Saved	Total Economic Value Created
MS (51)	9.39	59.73	AR (50)	8.59	58.84	28	$ 15,486,650
NC (40)	6.72	29.88	GA (39)	6.25	29.69	56	$ 55,510,353
TX (20)	5.29	38.81	ID (19)	5.13	36.57	69	$ 79,526,035
NJ (4)	3.57	35.47	MA (3)	3.23	35.18	34	$ 35,239,961
United States	5.44	33.32				496	$ 504,313,480

839 | High Rural Water Per- and Polyfluorinated Alkyl Substances (PFAS) Levels and Preeclampsia

Ellie Baltes[1]; Darrin Thompson[1]; Heath A. Davis[2]; Serena Gumusloglu[1]; Hanna Stevens[1]; David Cwiertny[1]; Donna A. Santillan[1]; Mark K. Santillan[1]

[1]University of Iowa, Iowa City, IA; [2]University of Iowa, Institute for Clinical and Translational Science, Iowa City, IA

10:30 AM - 12:30 PM

Objective: Per- and Polyfluorinated Alkyl Substances (PFAS) are synthetic chemicals used in pesticides. PFAS are found in humans with drinking water as the key route of entry. PFAS exposure in human and preclinical models is associated with preeclampsia (PreE). Yet, adequate control for covariates are limited in previous studies. The objective of this study to estimate the effect of PFAS levels in rural populations on the development of PreE.

Study Design: This retrospective cohort study uses a dataset from the Intergenerational Health Knowledgebase (N = 78,726 pregnancies, IRB#20101369) an integrated datamart of all EHR data of maternal, pediatric, and pregnancy care at the University of Iowa Health Care system. Pregnancies from high PFAS (hiP) areas (N = 1880) were identified by zip codes in which the municipal water tested higher than the maximum contaminant level (MCL) for one PFAS chemical as determined by the Iowa Department of Natural Resources. Low PFAS (loP) pregnancies (N = 1602) were identified by zip codes in which the MCL for any PFAS was not exceeded. Baseline characteristics were compared for both groups (alpha = 0.05). Logistic regression models were

constructed to evaluate the association of municipal water PFOS levels and PreE.

Results: Pregnancies from hiP areas in comparison to loP were significantly more rural by RUCA code (36% vs 3%, p< 0.001), had higher obesity rates (48% vs. 35%, p< 0.001), and higher PreE rates (12% vs. 9%, p = 0.014). Rates of diabetes, racial distribution, and rates of adverse neonatal outcomes were similar between the two groups. After controlling for obesity, race, and diabetes diagnosis, hiP pregnancies were associated with higher odds of developing PreE in comparison to loP pregnancies (aOR = 1.4 [1.1-1.8], p = 0.020).

Conclusion: High rural municipal water PFAS levels are associated with a higher odds of developing PreE even after controlling significant covariates. Future studies should investigate PFAS level exposure at the participant level to determine a more granular association with PFAS levels and PreE development.

840 | Hypertensive Diseases of Pregnancy Are Significantly Associated with Development of Long-Term Neonatal Seizures

Mark K. Santillan[1]; Donna A. Santillan[1]; Serena Gumusoglu[1]; Heath A. Davis[2]; Baojian Xue[1]; Grant Tiarks[1]; Brittany Todd[1]; Angela Wong[1]; Vinit Mahajan[3]; Alan Johnson[1]; Polly Ferguson[1]; Elizabeth Newell[1]; Jason Misurac[1]; Alexander Bassuk[1]
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10:30 AM - 12:30 PM

Objective: Hypertensive Diseases of Pregnancy (HDP) are associated with many long term maternal and child neurologic conditions. While neurodevelopmental and psychiatric conditions and maternal seizures are known to be associated with HDP, the relationship to neonatal seizures (NSz) is not well documented given the overall low rate of NSz. Data suggest common vascular mechanisms in HDP and maternal and offspring neuropathology. The objective of this study is to address the hypothesis that HDP is associated with an increased risk of long-term NSz.

Study Design: This case-control study uses a dataset from the Intergenerational Health Knowledgebase (N = 78,726 pregnancies, IRB#20101369) an integrated datamart of all short-term and long-term EHR data of maternal, pediatric, and pregnancy care at the University of Iowa Healthcare (UIHC) system. A composite case definitions of NSz (G40, R56, P90, R25.9, R40.4) and HDP (O10-11, 13-14, 16, I 10,15) were constructed using ICD-10 codes. Baseline characteristics were compared between cases and controls (alpha = 0.05). Logistic regression models were constructed to evaluate the association between the development of NSz ad HDP.

Results: NSz pregnancies (N = 1370) exhibited significantly higher rates of maternal BMI >40 (16% vs. 12%, p< 0.001), adverse neonatal outcomes (ANO, 59% vs. 35%, p< 0.001), HDP (37% vs. 33%, p< 0.001) in comparison to controls (N = 34297). NSz and control pregnancies had similar gestational ages at delivery (37.7 ± 31.6 vs. 38.1 ± 25.6 weeks, p = 0.571). After controlling for age, gravida, BMI, diabetes in, and race, pregnancies affected by HDP are at higher odds of developing subsequent seizures in the offspring (aOR = 1.132 [1.003-1.278], p = 0.045).

Conclusion: Although overall incidence of NSz is low, our data demonstrate a clear association of a high risk of long-term NSz in neonates born from pregnancies affected by HDP. Further studies should be directed at the human and preclinical shared mechanisms that link hypertensive diseases during pregnancy and neuropathology.

841 | The Association Between Maternal Comorbidity Burden and Severe Neonatal Morbidity

Matthew J. Blitz[1]; Insaf Kouba[2]; Ji Yoon Lee[1]; Annemarie Stroustrup[1]
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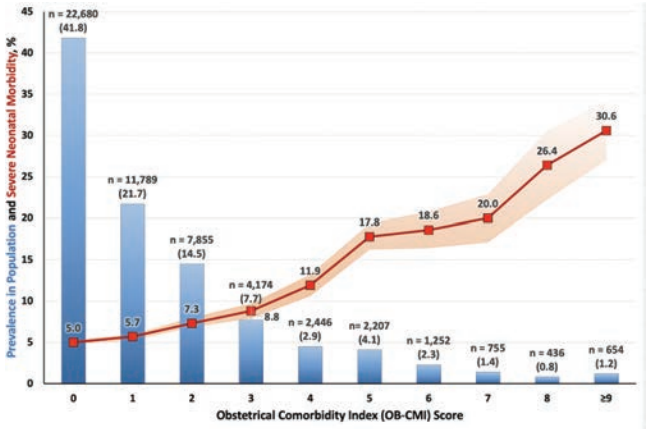
10:30 AM - 12:30 PM

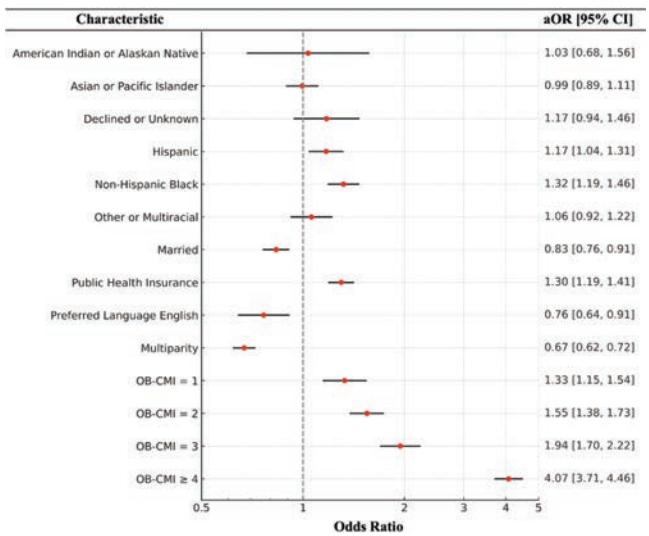
Objective: To determine the association between maternal comorbidity burden and severe neonatal morbidity (SNM), and to evaluate whether racial and ethnic group differences help to explain any disparities in outcomes.

Study Design: This was a retrospective cohort study of all deliveries at ≥23 weeks gestational age at two tertiary hospitals in New York from 2019-2022. Exclusion criteria were fetal demise and multiple gestation. The primary exposure was obstetric comorbidity index (OB-CMI) score, calculated at admission for delivery. This score is based on 24 weighted comorbidity indicators identified by ICD-10 codes and clinical documentation. Covariate factors assessed included race and ethnicity, health insurance, marital status, parity, and preferred language. The primary outcome was SNM, a composite neonatal adverse outcome indicator which includes pre-determined diagnoses and procedures. Multivariable logistic regression was used to model the probability of SNM as a function of OB-CMI score group, while adjusting for covariate factors.

Results: A total of 54,248 patients were included. Non-Hispanic White patients constituted the largest race and ethnicity group (42.8%), followed by Asian or Pacific Islander (18.7%), Non-Hispanic Black (14.5%), and Hispanic (12.2%). The overall SNM rate was 7.6% (n = 4,127). SNM increased from 5% among patients with an OB-CMI score of zero to greater than 30% when OB-CMI scores were 9 or more (Figure 1). Results of regression modeling are presented in Figure 2. Each successive OB-CMI group had an increased odds of SNM, and patients with OB-CMI ≥4 had more than 4 times greater odds of SNM compared to patients with an OB-CMI = 0. Non-Hispanic Black patients and Hispanic patients were at increased risk for SNM compared to non-Hispanic White Patients.

Conclusion: OB-CMI score is positively correlated with SNM. Racial and ethnic disparities in SNM were observed. Future studies should assess if these differences can be better explained by social determinants of health, environmental exposures, genetics, and nutrition.





842 | The use of a Fetal Pillow Device at Full Dilation Cesarean Delivery

Maya Ronen[1]; carmel porat[2]; moshe betser[3]; lee Segev[2]
[1]Shamir Medical Center, Shamir medical Center, HaMerkaz; [2]Shamir Medical Center, Beer Yaacov, HaMerkaz; [3]Shamir Medical Center, beer yaacov, HaMerkaz

10:30 AM - 12:30 PM

Objective: Impacted fetal head at full dilation cesarean delivery (CD) is a major cause of adverse maternal and neonatal outcomes. The Fetal Pillow is a device designed to reduce these complications. Our study aims to evaluate the outcomes of full-dilation CD with and without the use of Fetal Pillow.

Study Design: This retrospective cohort study included full-dilation CDs performed from January 2018 to July 2023, at a single tertiary center. Indications for CDs were arrest of decent, fetal distress and failed vacuum extraction. The study cohort included cases (Fetal Pillow group) matched to controls (without the use of Fetal Pillow) according to the indication to CD, in a 1: 2 ratio. The study evaluated maternal outcomes such as uterine incision extensions, maternal blood loss (ml), maternal postoperative infection and postoperative length of stay (days). Neonatal outcomes included NICU admissions, cord arterial blood pH, Apgar scores, respiratory distress, birth trauma, and encephalopathy.

Results: The study cohort included a total of 138 patients who underwent CD at full dilation. Among them, 46 were in the Fetal Pillow group, and 92 were controls. There were no significant differences between the groups in maternal characteristics such as age, BMI, previous CDs and obstetrics complications. There were also no differences between the groups in the rate of uterine extensions, maternal blood loss, postoperative infection or postoperative length of stay . The fetal pillow group had a lower rate of neonatal NICU admissions compared to the controls (17.3% versus 33.7%, respectively, p = 0.04). There were no differences between the groups in any other fetal outcomes.

Conclusion: The use of Fetal Pillow for impacted fetal head during full dilation CDs was not associated with any maternal complications. The use of Fetal Pillow may reduce NICU admissions.

843 | Chronic Hypertension: Timing of Delivery and Associated Morbidity

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10:30 AM - 12:30 PM

Objective: The American College of Obstetricians and Gynecologists (ACOG) recommends delivery for uncomplicated chronic hypertension (cHTN) at 37w0d-39w6d. We assessed delivery timing for cHTN and its association with cesarean birth, severe maternal morbidity (SMM), and severe neonatal morbidity (SNM) in a quality collaborative.

Study Design: Retrospective cohort study of nulliparous term singleton vertex births across 71 hospitals using clinically abstracted values from the Obstetrics Initiative, a quality collaborative supported by Blue Cross Blue Shield of Michigan and Blue Care Network. We included births complicated by cHTN from 01/2020 to 12/2023. The exposure was week of delivery and outcomes were cesarean rate, SMM (Centers for Disease Control definition), and SNM (unexpected complications in term newborns, PC-06). Adjusted odds ratios (aOR) were calculated with generalized linear mixed models with hospital random effects (to control for clustering) and adjustment for age, body mass index, diabetes, substance use, and social vulnerability index. A sensitivity analysis excluding 37-week deliveries was performed to assess delivery timing with assumption of better controlled cHTN at later gestational age.

Results: Among 3963 (3.6%) births with cHTN, delivery occurred at 37 (31.1%), 38 (33.8%), 39 (25.4%), and 40+ weeks (9.7%). Compared to 37 weeks, cesarean was lower at 38 (aOR 0.79, 95% CI 0.75-0.84) and higher at 40+ (aOR 1.15, 95% CI 1.10-1.21). SMM and SNM were lower at all gestational weeks compared to 37 weeks (**Table 1**). In the sensitivity analysis SMM was lower (aOR 0.92, 95% CI 0.92-0.93) and SNM was higher (aOR 1.02, 95% CI 1.02-1.02) in births at 39+ weeks versus those at 38 weeks with no difference in cesarean (aOR 0.92, 95% CI 0.82-1.15).

Conclusion: Almost 10% of patients with cHTN delivered at 40+ weeks, outside ACOG recommendations for cHTN. Delivery at 37 weeks is associated with morbidity that is likely related to severity of cHTN or superimposed preeclampsia. If delivery is not

indicated at 37 weeks, there was no clear benefit of delivery at 38 vs. 39 weeks.

Table 1: Risk Adjusted Model Summary Outcome

Gestational weeks	OR	CI	P value
Reference: 37 gestational weeks			
Cesarean			
38	0.79	[0.75, 0.84]	<0.01
39	0.95	[0.91, 1]	0.05
40+	1.15	[1.1, 1.21]	<0.01
SMM			
38	0.82	[0.72, 0.95]	0.01
39	0.80	[0.71, 0.9]	<0.01
40+	0.88	[0.78, 1]	0.04
SNM			
38	0.56	[0.56, 0.63]	<0.01
39	0.57	[0.52, 0.63]	<0.01
40+	0.66	[0.61, 0.73]	<0.01

844 | Corticosteroid Impact on Umbilical Artery Dopplers in Fetal Growth Restriction Pregnancies: Systematic Review and Meta-Analysis

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10:30 AM - 12:30 PM

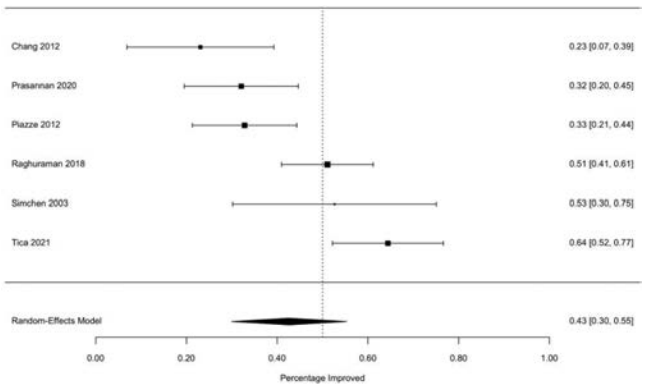
Objective: Current guidelines recommend the administration of antenatal corticosteroids (ACS) for pregnancies with fetal growth restriction (FGR) and abnormal umbilical artery Doppler (UAD) velocimetry. This systematic review examined the change in UAD after the administration of ACS in pregnancies complicated by FGR and any associations with perinatal outcomes.

Study Design: Seven electronic databases (PubMed, Cochrane Library, OVID Medline, Global Index Medicus, Scopus, Google Scholar and Embase) were searched from 1980 to May 2024 using MESH-terms for studies in English. Eligible studies provided a FGR definition and documentation of UAD prior to and after ACS administration. All studies were independently evaluated following PRISMA guidelines. Risk of bias was assessed via the ROBIN-I tool. Meta-analysis was conducted using the metafor package for R.

Results: A total of 13 studies were included with a total of 585 pregnancies. Six studies reported changes in end-diastolic flow (EDF) while 7 studies reported on pulsatility index (PI). Baseline PI decreased from 2.06 (95% CI, 1.63-2.49) to 1.78 (95% CI, 1.39-2.17) after administration of ACS, but subsequently returned to a baseline PI of 2.00 (95% CI, 1.56-2.43) at time of final Doppler evaluation. In studies evaluating EDF, 44% (95% CI, 33-55%) of patients showed improvement. Patients with improvement in EDF were found to have a lower rate of perinatal mortality compared to persistent absent or reversed EDF (6% vs. 12%).

Conclusion: Evidence suggests that UAD assessment after administration of ACS in fetuses with FGR may result in a transient change in UAD. Improvement of UAD after ACS may prognosticate more favorable perinatal outcomes. This systematic review and meta-analysis did highlight that the studies evaluating UAD changes in pregnancies affected by FGR are inconsistent in the metrics used to evaluate these changes. A set of standardized metrics is necessary for reporting ultrasound changes and perinatal outcomes in studies of Doppler changes following ACS in pregnancies affected by FGR.

Study	Chang 2012	Piazze 2012	Prasannan 2020	Raghuraman 2020	Simchen 2003	Tica 2021	Total
Total patients (n)	26	64	53	94	19	59	315
Improved EDF n (%)	6 (23)	21 (33)	17 (32)	48 (51)	10 (53)	38 (64)	140 (44)
perinatal death n (%)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8 (21)	8 (6)
Persistent abnormal EDF n (%)	20 (77)	43 (67)	36 (68)	46 (49)	9 (47)	21 (36)	175 (56)
perinatal death n (%)	5 (25)	1 (2)	6 (17)	0 (0)	2 (22)	7 (33)	21 (12)



845 | Leveraging Pharmacogenomic Data for Methadone Dosing in Pregnancy

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10:30 AM - 12:30 PM

Objective: Opioid use disorder (OUD) in pregnancy remains a significant cause of maternal/infant morbidity in the United States, making appropriate OUD treatment in pregnancy critical. Pregnancy increases methadone metabolism, and studies in non-pregnant adults demonstrate that CYP2B6 genetic variants are associated with altered methadone metabolism. Current protocols for methadone management in pregnancy do not take into consideration the potential impact of CYP2B6 phenotype, and data on how CYP2B6 phenotype impacts methadone dosing in pregnancy are lacking.

Study Design: This is a prospective study of pregnant patients with OUD admitted for inpatient methadone stabilization. Methadone stabilization followed a standardized protocol involving withdrawal assessments every four hours, as-needed methadone doses based on withdrawal scores, and daily dose increases until stability. Participants underwent sampling for a pharmacologic study, collection of medical history and details of dosing through hospitalization, and CYP2B6 genotyping. CYP2B6 phenotype was characterized as either rapid metabolizer or not (slow, intermediate or normal). Primary outcome was final dose at discharge.

Results: Of N = 40 enrolled, 29 had successful genotyping (Table 1), and 3/29 (10%) were rapid metabolizers. Rapid metabolizers had a higher mean dose at discharge, although this was not statistically significant (177+/-90mg vs 125mg +/-75mg, mean difference 52mg (-43mg to 147mg), p = 0.27). These results were results similar when restricted to participants in the 2nd trimester. Two patients who were rapid metabolizers left against medical advice prior to stable dose. The last dose they received was used for analysis.

Conclusion: Pregnant patients treated for OUD with a CYP2B6 rapid metabolizer phenotype had a trend toward a higher mean dose of methadone than non-rapid metabolizers; although our cohort was underpowered for statistical significance. This may support an impact of CYP2B6 genotype on methadone systemic exposure, which has implications for optimizing dosing protocol in pregnancy.

Table 1. Patient Demographics and Associated Methadone Stable Dose by Metabolizer Status

	Rapid Metabolizer[1] (N=3)	Non-Rapid Metabolizer[2] (N=26)	p-value
Race White Black Asian Other	 2 (57%) 1 (33%) 0 (0%) 0 (0%)	 16 (62%) 7 (27%) 0 (0%) 3 (12%	 0.82
Ethnicity Non-Hispanic Hispanic	 3 (100%) 0 (0%)	 24 (92%) 2 (8%)	 0.62
Trimester at admission 1st 2nd 3rd	 0 (0%) 3 (100%) 0 (0%)	 7 (27%) 12 (46%) 7 (27%)	 0.21
Maternal age	34.0±2.5	32.1±5.5	0.57
Maternal BMI	25.1±1.5	26.5±5.9	0.70
Methadone dose at discharge mean±SD	177±90mg	125mg ±75mg	0.27 MD 52mg (-43mg to 147mg)
Methadone dose at discharge (2nd trimester only) mean±SD	177±90mg	110±85mg (n=12)	0.25 MD 67mg (-52-187)

Data presented as N(%) or mean±standard deviation. MD: mean difference by independent sample t-test

1 Rapid Metabolizer Diplotypes included *1/*4 and *1/*22
2 Non-Rapid Metabolizer Phenotypes included normal metabolizers, poor metabolizers, and intermediate metabolizers

846 | Prolonged Second Stage: How Does Obesity Influence Likelihood of Successful Vaginal Delivery?

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10:30 AM - 12:30 PM

Objective: In 2024, ACOG revised clinical guidelines supporting the definition of a prolonged second stage labor as ≥ 3 hours. We sought to evaluate the difference in vaginal delivery rate for nulliparous patients with a singleton, term, vertex fetus (NTSV) with prolonged second stage between those with and without obesity.

Study Design: A retrospective cohort study of NTSV patients with a prolonged second stage of labor (≥ 3 hours) delivered at a single tertiary care hospital from 6/1/2023-12/31/2023. Obesity was defined as body mass index (BMI) ≥30 kg/m^2 at delivery. The primary outcome was vaginal delivery and secondary outcomes were select maternal and neonatal morbidities. Categorical variables were compared using Chi square, Fisher's exact and normally distributed continuous variables using Student's T test, as appropriate. Multivariable logistic regression was used to adjust for confounders.

Results: 173 patients with a prolonged second stage were included, 99 (57.2%) without obesity and 74 (42.8%) with obesity. Patients with obesity were more likely to have hypertension (p = 0.04) and hypertensive disorders of pregnancy (p = 0.02), as well as utilize oxytocin in the second stage (p = 0.04). 94 (94.9%) patients without obesity achieved a vaginal delivery compared to 62 (83.8%) with obesity (RR 0.88, 95% CI 0.67-0.98). After adjusting for confounders and compared to patients without obesity, patients with obesity were noted to have an adjusted relative risk of 0.81 (95% CI 0.54-0.96) for vaginal delivery. There was no difference between the groups with regard to operative vaginal delivery and maternal and neonatal morbidities. These findings persisted after adjusting for confounders.

Conclusion: While patients with obesity had a lower likelihood of vaginal delivery after a prolonged second stage compared to patients without obesity, both groups were overall highly successful in delivering vaginally and no differences in likelihood for select maternal or neonatal complications occurred. These findings may aid in counseling patients with a prolonged second stage.

Table 1: Baseline demographics between NTSV patients without obesity and with obesity

	BMI <30 (n=99)	BMI ≥30 (n=74)	P-value
Age (years)	29.94 (6.07)	28.33 (6.10)	0.09
Patient-reported ethnicity			0.03
Non-Hispanic/Latina	46 (46.5)	23 (31.1)	
Hispanic/Latina	50 (50.5)	51 (68.9)	
Other	3 (3.0)	0	
Patient-reported race			0.42
White	43 (43.4)	35 (47.3)	
Black	2 (2.0)	3 (4.0)	
Asian	14 (14.1)	6 (8.1)	
Hawaiian/Pacific Islander	1 (1.0)	3 (4.0)	
Other/unknown	39 (39.4)	27 (36.5)	
Co-morbid conditions			
Hypertension	1 (1.0)	6 (8.1)	0.04
Hypertensive disorder of pregnancy	10 (10.0)	18 (24.3)	0.02
Gestational diabetes	3 (3.0)	5 (6.7)	0.29
Pre-gestational diabetes	0	0	-
Autoimmune disorder	0	1 (1.35)	0.43
Thyroid disorder	6 (6.0)	0	0.04
Substance use disorder	2 (2.0)	1 (1.35)	1.00
Other	6 (6.0)	5 (6.7)	1.00
Gestational age on admission (weeks)	39.7 (1.0)	39.7 (1.1)	0.80
Admission type			0.07
Spontaneous/Augmented	62 (62.6)	36 (48.6)	
Induced	37 (37.4)	38 (51.40	
Estimated fetal weight on admission (grams)	3327.3 (302.5)	3313.8 (292.6)	0.80
Chorioamnionitis	19 (19.2)	17 (22.9)	0.54
Oxytocin use in 2nd stage	65 (65.6)	59 (79.3)	0.04

*Data presented as N (%) or mean (standard deviation).

Table 2: Relative risk for primary and secondary outcomes between NTSV patients without obesity and with obesity

	BMI <30 (n=99)	BMI ≥30 (n=74)	RR	aRR
Vaginal delivery	94 (94.9)	62 (83.8)	0.88 (0.67-0.98)	0.81 (0.54-0.96)
Operative vaginal delivery	37 (37.4)	30 (40.5)	1.08 (0.72-1.50)	0.98 (0.62-1.41)
Maternal Morbidity				
3rd degree laceration	3 (3.0)	6 (8.1)	2.67 (0.69-10.34)	2.74 (0.68-9.19)
4th degree laceration	2 (2.0)	0	-	-
PPH	2 (2.0)	2 (2.7)	1.34 (0.19-9.28)	1.60 (0.22-10.00)
Transfusion	0	2	-	-
UAE	0	0	-	-
Ex lap	0	0	-	-
Hysterectomy	0	0	-	-
Endometritis	2 (2.0)	0	-	-
ICU admission	1 (1.0)	0	-	-
5-minute Apgar <7	2 (2.0)	2 (2.7)	1.33 (0.19-9.27)	1.14 (0.15-71)
NICU admission	5 (5.0)	5 (6.7)	1.33 (0.41-4.45)	1.33 (0.38-4.17)

*Adjusted for chronic hypertension, hypertensive disorders of pregnancy, and oxytocin use in second stage of labor. Abbreviations: BMI, body mass index; RR, relative risk; aRR, adjusted relative risk; PPH, postpartum hemorrhage; UAE, uterine artery embolization; ex lap, exploratory laparotomy; ICU, intensive care unit; NICU, neonatal intensive care unit.

847 | Perinatal Outcomes in Pregnant Patients with a History of Migraine Headaches

Megha Arora; Bharti Garg; Aaron B. Caughey
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10:30 AM - 12:30 PM

Objective: To examine maternal and neonatal outcomes among pregnant patients with and without a history of migraine headaches.

Study Design: We conducted a retrospective cohort study of births in the state of California from 2008-2020 to compare perinatal outcomes between those with and without history of migraine headaches. Singleton, non-anomalous deliveries at 23-42 weeks of gestation were used. Outcomes included gestational hypertension, preeclampsia, severe maternal morbidity (SMM), preterm birth (< 37 weeks), NICU admission, and respiratory distress syndrome (RDS). We performed multivariable logistic regression controlling for age, race/ethnicity, education, pre-pregnancy BMI, parity, and insurance status to estimate adjusted odds ratios (aOR) with 95% confidence intervals.

Results: In the cohort of 5,065,732 individuals, there were 48,518 (0.96%) individuals with history of migraines. There were higher rates of migraines among those who were white, highly educated, and privately insured. On multivariable regression, those with migraines had higher odds of gestational hypertension (7.1% vs 3.4%; aOR 1.75, 95% CI 1.69-1.82), preeclampsia (6.7% vs 3.8%; aOR 1.70, 95% CI 1.64-1.76), SMM (2.0% vs 1.2%; aOR 1.71, 95% CI 1.61-1.83), preterm delivery (8.8% vs 6.4%; aOR 1.45, 95% CI 1.40-1.50), and neonatal RDS (4.5% vs 2.3%; aOR 1.75, 95% CI 1.67-1.83).

Conclusion: In this large cohort of pregnant patients, those with a history of migraines were more likely to experience adverse perinatal outcomes, despite the presence of multiple protective social determinants with respect to socioeconomic status and experience of racism. This signals that there may be physiologic or structural vulnerabilities among individuals with migraines contributing to adverse outcomes during pregnancy which require further characterization.

Table 1. Proportions and adjusted odds ratios for adverse outcomes in patients with and without a history of migraines in California (2008-2020)

	No history of migraines	History of migraines	P*	aOR (95% CI)**
Gestational hypertension	3.4%	7.1%	<0.001	1.75 (1.69-1.82)
Preeclampsia	3.8%	6.7%	<0.001	1.70 (1.64-1.76)
Severe maternal morbidity (SMM)	1.2%	2.0%	<0.001	1.84 (1.72-1.96)
Preterm birth <37 weeks	6.4%	8.8%	<0.001	1.45 (1.40-1.50)
Respiratory distress syndrome	2.3%	4.5%	<0.001	1.75 (1.67-1.83)

*Chi-square test
**Adjusted for maternal race and ethnicity, age, education, pre-pregnancy BMI, insurance and parity.

848 | Association of Interpregnancy Interval and Perinatal Outcomes Among Individuals with History of Pprom

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10:30 AM - 12:30 PM

Objective: To examine the association of interpregnancy interval with adverse perinatal outcomes among individuals with a history of preterm prelabor rupture of membranes (PPROM).

Study Design: This was a retrospective cohort study of two consecutive births in California between 2008-2020 among patients with a history of PPROM in the index pregnancy. Interpregnancy interval (IPI) was categorized as < 12 months, 12-23 months, 24-35 months, 36-59 months, and ≥60 months. Outcomes included gestational hypertension, preeclampsia, preterm birth (< 37 weeks), severe maternal morbidity (SMM), and primary cesarean delivery. Chi squared and multivariable logistic regression were used for statistical analysis.

Results: In our cohort of 15,271 individuals with a history of PPROM in an index pregnancy, 3,299 (21.6%) had a short IPI (< 12 months) and 1,537 had a long IPI (≥60 months). As compared to IPI of 12-23 months, pregnancies with IPI< 12 months had greater odds of preterm birth (24.10% vs 19.54%; aOR 1.22, 95% CI 1.09-1.37), SMM (1.52% vs 0.86%; aOR 1.58, 95% CI 1.03-2.43), and primary cesarean delivery (11.3% vs 9.26%; aOR 1.28, 95% CI 1.08-1.53). Pregnancies with IPI≥60 months also had increased odds of adverse outcomes including preeclampsia (6.57% vs 3.63%; aOR 1.66, 95% CI 1.28-2.15), preterm birth (24.20% vs 19.54%; aOR 1.22, 95% CI 1.06-1.41), SMM (1.95% vs 0.86%; aOR 1.85, 95% CI 1.12-3.03), and primary cesarean (13.63% vs 9.26%; aOR 1.45, 95% CI 1.17-1.80).

Conclusion: Both short (< 12 months) and long (≥60 months) IPIs were associated with adverse perinatal outcomes among patients with a history of PPROM. These findings highlight the importance of counseling those with PPROM in a prior pregnancy on optimal pregnancy timing to mitigate risks in subsequent pregnancies.

Table 1. Unadjusted rates of perinatal outcomes associated with interpregnancy intervals among pregnant patients with a history of PPROM

	<12 months N=3,299	12-23 months N=4,764	24-35 months N=2,903	36-59 months N=2,768	≥60 months N=1,537	p-value*
Gestational hypertension	2.58%	3.46%	4.27%	4.23%	4.55%	<0.001
Preeclampsia	3.73%	3.63%	4.41%	5.49%	6.57%	<0.001
Preterm birth (<37 weeks)	24.10%	19.54%	21.25%	22.33%	24.20%	<0.001
SMM	1.52%	0.86%	0.96%	1.34%	1.95%	0.003
Primary cesarean	11.3%	9.3%	10.0%	13.2%	13.6%	<0.001

*Chi-squared analysis

Table 2. Multivariable analyses of perinatal outcomes associated with interpregnancy intervals among pregnant patients with a history of PPROM

	<12 months aOR (95% CI)	12-23 months aOR (95% CI)	24-35 months aOR (95% CI)	36-59 months aOR (95% CI)	≥60 months aOR (95% CI)
Gestational hypertension	0.79 (0.61, 1.03)	*reference*	1.24 (0.97, 1.57)	1.25 (0.97, 1.59)	1.29 (0.95, 1.73)
Preeclampsia	0.97 (0.76, 1.23)	*reference*	1.19 (0.94, 1.50)	1.42 (1.13, 1.78)**	1.66 (1.28, 2.15)**
Preterm birth (<37 weeks)	1.22 (1.09, 1.37)**	*reference*	1.10 (0.98, 1.24)	1.15 (1.02, 1.30)**	1.22 (1.06, 1.41)**
SMM	1.58 (1.03, 2.43)**	*reference*	1.04 (0.63, 1.70)	1.38 (0.88, 2.18)	1.85 (1.12, 3.03)**
Primary cesarean delivery	1.28 (1.08, 1.53)**	*reference*	1.07 (0.89, 1.29)	1.43 (1.20, 1.72)**	1.45 (1.17, 1.80)**

aOR - Adjusted Odds Ratio, CI - Confidence Interval
*Adjusted for maternal age, race/ethnicity, insurance status, educational attainment, number of prenatal care visits, and smoking status
**Significant 95% confidence interval

849 | Preconception Hormone Levels are Associated with Preterm Birth and Measures of Maternal Stress and Mood

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10:30 AM - 12:30 PM

Objective: Chronic stress during pregnancy has been associated with adverse pregnancy outcomes (APOs) including preterm birth (PTB). In addition, progesterone is crucial in the maintenance of pregnancy and deficiency can increase the risk of miscarriage and PTB. Assessment of hormone levels in human hair provides a stable, non-invasive measurement of chronic hormonal activity. Our objective was to determine the association between preconception maternal hair cortisol and progesterone levels and APOs.

Study Design: Preconception hair hormone levels (HHLs), mood, and APOs were evaluated in participants who were part of a larger prospective cohort study during which maternal hair was cut 3 times during pregnancy: around 16 weeks, 28 weeks, and delivery. As the proximal 1cm of hair from the scalp represents ~one preceding month of hair growth, segments longer than 3 cm at 16 weeks were considered to represent the preconception period. HHLs were analyzed using mass spectrometry. Participant data was collected via chart review and interview. Our primary outcome was the relationship between preconception HHLs and delivery < 37 weeks (PTB). Secondary outcomes included: pre-eclampsia/PIH (PREE) and maternal mood questionnaires including the State-Trait Anxiety Inventory (STAI), Center for Epidemiologic studies-depression scale (CESD). Data were analyzed using Spearman correlations, $p < 0.05$ considered significant.

Results: Of 163 participants, 110 and 34 participants had preconception cortisol and progesterone HHLs available for analysis, respectively. Correlations were noted between cortisol and PTB ($r = 0.20$, $p = 0.04$) and progesterone and STAI and CESD scores ($r = 0.34$, $p = 0.03$ and $r = 0.33$, $p = 0.042$). Additional correlations ($p > 0.05$) included positive relationships between cortisol and: PREE and CESD score at all gestational ages.

Conclusion: Higher preconception cortisol is correlated with higher risk of PTB and higher preconception progesterone correlates with depression and anxiety. These data improve our understanding of the complex relationships between preconception stress, mood, and pregnancy outcomes.

850 | Can Remote Blood Pressure Monitoring Reduce Racial Disparities in Outcomes Among Postpartum Patients with Hypertension?

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10:30 AM - 12:30 PM

Objective: Remote self-measured blood pressure (SMBP) monitoring programs have been shown to reduce racial inequity in postpartum blood pressure ascertainment. However, their effect on disparities in healthcare utilization and severe maternal morbidity (SMM) is less clear. We aimed to compare outcomes between participants in our remote SMBP program who self-identified as Black versus non-Hispanic White.

Study Design: Postpartum individuals with hypertension (HTN) at our tertiary hospital are offered enrollment in our remote SMBP program. For this analysis, participants who did not self-identify as Black or non-Hispanic White were excluded. The primary outcome was a composite of HTN-related postpartum readmission or ED visit within 30 days of delivery. Secondary outcomes were individual components of the primary composite, HTN-related SMM, and anti-hypertension medication initiation or titration. A log-link binomial generalized linear model was used to estimate relative risks (aRR) adjusting for potential confounders.

Results: Among 2003 participants in the SMBP program from 2022 - 2024, 1363 met inclusion criteria. Of these, 988 (49.3%) self-identified as non-Hispanic White and 375 (18.7%) as Black. Compared to non-Hispanic White participants, Black participants were younger, and more likely to have public insurance and gestational HTN (**Table 1**). After adjusting for these factors, there was no significant difference in the composite of HTN-related postpartum readmission or ED visit between Black and non-Hispanic White participants (19.2% vs 16.7%; aRR 1.29, 95% CI 0.98, 1.69). Risk of HTN-related readmission alone was significantly higher among Black participants (12.2% vs 9.9%; aRR 1.48, 95% CI 1.03, 2.11). There was no significant difference in HTN-related SMM (12.5% vs 11.7%; aRR 1.00, 95% CI 0.72, 1.42). There was also no difference in anti-hypertensive medication initiation or titration (**Table 2**).

Conclusion: Our remote SMBP program for postpartum patients with HTN eliminated racial disparities in overall HTN-related healthcare utilization and HTN-related SMM.

Table 1: Demographics of participants

Variable	Black (n=375)	Non-Hispanic White (N= 988)	P value
Age	32 (29, 36)	31 (26, 35)	**0.001**
Primary insurance type			**<0.001**
Private	127 (33.9)	732 (74.2)	
Medicaid/Medicare	245 (65.3)	250 (25.4)	
None	3 (0.8)	4 (0.4)	
Hypertension diagnosis prior to delivery			
Gestational hypertension	82 (21.9)	318 (32.2)	**0.0002**
Preeclampsia with severe features	75 (20.0)	202 (20.5)	0.88
Preeclampsia without severe features	37 (9.9)	124 (12.6)	0.19
Chronic HTN with superimposed preeclampsia	28 (7.5)	56 (5.7)	0.26
Eclampsia	0 (0.0)	3 (0.3)	0.56
Chronic HTN alone	63 (16.8)	128 (13.0)	0.08
Gestational age (weeks) at delivery	37.9 (36.6, 39.3)	38.3 (36.6, 39.3)	0.09
Mode of delivery			0.46
Vaginal	188 (50.5)	470 (48.2)	
c-section	184 (49.5)	506 (51.8)	
Postpartum day of discharge	3 (2, 4)	3 (2, 4)	0.92

Data presented as n (%) or median (interquartile range)

Table 2: Primary and Secondary Outcomes

	Black (n=375)	Non-Hispanic White (N= 988)	P value	Relative Risk (95% CI)	Adjusted RR (95% CI)
Primary Outcome					
Composite of hypertension-related ED visit or Hospital Readmission	71 (19.2)	162 (16.7)	0.29	1.15 (0.89, 1.48)	1.29 (0.98-1.69)
Secondary Outcomes					
ED visit for hypertension	69 (18.7)	161 (16.6)	0.37	1.13 (0.87, 1.45)	1.26 (0.96, 1.65)
Hospital readmission for hypertension	45 (12.2)	96 (9.9)	0.23	1.23 (0.88-1.72)	**1.48 (1.03, 2.11)**
Hypertension-related severe maternal morbidity	47 (12.5)	116 (11.7)	0.71	1.06 (0.78, 1.47)	1.00 (0.72, 1.42)
Anti-hypertensive medication initiation or titration	117 (31.3)	296 (30.5)	0.79	1.03 (0.86, 1.23)	1.07 (0.88, 1.30)

851 | Should Fasting Blood Glucose Value on the Ogtt be Incorporated Into Initial Gestational Diabetes Counseling?

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10:30 AM - 12:30 PM

Objective: Hypoglycemic agents are used to optimize glycemic control in the treatment of GDM.The aim of this study was to assess the predictability of the fasting blood glucose value(FBS) on the OGTT in predicting the need for hypoglycemic agents in patients with GDM.

Study Design: This study was a single-center retrospective cohort study of singleton pregnancies with GDM between 2018-2023.Diagnosis was made by Carpenter-Coustan(CC) criteria.Initial management involved dietary and lifestyle modifications, with hypoglycemic agents introduced if blood glucose values were above threshold(FBS > 90mg/dl, 2hpp > 120mg/dl or 1hpp > 140mg/dl).Receiver operating characteristic curves(ROC) were generated to determine predictability of FBS on the OGTT for the need for hypoglycemic agents.Predictability of FBS on OGTT was evaluated using the clinical cut-off values of 81mg/dl(based on the Youden's Index),95mg/dl(based on CC) and 105mg/dl(based on NDDG). Sensitivity, specificity, positive and negative predictive values were calculated.

Results: 1,407 patients diagnosed with GDM, 567(40%) were prescribed hypoglycemic agents. There was a statistically significant difference between patients that required hypoglycemic agents in regards to age, BMI, race, and history of GDM.FBS on OGTT was predictive of need for hypoglycemic agents based on the ROC curve with an AUC of 0.76 (95% CI 0.74-0.79), indicating a 76% chance that FBS on GTT can distinguish between patients who did and did not need hypoglycemic agents(Figure 1). The value with the highest Youden's Index was 81mg/dl.A cut-off value of 95mg/dL had the highest positive predictive value(PPV); of women who had ≥ 95mg/dL FBS on OGTT, 75.25% required hypoglycemic agents, whereas 32.9% of patients with a FBS < 95mg/dl needed hypoglycemic agents(Table 1).

Conclusion: Our data suggests that if a patient has a FBS of ≥ 95mg/dL there is a 75% chance that they will require hypoglycemic agents.This can be used during initial counseling to educate patients diagnosed with GDM on the possibility of the need for hypoglycemic agents and provide reassurance to patient's with FBS < 95mg/dL.

Figure 1: Predicted Probabilities for need for hypoglycemic agents among patients with GDM based on FBS on OGTT

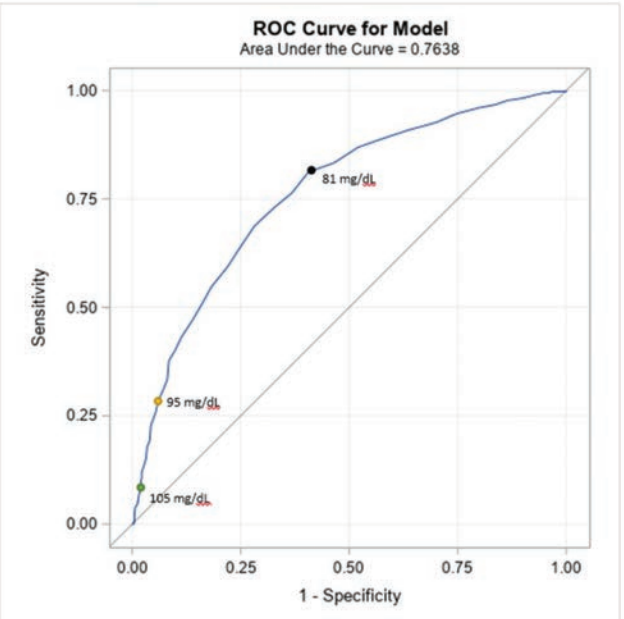

Table 1. Different cut-off levels of FBS on OGTT in prediction of the need for hypoglycemic agents among patients with GDM

	>= 81 mg/dL	>= 95 mg/dL	>= 105 mg/dL
Sensitivity (%)	81.25	28.79	7.78
Specificity (%)	59.36	93.88	98.16
Positive predictive value (%)	56.37	75.25	73.21
Negative predictive value (%)	83.05	67.10	62.22

852 | What Best Predicts for Need for Hypoglycemic Agents in Patients with Gestational Diabetes?

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10:30 AM - 12:30 PM

Objective: This study aimed to identify antenatal characteristics that best predict the need for hypoglycemic agents in patients with gestational diabetes (GDM).

Study Design: This study was a single-center retrospective cohort study of patients with singleton pregnancies between 2018-2023, diagnosed with GDM between 24-34 weeks gestation by Carpenter-Coustan criteria on a 3hour OGTT. Hypoglycemic agents were added when optimal control was not achieved as determined by serial finger stick analysis (FBS < 95mg/dl,

postprandial values at 1h 140mg/dl, 2h 120mg/dl).Logistic regression models were developed to determine the need for hypoglycemic agents and included commonly associated predictors of disease severity. Data collected included age, body mass index (BMI), race, gestational age (GA) at diagnosis, history of GDM, and the 1h, 2h, and 3h OGTT values.Model 1 utilized only the fasting OGTT value as the predictor.Model 2 included the aforementioned variables excluding the fasting OGTT value.Model 3 incorporated the fasting OGTT value along with the other predictors from Model 2.

Results: 1,407 patients were diagnosed with GDM;567(40%) were prescribed hypoglycemic agents.

A comparative analysis of the three models was performed to evaluate their predictive performance(Table 1, Figure 1).Model 1, using only the fasting OGTT value, had an area under the curve (AUC) of 0.77.Model 2, which excluded the fasting OGTT value, had an AUC of 0.71.Model 3, incorporating both the fasting OGTT value and the other predictors from Model 2, achieved an AUC of 0.76.This was significantly different from Model 2 ($p < 0.0001$) and Model 1 ($p = 0.0021$) (Table 1).

Conclusion: Our model suggests that the fasting value on the OGTT alone (Model 1) is a significant predictor of the need for hypoglycemic agents when compared to common predictors for disease severity (Model 2). Therefore, the isolated fasting value is a valuable clinical predictor in assessing the risk for hypoglycemic agents and should be used when counseling patients.

Figure 1. Comparison of receiver operating characteristic (ROC) curve for three predictive models

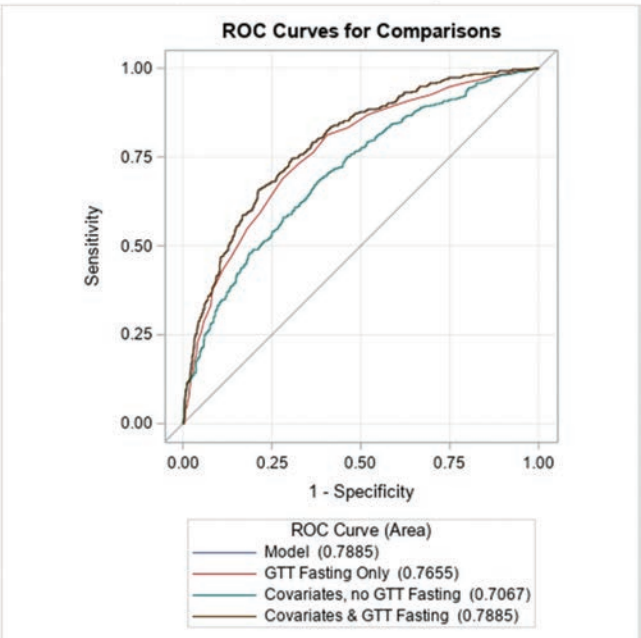

Table 1. Model performance predicting need for hypoglycemic agents among patients with GDM

Predictive model	Selected predictors	AUC	P value M1 vs. M2	P value M2 vs. M3	P value M1 vs. M3
Model 1 (M1)	GTT Fasting	0.77 (0.74, 0.79)	0.0003		
Model 2 (M2)	Age, BMI, race, GA at entry, hx GDM, GTT 1 hr GTT 2 hr, GTT 3 hr	0.71 (0.68, 0.73)		<0.0001	
Model 3 (M3)	GTT Fasting, Age, BMI, race, GA at entry, hx GDM, GTT 1 hr GTT 2 hr, GTT 3 hr	0.79 (0.76, 0.81)			0.0021

§ Multivariable logistic regression models were used and AUCs were compared between models.

853 | Randomized Controlled Trial of Detemir versus NPH in Gestational and Type 2 Diabetes: DETERMINE Study

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10:30 AM - 12:30 PM

Objective: Diabetes mellitus (DM) is one of the most common complications in pregnancy. Neonatal hypoglycemia (HG) as a result of DM is associated with NICU admissions and delay to milestones. We hypothesized that the longer-acting insulin detemir may yield lower rates of neonatal HG, compared to intermediate-acting NPH in pregnancies with GDM or T2DM.

Study Design: We conducted a prospective, multi-center, unblinded, randomized-controlled trial. Subjects requiring insulin initiation during pregnancy were randomized 1:1 to detemir or NPH. IRB approval and clinicaltrials.gov registration were obtained. Primary outcomes were rates of neonatal HG (< 45 mg/dl) in the first 24 hours of life, and persistent HG (< 50 mg/dl) beyond 24 hours. Secondary outcomes were rates of maternal, antenatal and neonatal complications. Data were analyzed using Wilcoxon Rank sum, Chi-Square or Fisher's exact tests. Uni- and multivariable logistic regressions were performed. Planned enrollment was 336, but the trial was halted early due to discontinuation of detemir in 2024.

Results: 73 subjects were recruited (NPH: 38, Detemir: 35). Demographic differences were not noted for most categories, but intake A1c (NPH: 5.7%, IQR 5.5-6.0%; Det: 6.8%, IQR 6.0-8.7%; $p = 0.021$) and race (more Asian/Caucasian in NPH versus more Black in detemir) differed, likely due to early termination of study. No differences were noted in rates of HG (44.4 v 36.4%, $p = 0.495$) or persistent HG (5.6 v 6.1%, $p = 1.0$), even after controlling for DM type, preterm birth, BMI and site. No differences were noted for secondary neonatal outcomes (Table 2). Rates of postpartum hemorrhage were higher for NPH (36.8 v 8.8%, $p = 0.005$), but no other differences in maternal outcomes were noted, including mode of delivery, HTN, insulin drip, lacerations, or infection (Table 1).

Conclusion: No difference in rates of neonatal HG were seen between NPH and detemir groups. This study is limited by early termination of the trial due to discontinued production of detemir. Further studies will need to be performed to compare currently available basal insulins in management of DM in pregnancy.

Table 1: Maternal outcomes by type of insulin (N=73)			
	NPH (n=38)	Detemir (n=35)	P-value
Max Insulin 1st Trimester, median (IQR)	26.0 (16.0, 34.0)	72.0 (58.0, 76.0)	**0.020**[2]
Max Insulin 2nd Trimester, median (IQR)	30.0 (10.0, 48.0)	51.0 (35.0, 90.5)	0.079[2]
Max Insulin 3rd Trimester, median (IQR)	31.0 (14.0, 58.0)	30.0 (16.0, 81.0)	0.631[2]
% Elevated Fasting, n (%)			0.619[1]
0-20	17 (44.7%)	18 (51.4%)	
21-50	7 (18.4%)	3 (8.6%)	
51-75	1 (2.6%)	3 (8.6%)	
76+	4 (10.5%)	4 (11.4%)	
Unknown	9 (23.7%)	7 (20.0%)	
% Elevated Postprandial, n (%)			0.943[1]
0-20	22 (57.9%)	20 (57.1%)	
21-50	4 (10.5%)	2 (5.7%)	
51-75	1 (2.6%)	2 (5.7%)	
76+	2 (5.3%)	2 (5.7%)	
Unknown	9 (23.7%)	9 (25.7%)	
Most Recent A1C, median (IQR)	5.5 (5.3, 5.8)	6.0 (5.5, 6.7)	**0.046**[2]
Change in A1C, median (IQR)	0.0 (0.0, 0.3)	0.8 (0.0, 2.7)	0.090[2]
Mode of Delivery, n (%)			0.221[3]
Vaginal	18 (47.4%)	21 (61.8%)	
SVD	16 (42.1%)	21 (61.8%)	
FAVD	1 (2.6%)	0 (0.0%)	
VAVD	1 (2.6%)	0 (0.0%)	
Cesarean delivery	20 (52.6%)	13 (38.2%)	
Scheduled cesarean delivery	10 (26.3%)	7 (20.6%)	
Unscheduled repeat cesarean delivery	1 (2.6%)	2 (5.9%)	
Unscheduled primary cesarean delivery	9 (23.7%)	4 (11.8%)	
NPO at Time of Delivery, n (%)	25 (65.8%)	17 (50%)	0.175[3]
Hypertensive Disorders, n (%)			0.547[1]
chronic HTN	2 (5.3%)	1 (2.9%)	
gHTN	2 (5.3%)	3 (8.6%)	
Preeclampsia w/o severe features	3 (7.9%)	2 (5.7%)	
Preeclampsia w/ severe features	3 (7.9%)	3 (8.6%)	
Superimposed preeclampsia w/o severe features	2 (5.3%)	0 (0.0%)	
Superimposed preeclampsia w/ severe features	0 (0.0%)	3 (8.6%)	
None	26 (68.4%)	23 (65.7%)	
Insulin Drip, n (%)	1 (2.6%)	2 (5.9%)	0.599[1]
PPH, n (%)	14 (36.8%)	3 (8.8%)	**0.005**[3]
Transfusion Needed, n (%)	3 (7.9%)	0 (0.0)	1.000[1]
Chorioamnionitis, n (%)	6 (15.8%)	3 (8.8%)	0.485[1]
[1]Fisher Exact p-value; [2]Wilcoxon rank sum p-value; [3]Chi-Square p-value;			

Table 2: Priamary and secondary fetal outcomes by type of insulin (N=73)			
	NPH (n=38)	Detemir (n=35)	P-value
Initial POC glucose, Median (IQR)	57.5 (48.0, 69.5)	52.0 (47.0, 66.0)	0.464[1]
Hypoglycemia, n (%)	16 (44.4%)	12 (36.4%)	0.495[2]
Hypoglycemia in >24 hours, n (%)	2 (5.6%)	2 (6.1%)	1.000[3]
Fetal Anomalies, n (%)	4 (10.5%)	3 (8.8%)	1.000[3]
MVP, Median (IQR)	4.9 (4.0, 6.0)	4.7 (3.8, 6.0)	0.379[1]
GA at Delivery, Median (IQR)	38.9 (37.4, 39.3)	38.1 (37.1, 39.1)	0.345[1]
Shoulder Dystocia, n (%)	1 (2.6%)	1 (2.9%)	1.000[3]
Birth Weight (g), Median (IQR)	3265 (2930, 3680)	3335 (3033, 3740)	0.433[1]
5 min APGAR, n (%)			0.361[3]
APGAR 8-10	34 (89.5%)	33 (97.1%)	
APGAR 0-7	4 (10.5%)	1 (2.9%)	
Need for Bili Lights, n (%)	3 (8.3%)	8 (24.2%)	0.071[2]
NICU Admission, n (%)	9 (25.0%)	6 (18.2%)	0.493[2]
[1]Wilcoxon rank sum p-value; [2]Chi-Square p-value; [3]Fisher Exact p-value			

854 | Development of a Benchtop Model of Cervical Laceration with Cerclage in Situ

Alyssa L. Trochtenberg[1]; Alexandra Denisevich[2]; Skylar Murphy[2]; Joanna Chase[3]; Mireyda Perez Hernandez[3]; Tim Looney[4]; Walfre Franco[3]; Devon Campbell[5]; Michael House[6]
[1]Tufts University School of Medicine, Tufts University School of Medicine, MA; [2]Cx Therapeutics, Lowell, MA; [3]University of Massachusetts, Lowell, Lowell, MA; [4]Northeast Biomedical, Tyngsboro, MA; [5]Prodct, LLC, Lexington, MA; [6]Tufts Medical Center, Boston, MA

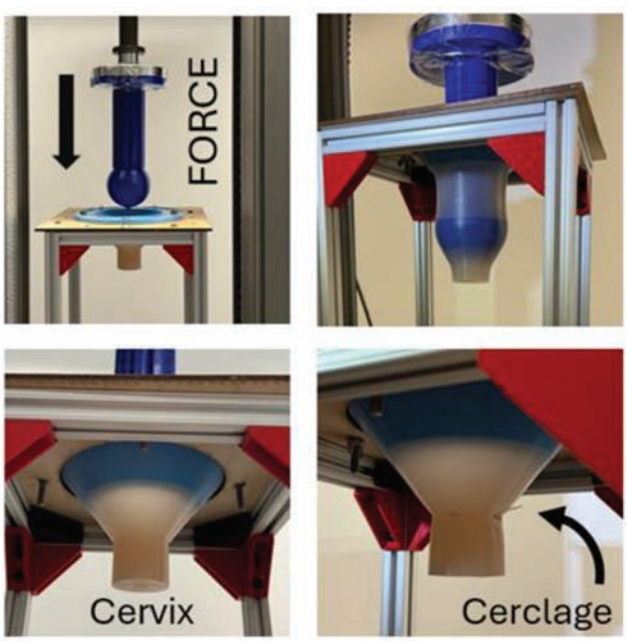
10:30 AM - 12:30 PM

Objective: Our long-term objective is the development of a novel medical device as a cerclage alternative. Cervical laceration is a known complication of cerclage. One goal of the medical device is to reduce the risk of cervical laceration. However, no benchtop model of cervical laceration exists. Thus, we sought to develop a three-dimensional (3D) benchtop model to study cervical laceration using a silicone-based cervix that mimics the stiffness of the human cervix in pregnancy.

Study Design: The silicone cervix model consisted of two parts (see "Cervix" image in Figure). The upper part (blue color) was composed of Smooth-Sil 950 (Smooth-On, Macungie, PA). The lower part (the cervix, tan color) was composed of Ecoflex, a soft silicone (Smooth-On). The silicone cervix formula was selected to match the mechanical properties of human cervical tissue based on pilot studies, as follows: 1-part Ecoflex 00-30 Part A; 1-part Ecoflex Part B; 3-parts SmoothOn silicone thinner . Ecoflex was first poured into the bottom portion of a 3D printed mold and cured to make the silicone cervix. Next, Smooth Sil 950 was added to fill the mold. The stiffness of the silicone cervix was tested with the Pregnolia system (Pregnolia, Switzerland) (N = 9). To assess cervical laceration, the silicone cervix was mounted on a test fixture attached to an Instron machine. A 3D printed fetal head (diameter 8.9 cm) was pushed through the silicone cervix (Figure, top right) (N = 6). Outcomes were compared between silicone cervices with no cerclage and with an O-Vicryl cerclage suture. Silicone tearing was used as an estimate of the risk of cervical laceration

Results: The mean (± SD) stiffness of the silicone cervix was 168 ± 17 millibar, which is similar to the stiffness of the human cervix in previously published studies. Silicone cervices without a cerclage had no tearing. However, tearing occurred in all silicone cervices with a cerclage in place ($P = 0.002$).

Conclusion: We designed a benchtop model that reliably simulates cervical laceration, which can be used to study alternate devices for the treatment of cervical insufficiency.



855 | The Prevalence of Food Insecurity at Time of Delivery and Associated Peripartum Outcomes

Miriam L. Hernandez-Zepeda; Monica Rincon; Amy M. Valent; Bharti Garg
Oregon Health & Science University, Portland, OR

10:30 AM - 12:30 PM

Objective: Food insecurity is the social condition of having limited or uncertain access to adequate food. Nutritional requirements increase in pregnancy, however the impact of food insecurity in pregnancy is not well understood. The objective of this study was to determine the incidence of food insecurity at our institution, and to investigate the relationship between food insecurity and peripartum and neonatal outcomes.

Study Design: Prospective cohort study of all pregnant or postpartum people admitted to Oregon Health and Science University from August 2023 to February 2024 to 1) determine the prevalence of food insecurity and 2) compare perinatal outcomes between those that screened positive for food insecurity to those secure. After informed consent, participants filled out the United States Department of Agriculture (USDA) Six-Item Short Form to screen for food insecurity. Chi-square and t-tests were used for statistical analysis.

Results: Of the 1273 pregnant people admitted during this study period, 232 were screened for food insecurity and 51 screened positive (22%). Of the 51 people who screened positive, 56.9% received a social work consult, 35.3% declined a social work consult, and 27.5% were eligible but not enrolled in food assistance programs. People with food insecurity were younger (28.8 ± 5.7 vs 33.4 ± 5.1 years old, $P < 0.001$), not married (31.4% vs 79.6%, $P < 0.001$), among underrepresented racial/ethnic groups (54.9% vs 28.8%, $P < 0.001$), have government insurance (80.4% vs 21.0%, $P < 0.001$), and have higher prenatal EPDS scores (10.4 vs 4.4, $P < 0.001$). People with food insecurity trended to have higher rates of iron deficiency anemia, higher postpartum EPDS scores, and lower rates of breastfeeding. Neonatal outcomes were similar between both groups.

Conclusion: Food insecurity is an important social driver of health that can affect anyone. Understanding the relationship between food insecurity and peripartum and neonatal outcomes as well as individual perceptions to receiving help is critical to addressing inequities that impact health.

Table 1: Perinatal outcomes in pregnant people who are food insecure compared to food secure.

Perinatal Outcomes	Food Insecure (n=51)	Food Secure (n=181)	P-value
Hypertensive disorders of pregnancy	6 (11.8%)	35 (19.3%)	0.21
Gestational diabetes	6 (11.8%)	37 (20.4%)	0.16
Total gestational weight gain, Median (IQR)	10.4 (5.9-16.4)	12.3 (7.8-16.7)	0.34
Iron deficiency anemia	16 (31.4%)	38 (21.0%)	0.12
Mode of delivery			0.76
Spontaneous vaginal	30 (58.8%)	103 (56.9%)	
Operative vaginal	0 (0.0%)	6 (3.3%)	
Scheduled cesarean	10 (19.6%)	33 (18.2%)	
Unscheduled cesarean	10 (19.6%)	38 (21.0%)	
Estimated or quantitative blood loss	797.6 ± 872.7	658.9 ± 586.5	0.19
Postpartum hemorrhage	2 (3.9%)	3 (1.7%)	0.30
Breastfeeding	40 (78.4%)	161 (89.0%)	0.05
Postpartum EPDS score	8.7 ± 5.3	4.7 ± 4.8	0.02

IQR = interquartile range

856 | Association of Co-Occurring Chronic Hypertension and Oligohydramnios on Neonatal Outcomes

Miriam L. Hernandez-Zepeda; Bharti Garg; Alyssa R. Hersh; Kristin C. Prewitt; Aaron B. Caughey
Oregon Health & Science University, Portland, OR

10:30 AM - 12:30 PM

Objective: Oligohydramnios has been associated with uteroplacental insufficiency and occurs at a higher rate among patients with chronic hypertension. However, the additional risk associated with oligohydramnios and adverse neonatal outcomes has not been well elucidated in this population, which is already at higher risk of adverse outcomes. The objective of this study was to investigate the association between oligohydramnios and chronic hypertension on neonatal outcomes.

Study Design: This is a retrospective cohort study comparing pregnant persons with chronic hypertension who had oligohydramnios versus no oligohydramnios. We used a California cohort of singleton, non-anomalous pregnancies with late preterm or term births (34 to 41 weeks) who delivered between 2008 and 2020. Chi-squared and multivariable logistic regression models were used for statistical analysis with a p-value of 0.05.

Results: Of the 434,362 pregnant persons with chronic hypertension who met inclusion criteria, 14,867 had oligohydramnios (3.4%). Pregnant persons with chronic hypertension with oligohydramnios were significantly different by race/ethnicity, body mass index, and parity compared to those without oligohydramnios. The rate of preexisting diabetes was similar between groups (4.3% vs 4.0%, $P = 0.13$). Oligohydramnios was associated with a higher adjusted odds of preterm birth (aOR 1.58; 1.51-1.65), NICU admission (aOR 1.13; 95% CI 1.07-1.19), small for gestational age (aOR 2.43; 95% CI 2.34-2.53), and stillbirth (aOR 1.81; 95% CI 1.05-3.12).

Conclusion: This study demonstrates that oligohydramnios with chronic hypertension is associated with adverse neonatal outcomes. Our study can enhance patient knowledge and provider counseling to mitigate neonatal impacts of co-occurring diagnoses.

Table 1: Neonatal outcomes among pregnant persons with chronic hypertension oligohydramnios.

Neonatal Outcomes	No oligohydramnios (N = 419,495)	Oligohydramnios (14,867)	Odds Ratio (95% CI)
Preterm birth (<37 weeks)	13.0%	19.1%	1.58 (1.51 - 1.65)
NICU admission	12.1%	15.2%	1.13 (1.07 - 1.19)
Apgar score at 5 minutes (< 7)	1.6%	1.7%	0.93 (0.81 - 1.06)
Small for gestational age	13.4%	28.0%	2.43 (2.34 - 2.53)
Respiratory distress syndrome	1.22%	1.26%	0.83 (0.71 – 0.97)
Neonatal death	0.06%	0.11%	1.62 (0.94 - 2.79)
Infant death	0.16%	0.20%	1.16 (0.78 - 1.73)
Stillbirth	0.13%	0.25%	1.81 (1.05 - 3.12)
Placental abruption	1.44%	1.64%	1.03 (0.90 - 1.18)

Analyses adjusted for race/ethnicity, age, educational attainment, body mass index, insurance type, parity, prenatal care attendance, gestational age, pre-existing diabetes mellitus. Stillbirth was analysis using 2016-2020 data.

857 | Association Between Prenatal Exposure to Environmental Phthalates and Phenols with Adverse Pregnancy Outcomes

Misa Hayasaka[1]; George R. Saade[2]; Tetsuya Kawakita[2]
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10:30 AM - 12:30 PM

Objective: To evaluate the association between prenatal exposure to phthalates and phenols with adverse pregnancy outcomes.

Study Design: This prospective cohort study used data from the Environmental Influences on Child Health Outcomes (ECHO) consortium, which includes longitudinal data on over 30,000

pregnancies from 69 cohorts across the US. Participants were singleton pregnant individuals with data on urinary chemical concentrations at least one time during pregnancy and pregnancy outcomes. Urinary chemical measurements were performed separately by cohort. Individuals were classified into quartiles of various urinary chemical levels. Outcomes examined included preterm birth (PTB), small for gestational age (SGA), and gestational diabetes mellitus (GDM). Generalized estimating equations models with Poisson distribution and robust variance were used to estimate relative risks (RR) with 95% confidence intervals (95%CI) using the lowest quartile as the reference. All models were adjusted for maternal age, education, race and ethnicity, prepregnancy body mass index, marital status, and study cohorts.

Results: Among the 5,749 participants, 543 (9.4%) had PTB, 335 (5.8%) had SGA, and 401 (7.0%) had GDM. Table 1 presents the urinary levels of the chemicals assayed and the number of samples. Models showed that higher quartiles of phthalates and phenols were associated with an increased risk of PTB and SGA, whereas no significant associations were found for GDM (Table 2). The highest risk of PTB was noted with the 4th quartile of phthalic acid (RR 1.67; 95% CI 1.22-2.28) compared to the 1st quartile. The highest risk for SGA was observed with the 4th quartile of mono-isononyl phthalate (RR 2.37; 95%CI 1.57-3.58).

Conclusion: Pregnancy exposure to phthalates and phenols, ubiquitous environmental chemicals, could be preventable risk factors for PTB and SGA. Further study is needed to confirm these observations and identify the exposure sources.

Table 1. Distribution of the Levels of Chemicals assayed and the Number of Urinary samples

Chemicals	N	N = 11,587[1]
Σ Low-molecular-weight (LMW) Phthalates, nmol/mL	8,709	0.40 (0.18, 0.91)
Σ Di-2-ethylhexyl phthalate (DEHP), nmol/mL	8,504	0.09 (0.05, 0.19)
Di-n-octyl phthalate (DOP)/mono (3-carboxypropyl) phthalate (MCPP), ng/mL	8,934	1.5 (0.7, 3.3)
Di-isononyl phthalate (DiNP)/mono-isononyl phthalate (MINP), ng/mL	7,459	0.00 (0.00, 1.23)
Σ Di-isodecyl phthalate (DiDP), nmol/mL	6,223	0.02 (0.01, 0.07)
Phthalic acid, ng/mL	4,423	28 (12, 67)
Σ Bisphenols, nmol/mL	6,755	0.009 (0.004, 0.019)
Σ Parabens, nmol/mL	5,523	0.05 (0.01, 0.24)
Triclosan, ng/mL	5,831	6 (1, 34)
Triclocarban, ng/mL	4,437	0.01 (0.00, 0.30)
Oxybenzone (Benzophenone-3), ng/mL	5,611	25 (8, 108)

[1]Median (IQR), Including multiple urine samples collected from each individual during pregnancy
Σ represents molar sum

Table2. Associations Between Prenatal Chemical Concentrations and Pregnancy Outcomes

Chemical	PTB		SGA		GDM	
	RR (95% CI)	*P*-value	RR (95% CI)	*P*-value	RR (95% CI)	*P*-value
Phthalate Metabolites						
Σ Low-molecular-weight (LMW) Phthalates						
2nd Quartile	0.95 (0.77-1.18)	0.654	1.12 (0.84-1.51)	0.435	1.21 (0.95-1.56)	0.126
3rd Quartile	0.87 (0.69-1.08)	0.203	1.23 (0.92-1.65)	0.163	1.08 (0.83-1.40)	0.559
4th Quartile	0.90 (0.71-1.14)	0.373	1.14 (0.84-1.54)	0.412	0.77 (0.57-1.04)	0.09
High-molecular-weight (HMW) Phthalates						
Σ Di-2-ethylhexyl phthalate (DEHP)						
2nd Quartile	1.12 (0.91-1.38)	0.293	1.10 (0.83-1.46)	0.495	0.89 (0.70-1.15)	0.38
3rd Quartile	0.97 (0.77-1.21)	0.791	1.26 (0.96-1.67)	0.099	1.03 (0.81-1.32)	0.786
4th Quartile	**1.30 (1.04-1.62)**	**0.024**	1.26 (0.93-1.70)	0.141	1.00 (0.75-1.34)	0.98
Di-n-octyl phthalate (DOP) / mono (3-carboxypropyl) phthalate (MCPP)						
2nd Quartile	1.05 (0.84-1.30)	0.674	1.17 (0.90-1.52)	0.25	1.12 (0.88-1.42)	0.358
3rd Quartile	1.14 (0.92-1.42)	0.229	1.30 (1.00-1.69)	0.053	1.00 (0.77-1.30)	0.991
4th Quartile	**1.33 (1.06-1.67)**	**0.013**	0.99 (0.73-1.35)	0.955	1.12 (0.85-1.47)	0.431
Di-isononyl phthalate (DiNP) / mono-isononyl phthalate (MINP)						
2nd Quartile	**1.51 (1.18-1.92)**	**<0.001**	**2.03 (1.31-3.14)**	**0.002**	1.00 (0.72-1.38)	0.993
3rd Quartile	0.93 (0.70-1.23)	0.61	**2.11 (1.37-3.25)**	**<0.001**	1.00 (0.74-1.34)	0.993
4th Quartile	**1.34 (1.05-1.69)**	**0.016**	**2.37 (1.57-3.58)**	**<0.001**	0.98 (0.76-1.27)	0.887
Σ Di-isodecyl phthalate (DiDP)						
2nd Quartile	1.06 (0.82-1.37)	0.676	0.91 (0.69-1.20)	0.509	0.95 (0.74-1.24)	0.72
3rd Quartile	1.10 (0.84-1.44)	0.48	1.02 (0.76-1.35)	0.913	0.98 (0.74-1.28)	0.865
4th Quartile	**1.58 (1.22-2.05)**	**<0.001**	0.86 (0.62-1.21)	0.396	0.98 (0.74-1.29)	0.861
Phthalic acid						
2nd Quartile	0.99 (0.73-1.36)	0.968	1.04 (0.74-1.46)	0.819	0.95 (0.70-1.27)	0.717
3rd Quartile	1.22 (0.89-1.67)	0.212	1.12 (0.80-1.58)	0.505	0.93 (0.68-1.28)	0.666
4th Quartile	**1.67 (1.22-2.28)**	**0.001**	1.13 (0.78-1.64)	0.503	0.90 (0.63-1.28)	0.54
Phenols						
Σ Bisphenols						
2nd Quartile	1.19 (0.92-1.52)	0.182	1.28 (0.91-1.80)	0.15	0.88 (0.69-1.13)	0.308
3rd Quartile	1.26 (0.98-1.62)	0.07	1.14 (0.80-1.64)	0.46	1.05 (0.81-1.36)	0.704
4th Quartile	**1.32 (1.03-1.69)**	**0.031**	1.21 (0.84-1.74)	0.302	0.99 (0.75-1.30)	0.931
Σ Parabens						
2nd Quartile	0.99 (0.73-1.35)	0.948	1.03 (0.57-1.85)	0.916	0.98 (0.66-1.47)	0.937
3rd Quartile	0.94 (0.69-1.28)	0.703	1.26 (0.73-2.20)	0.404	0.93 (0.62-1.40)	0.739
4th Quartile	1.01 (0.74-1.36)	0.961	1.70 (0.99-2.92)	0.054	1.01 (0.65-1.59)	0.949
Triclosan						
2nd Quartile	1.15 (0.83-1.60)	0.396	1.00 (0.56-1.78)	0.99	1.27 (0.89-1.82)	0.183
3rd Quartile	**1.50 (1.08-2.09)**	**0.016**	1.41 (0.81-2.44)	0.221	1.15 (0.80-1.66)	0.452
4th Quartile	**1.58 (1.16-2.14)**	**0.003**	1.58 (0.95-2.63)	0.08	1.29 (0.91-1.81)	0.151
Triclocarban						
2nd Quartile	0.56 (0.33-0.96)	0.035	0.77 (0.37-1.61)	0.485	1.25 (0.65-2.42)	0.50
3rd Quartile	0.85 (0.61-1.18)	0.322	0.86 (0.48-1.53)	0.598	1.03 (0.70-1.51)	0.891
4th Quartile	1.11 (0.81-1.52)	0.501	0.75 (0.43-1.32)	0.321	0.88 (0.56-1.38)	0.568
Oxybenzone (Benzophenone-3)						
2nd Quartile	1.02 (0.73-1.42)	0.924	1.68 (0.95-2.98)	0.076	0.92 (0.61-1.38)	0.683
3rd Quartile	0.94 (0.66-1.33)	0.721	1.26 (0.69-2.31)	0.449	0.83 (0.56-1.22)	0.346
4th Quartile	0.94 (0.66-1.35)	0.745	**2.09 (1.18-3.70)**	**0.011**	1.04 (0.72-1.50)	0.85

RR, relative risk; CI, confidence interval
PTB, Preterm birth; SGA, small for gestational age; GDM, gestational diabetes mellitus
Bolded values indicate statistically significant findings (p < 0.05)

858 | Association of Postpartum Hemorrhage Management with Risks of Hysterectomy, Icu Admission, and Severe Maternal Morbidity

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10:30 AM - 12:30 PM

Objective: To examine if varying management strategies of postpartum hemorrhage (PPH) is associated with hysterectomy, intensive care unit (ICU) admission, and severe maternal morbidity (SMM).

Study Design: This retrospective cross-sectional study utilized Epic Systems' Cosmos research platform, a US-based electronic health record database with de-identified patient-level data. Individuals with an inpatient birth, PPH ICD-10-CM code, and PPH treatment from 1/1/17-12/31/23, without a placenta accreta spectrum ICD-10-CM code were included. Management strategies were categorized into 4 groups: "less aggressive medication use only" (2 types with < 2 doses of either or 1 type with < 3 doses); "more aggressive medication use only" (3 types, 2 types with ≥2 doses of either, or 1 type with ≥3 doses; "less aggressive medication plus procedure(s)"; and "more aggressive medication plus procedure(s)". Medications included carboprost, methylergonovine, and tranexamic acid. Procedures included insertion of intrauterine device, curettage, and uterine artery embolization. Outcomes were hysterectomy, ICU admission, and

SMM with and without transfusion during the birth encounter. Bivariable and multivariable logistic regression analyses were performed.

Results: Of 277,585 patients treated for PPH, 84.9% received less aggressive medication use only (Table). There were 1,951 (7 per 1,000) hysterectomies, 6,383 (2.3%) ICU admissions, and 18,474 (6.7%) SMM cases without and 45,238 (16.3%) with transfusion. Patients with PPH procedures regardless of medication use, were more likely to undergo hysterectomy and experience SMM than those with less aggressive medication use only. Compared to patients with less aggressive medication use only, those with aggressive medication use only were significantly less likely to experience SMM without transfusion.

Conclusion: Higher odds of hysterectomy and morbidity among patients with PPH procedures could represent delay in definitive treatment or confounding by indication (more severe PPH cases). Either way, these procedures are markers of increased risk for hysterectomy, ICU admission, and SMM.

Table. Outcomes associated with type of postpartum hemorrhage (PPH) management among 277,585 patients with PPH

	Hysterectomy		Intensive Care Unit admission		SMM^ without blood transfusion		SMM^ including blood transfusion	
PPH Management	n (%)	aOR (95% CI)*	n (%)	aOR (95% CI)*	n (%)	aOR (95% CI)*	n (%)	aOR (95% CI)*
Less aggressive medication use only (n=235,605, 84.5%)	1,237 (0.5)	Referent	3,892 (1.6)	Referent	14,532 (6.1)	Referent	34,036 (14.0)	Referent
More aggressive medication use only (n=16,576, 6.0%)	92 (0.6)	1.29 (0.99-1.64)	299 (1.8)	1.08 (0.94-1.25)	747 (4.5)	0.70 (0.64-0.77)	2,670 (16.0)	1.25 (1.19-1.31)
Less aggressive medication use + procedure(s) (n=21,065, 7.6%)	541 (2.5)	3.48 (3.06-3.94)	1,815 (8.4)	4.38 (4.07-4.71)	2,671 (12.0)	1.77 (1.68-1.87)	6,934 (32.0)	2.77 (2.67-2.87)
More aggressive medication use + procedure(s) (n=4,339, 1.6%)	81 (1.8)	3.03 (2.27-3.96)	377 (8.5)	4.14 (3.58-4.78)	524 (12.0)	1.68 (1.50-1.88)	1,598 (36.0)	3.59 (3.33-3.87)

SMM=severe maternal morbidity, PPH=postpartum hemorrhage, aOR=adjusted odds ratio, CI=confidence interval
^Severe maternal morbidity (SMM) cases were identified using the United States Centers for Disease Control and Prevention (CDC)'s algorithm based on 21 SMM indicators and corresponding ICD-10 codes
*Adjusted for year, maternal age, race/ethnicity, social vulnerability index, insurance type, chronic hypertension, diabetes, asthma, cardiac disease, obesity, parity, pregnancy-induced hypertension, antihypertensive medication use, magnesium sulfate infusion before delivery, gestational diabetes, preterm birth, and cesarean delivery

859 | The Association Between Umbilical Artery End Diastolic Flow and Growth Velocity in Growth Restricted Fetuses

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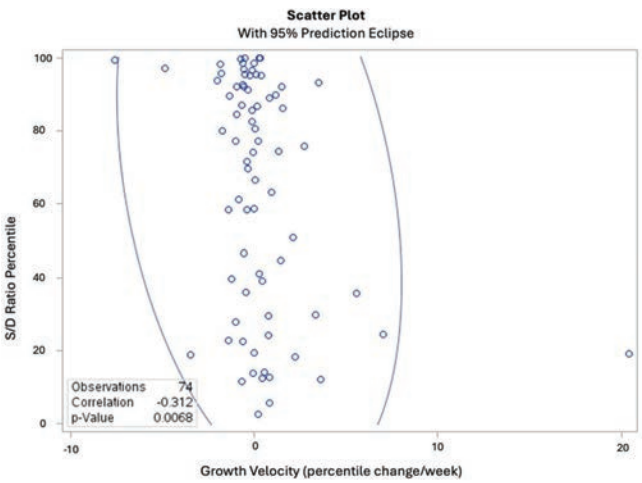
10:30 AM - 12:30 PM

Objective: Growth velocity is receiving increasing attention as a potential marker of fetal wellbeing. We aimed to investigate the relationship between umbilical artery diastolic flow, an established surveillance tool, and growth velocity.

Study Design: We conducted a retrospective cohort analysis of pregnant patients aged 18-45 years old who delivered between 2012 and 2022. Pregnancies with congenital abnormalities or multiple gestations were excluded. Growth velocity was defined as the difference between estimated fetal weight percentiles at 26-32 weeks and at 32-36 weeks divided by the time between ultrasound (percentile change per week). The last systolic to diastolic (S/D) ratio obtained between 32-36 weeks was chosen as the marker of umbilical artery end diastolic flow. A linear correlation model was used to investigate the relationship between S/D ratio percentile and growth velocity.

Results: 324 patients met inclusion criteria, and 74 patients had at least one umbilical artery study between 32-26 weeks. The range of growth velocity was -7.58-20.40/week (mean = 0.31/week). The range of S/D ratio percentiles was 2.46%-99.98% (mean = 63.70%); all patients had forward diastolic flow. There was a negative correlation between S/D ratio percentile and growth velocity with r = -0.31 (p< 0.01). This is shown in Figure 1.

Conclusion: Decreasing umbilical artery diastolic flow correlated with fetal growth deceleration over the weeks preceding the umbilical artery doppler exam. Additional studies are needed to determine whether using growth velocity combined with umbilical artery doppler studies improves prediction of fetal compromise and adverse neonatal outcomes.



860 | Leveraging Deep Neural Networks of Transvaginal Cervical Characteristics to Predict Delivery Timing

Peinan Zhao[1]; Joshua Goyert[2]; Methodius G. Tuuli[3]; Adam K. Lewkowitz[4]; Julie Tumbarello[5]; Emily Dively, BSN[6]; Madeline Felske[5]; Wendy Sparks[5]; Giselle Kolenic[2]; Molly J. Stout[7]
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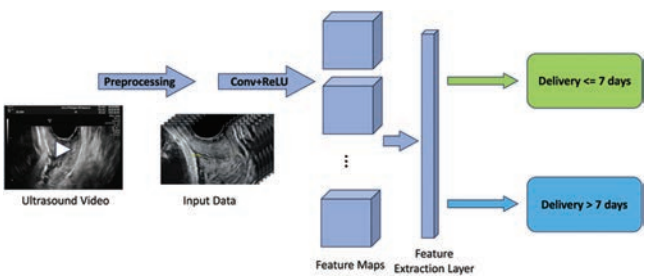
10:30 AM - 12:30 PM

Objective: To utilize deep neural networks of biomechanical characteristics obtained from transvaginal ultrasound videos to predict timing of delivery within 7 days at term.

Study Design: This is a prospective longitudinal cohort of patients who underwent fully quantitative cervical elastography (FQ-CES) starting at 37 weeks and weekly thereafter until delivery. FQ-CES quantifies cervical tissue stiffness utilizing a transvaginal ultrasound probe to quantify both pressure applied and tissue deformation to allow operator independent comparisons. Singleton pregnancies at 37 weeks without delivery planed before 39 weeks were enrolled. FQ-CES and cervical length (CL) were collected weekly until delivery. Patients remained enrolled regardless of their eventual timing or indication for delivery. Transvaginal ultrasound videos from FQ-CES exams were used to build a deep convolutional neural network with *Xception* architecture. The primary outcome is delivery within 7 days.

Results: 118 individuals with 241 FQ-CES ultrasound exams were included. 80% of data was randomly selected as training dataset with a 5-fold cross-validation split. Among 241 FQ-CES exams, 102 (42.3%) delivered ≤7 days and 139 (57.7%) delivered >7 days. Frames from ultrasound videos were treated as individual image inputs. For multiple image predictions inside one FQ-CES exam, majority vote method was applied. The deep convolutional neural network showed high predictive performance including high 92% sensitivity, 90% specificity, and accurate prediction of delivery within 7 days in 91% of the population. In contrast, the network utilizing CL < 2cm showed lower prediction performance (Table)
Conclusion: Deep learning models based on FQ-CES videos have much higher predictive performance for delivery within 7 days. This may be due to the ability to capture characteristics related to anatomy, biomechanical properties, and cervical tissue interaction with surrounding tissues. This technique could be be leveraged to capture intricate cervical characteristics to predict delivery timing.

Prediction Metrics	Cervical length	FQ-CES (Deep learning)
Sensitivity	26.3%	91.7%
Specificity	91.6%	90.3%
Pos. Pred. Value (PPV)	67.4%	86.3%
Neg. Pred. Value (NPV)	65.3%	94.2%
Accuracy	59.0%	91.0%



861 | Vaccine Perceptions Among Hispanic Pregnant and Lactating Individuals During the COVID-19 Vaccine Introduction

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University of Washington, Seattle, WA

10:30 AM - 12:30 PM
Objective: To investigate vaccine perceptions and hesitancy of Hispanic pregnant and lactating individuals in the setting of the COVID-19 vaccination implementation.
Study Design: An online prospective cohort study of people who were pregnant, lactating, or planning pregnancy launched in January 2021 shortly after approval of the COVID-19 vaccination. Race and ethnicity data were collected using the Centers for Disease Control and Prevention's National Health Interview Survey categories. Participants in this IRB-exempt study completed surveys via REDCap online including one on vaccine perceptions. We performed statistical analysis using Chi-square tests and Fisher's exact tests for categorical variables and t-tests and Wilcoxon rank sum tests for normal and non-normal continuous variables, respectively.
Results: Among the 26,322 participants, 1,618 identified as Hispanic and 24,704 as non-Hispanic. Most participants were well-educated (94.0%) and worked in healthcare (53.0%). Hispanic participants were less likely to gain knowledge about vaccines from physicians compared to non-Hispanic participants (n = 1,190, 73.6%; n = 19,020, 77.0%; p = 0.001) and reported using the internet (n = 266, 16.4%; n = 3,512, 14.2%; p = 0.01), social media (n = 105, 6.5%; n = 1.201, 4.9%; p = 0.003) and radio (n = 65, 4.0%; n = 763, 3.1%; p = 0.04) more than non-Hispanic participants. Compared to non-Hispanics, Hispanics trusted physicians less (p = 600, 37.8%; p = 10,104, 41.6% p = 0.002) and medical literature more (p = 366, 23.0%; p = 4,696, 19.4%; p = 0.002) regarding knowledge on vaccines. On average Hispanic participants reported a lower understanding on which vaccines they and their children should receive (p< 0.001) however no difference noted regarding understanding on how vaccines work or vaccine schedules (p = 0.81 and p = 0.11, respectively) compared to non-Hispanic participants.
Conclusion: When compared to non-Hispanic people, Hispanic participants report a greater use of non-traditional methods to gain vaccines knowledge and report trusting their physicians less and medical literature more on vaccines.

Figure 1.1 Responses to where Hispanic and non-Hispanic patients obtain vaccination knowledge

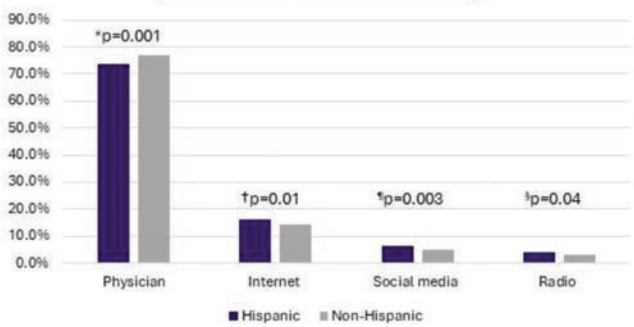

Figure 1.2: The source Hispanic and non-Hispanic patients trust the most for knowledge about vaccinations

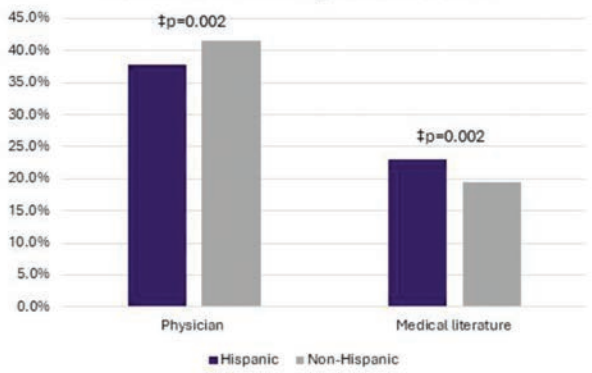

Table 1: Baseline Characteristics

	Hispanic n=1,618	Non-Hispanic n=24,704	P value
Age (mean, SD)	32.9 (3.9)	33.2 (3.6)	0.02
Gravidity	2 (1, 3)	2 (1, 3)	0.09
Parity	1 (0, 2)	1 (1, 2)	0.007
Pregnancy Status			0.38
Pregnant	668 (41.3)	10,507 (42.5)	
Lactating	766 (47.3)	11,626 (47.1)	
Neither pregnant of lactating	184 (11.4)	2,571 (10.4)	
Race reported	1,615	24,659	
American Indian or Alaskanative	59 (3.7)	167 (0.7)	<0.001
Asian	48 (3.0)	1,905 (7.7)	<0.001
Black or African American	53 (3.3)	320 (1.3)	<0.001
Native Hawaiian / Other Pacific Islander	13 (0.8)	101 (0.4)	0.03
White	1,303 (80.7)	22,766 (92.3)	<0.001
Other	212 (13.1)	149 (0.6)	<0.001
Prefer to not answer	74 (4.6)	25 (0.1)	<0.001
Birth country			<0.001
United States	1,588 (98.5)	23,794 (96.6)	
Canada	8 (0.5)	650 (2.6)	
Other	17 (1.1)	180 (0.7)	
Primary language			<0.001
English	1,444 (89.6)	24,352 (98.9)	
Spanish	140 (8.7)	10 (0.04)	
Other	27 (1.7)	230 (0.9)	
Prefer not to answer	1 (0.1)	34 (0.1)	
Area of employment			0.04
Academics/Science	175 (11.5)	2,696 (11.3)	
Teacher/Child Care	95 (6.2)	1,544 (6.5)	
Healthcare	817 (53.5)	13,139 (55.2)	
Office work/tech	150 (9.8)	2,614 (11.0)	
Other	284 (18.6)	3,745 (15.7)	
Prefer not to answer	7 (0.5)	65 (0.3)	
Education			<0.001
Some college or less	159 (9.9)	1,273 (5.2)	
Bachelor's degree (e.g., BA, BS)	562 (35.0)	7,577 (30.8)	
Master's degree	498 (31.0)	8,706 (35.4)	
Doctorate or Professional degree	388 (24.1)	7,038 (28.6)	

862 | The Impact of Antepartum Fibroid Characteristics on Severe Maternal Morbidity

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10:30 AM - 12:30 PM

Objective: To evaluate the association between uterine fibroids and their characteristics (e.g. number, size) with severe maternal morbidity (SMM).

Study Design: Multicenter retrospective cross-sectional study of all singletons who had a prenatal ultrasound at ≥ 18 weeks and delivered from 2019-2023. Fibroid characteristics were documented when identified on ultrasound. Patients with >1 delivery during the study period had only their first included for analysis. The primary outcomes were SMM, defined based on the Centers for Disease Control and Prevention list of 21 indicators, and non-transfusion SMM. Both were assessed based on the presence of any fibroid, fibroid number (1, 2, ≥3), and size (largest dimension < 5cm, 5-10cm, >10cm), compared to patients with no fibroids. Multivariate logistic regression was performed to adjust for maternal race/ethnicity and obstetric comorbidity index, a validated screening tool used to predict SMM. Data were presented as adjusted odds ratios (aOR) with 95% confidence intervals (CI).

Results: Of the 79,802 patients included, 4,756 (6.0%) had at least one fibroid. The prevalence of SMM and non-transfusion SMM were 4.3% and 1.1%, respectively. Outcomes are displayed in the Table. The presence of any fibroid, regardless of number or size, was associated with an increased risk of SMM. There was no statistically significant association between fibroids and non-transfusion SMM. Patients with more and larger fibroids were at higher risk of SMM compared to those without fibroids. Fibroid number and size did not impact the risk of non-transfusion SMM. After adjusting for fibroid number and size, patients with fibroids in the lower uterine segment or cervix were at higher risk of SMM compared to those without fibroids in that location (aOR 1.48, 95% 1.12-1.96).

Conclusion: The association between fibroids and their characteristics with risk of SMM is likely related to hemorrhage. Providers should consider these risks and interventions to help reduce such risk when caring for patients with fibroids during pregnancy and their delivery.

Table. The association between fibroids and their characteristics with SMM and non-transfusion SMM.

		aOR* (95% CI)	
		SMM	Non-transfusion SMM
Any fibroid	No fibroids	Reference	
	Fibroids	1.34 (1.19-1.51)	1.06 (0.82-1.37)
Number of fibroids	No fibroids	Reference	
	1	1.24 (1.06-1.45)	1.09 (0.79-1.50)
	2	1.28 (1.00-1.65)	0.95 (0.54-1.66)
	≥3	1.69 (1.35-2.13)	1.11 (0.66-1.87)
Fibroid size based on largest dimension	No fibroids	Reference	
	<5cm	1.09 (0.93-1.28)	1.06 (0.77-1.46)
	5-10cm	1.58 (1.31-1.91)	1.16 (0.78-1.75)
	>10cm	2.92 (2.03-4.19)	0.54 (0.13-2.19)

*Models adjusted for maternal race/ethnicity and obstetric comorbidity index (OB-CMI). OB-CMI was entered into the model as a categorical variable.

863 | The Impact of Antenatal Corticosteroids on Severe Neonatal Morbidity in Preterm Births

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10:30 AM - 12:30 PM

Objective: Studies evaluating the impact of antenatal corticosteroids (ACS) have typically included a wide gestational age (GA) range of preterm births. We aimed to evaluate whether antenatal corticosteroid (ACS) exposure is associated with a decreased risk of severe neonatal morbidity (SNM) in the periviable, early, and late preterm periods.

Study Design: Retrospective cohort study of all singleton preterm births (PTBs) between 22 0/7-36 6/7 weeks' gestation at 2 tertiary academic medical centers from 2019-2022. Patients who had neonates that were not actively resuscitated at birth, intrauterine fetal demise, and missing data were excluded. The primary outcome of SNM, a standardized composite neonatal adverse outcome indicator which includes diagnoses and procedures from the neonatal intensive care unit indicative of severe morbidity, was compared between PTBs exposed to ACS prior to delivery and those unexposed. We compared SNM by ACS exposure stratified by 4 gestational age of delivery groups: 22 0/7-25 6/7, 26 0/7-29 6/7, 30 0/7-33 6/7, and 34 0/7-36 6/7 weeks of gestation. Multivariate logistic regression was performed to adjust for potential confounders. Data were presented as adjusted odds ratios (aOR) with 95% confidence intervals (CI).

Results: Of the 5,070 preterm births included, 2,456 (48.4%) were exposed to ACS prior to delivery. ACS was associated with a lower odds of SNM among PTBs occurring at 22 0/7-25 6/7 weeks of gestation, but the association at 26 0/7-29 6/7 and 30 0/7-33 6/7 weeks was not statistically significant (Table). Among late

PTBs (34 0/7-36 6/7 weeks), ACS exposure was associated with an increased risk of SNM compared to those unexposed (Table).
Conclusion: Our data suggest that the effect of ACS on neonatal outcomes varies by GA at delivery with improved outcomes at periviable GA and worse outcomes in the late preterm period. This differential effect should be considered when counseling patients and deciding if and when to administer ACS.

Table. Severe neonatal morbidity compared between ACS exposed and unexposed preterm births.

		ACS Exposed	ACS Unexposed	aOR* with 95% CI
Severe neonatal morbidity**	22 0/7-25 6/7 weeks	62/86 (72.1)	36/38 (94.7)	0.13 (0.02-0.50)
	26 0/7-29 6/7 weeks	230/270 (85.2)	57/66 (86.4)	0.87 (0.35-1.97)
	30 0/7-33 6/7 weeks	470/715 (65.7)	140/202 (69.3)	0.79 (0.55-1.12)
	34 0/7-36 6/7 weeks	351/1,385 (25.3)	442/2,308 (19.2)	1.49 (1.25-1.76)

Data are presented as number (percentage).
*Models adjusted for maternal age, body mass index, race/ethnicity, nulliparity, pregestational diabetes, chronic hypertension.
**Composite of ≥ 1 of the following: neonatal resuscitation, continuous positive airway pressure, respiratory distress syndrome, mechanical ventilation, any body cavity surgical procedure, blood transfusion, Intraventricular hemorrhage, sepsis, pneumothorax, chest tube insertion, pneumonia, bronchopulmonary dysplasia, necrotizing enterocolitis, periventricular leukomalacia, hypoxic ischemic encephalopathy, cerebral infarction, exchange transfusion, retinopathy of prematurity, seizures, brachial plexus injury, neonatal death within 28 days of birth or before discharge from hospital.

864 | Preterm Labor with Intact Membranes: the Differential Diagnosis Between Intraamniotic Infection and Sterile Intraamniotic Inflammation

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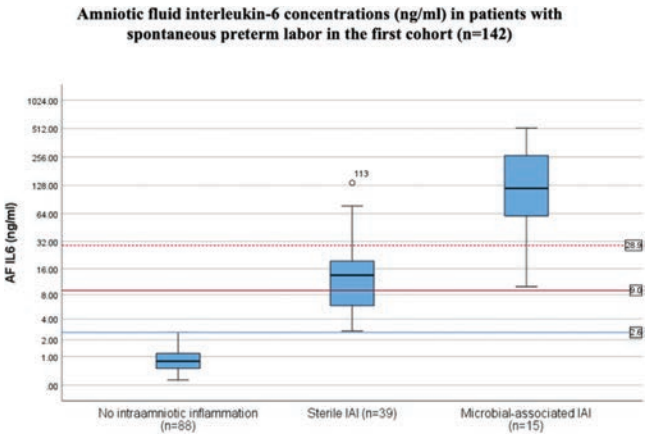
10:30 AM - 12:30 PM
Objective: Preterm labor (PTL) is a syndrome caused by multiple pathologic processes. Intraamniotic inflammation is a major cause of preterm birth and neonatal morbidity/mortality. The two causes of intraamniotic inflammation [intraamniotic infection (IAI) and sterile intraamniotic inflammation (S-IAI)] can be treated in humans. The optimal test to identify intraamniotic inflammation is amniotic fluid (AF) interleukin (IL)-6. This study was designed to determine if AF IL-6 concentration can be used in the differential diagnosis between IAI and S-IAI.
Study Design: The value of AF IL-6 was tested in two independent cohorts of patients with PTL (20–35 weeks of gestation). AF was analyzed for microorganisms using culture and PCR. IL-6 concentration was determined by ELISA. IAI was diagnosed by the combination of bacteria and inflammation (AF IL-6 ≥ 2.6 ng/ml). S-IAI was diagnosed if inflammation was present without microorganisms. ROC analysis was used from the first cohort (n = 142) to identify patients with IAI. The results were tested in a second cohort (n = 166).
Results: 1) Patients with IAI had the highest AF IL-6 concentrations among the groups (Figure); 2) an AF IL-6 ≥ 28.9 ng/ml had a sensitivity of 87% and a specificity of 97% to identify patients with IAI [AUC 0.97 (95% CI, 0.94–1.00)]; 3) an AF IL-6 ≥ 9 ng/ml identified all patients with IAI with a false-positive rate of 19%; 4) all patients with an AF IL-6 concentration between 2.6 and 9 ng/mL were diagnosed with S-IAI, and this IL-6 interval identified 38.5% (15/39) of patients with S-IAI; and 5) results were replicated in the second cohort. AF IL-6 ≥ 28.9 ng/ml had a sensitivity of 83% and a specificity of 83% for IAI. AF IL-6 ≥ 9 ng/ml identified all patients with IAI, and IL-6 between 2.6 and 9 ng/ml identified 39.5% with sterile intraamniotic inflammation.
Conclusion: AF IL-6 concentration can be used for the rapid assessment and diagnosis of IAI and S-IAI.



865 | Placental Pathology in Nulliparas with Gestational Hypertension and Preeclampsia

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10:30 AM - 12:30 PM
Objective: To investigate placental pathology patterns in first-time mothers with gestational hypertension and preeclampsia.
Study Design: This was a secondary analysis of the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-be. The present analysis included nulliparous participants with singleton gestations who developed gestational hypertension or preeclampsia and had placental pathology reports available. Placental characteristics and pathologies were described and compared between different types of hypertensive disorders of pregnancy (HDP) and by gestational age at HDP diagnosis using univariate and bivariate analyses.
Results: Of 543 participants who met inclusion criteria, 297 (54.7%) had gestational hypertension, and 246 (45.3%) had preeclampsia. Of these, 228 (42.3%) had an HDP diagnosis prior to 37 weeks. The rate of acute fetal and maternal placental inflammation was higher among those with term preeclampsia (46.2%) and gestational hypertension (42.1%) and lower among placentas of preterm preeclampsia (12.6%, p< .001; Table 1). In contrast, the rate of maternal vascular malperfusion was highest in preterm preeclampsia (62.1%) and lowest in gestational hypertension (29.6%, p< .001). The rates of fetal vascular malperfusion did not differ between HDP phenotypes. Table 2 examined placental findings by gestational age at diagnosis of ≥37 weeks, 34-36 weeks, and < 34 weeks. Presence of acute maternal and fetal inflammatory response increased with advancing gestation (19.5% at < 34 weeks, 23.8% at 34-36 weeks, and 49.8% at ≥37 weeks; p< .001) while the prevalence of maternal vascular malperfusion decreased with advancing gestation (48.8% at < 34 weeks, 44.8% at 34-36 weeks, and 31.2% at ≥37 weeks; p< .001).

Conclusion: Maternal vascular malperfusion lesions in the placenta were more common in early-onset HDP while acute inflammatory lesions were more common in late-onset HDP. This distinction helps in understanding that early- and late-onset HDP may have different underlying pathological mechanisms.

Table 1. Placental characteristics and pathology according to hypertensive disorder of pregnancy

	Gestational hypertension (n = 297)	Term preeclampsia (n = 143)	Preterm preeclampsia (n = 103)	p-value
Placental weight (grams)	435.5 (363.3-506.8)	452.0 (378.0-562.8)	322.0 (249.0-397.5)	**<.001**
Any AI	125 (42.1)	66 (46.2)	13 (12.6)	**<.001**
Stage of maternal inflammatory response				**<.001**
None	178 (59.9)	81 (56.6)	91 (88.3)	
Low	56 (18.9)	20 (14.0)	6 (5.8)	
High	63 (21.2)	42 (29.4)	6 (5.8)	
Any fetal inflammatory response	36 (12.1)	20 (14.0)	3 (2.9)	**.006**
Any CI	16 (5.4)	10 (7.0)	4 (3.9)	.584
Any FVM	34 (11.4)	18 (12.6)	7 (6.8)	.323
Any MVM	88 (29.6)	53 (37.1)	64 (62.1)	**<.001**
Villous pathology present	85 (28.6)	51 (35.7)	63 (61.2)	**<.001**
Vessel pathology present	5 (1.7)	5 (3.5)	11 (10.7)	**<.001**
Grade of MVM				**<.001**
None	209 (70.4)	90 (62.9)	39 (37.9)	
Low	48 (16.2)	31 (21.7)	32 (31.1)	
High	40 (13.5)	22 (15.4)	32 (31.1)	
SGA placenta	106 (42.7)	46 (37.7)	44 (51.8)	.135

Data presented as N (%) or median (interquartile range).
Abbreviations: AI, acute inflammation; CI, chronic inflammation; FVM, fetal vascular malperfusion; MVM, maternal vascular malperfusion; SGA, small for gestational age.

Table 2. Placental characteristics and pathology according to gestational age at diagnosis of hypertensive disorder of pregnancy

	≥37 weeks (n = 311)	34-36 weeks (n = 105)	<34 weeks (n = 123)	p-value
Placental weight (grams)	455.5 (380.0-542.0)	390.0 (332.0-481.0)	344.0 (250.0-417.0)	**<.001**
Any AI	155 (49.8)	25 (23.8)	24 (19.5)	**<.001**
Stage of maternal inflammatory response				**<.001**
None	164 (52.7)	81 (77.1)	101 (82.1)	
Low	60 (19.3)	11 (10.5)	11 (8.9)	
High	87 (28.0)	13 (12.4)	11 (8.9)	
Any fetal inflammatory response	49 (15.8)	6 (5.7)	4 (3.3)	**<.001**
Any CI	16 (5.1)	7 (6.7)	7 (5.7)	.786
Any FVM	36 (11.6)	13 (12.4)	10 (8.1)	.538
Any MVM	97 (31.2)	47 (44.8)	60 (48.8)	**<.001**
Villous pathology present	93 (29.9)	45 (42.9)	60 (48.8)	**<.001**
Vessel pathology present	5 (1.6)	8 (7.6)	8 (6.5)	**.003**
Grade of MVM				**.004**
None	214 (68.8)	58 (55.2)	63 (51.2)	
Low	56 (18.0)	25 (23.8)	30 (24.4)	
High	41 (13.2)	22 (21.0)	30 (24.4)	
SGA placenta	104 (39.7)	40 (46.0)	51 (49.5)	.193

Data presented as N (%) or median (interquartile range).
Abbreviations: AI, acute inflammation; CI, chronic inflammation; FVM, fetal vascular malperfusion; MVM, maternal vascular malperfusion; SGA, small for gestational age.

866 | Insomnia is an Independent Risk Factor for Severe Morbidity During Pregnancy

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10:30 AM - 12:30 PM

Objective: Sleep disorders, such as insomnia and obstructive sleep apnea (OSA), are associated with pregnancy complications. In this study, we aimed to determine the impact of insomnia on the risk of severe morbidity (SM) and to compare the magnitude of the associations between insomnia/OSA and SM.

Study Design: We performed a cross-sectional study of liveborn singleton births in California (2011-2020). Birth certificates were linked to hospital discharge records for birthing people and their infants. Insomnia and OSA were identified as exposures using ICD-9 and 10 codes. The primary outcome was SM, as defined by the US Centers for Disease Control and Prevention. Secondary outcomes included components of SM. The relative risks, and corresponding 95% confidence intervals (CI), were calculated for outcomes by sleep disorder using Poisson regression models.

Results: During the study period, there were 4,145,166 singleton live births with linked records. The prevalence of insomnia and OSA were 117.4 and 138 per 1000 live births, respectively. Among people with sleep disorders, only 72 had both diagnoses (0.7%). Compared to people with no sleep disorders (reference), a higher percentage of people with sleep disorders were age >35 years, White, privately-insured, BMI >30 kg/m^2, and had cesarean deliveries. The RR of SM was 3.4 fold higher (95% CI 3.1, 3.8) and 4.3 fold higher (95% CI 3.9, 4.6) for those with insomnia and OSA, respectively (Table). This risk of SM was even greater for non-transfusion SM. The magnitude of risk for disseminated intravascular coagulation, puerperal cerebrovascular disorders, sepsis, shock, and hysterectomy was slightly higher for patients with insomnia versus those with OSA (Table). The magnitude of risk for all other components of SM was greater in OSA versus insomnia.

Conclusion: While both insomnia and OSA confer an increased risk for SM, they are associated with distinct demographic traits. Further study is need to identify baseline patient characteristics associated with each of these sleep disorders during pregnancy and to design targeted preventative interventions.

Table
Risk of severe morbidity by sleep disorder in a cross-sectional study of singleton live births in California (2011-2020)

	No Insomnia or OSA	Insomnia		OSA	
	n (%)	n (%)	RR (95% CI)	n (%)	RR (95% CI)
Sample	4,134,671	4,855		5,714	
No SM[a]	4,040,814 (97.7)	4,481 (92.3)	*Reference*	5,161 (90.3)	*Reference*
Any SM	93,857 (2.3)	374 (7.0)	3.4 (3.1, 3.8)	553 (9.7)	4.3 (3.9, 4.6)
SM without blood transfusions	45,419 (1.1)	238 (4.9)	4.5 (4.0, 5.2)	401 (7.0)	6.5 (5.9, 7.2)
Acute renal failure	4,969 (0.1)	29 (0.6)	5.2 (3.6, 7.5)	54 (1.0)	8.4 (6.4, 11.0)
Acute respiratory Distress syndrome	4,571 (0.1)	52 (1.1)	10.2 (7.7, 13.3)	87 (1.5)	14.6 (11.9, 18.1)
Disseminated intravascular coagulation	10,200 (0.3)	32 (0.7)	2.8 (2.0, 4.0)	34 (0.6)	2.6 (1.9, 3.6)
Blood transfusion	46,876 (1.1)	143 (3.0)	2.7 (2.3, 3.2)	176 (3.1)	2.9 (2.5, 3.3)
Eclampsia	6,379 (0.2)	26 (0.5)	3.7 (2.5, 5.4)	35 (0.6)	4.3 (3.1, 6.0)
Puerperal Cerebrovascular disorders	2,104 (0.1)	20 (0.4)	8.5 (5.5, 13.3)	15 (0.3)	5.6 (3.4, 9.3)
Pulmonary edema/ acute heart failure	3,246 (0.1)	18 (0.4)	5.0 (3.1, 7.9)	90 (1.6)	21.4 (17.3, 26.3)
Sepsis	13,456 (0.3)	70 (1.4)	4.6 (3.7, 5.9)	75 (1.3)	4.3 (3.4, 5.4)
Shock	3,264 (0.1)	21 (0.4)	5.8 (3.8, 8.9)	20 (0.4)	4.8 (3.1, 7.4)
Air and thrombotic Embolism	1,969 (0.1)	17 (0.4)	7.8 (4.8, 12.5)	21 (0.4)	8.3 (5.4, 12.8)
Hysterectomy	3,368 (0.1)	16 (0.3)	4.3 (2.6, 7.0)	18 (0.3)	4.2 (2.6, 6.6)
Ventilation	1,403 (0.0)	24 (0.5)	15.3 (10.3, 23.0)	96 (1.7)	52.6 (42.8, 64.7)

[a]Severe morbidity defined to by US Centers for Disease Control and Prevention based on ICD diagnostic and procedure codes.
Data withheld for the following morbidities due to small numbers: acute myocardial infarction, aneurysm, amniotic fluid embolism, cardiac arrest / ventricular fibrillation, conversion of cardiac rhythm, heart failure/arrest during surgery or procedure, severe anesthesia complications, sickle cell disease with crisis, and temporary tracheostomy
CI: confidence interval; OSA: obstructive sleep apnea: RR: relative risk; SM: severe morbidity as defined by the CDC.

867 | Maternal Trauma in Pregnancy - How Bad Are the Consequences?

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10:30 AM - 12:30 PM

Objective: Abdominal trauma during pregnancy may compromise placental perfusion and fetal wellbeing. This study aimed to assess perinatal outcomes following abdominal trauma due to motor vehicle accidents (MVA) and falls.

Study Design: This population-based cohort study included all pregnant women presenting to a tertiary-care center emergency room between the years 1991-2021. Trauma victims were categorized as vehicle occupant MVA, pedestrian MVA, or following a fall. Comorbidities and pregnancy outcomes were compared between patients with and without trauma. Generalized estimation equation (GEE) models were used to control for confounders such as maternal age and gravidity.

Results: A total of 356,356 births were recorded, including 66 (0.02%) following vehicle occupant MVA, 46 (0.01%) following pedestrian MVA, and 142 (0.04%) following a fall. Placental abruption, non-reassuring fetal heart rate (NRFHR), preterm delivery and perinatal mortality were all more common among trauma patients. After controlling for maternal age and gravidity, using GEE models, abdominal trauma was significantly associated with placental abruption (adjusted OR 21.7 for vehicle occupant MVA, adjusted OR 4.7 for pedestrian MVA, OR 2.5 for fall), NRFHR (adjusted OR 3.6 for vehicle occupant MVA, adjusted OR 2.6 for pedestrian MVA, adjusted OR 1.6 for fall), and preterm delivery (adjusted OR 4.1 for vehicle occupant MVA, adjusted OR 1.2 for pedestrian MVA, adjusted OR 2.8 for fall) as compared to non-trauma parturients. Perinatal mortality was higher among vehicle occupant MVA (adjusted OR 9.8) and fall (adjusted OR 4.0) than among non-trauma parturients (Table).

Conclusion: Abdominal trauma during pregnancy is an independent risk factor for adverse perinatal outcomes. The greatest risk seems to be among occupants of a vehicle involved in a collision.

Pregnancy characteristics and perinatal outcomes of trauma and pregnancy. Results from univariate analysis and GEE models

	No Trauma n = 356,102	Driver/Passenger MVA n = 66 [OR (95% CI)]	Pedestrian MVA n = 46 [OR (95% CI)]	Fall n = 142 [OR (95% CI)]	P-Value
Placental Abruption (crude)	1,846 (0.5%)	7 (10.6%)	1 (2.2%)	2 (1.4%)	<0.001
Adjusted OR*		21.7 (95% CI 9.8-48.3)	4.7 (95% CI 0.7-33.1)	2.5 (95% CI 0.6-9.7)	
Non-Reassuring Fetal Heart Rate (crude)	18,873 (5.3%)	12 (18.2%)	6 (13.0%)	14 (9.9%)	<0.001
Adjusted OR *		3.6 (95% CI 1.9-6.9)	2.6 (95% CI 1.1-6.1)	1.6 (95% CI 0.9-2.9)	
Preterm delivery <37 wks (crude)	24,463 (6.9%)	16 (24.2%)	6 (13.0%)	26 (18.3%)	<0.001
Adjusted OR*		4.1 (95% CI 2.4-7.3)	1.2 (95% CI 0.3-5.6)	2.8 (95% CI 1.9-4.3)	
Perinatal Mortality (crude)	2,814 (0.8%)	5 (7.6%)	0 (-)	5 (3.5%)	<0.001
Adjusted OR*		9.8 (95% CI 3.9-24.7)	<0.001	4.0 (95% CI 1.6-9.8)	

* Controlling for maternal age and gravidity

868 | Fetal Pleural Effusions: Natural History and Response to Interventions

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10:30 AM - 12:30 PM

Objective: Primary fetal pleural effusions (FPEs) require close surveillance, and thoracentesis or thoracoamniotic shunts are often considered for management. However, it can be challenging to predict which FPEs will evolve or respond to interventions. We aimed to analyze the prenatal course of primary FPEs and response to interventions.

Study Design: Retrospective cohort study of pregnancies with primary fetal FPEs referred to our center between 2017-2024. We included isolated unilateral FPEs or asymmetric bilateral FPEs with one side dominant. All ultrasound reports and records were reviewed for the course of the FPEs, other complications, fetal interventions, and relevant test results. Each case was categorized as improved or resolved FPE, stable FPE, or worsened FPE (including progression to non-immune hydrops fetalis).

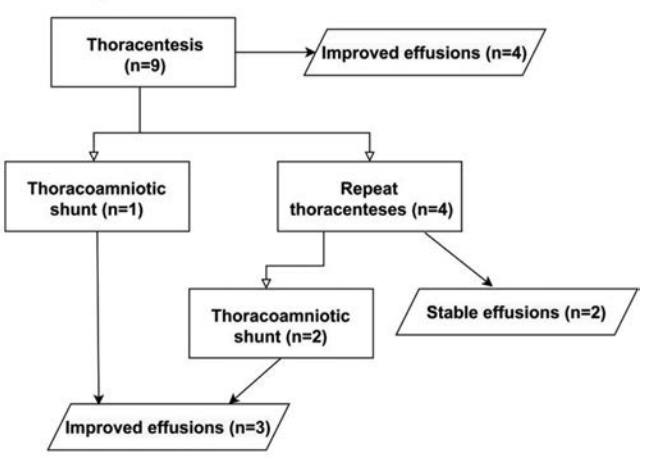
Results: Among 24 cases identified, 9 underwent thoracentesis and/or thoracoamniotic shunt. Median gestational age at diagnosis and first intervention was 19.4 and 20.7 weeks, respectively, for cases with an intervention. A majority (60%) of cases without intervention improved or remained stable (Table). All 9 cases with intervention had additional markers of severity (i.e. mediastinal shift or ascites), compared to only 53% (8/15) without intervention. Each case with an intervention had a thoracentesis, 44% (4/9) had more than one thoracentesis, and 33% (3/9) later had thoracoamniotic shunt placement (Fig). FPEs were chylous in 63% (5/8) of sampled cases; 60% (3/5) of chylous and all (3/3) serous effusions improved after intervention. All cases had a negative viral workup, and among 22 cases that underwent genetic screening and 13 that had diagnostic testing including exome sequencing, only 1 case was identified to have fetal trisomy 21.

Conclusion: Many primary FPEs improved or resolved spontaneously without intervention, and genetic diagnoses were uncommon. Most cases requiring intervention responded to thoracentesis and few ultimately required a thoracoamniotic shunt. These data are useful for anticipating the course of and response to interventions among these complicated pregnancies.

Table. Interventions performed and frequency of improved, stable, and worsened effusions.

	Improved or resolved effusions	Stable effusions	Worsened effusions
No intervention (n=15)	47% (7)	13% (2)	40% (6)
Any intervention (n=9)	77% (7)	22% (2)	0%
Thoracentesis without shunt (n=6)	60% (4)	40% (2)	0%
Thoracoamniotic shunt (n=3)	100% (3)	0%	0%

Fig. Outcomes of fetal interventions



869 | The Correlation of Antenatal Sonographic Parameters and Neurodevelopmental Outcomes in Fetal Growth Restriction

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10:30 AM - 12:30 PM

Objective: To determine how different antenatal sonographic parameters correlate with early childhood neurodevelopmental outcomes in fetuses categorized as fetal-growth restricted (FGR) or small-for-gestational-age (SGA).

Study Design: This was a prospective cohort of singleton FGR or SGA fetuses diagnosed after 20 weeks of gestation. FGR and SGA were defined using Delphi criteria. Using abdominal circumference (AC), umbilical vein flow (UVF) percentiles by gestational age (GA), corpus callosum length (CCL MoM), corpus vermian height (CVH MoM), transverse cerebellar diameter (TCD MoM), and the ratio of the insula circumference to head circumference (IC) from the last ultrasound before delivery, we tested for correlations to neurodevelopmental outcomes. We evaluated neurodevelopmental outcomes using the Bayley-III Scales of Infant Development (BSID). Mann-Whitney U tests compared the measurements and scales between FGR and SGA. Pearson correlation was used to compare the sonographic parameters to the BSID subscale and sum percentile scores. Using significant ultrasound parameters as predictors, a multivariate linear regression model was created for each BSID scale as a dependent variable.

Results: A total of 90 pregnancies were included in the study. BSID scores were available for 32 infants. SGA fetuses had higher UVF ($p = 0.001$) and higher motor scores ($p = 0.014$) compared to FGR (Table 1). EFW and AC centile correlate with motor scores, UVF correlates with language, adaptive behavior, and sum scores, and IC correlates with adaptive behavior. In the multivariate model, EFW was excluded given collinearity with AC. In the final multivariate analyses, AC was the only significant predictor for motor, UVF was a significant predictor for language, social-emotional, and sum scores, while insula predicted adaptive behavior and sum score (Table 2).

Conclusion: AC, UVF, and IC may be useful predictors of neurodevelopmental outcomes of the growth-restricted fetus. Long-term follow-up studies with larger cohorts are needed to better evaluate the impact of antenatal sonographic parameters on later neurodevelopment.

Table 1. Descriptive distribution of demographic, sonographic, and neurodevelopmental outcomes in FGR and SGA subgroups (N = 90)

	FGR (N = 75)	SGA (N = 15)	p-value
Maternal age (years)	29 (25 – 32.5)	25 (22 – 31.5)	0.472
Race – N (%)			0.325
White	62 (82.7%)	12 (80%)	
Black	4 (5.3%)	1 (6.7%)	
Asian	2 (2.7%)	2 (13.3%)	
More than one	2 (2.7%)	0	
Unknown	5 (6.7%)	0	
Ethnicity – N (%)			0.241
Hispanic or Latino	6 (8%)	3 (20%)	
Non-Hispanic or Latino	64 (85.3%)	12 (80%)	
Unknown	5 (6.7%)	0	
Body mass index (kg/m^2)	23.91 (21.88 – 26.29)	27.98 (21.57 – 33.06)	0.035*
Estimated fetal weight percentile	3 (1 – 5)	12 (6.5 – 22)	0.001*
Abdominal circumference percentile	2 (1 – 6)	11 (6 – 37)	0.001*
UA-PI percentile	71 (51 – 94)	53 (29 – 61)	0.007*
MCA-PI percentile	39 (8.5 – 83)	43 (28.5 – 76)	0.67
CPR percentile	21 (4 – 51.5)	24 (20 – 43)	0.46
UVF percentile (by gestational age)	19.6 (3.2 – 39.3)	59 (4.11 – 82.0)	0.001*
CCL MoM (N = 35)	1.09 (1.01 – 1.18)	1.16 (1.11 – 1.21)	0.623
CVH MoM (N = 25)	0.908 (0.84 – 0.98)	0.96 (0.86 – 1.11)	0.133
TCD MoM (N = 25)	0.998 (0.97 – 1.04)	1.026 (0.98 – 1.032)	0.41
Insula circumference/ Head circumference (N = 32)	0.204 (0.19 – 0.22)	0.2 (0.19 – 0.21)	0.96
Neurodevelopmental assessment (BSID) (N = 32)			
Age at time of Bayley's exam (months)	36.7 (26.77 – 39.96)	38.73 (37.07 – 40.32)	0.25
Cognitive subtest – percentile rank	50 (37 – 53.25)	50 (46.75 – 53.25)	0.879
Motor subtest – sum percentile rank	42 (32.25 – 50)	63 (56 – 70.75)	0.014*
Language subtest – percentile rank	54 (27 – 73)	62 (58 – 66)	0.432
Social-emotional subtest – percentile rank	63 (34 – 84)	77 (49.5 – 93)	0.706
Adaptive behavior subtest – sum percentile rank	58 (31.5 – 66)	88.5 (77 – 91.5)	0.054
Sum percentile	256.8 (212 – 311.75)	352.5 (314.25 – 359.5)	0.152

*denotes statistical significance
Abbreviations: UA-PI (umbilical artery pulsatility index); MCA-PI (middle cerebral artery pulsatility index); CPR (cerebroplacental ratio); UVF (umbilical vein flow); CCL (corpus callosum length); MoM (multiple of the median); CVH (corpus vermian height), (TCD) transverse cerebellar diameter.

Table 2. P-values (p), regression coefficients (ß), 95% confidence intervals (CI), and coefficient of determination (R^2) of the linear regression model of sonographic parameters and neurodevelopmental outcomes.

Outcomes	Sonographic Parameter	p	ß	95% CI	R^2
Cognitive percentile	AC% UVF% IC/HC	0.78 0.91 0.89	NS NS NS	NS NS NS	0.05
Motor percentile	AC% UVF% IC/HC	0.03* 0.64 0.08	0.369 NS NS	0.04 – 1.08 NS NS	0.274
Language percentile	AC% UVF% IC/HC	0.36 0.02* 0.17	NS 0.408 NS	NS 0.07 – 0.67 NS	0.29
Social-emotional percentile	AC% UVF% IC/HC	0.20 0.04* 0.28	NS 0.38 NS	NS 0.03 – 0.79 NS	0.195
Adaptive behavior percentile	AC% UVF% IC/HC	0.63 0.06 0.004*	NS NS -0.474	NS NS -826.04 – -170.78	0.364
Sum percentile	AC% UVF% IC/HC	0.66 0.04* 0.048*	NS 0.353 -0.335	NS 0.05 – 2.23 -2302.14 – -9.05	0.278

870 | Impact of Pregnancy Intention on Immediate Pregnancy Outcomes and Postpartum Mental Health

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10:30 AM - 12:30 PM

Objective: To estimate rates of pregnancy intention, describe their characteristics, and examine pregnancy and postpartum mental health outcomes among intended vs. unintended

pregnancies using electronic health records (EHRs) of pregnant patients in a large integrated healthcare system.

Study Design: We conducted a retrospective cohort study using EHRs on singleton pregnancies delivered at ≥20 weeks in Kaiser Permanente Southern California (KPSC) healthcare system (01/01/2014-12/31/2023). Data on pregnancy intentions (wanted, mistimed, unwanted) were extracted from a self-reported questionnaire administered at the first prenatal visit and in combination with an ICD-10 code (Z64.0) for unintended pregnancy. We extracted postpartum mental health outcomes using diagnostic codes. Multivariable logistic regression models were used to estimate adjusted odds ratios (OR) and 95% confidence intervals (CI).

Results: Of 149,739 who had a record of pregnancy intentions, 34% (n = 51,262) were intended and 66% (n = 98,477) were unintended. Young age, lower socioeconomic status, and late/no prenatal care initiation were more common among unintended pregnancies. This group had higher rates of smoking (5.6% vs 2.6%) and illicit drug use (7.9% vs 3.5%) during pregnancy than those with intended. Unintended pregnancy was associated with higher odds of (pre)eclampsia (OR: 1.07, 95% CI: 1.02, 1.12), and lower odds of gestational diabetes (OR: 0.91, 95% CI: 0.87, 0.94), placenta previa (OR: 0.93, 95% CI: 0.88, 0.98) and cesarean delivery (OR: 0.93, 95% CI: 0.91, 0.96). Additionally, those with unintended pregnancies had higher odds of postpartum depression (OR: 1.24, 95% CI: 1.20, 1.28) and anxiety disorders (OR: 1.19, 95% CI: 1.15, 1.23)

Conclusion: Among completed records, unintended pregnancies were over half and independently associated with (pre)eclampsia and postpartum mental health outcomes. Pregnancy intention has a positive influence on selected birth outcomes. Findings suggest that mental health assessments and integrated services supporting high-risk pregnancy management are vital in improving pregnancy outcomes.

871 | Early Vs. Late Placement of Cervical Cerclage Performed due to Cervical Insufficiency in Twins

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10:30 AM - 12:30 PM

Objective: The study was aimed to assess the impact of early vs. late (above 15 weeks gestation) cervical cerclage placement performed due to cervical insufficiency in twins on perinatal outcome.

Study Design: A retrospective cohort study was conducted including all patients with twin pregnancy (n = 92 women) with cervical cerclage. Deliveries occurred between the years 1990 and 2023 in a tertiary medical center. Perinatal outcome was compared between women who underwent cervical cerclage placement ≤15 weeks and women who underwent cervical cerclage placement >15 weeks. Adverse perinatal outcome was defined as either 5 minute Apgar scores < 7 or neonatal intensive care unit (NICU) admission of at least one of the twins. Multiple logistic regression models were used to control for confounders.

Results: A total of 92 women were included in the study, complete data was available for 77 women. Late placement of cervical cerclage (>15 weeks, n = 34), was found as a risk factor for PTD less than 35 weeks (79.4% vs. 58.1%, OR 2.77, 1.01–8.33; P = 0.048). No significant association was noted between late cerclage placement due to cervical insufficiency in twins and adverse perinatal outcome (29.4% vs. 15.6%, OR 2.5, 0.75–7.14; P = 0.138) as compared with early placement (Table). Using multivariable analysis, controlling for maternal age, late cerclage placement was noted as an independent risk factor for PTD < 35weeks gestation (adjusted OR 2.94, 95% CI 1.02 - 8.33; P = 0.047).

Conclusion: Late placement of cervical cerclage (>15 weeks) in twin pregnancies, performed due to cervical insufficiency, is an independent risk factor for preterm delivery of less than 35 weeks gestation. Nevertheless, in our population, late vs. early placement of cerclage is not a risk factor for adverse perinatal outcome.

Table: Early vs. late placement of cervical cerclage performed due to cervical insufficiency in twins

	Cerclage placement > 15 weeks (n=34)	Cerclage placement ≤ 15 weeks (n=43)	OR (95% CI)
PTD < 35w weeks	79.4%	58.1%	2.8 (1.01 – 8.33); P=0.048
Adverse perinatal outcome*	29.4%	15.6%	2.5 (0.75– 7.14); P = 0.138

* 5 minutes Apgar <7 or NICU admission of at least one of the twins.

** Adjusted for maternal age

872 | Decreasing Trend of Gastroschisis Prevalence in the United States between 2014 and 2022

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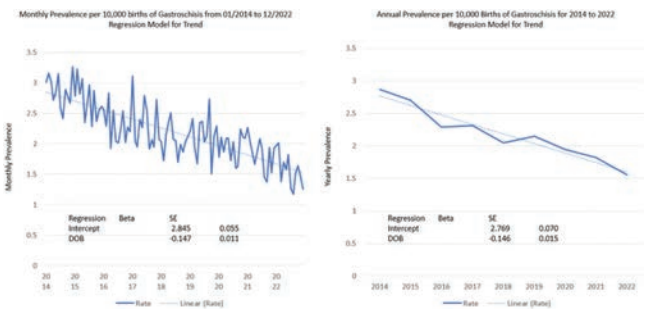
10:30 AM - 12:30 PM

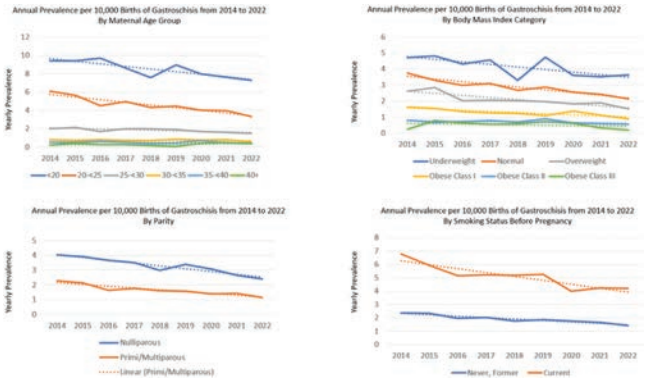
Objective: To investigate the prevalence trend and characteristics of congenital gastroschisis in the United States between 2014 and 2022

Study Design: A cross-sectional retrospective analysis of the Centers for Disease Control and Prevention database for United States live births between 2014 and 2022. Neonatal singleton live births with documented isolated gastroschisis were included, and neonates with other major congenital anomalies and known chromosomal abnormalities were excluded. Prevalence per 10,000 live births along with 95% confidence intervals were estimated, with comparisons to unaffected birth rates in same aged cohorts.

Results: Among 32,088,301 singleton live births (2014–2022), 6,804 cases of isolated gastroschisis were identified (point prevalence: 2 per 10,000 live births). Starting in 2018, a significant decline in gastroschisis prevalence was observed, decreasing from 2.86 in 2014 to 1.55 per 10,000 live births in 2022 ($p<$ 0.001). The risk of gastroschisis was significantly higher in teen and nulliparous gravidae, among non-Hispanic indigenous Americans, with maternal tobacco use, and among vulnerable populations (underweight, < 12th grade education, Medicaid). The declining rate in neonates with gastroschisis, compared to neonates without gastroschisis, is attributable to declines in births among gravidae under 25 (p = 0.02), with significant declines in prevalence of other attributable maternal factors ($p<$ 0.001). Despite early reports suggesting a mediating effect of COVID-19, there was no significant difference of the pandemic on the declining trend rate.

Conclusion: This comprehensive analysis of over 32 million births highlights a notable decline in the prevalence of neonates with gastroschisis, which is attributable to a declining birth rate in the highest at-risk strata of vulnerable gravidae. Given recent increases in birth rates in these same populations, our findings anticipate a reverse of the trend of declining gastroschisis disease prevalence. Further research is necessary to understand the role of access to reproductive care in rates of common congenital anomalies.





873 | Evaluating Surgical Approaches for Prenatal Repair of Open Spina Bifida: A Systematic Review and Meta-Analysis

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10:30 AM - 12:30 PM

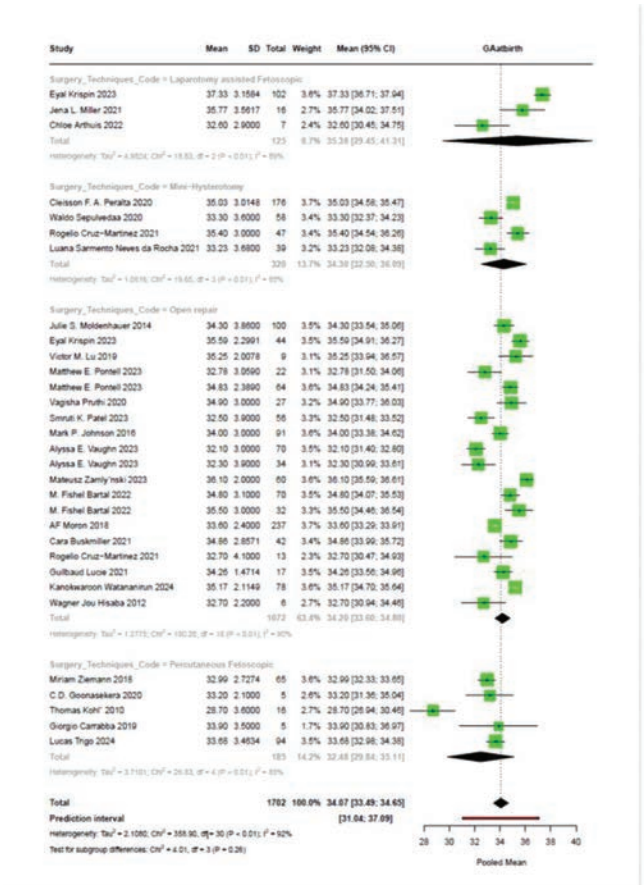
Objective: Over the past decade, prenatal repair of open spina bifida has become well-established. Since the MOMS trial, a widely varying number of surgical approaches have emerged, each focused on optimizing outcomes while minimizing risks. This study aims to compare the outcomes of these different surgical techniques.

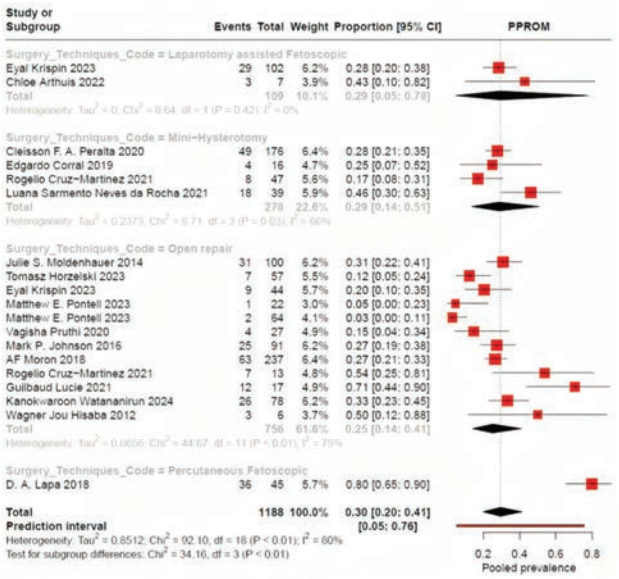
Study Design: This systematic review and meta-analysis synthesizes data from 38 studies between 2010 and 2024. Eligible studies included pregnant patients diagnosed with open spina bifida who underwent the following intrauterine repair techniques: open, mini-hysterotomy, laparotomy-assisted fetoscopic, and percutaneous fetoscopic repair. The primary outcome investigated was gestational age (GA) at delivery, while secondary outcomes were preterm premature rupture of membranes (PPROM), preterm delivery, vaginal birth, and perinatal mortality.

Results: In this study, 2,333 prenatal repair of open spina bifida procedures were analyzed across 14 countries. Of these, open repair accounted for 65.66%, mini-hysterotomy 14.40%, laparotomy-assisted fetoscopic 5.36%, and percutaneous fetoscopic 14.57%. Subgroup analyses revealed a mean GA at birth of

34.20 weeks for open repair, 34.30 weeks for mini-hysterotomy, 35.38 weeks for laparotomy-assisted, and 32.48 weeks for percutaneous fetoscopic method, with no significant difference noted between subgroups. Overall rates of preterm delivery before 37 weeks and PPROM were 0.75 and 0.30, respectively. Both showed significant differences between subgroups (P< 0.01). Vaginal birth rates had significant subgroup differences (P< 0.01), with the laparotomy-assisted fetoscopic group more likely to have vaginal deliveries (0.02, 0.04, 0.49, 0.18 for open, mini, laparotomy, and percutaneous, respectively)

Conclusion: Collectively, the data from this meta-analysis suggests that gestational age does not significantly differ by the surgical technique employed for prenatal repair of open spina bifida.





874 | Planned Versus Emergent Uterine Preserving Cesarean Delivery for Placenta Accreta Spectrum

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10:30 AM - 12:30 PM

Objective: Uterine preserving cesarean delivery is increasingly used to manage placenta accreta spectrum (PAS). Outcomes of emergent compared to elective cesarean hysterectomy were previously studied. The aim of this study is to compare maternal and neonatal outcomes between women who had emergent and elective uterine preserving cesarean delivery for PAS cases.

Study Design: This is a retrospective study conducted at a single tertiary center. PAS cases scheduled for uterine preserving surgery between 3/2011 to 11/2020 were retrieved and analyzed. Delivery was defined as elective when performed at a time and date planned by a dedicated multidisciplinary team, all other cases were defined as emergent. The primary outcome is composite maternal outcome defined by one or more of these variables: unplanned hysterectomy, intensive care unit admission, transfusion of six or more red blood cell units, disseminated intra-vascular coagulation. ureteric injury, bowel injury, unintentional cystotomy and relaparotomy. Secondary outcome included neonatal outcome such as APGAR score, cord pH, admission to the neonatal intensive care and mechanical ventilation.

Results: 274 women with PAS diagnosis were scheduled to uterine preserving surgery. 215 underwent elective surgery and 59 had emergent surgery. Composite maternal outcome occurred in 81 women (29.6%) of all women, no significant difference was found between the elective surgery group and the emergent surgery group (28.8% vs 32.2% p = 0.631). Significant differences were found in neonatal outcomes: longer hospital stay (8.42 ± 7.06 vs 16.28 ± 13.98 p< 0.01), higher rate of mechanical ventilation (7%

vs 18.6% p< 0.01) and neonatal intensive care unit hospitalization in the emergent cesarean group (24.2% vs 55.9% p< 0.01).

Conclusion: Emergent uterine preserving surgery in PAS cases is not associated with increased maternal morbidity. This should be considered against prematurity complication when scheduling uterine preserving surgery. Higher rate of neonatal adverse outcomes was found in the emergency group can be attributed to an earlier gestational week at delivery.

Table 1. A comparison between baseline characteristics in those who had elective cesarean delivery and those who had emergent cesarean delivery.

Characteristics	Elective Cesarean Delivery (215)	Emergent Cesarean Delivery (59)	P
Age	35.62 ± 4.93	34.93 ± 4.45	0.335
Body mass index (BMI)	29.67 ± 5.16	28.79 ± 5.76	0.410
Gravity	5.38 ± 2.91	4.88 ± 2.50	0.229
Parity	3.30 ± 2.27	2.93 ± 2.09	0.261
Previous cesarean delivery	212 (98.6)	57 (96.6)	0.311
Number of past cesarean delivery	2.25 ± 1.39	2.14 ± 1.66	0.588
Current pregnancy characteristics:			
Time from last Cesarean delivery (years)	3.95 ± 2.44	4.33 ± 3.42	0.336
Pre-operation suspicion of placenta accreta spectrum (ultra-sound)	183 (85.1)	44 (74.6)	0.057
Pre-operation placenta accreta spectrum grade (ultra-sound)	2.39 ± 0.92	2.25 ± 0.90	0.374
Placenta previa	114 (53.0)	33 (55.9)	0.691
Pregnancy duration (weeks)	36.10 ± 1.420	33.97 ± 3.010	<.001
Pre-operative:			
Hemoglobin before surgery	11.34 ± 1.01	11.10 ± 1.21	0.120
Preoperative ureter catheter	46 (21.4)	4 (6.8)	0.010
General anesthesia	161 (74.9)	42 (71.2)	0.566
Spinal anesthesia	56 (26)	19 (32.2)	0.410
Surgery findings:			
Bladder invasion perceived by surgeon	30 (14.0)	3 (5.1)	0.064
PAS clinical grade	2.50 ± 0.97	2.41 ± 1.04	0.531
PAS grade ≥ 3	122 (56.7)	33 (55.9)	1
PAS Histology grade	2.17 ± 0.71	2.08 ± 0.64	0.675
Intra-operative:			
Surgery duration - minutes	97.25 ± 51.91	99.00 ± 59.50	0.831
Fundal uterine incision	3 (1.4)	7 (11.9)	<0.001
Uterotonic agents' administration	116 (54)	31 (52.5)	0.883
Tranexamic acid	101 (48.1)	18 (31.6)	0.026

Data are mean ±SD (independent t test), or n (%) (x2 or Fisher exact test) unless otherwise specified.

Table 2. Maternal surgical, post operative, medical and obstetrics outcomes for women who underwent elective cesarean delivery and those who underwent emergent cesarean delivery.

Outcomes	Elective Cesarean Delivery (215)	Emergent Cesarean Delivery (59)	P
Maternal outcomes:			
Composite maternal outcome	62 (28.8)	19 (32.2)	0.631
Hysterectomy	39 (18.1)	12 (20.3)	0.708
Bowel damage	0 (0.0)	1 (1.7)	0.056
Ureteral damage	2 (0.9)	1 (1.7)	0.617
Unintentional Bladder cystotomy	18 (8.4)	5 (8.5)	0.819
Disseminated intravascular coagulation	11 (5.1)	5 (8.5)	0.349
Maternal intensive care unit admission	6 (2.8)	2 (3.4)	0.683
≥ 6 packed red blood cell units	38 (17.7)	11 (18.6)	0.863
Relaparotomy	8 (3.7)	3 (5.1)	0.636
Neonatal outcomes:			
Weight (grams)	2776 ± 392	2354 ± 602	**<.001**
APGAR score ≤ 6	15 (7.0)	4 (6.8)	0.958
Cord pH< 7.1	0 (0)	0 (0)	n/a
Days in hospital	8.42 ± 7.06	16.28 ± 13.98	**<.001**
Mechanical ventilation	15 (7.0)	11 (18.6)	**0.007**
Neonatal intensive care unit hospitalization	52 (24.2)	33 (55.9)	**<.001**

Data are mean ±SD (independent t test) or n (%) (x2 or Fisher exact test) unless otherwise specifie

875 | Angiogenic Factors for Prediction of Adverse Outcomes in Pregnancies Complicated by Isolated Fetal Growth Restriction

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10:30 AM - 12:30 PM

Objective: To evaluate whether abnormal sFlt-1/PlGF ratio predicts latency to delivery and development of hypertensive disorders of pregnancy (HDP) among individuals presenting with fetal growth restriction (FGR)

Study Design: A retrospective study including individuals at ≥ 23 weeks presenting to a tertiary care center with suspected FGR (< 10th percentile) (08/2023 to 04/2024). During this period, sFlt-1/PlGF levels were obtained for all individuals with FGR but were not used to guide
clinical management. Patients with HDP on presentation were excluded. Median interval to delivery, rate of HDP, and other adverse outcomes were compared between those with and without abnormal sFLT-1/PLGF ratio (≥ 38).
Odds ratio and 95% confidence interval (95%CI) were calculated.

Results: Of 104 patients with suspected FGR, 36 (34.6%) had an abnormal ratio of sFlt-1/PlGF (≥38). Those with abnormal sFlt-1/PlGF levels were more likely to be nulliparous compared to those with normal testing (Table 1). The rate of HDP was higher among those with abnormal sFlt- 1/PlGF ratio (30.6% Vs 2.94%, p< 0.01, OR14.5 (3-70.2)) with a shorter median latency from test to delivery (20 vs 36 days, p< 0.01) compared to normal testing. Furthermore, those with abnormal sFlt- 1/PlGF ratio delivered earlier (35.4 vs. 37.1, p< 0.01) with a lower birthweight (1876 vs 2182 gram, p< 0.01) compared to those with normal testing.

Conclusion: Abnormal sFlt-1/PlGF ratio in normotensive individuals with suspected FGR may predict short interval to delivery, development of HDP, and adverse perinatal outcomes.

Table 1 – Maternal and obstetrics characteristics

	sFLT-1/PLGF > 38 N=36	sFLT-1/PLGF < 38 N=68	P value
Maternal age (years)	32 (29.2-36)	32 (28-35.7)	0.55
Maternal age >35	10 (27.8)	17 (25)	0.75
Singleton	27 (75)	60 (88.2)	0.08
Nulliparity	20 (55.6)	22 (32.3)	0.02
BMI	26.13(23.2-31.1)	26.2(24.2-28.8)	0.94
Pre gestational diabetes	0 (0)	0 (0)	N/A
Chronic HTN	3 (8.3)	3 (4.4)	0.41
Smoking	0 (0)	4 (5.8)	0.13
SFLT-1	8138.5 (5251.5-13383)	1977.5 (1369.2-3071.5)	**< 0.01**
PLGF	102 (77.2-160.5)	420 (255.2-647.5)	**< 0.01**
SFLT-1 / PLGF ratio	74.88(42.2-119.5)	4.6(2.4-11. 4)	**< 0.01**
SFLT-1 /PLGF ratio > 100	14 (38. 9)	0 (0)	**< 0.01**
SFLT-1 /PLGF ratio > 200	5 (13.9)	0 (0)	**< 0.01**

Continuous variables are presented as median ± IQR and categorical variables as n (%). p-values in bold are statistically significant. BMI – body mass index (kg/m^2), PGDM – pre-gestational diabetes mellitus, HDP- Hypertensive disorders of pregnancy

Table 2 – Perinatal and neonatal outcomes

	sFLT-1/PLGF > 38 N=36	sFLT-1/PLGF < 38 N=68	P value	OR
Hypertensive disorder of pregnancy	11 (30. 6)	2 (2.9)	**< 0.01**	**14.5 (3-70.2)**
Induction of labor	10 (27. 8)	20 (29.4)	0.86	0.92 (0.4-2.3)
Time from test to delivery (days)	20 (4-41.2)	36 (23.2-47.7)	**0.01**	**0.97 (0.95-0.99)**
Time from abnormal test to delivery (days)	10 (2-34)	N/A	N/A	
GA at delivery	35.4 (32.1-37)	37.1 (36.3-38.1)	**< 0.01**	**0.73 (0.6-0.9)**
Preterm birth (< 37)	26 (72.2)	28 (41.2)	**< 0.01**	**3.71 (1.5-8.9)**
Preterm delivery (< 34)	11 (30. 6)	10 (14.71)	0.055	2.55 (0.9-6.8)
Cesarean Delivery	12 (33.3)	23 (33.8)	0.96	0.97 (0.41-2.3)
urgent cesarean delivery	22 (61.1)	15 (22.1)	**< 0.01**	**5.55 (2.3-13.4)**
Arterial cord pH	7.29 (7.26-7.31)	7.27 (7.2-7.31)	0.14	68.56 (0.2-24690.9)
Arterial cord pH < 7.1	3 (8.82)	0 (0)	0.24	N/A
Neonatal weight	1810 (1370-2090)	2270 (1900-2635)	**< 0.01**	**0.99 (0.99-0.99)**
APGAR 5' < 7	3 (8.82)	1 (1.3)	0.21	5.25 (0.5-52.2)
NICU admission	29 (65.91)	21 (27.27)	**< 0.01**	**4.6 (2.1-10.3)**
Composite adverse neonatal outcomes	12 (27.27)	8 (10.39)	**0.01**	**3.32 (1.2-9.1)**

Continuous variables are presented as median ± IQR and categorical variables as n (%). p-values in bold are statistically significant. Hypertensive disorder of pregnancy defined according to the ACOG guidelines Composite adverse neonatal outcomes one or more of the following severe complications: Neonatal seizures, intra-ventricular hemorrhage, hypoxic-ischemic encephalopathy, periventricular leukomalacia, necrotizing enterocolitis, or neonatal death

876 | Does an Early Isolated Decrease in Fetal Abdominal Circumference Heighten the Risk of Growth Restriction?

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10:30 AM - 12:30 PM

Objective: To determine if an isolated second trimester fetal abdominal circumference (AC) < 10th %tile is an independent risk factor for fetal growth restriction (FGR) and small for gestational age (SGA) neonates.

Study Design: This multi-center retrospective cohort study analyzed patients who delivered term singletons between 1/1/2019-1/1/2024. The exposed group involved normally grown fetuses with isolated AC's < 10th %tile, measured between 18 and 24 weeks gestation. Control subjects were randomly selected from the same time period. Congenital anomalies were excluded. Statistical analyses included independent t-tests for continuous variables, chi-squared tests for categorical variables, and binary logistic regression models both unadjusted and adjusted for FGR and SGA.

Results: Of the 1,213 patients screened, 589 met the inclusion criteria (AC< 10 n = 213; Control n = 376). The mean AC was 6.3%tile in the exposed group compared to 51.2%tile in the controls. Birthweight in grams (2,782 vs. 3,257, p< 0.001) and %tiles (18.3% vs. 41.8%, p< 0.001) were lower in the AC< 10 group. AC was found to be an independent risk factor for both FGR (AOR 12.5 [6.7, 23.4]) and SGA (AOR 5.08 [3.32, 7.76]). Logistic regressions analysis for primary and secondary outcomes are shown in Table 2. Although there were more pregestational diabetic mothers in the AC< 10 group (10.3% vs. 3.7%, p = 0.001), pregestational diabetes was ultimately protective of FGR (AOR 0.15 [0.04, 0.54]). As maternal BMI increased, the likelihood of FGR (AOR 0.95 [0.90, 0.995]) and SGA (AOR 0.94 [0.91, 0.97]) decreased. Demographically, Black patients were more prevalent in the AC< 10 group compared to controls (36.2% vs. 25.8%, p = 0.027). There were no differences in parity, gestational diabetes, chronic or gestational hypertension, pre-eclampsia, BMI, or mode of delivery between groups.

Conclusion: An isolated second trimester AC< 10th %tile in an otherwise normally grown fetus is an independent risk factor for both FGR and SGA. Increased maternal BMI was protective of both FGR and SGA. A history of pregestational diabetes was protective of FGR but not SGA.

Table 1. Univariate comparisons of demographic and delivery outcomes

	Control Group AC 10-90 N = 376	Comparison Group AC < 10 N = 213	p-value and Cohen's d effect size
Abdominal Circumference (AC)	51.2 (18.3)	6.3 (2.3)	
Age at Delivery	31.5 (5.9)	29.7 (5.7)	**p = .001**; d = .297
Race/Ethnicity			
Asian/Pacific Islander	5.1% (19)	6.6% (14)	**p = .027**
Black	25.8% (97)^	36.2% (77)^^	
Hispanic/Latino	30.1% (113)	27.7% (59)	
White	39.1% (147)^	27.7% (59)^^	
Parity Prior to Delivery			
0	37.5% (141)	33.3% (71)	p = .614
1	32.7% (123)	31.5% (67)	
2	16.5% (62)	18.8% (40)	
3	7.4% (28)	11.3% (24)	
4	4.0% (15)	3.3% (7)	
5+	1.9% (7)	1.9% (4)	
Comorbidities			
Pregestational Diabetes	3.7% (14)	10.3% (22)	**p = .001**
Gestational Diabetes	11.4% (43)	8.0% (17)	p = .183
Chronic Hypertension	13.3% (50)	9.4% (20)	p = .159
Gestational Hypertension	9.0% (34)	10.3% (22)	p = .609
Pre-eclampsia	3.7% (14)	5.2% (11)	p = .405
BMI at Delivery	33.6 (7.1)	33.1 (6.9)	p = .337
Mode of Delivery			
Operative Vaginal	1.1% (4)	0.0% (0)	p = .076
Spontaneous Vaginal	59.9% (226)	67.6% (144)	
Cesarean	39.0% (147)	32.4% (69)	
Gestational Age at Birth			
Mean Weeks	38.9 (1.1)	38.4 (1.2)	**p <.001**; d = .425
Median Weeks	Median = 39.0	Median = 38.1	**p <.001**
37 weeks	3.5% (13)^	9.9% (21)^^	**p <.001**
>37 up to 38 weeks	23.4% (88)^	36.2% (77)^^	
>38 up to 39 weeks	26.6% (100)	27.2% (58)	
>39 up to 40 weeks	30.9% (116)^	15.0% (32)^^	
>40 up to 41 weeks	13.8% (52)	9.9% (21)	
>41 weeks	1.9% (7)	1.9% (4)	
Birthweight			
Grams	3256.8 (420.3)	2782.2 (488.0)	**p <.001**; d = 1.064
Percentile	41.8% (28.4%)	18.3 (22.1%)	**p <.001**; d = .894
FGR	4.8% (18)	39.0% (83)	**p <.001**
SGA	16.0% (60)	53.5% (114)	**p <.001**

Note: Continuous variables are represented as Means (Standard Deviations) and categorical variables are represented as Percentages (Counts). Post-hoc tests are represented with ^ to show significant differences between groups based on comparison category.

Table 2: Binary Logistic Regression to Determine Factors Related to FGR and SGA

	FGR				SGA			
	UOR (95%CI)	p-value	AOR (95%CI)	p-value	UOR (95%CI)	p-value	AOR (95%CI)	p-value
AC <10th Percentile	12.70 (7.34, 21.96)	**<.001**	12.5 (6.7, 23.4)	**<.001**	5.95 (4.05, 8.75)	**.001**	5.08 (3.32, 7.76)	**<.001**
Age at Delivery	0.97 (0.94, 1.01)	.097	1.02 (0.97, 1.07)	.464	0.95 (0.92, 0.98)	**.001**	0.97 (0.94, 1.01)	.127
Race/Ethn (Ref: White)								
Asian	2.25 (0.95, 5.31)	.064	2.03 (0.67, 6.14)	.208	1.78 (0.81, 3.94)	.154	1.22 (0.49, 3.06)	.624
Black	1.68 (0.99, 2.84)	.055	1.52 (0.78, 3.00)	.222	2.34 (1.50, 3.66)	**<.001**	2.58 (1.53, 4.36)	**<.001**
Hispanic/Latino	0.97 (0.55, 1.74)	.926	0.92 (0.45, 1.91)	.826	1.34 (0.84, 2.14)	.181	1.38 (0.81, 2.35)	.242
Multiparity	0.97 (0.62, 1.51)	.883	0.64 (0.35, 1.19)	.158	0.88 (0.61, 1.27)	.482	0.71 (0.45, 1.13)	.151
Pregestational Diabetes	0.59 (0.20, 1.70)	.327	0.15 (0.04, 0.54)	**.003**	1.22 (0.59, 2.49)	.591	0.59 (0.25, 1.41)	.233
Gestational Diabetes	0.84 (0.40, 1.76)	.642	0.61 (0.25, 1.52)	.288	0.57 (0.30, 1.11)	.096	0.55 (0.26, 1.18)	.124
Chronic HTN	0.42 (0.18, 1.00)	**.049**	0.81 (0.28, 2.33)	.690	0.51 (0.27, 0.96)	**.037**	0.74 (0.34, 1.59)	.437
Gestational HTN	1.06 (0.51, 2.17)	.882	0.70 (0.26, 1.88)	.478	0.78 (0.42, 1.48)	.451	0.55 (0.24, 1.23)	.144
Pre-eclampsia	0.92 (0.31, 2.73)	.876	0.75 (0.18, 3.12)	.693	0.93 (0.38, 2.27)	.878	1.00 (0.33, 3.02)	.997
Gestational Age at Birth	0.35 (0.27, 0.46)	**<.001**	0.35 (0.26, 0.47)	**<.001**	0.63 (0.53, 0.75)	**<.001**	0.66 (0.55, 0.80)	**<.001**
BMI at Delivery	0.95 (0.91, 0.98)	**.002**	0.95 (0.90, 0.995)	**.030**	0.94 (0.91, 0.97)	**<.001**	0.94 (0.91, 0.97)	**<.001**
Cesarean Delivery	0.65 (0.41, 1.03)	.068	0.70 (0.38, 1.28)	.242	0.68 (0.47, 1.00)	**.048**	0.82 (0.53, 1.29)	.397

Note: UOR is the Unadjusted Odds Ratios with corresponding 95% Confidence Intervals (CI); AOR is the Adjusted Odds Ratios with the corresponding 95% CIs.

877 | Maternal and Fetal Outcomes of Pregnancies in Women with Cystic Fibrosis

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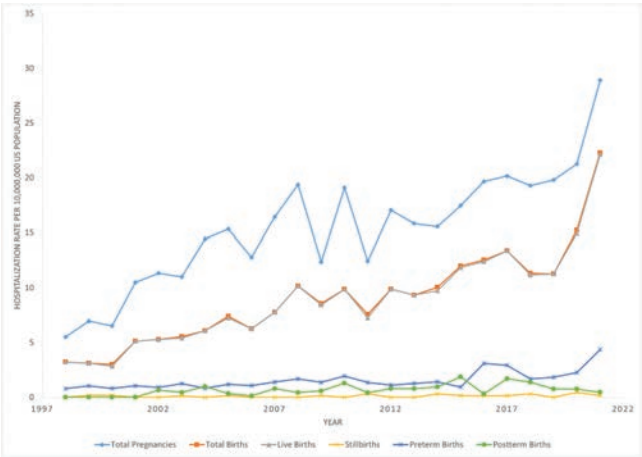
10:30 AM - 12:30 PM

Objective: Cystic fibrosis (CF) is a genetic disease that had previously made pregnancy near impossible. With advancements in therapy, pregnancies in women with CF are increasing. We aim to describe the maternal and fetal outcomes in a large cohort of pregnancies with CF in the U.S.

Study Design: We utilized the National Inpatient Sample and extracted cases of CF-associated pregnancies and deliveries. We described the characteristics and perinatal outcomes of pregnant women with CF and compared them to general non-CF pregnancies in the U.S. from 1998-2021. Trends were analyzed with Poisson regression and rates were analyzed with chi-squared test.

Results: There was a total of 11,496 pregnancies with CF. From 1998 to 2021, hospitalization rates of CF pregnancies and deliveries have increased by 5-fold and 7-fold, respectively (Figure 1). Median age was 26 years in the CF pregnant cohort compared to 28 years in the non-CF cohort (p< 0.0001). Median length of hospital stay was longer in the CF cohort (3 days vs 2 days; p< 0.0001). Maternal deaths occurred at significantly higher rates in the CF cohort (0.496% vs 0.013%; p< 0.0001). Rates of diabetes (6.79% vs 1.11%; p< 0.0001), obesity (4.59% vs 3.81%; p = 0.049), hepatitis C infection (0.51% vs 0.28%; p = 0.033), cirrhosis (0.435% vs 0.006%; p< 0.0001), intravenous drug use (1.16% vs 0.61%; p< 0.001), and coagulopathy (1.24% vs 0.32%; p< 0.0001) were significantly higher in the CF pregnancy group compared to the non-CF pregnancy group. Poor fetal growth was more common in the CF cohort (3.05% vs 2.28%; p = 0.013). Rates of pre-eclampsia, eclampsia, and intrauterine fetal demise were similar between the two groups (p >0.05). Among the 11,496 CF pregnancies, 6,786 (59.0%) had record of delivery. Rates of stillbirths (1.31% vs 0.76%; p = 0.020) and preterm births (17.30% vs 7.83%; p< 0.0001) were higher in the CF cohort. Maternal death during delivery was also higher in the CF cohort (0.147% vs 0.006%; p< 0.0001).

Conclusion: CF pregnancies and deliveries are increasing over time, but morbidity and mortality in this group is higher than in the general pregnant population.



878 | Association Between Hypertensive Disorders and Neonatal Mortality Among Periviable Deliveries

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10:30 AM - 12:30 PM

Objective: The objective of this study was to determine the association between hypertensive disorders of pregnancy (including chronic hypertension, gestational hypertension, and pre-eclampsia) and 1-year survival among periviable neonates delivered at 22w0d-25w6d.

Study Design: This is a retrospective cohort study using a maternal-infant linked database of live births in the state of Florida from 2006 to 2019. Singleton deliveries of infants born at 22w0d to 25w6d in which neonatal resuscitation was attempted were included. Adjusted hazard ratios (aHRs) were estimated to compare survival across exposures groups, overall and by week of gestation.

Results: Of the 6,898 periviable deliveries identified during the study period, 1,405 (20.4%) were affected by a hypertensive disorder. Patients affected with hypertension were also more likely to be of advanced maternal age, overweight/obese, non-Hispanic Black, have pre-existing diabetes, have connective tissue / autoimmune conditions, and have a diagnosis of fetal growth restriction. Among all periviable births, hypertensive disorders were associated with increased risk of death during the first year of life (aHR 1.24, 95% CI 1.13-1.38). However, when stratified by gestational age week, hypertensive disorder had no effect on risk of death at 1-year among 22- and 23-week neonates (aHR 0.73, 95% CI 0.50-1.07 and aHR 1.17, 95% CI 0.96-1.43 respectively), but increased risk of death among 24- and 25- week neonates (aHR 1.37, 95% CI 1.16-1.62 and aHR 1.41, 95% CI 1.17-1.69 respectively).

Conclusion: This study demonstrates that hypertensive disorders of pregnancy are associated with increased neonatal mortality among periviable neonates born at 24- and 25-weeks gestation, but not at 22- and 23-weeks gestation. These findings may help guide perinatologists when counseling patients in the periviable period.

Table 1: Crude and adjusted hazard ratios (HR) and 95% confidence intervals (CI) for one-year mortality

	Model 1: crude HR (95% CI)	Model 2: aHR (95% CI)[1]	Model 3: aHR (95% CI)[2]
Hypertensive Disorder			
No	Ref.	Ref.	Ref.
Yes	0.99 (0.90, 1.09)	1.04 (0.95, 1.15)	1.24 (1.13, 1.38)
Maternal age			
<20 years	1.28 (1.11, 1.47)	1.21 (1.04, 1.41)	1.26 (1.08, 1.47)
20-24 years	1.18 (1.05, 1.32)	1.16 (1.03, 1.29)	1.16 (1.03, 1.30)
25-29 years	Ref.	Ref.	Ref.
30-34 years	1.01 (0.90, 1.13)	1.01 (0.90, 1.13)	1.00 (0.89, 1.12)
35-39 years	0.99 (0.87, 1.12)	1.00 (0.87, 1.14)	0.94 (0.83, 1.07)
40+ years	0.69 (0.55, 0.86)	0.67 (0.53, 0.84)	0.67 (0.53, 0.84)
Maternal Weight			
Underweight (<18.5)	1.10 (0.90, 1.34)	1.00 (0.82, 1.23)	0.97 (0.79, 1.19)
Normal (18.5 to 24.9)	Ref.	Ref.	Ref.
Overweight (25.0 to 29.9)	0.88 (0.79, 0.98)	0.92 (0.83, 1.03)	0.92 (0.82, 1.02)
Obese (30.0 or higher)	0.87 (0.79, 0.96)	0.92 (0.83, 1.01)	0.90 (0.81, 1.00)
Unknown	1.04 (0.92, 1.18)	1.05 (0.93, 1.20)	1.02 (0.90, 1.16)
Race/ethnicity			
White, NH	Ref.	Ref.	Ref.
Black, NH	0.85 (0.77, 0.93)	0.85 (0.77, 0.93)	0.75 (0.68, 0.83)
Hispanic	0.85 (0.76, 0.95)	0.86 (0.77, 0.96)	0.77 (0.68, 0.86)
Other/Unknown, NH	0.83 (0.67, 1.02)	0.88 (0.71, 1.08)	0.84 (0.68, 1.04)
Education			
Less than high school	1.26 (1.13, 1.40)	1.16 (1.03, 1.30)	1.15 (1.02, 1.30)
High school graduate or GED	1.16 (1.06, 1.26)	1.11 (1.01, 1.21)	1.09 (1.00, 1.19)
At least some college	Ref.	Ref.	Ref.
Tobacco use			
No	Ref.	Ref.	Ref.
Yes	1.26 (1.07, 1.49)	1.14 (0.97, 1.35)	1.10 (0.93, 1.30)
Parity			
Nulliparous/Primiparous	Ref.	Ref.	Ref.
Multiparous	1.05 (0.96, 1.15)	1.10 (1.00, 1.21)	1.12 (1.02, 1.24)
Preexisting diabetes mellitus			
No	Ref.	Ref.	Ref.
Yes	0.91 (0.72, 1.15)	1.01 (0.79, 1.28)	1.04 (0.82, 1.32)
Gestational diabetes mellitus			
No	Ref.	Ref.	Ref.
Yes	0.71 (0.55, 0.93)	0.76 (0.58, 1.00)	0.81 (0.62, 1.06)
Connective tissue/autoimmune disease			
No	Ref.	Ref.	Ref.
Yes	0.98 (0.64, 1.50)	0.98 (0.64, 1.52)	1.14 (0.74, 1.75)
Gestational age		NA	
22	5.39 (4.72, 6.14)		5.72 (5.01, 6.54)
23	2.85 (2.56, 3.18)		3.00 (2.69, 3.35)
24	1.69 (1.52, 1.88)		1.72 (1.55, 1.92)
25	Ref.		Ref.

Abbreviations: HR = Hazard Ratio, aHR = Adjusted Hazard Ratio, CI = Confidence Interval, Ref. = Reference, NH = Non-Hispanic, GED = General Educational Development Test
[1]Total effect of HDP on 1-year survival

Table 2: Crude and adjusted hazard ratios (HR) and 95% confidence intervals (CI) for one-year mortality by gestational age

Gestational age	Unadjusted HR (95% CI)	Adjusted HR (95% CI)[1]
22	0.77 (0.54, 1.11)	0.73 (0.50, 1.07)
23	1.05 (0.87, 1.28)	1.17 (0.96, 1.43)
24	1.26 (1.08, 1.49)	1.37 (1.16, 1.62)
25	1.30 (1.09, 1.56)	1.41 (1.17, 1.69)

Abbreviations: HR = Hazard Ratio, CI = Confidence Interval
Reference = Hypertensive Disorder
[1]Adjusted for maternal age, weight, race/ethnicity, education, tobacco use, parity, preexisting diabetes mellitus, gestational diabetes mellitus, and connective tissue/autoimmune disease

879 | Assessment of Cardiac Outcomes in Pregnant Women with Congenital Heart Disease: A Single Center Experience

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10:30 AM - 12:30 PM

Objective: Women with congenital heart disease (CHD) have a significant risk of cardiovascular complications during pregnancy. This study examined the association between current cardiac risk stratification tools and cardiovascular outcomes in adult pregnant women with CHD.

Study Design: A retrospective observational study was performed via chart review of all patients ≥ 18 years of age with underlying mild, moderate, or complex CHD who received care at the Albert Einstein College of Medicine at the Montefiore Medical Center, Bronx, New York from January 2015 until April 2024. Pregnancy risk scores were calculated using the mWHO, ZAHARA, CARPREG I, and CARPREG II risk classification models. The primary outcome was to compare the observed versus predicted occurrence of maternal cardiovascular complications by each model. Secondary outcomes included identifying individual risk factors for maternal cardiovascular complications. A univariate analysis was performed to identify significant predictors of cardiovascular complications.

Results: Of 170 pregnancies, 16 (9.4%) had cardiovascular complications antepartum or up to 6 months postpartum. The ratio of weighted average observed risk within the cohort to weighted average predicted risk was calculated for each model: 0.63 for mWHO, 0.73 for ZAHARA, 0.73 for CARPREG I, and 0.84 for CARPREG II (Figure 1). Significant ($p < 0.05$) univariate risk factors for maternal cardiovascular complications included anticoagulation during pregnancy, prior cardiac event or arrhythmia, cardiac medication during pregnancy, moderate to severe pulmonary hypertension, systemic ventricular dysfunction, cardiac medication before pregnancy, NYHA functional class >II, and late pregnancy assessment (Table 1).

Conclusion: All four risk models overpredicted maternal cardiac risk. CARPREG II was the most accurate representation of cardiac risk in our cohort of pregnant women in the Bronx with CHD. Though not included in any of the risk models, anticoagulation during pregnancy was the most significant individual predictor of maternal cardiovascular complications.

Figure 1. Comparison of percentage observed cardiovascular events and percentage predicted events per risk stratification model

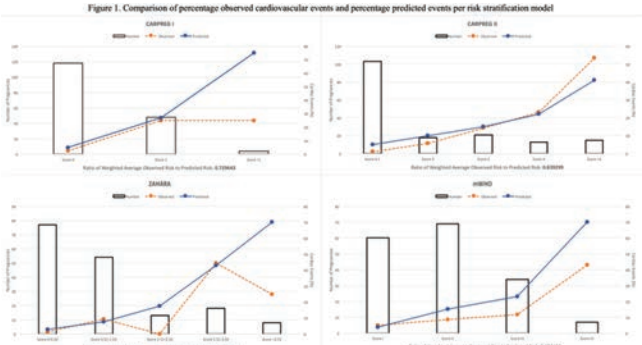

Table 1. Univariate model for predicting maternal cardiovascular outcomes in n=170 pregnancies from January 2015 to April 2024

Risk factors	N	Cardiovascular complications[a], n (%)	Odds ratio (95% CI)	*P*-value
Anticoagulation during pregnancy	**13**	**6 (46.2)**	**12.6 (3.6-44.6)**	**0.0001**
Prior cardiac event or arrhythmia	**38**	**10 (26.3)**	**7.5 (2.5-22.3)**	**0.0003**
Cardiac medication during pregnancy[b]	**52**	**11 (21.2)**	**6.1 (2.0-18.5)**	**0.0015**
Pulmonary hypertension (moderate to severe)[c]	**4**	**3 (75.0)**	**35.3 (3.4-364.0)**	**0.0028**
Systemic ventricular dysfunction[d]	**10**	**4 (40.0)**	**8.2 (2.0-33.2)**	**0.0031**
Cardiac medication before pregnancy[b]	**65**	**12 (18.5)**	**5.7 (1.7-18.6)**	**0.0038**
NYHA functional class >II	**2**	**2 (100.0)**	**53.3 (2.4-1163.6)**	**0.0115**
Late pregnancy assessment[e]	**13**	**4 (30.8)**	**5.4 (1.4-20.0)**	**0.0123**
Mechanical valve prosthesis	2	1 (50.0)	10.2 (0.6-171.5)	0.1068
BMI > 30	61	8 (13.1)	1.9 (0.6-5.4)	0.2220
Unrepaired CHD	88	9 (10.2)	1.7 (0.6-4.8)	0.3079
Gestational diabetes	14	2 (14.3)	1.7 (0.3-8.3)	0.5187
Cyanotic heart disease (Corrected or uncorrected)	19	1 (5.3)	0.5 (0.1-4.3)	0.5629
Hypertensive disorders of pregnancy[f]	29	2 (6.9)	0.7 (0.1-3.1)	0.6126
High-risk valve disease/left heart obstruction[g]	16	2 (12.5)	1.4 (0.3-6.9)	0.6582
Coronary artery disease	6	0	0.7 (0.0-12.9)	0.8051
Smoking during pregnancy	3	0	1.3 (0.1-26.5)	0.8596

[a]Including clinically significant arrhythmias, clinically significant heart failure, pulmonary embolism, deep vein thrombosis, need for urgent or invasive cardiovascular intervention
[b]Including beta-blockers, aspirin, diuretics, calcium channel blockers
[c]Right ventricular systolic pressure ≥50 mm Hg in the absence of right ventricular outflow obstruction
[d]Mild ejection fraction (EF) <55%
[e]First antenatal visit after 20 weeks gestation
[f]Presence of pregnancy induced hypertension (PIH) or preeclampsia
[g]Aortic valve area <1.5 cm^2, subaortic gradient >30 mmHg, mitral valve area <2 cm, or moderate to severe mitral regurgitation

880 | Treating Women with Isolated Intrapartum Fever as Chorioamnionitis: A Cost Effectiveness Analysis

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10:30 AM - 12:30 PM

Objective: Intrapartum fever (≥ 38°C) affects many deliveries annually in the U.S., posing risks to mothers and neonates. Standard treatments include expectant management for isolated intrapartum fever and ampicillin-gentamicin for chorioamnionitis. Antibiotic treatment helps reduce infection risk due to expectant management but may increase costs. This study evaluated the cost-effectiveness of treating isolated intrapartum fever as chorioamnionitis.

Study Design: We constructed a decision-analytic model in TreeAge Pro to compare outcomes between isolated intrapartum fever (expectant management) versus chorioamnionitis (ampicillin/gentamicin). Our theoretical cohort was 222,000 patients, representing vaginal singleton pregnancies with intrapartum temperature ≥ 38°C in the U.S. annually. Outcomes were incremental cost per quality-adjusted life years (QALYs), postpartum endometritis, neonatal early-onset sepsis (nEOS), neonatal death, neonatal neurodevelopmental delay (NDD), and acute kidney injury (AKI) from gentamicin toxicity. The willingness-to-pay threshold was $100,000/QALY. We discounted QALYs at a rate of 3%. Model inputs were derived from literature and assessed using univariate sensitivity analyses.

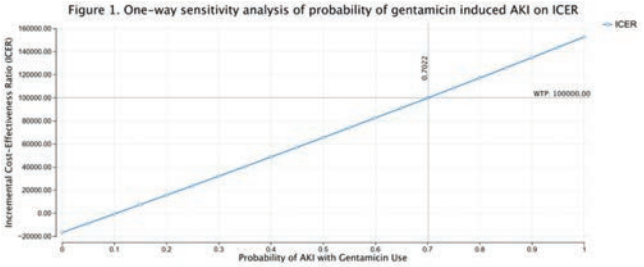
Results: In our theoretical cohort of 222,000 individuals, antibiotic treatment reduced 7,481 cases of postpartum endometritis (8,649 vs 16,131), 6,047 cases of nEOS (961 vs 7,009), 677 neonatal deaths (1,350 vs 2,027), and 331 cases of NDD (15,485 vs 15,815) compared to expectant management. However, gentamicin use for chorioamnionitis resulted in 21,305 more cases of AKI (31,069 vs 9,764). Despite higher costs, treating intrapartum fever as chorioamnionitis was cost-effective with a cost-effectiveness ratio (ICER) of $5,708/QALY. Sensitivity analyses showed treatment remained cost-effective until AKI probability exceeded 70%.

Conclusion: Treating intrapartum fever with antibiotics is a cost-effective strategy to reduce the adverse outcomes of untreated intrapartum fever. Adopting a protocol to treat all intrapartum fevers ≥ 38°C as chorioamnionitis with appropriate antibiotics could benefit health systems.

Table 1. Outcomes in a theoretical cohort of 222,000 pregnant individuals with a temperature ≥ 38°C.

	Antibiotics	No Antibiotics	Difference
Postpartum Endometritis	8,649	16,131	-7,481
Neonatal Early Onset Sepsis (nEOS)	961	7,009	-6,047
Neonatal Death	1,350	2,027	-677
Neurodevelopmental Delay (NDD)	15,485	15,815	-331
Acute Kidney Injury (AKI)	31,069	9,764	21,305
Cost (USD)	16,411,256,352	16,250,183,543	161,072,808
Effectiveness (QALYs)	12,284,432	12,256,214	28,218
Incremental Cost Effectiveness Ratio (ICER)	**$5,708.00 / QALY**		

Figure 1. One-way sensitivity analysis of probability of gentamicin induced AKI on ICER



881 | Circumstances and Trends of Pregnancy-Associated Suicides in the United States from 2018 to 2021

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10:30 AM - 12:30 PM

Objective: Pregnancy-associated suicide is a common cause of maternal mortality in the US. Our objective was to investigate the trends and occurrence of circumstances surrounding pregnancy-associated suicide before and during the COVID-19 pandemic, with a specific focus on understanding its relationship with intimate partner adversity (IPA).

Study Design: In a cross-sectional study, we analyzed 315 pregnancy-associated suicide incidents from 34 states, the District

of Columbia, and Puerto Rico with complete case reporting (Figure) in the 2018-2021 National Violent Death Reporting System, which is a national surveillance system for violent death and the largest dataset on suicide decedents. Information was captured by standardized coding in death certificates, records from coroner and medical examiners and law enforcement, and toxicology reports. IPA was defined as a divorce, breakup, argument, jealousy, conflict, or violence among intimate partners, which appeared to have contributed to suicide. The characteristics of the victim, incident, and circumstances were compared, stratified by the presence of documented IPA, using bivariate analyses.

Results: Pregnancy-associated suicide counts decreased 12.5% from 168 (2018-2019) to 147 (2020-2021). Half died between 43 to 365 days postpartum (Table). Firearms were the primary lethal means (41%) followed by hanging, strangulation, or suffocation (40%). Among 315 cases, 63% were White, 60% had a previously identified mental health condition (MHC), and 46% had IPA. Compared to cases without IPA, IPA-involved cases did not vary by the presence of MHC or injury location ($p > 0.05$) but were more likely to involve a suicide following the homicide ($p = 0.04$) and alcohol use ($p = 0.02$).

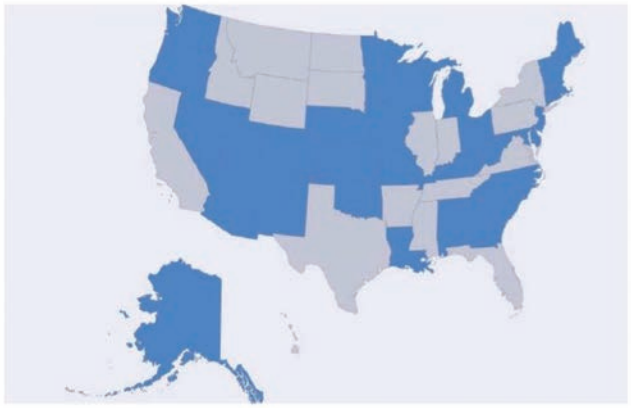
Conclusion: Pregnancy-associated suicide decreased from two years before to two years during the pandemic in the US. MHC, IPA, and firearm use were common. Policies and programs to screen and respond to MHC, firearm use, IPA and violence among women of reproductive age may be beneficial public health strategies to prevent pregnancy-associated suicide.

Table. Victim and Incident Characteristics of Pregnancy-Associated Suicides by Intimate Partner Problem Status in 34 States, the District of Columbia, and Puerto Rico, the National Violent Death Reporting System, 2018 to 2021

Characteristics	Total n=315	Not IPP n=170	IPP n=145	*p* value
Age Mean (SD)	28 (7)	29 (7)	27 (6)	**0.04**
Years Range	13-48	13-48	16-47	
Pregnancy Status				0.85
During pregnancy	110 (35%)	59 (35%)	51 (35%)	
Within 42 days of death	45 (14%)	26 (15%)	19 (13%)	
43 to 365 days of death	60 (51%)	85 (50%)	75 (52%)	
Race/Ethnicity				0.20
White, non-Hispanic	200 (63%)	111 (65%)	89 (61%)	
Black, non-Hispanic	45 (14%)	27 (16%)	18 (12%)	
Hispanic	43 (14%)	18 (11%)	25 (17%)	
API, non-Hispanic	12 (4%)	8 (5%)	4 (3%)	
AIAN, non-Hispanic	9 (3%)	3 (2%)	6 (4%)	
Other, non-Hispanic	6 (2%)	3 (2%)	3 (2%)	
Married	107 (34%)	62 (36%)	45 (31%)	0.31
Homicide-Suicide	12 (4%)	3 (2%)	9 (6%)	**0.04**
Injury Location				
At victim's home	220 (70%)	114 (67%)	106 (73%)	0.53
Not at victim's home	86 (27%)	48 (28%)	38 (26%)	
Unknown	9 (3%)	8 (5%)	1 (1%)	
Lethal Means				**<0.01**
Firearm	130 (41%)	63 (37%)	67 (46%)	
Hanging, SS	127 (40%)	62 (36%)	65 (45%)	
Poisoning	31 (10%)	24 (14%)	7 (5%)	
Fall, drowning	16 (5%)	10 (6%)	6 (4%)	
Motor vehicle and other	10 (3%)	10 (6%)	0 (0%)	
Unknown	1 (1%)	1 (1%)	0 (0%)	
Mental Health Problems	189 (60%)	97 (57%)	92 (63%)	0.25
Substance Abuse without Alcohol	79 (25%)	39 (23%)	40 (28%)	0.34
Alcohol Use	38 (12%)	14 (8%)	24 (17%)	**0.02**

Note: IPP = intimate partner problems. API = Asian/Pacific Islander. SS = strangulation, suffocation. AIAN = American Indian or Alaska Native. Other race/ethnicity = Unspecified, two or more races, & unknown. Motor vehicle and other, e.g., trains, planes, boats. *p* value was based on complete cases.

Figure. Sample 34 states, the District of Columbia, and Puerto Rico in Blue



882 | Features of Additional Uterotonic Use Without Postpartum Hemorrhage

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10:30 AM - 12:30 PM

Objective: Use of uterotonics beyond prophylactic ranges from 2-25%, while postpartum hemorrhage (PPH; blood loss $\geq$ 1000 mL) ranges from 3-5%. We examined factors in individuals without PPH who received additional uterotonics versus those who did not.

Study Design: This retrospective cohort included all singleton live births $\geq$ 22 weeks with 24-hour blood loss < 1000 mL at a Level IV center over 24 months. Clinical and demographic elements were abstracted by medical staff, and additional uterotonic use was defined as any agent utilized after prophylactic oxytocin, including additional doses of oxytocin, misoprostol, methylergonovine, tranexamic acid or carboprost. Individuals were stratified by route of delivery and examined by students' t-test and chi-square.

Results: Of 8,623 deliveries, 7,616 (88%) were included with 4,369 (57.4%) vaginal deliveries (VD) and 3,247 (42.6%) cesarean deliveries (CD). VD without PPH was significantly more likely to receive additional uterotonics compared to CD (14% vs. 11%, $p< 0.001$). The average blood loss was higher with vs. without uterotonics (398 ± 211.24 mL vs 241 ± 149.92 mL, $p< 0.001$ for VD; 700 ± 135.43 mL vs 633 ± 129.62 mL, $p< 0.001$ for CD). While some pre-existing characteristics differed, they were inconsistent across routes except for BMI, hypertensive disorders, low platelets, magnesium sulfate and oxytocin use (Table 1 & 2). There were no significant differences in provider characteristics. PPH risk stratification was only different in VD. Deliveries without PPH who received additional uterotonics were more likely to be transfused, receive additional surgical intervention and be admitted to intensive care (Table 2).

Conclusion: About 1 in 10 deliveries without PPH received uterotonics beyond prophylactic. No risk factors or patient characteristic predicted this behavior. Blood loss and interventions

were increased with additional uterotonics, suggesting clinicians may be pre-emptively treating clinical concern rather than risk factors. Additional exploration into risks, benefits, and threshold of early intervention with uterotonics is warranted.

	Vaginal Deliveries					Cesarean Delivery				
	No Uterotonics n = 3,758		Uterotonics n = 611		p value	No Uterotonics n = 2,686		Uterotonics n = 361		p value
Maternal Demographics	N	%	N	%		N	%	N	%	
Age (yr)	27.98	± 5.84	28.42	± 5.87	0.086	29.79	± 5.93	29.79	± 6.28	0.996
Race					**<0.001**					0.555
White	916	24%	143	23%		682	24%	83	23%	
Black	1400	37%	181	30%		1084	38%	122	34%	
Hispanic	846	23%	156	26%		616	21%	98	27%	
Other	596	16%	131	21%		504	17%	58	16%	
Nulliparous	1400	37%	254	42%	0.041	1022	35%	176	49%	**<0.001**
BMI at delivery-					**<0.001**					**0.003**
<30	1572	42%	221	36%		857	30%	90	25%	
30-40	1739	46%	282	46%		1335	46%	192	53%	
≥ 40	440	12%	107	18%		690	24%	76	21%	
Unknown	7	0%	1	0%		4	0%	3	1%	
Diabetes	810	8%	70	11%	**0.009**	434	16%	59	16%	0.515
Hypertensive disorder	1188	31%	244	40%	**<0.001**	984	34%	153	42%	**0.002**
Induction	2187	58%	389	63%	0.013	868	23%	146	40%	**<0.001**
Academic Provider	2342	62%	611	100%	0.362	1708	59%	201	56%	0.211
Private Insurance	1544	41%	279	46%	0.033	1284	44%	178	49%	0.083
Hct at admission (%)	34.2%	± 3.71	34.2%	± 3.79	0.293	34.2%	± 3.7	33.9%	± 4.14	0.155

Table 1. Maternal demographics. BMI, body mass index; Hct, hematocrit

	Vaginal Deliveries					Cesarean Delivery				
	No Uterotonics n = 3,758		Uterotonics n = 611		p value	No Uterotonics n = 2,886		Uterotonics n = 361		p value
Risk stratification documented	1614	43%	254	42%	0.523	827	29%	113	31%	0.296
Risk stratification					**<0.001**					0.049
Low	2159	57%	309	51%		744	26%	79	22%	
Medium	538	14%	142	23%		1321	46%	158	44%	
High	1061	28%	160	26%		821	28%	124	34%	
PPH Risk Factors										
Abnormal Vital Signs	612	16%	86	14%	0.167	446	15%	66	18%	0.167
History of PPH	60	2%	19	3%	**0.009**	52	2%	12	3%	0.050
Admit Bleeding	28	1%	9	1%	0.069	46	2%	11	3%	0.047
Coagulopathy	5	0%	3	0%	0.055	4	0%	2	1%	0.083
Prior Uterine Surgery	134	4%	18	3%	0.438	1498	52%	132	37%	**<0.001**
Placenta Previa	0	0%	0	0%	0.687	38	1%	10	3%	0.031
Magnesium Sulfate	242	6%	87	14%	**<0.001**	340	12%	74	20%	**<0.001**
Chorioamnionitis	110	3%	26	4%	0.080	65	2%	33	9%	**<0.001**
Oxytocin > 18 hrs	302	8%	75	12%	**0.001**	170	6%	54	15%	**<0.001**
Fibroids	52	1%	11	2%	0.423	127	4%	31	9%	**<0.001**
>4 prior births	122	3%	34	6%	**0.004**	72	2%	11	3%	0.531
Platelets < 100k	28	1%	11	2%	**0.010**	18	1%	11	3%	**<0.001**
Morbidity										
Transfusion	29	1%	16	3%	**<0.001**	78	3%	19	5%	**0.007**
ICU Admission	1	0%	3	0%	**<0.001**	16	1%	12	3%	**<0.001**
Surgical Intervention						26	1%	10	3%	**0.001**

Table 2 Hemorrhage Risk Stratification, using the American College of Obstetrics and Gynecology 3-teired schema at delivery, and morbidity. PPH – Postpartum Hemorrhage; ICU – Intensive Care Unit

883 | Hypertension in Pregnancy Without a Documented Diagnosis: A Missed Window of Opportunity

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10:30 AM - 12:30 PM

Objective: Obstetric patients with chronic hypertension (HTN) and hypertensive disorders of pregnancy (HDP) may not receive corresponding ICD-10 codes due to missed diagnoses or documentation errors. We aimed to compare (1) healthcare engagement at 6 weeks postpartum (PP) and (2) American College of Cardiology (ACC) HTN staging at 6 months PP between hypertensive patients with and without corresponding ICD-10 codes.

Study Design: This was a retrospective study of patients delivering within a healthcare system from 2013-2023 with ≥1 prenatal visit. Exclusion criteria were < 2 recorded blood pressures (BPs) at < 20 weeks' gestation and no evidence of elevated BPs or cHTN/HDP by ICD-10 code. The electronic medical record was used to identify patients with HTN; these were then classified as "BP only" (≥2 BPs of ≥140/90 mmHg at < 20 weeks and/or 20 weeks to delivery discharge *without* an ICD-10 code for cHTN/HDP) or "ICD-10" (*with* an ICD-10 code for cHTN/HDP). Demographic characteristics and ACC HTN stages at 6 months were compared between groups using chi-square tests. The primary outcomes - attendance at any PP visit or HTN-focused visit within 6 weeks PP - were compared using multivariate logistic regression, adjusted for significant covariates.

Results: Of 21,296 patients, 9,833 (46.2%) were identified as BP only and 11,463 (53.8%) as ICD-10. Compared to the BP only group, the ICD-10 group was significantly more likely to attend any PP visit [80.1% vs. 65.6%; aOR 2.0 (95% CI 1.8-2.1)] or PP HTN-focused visit [36.4% vs. 2.5%; aOR 17.3 (95% CI 15.1-19.8)]. Both BP only and ICD-10 patients demonstrated elevated BP by ACC staging at 6 months PP: elevated (13.1% vs 13.3%), Stage 1 (14.7% vs 22.6%), and Stage 2 (2.3% vs 9.4%).

Conclusion: Elevated BP in pregnancy in the absence of an associated ICD-10 diagnosis code is associated with lower healthcare engagement up to 6 weeks PP. Despite this, patients with elevated BPs without an ICD-10 diagnosis of cHTN or HDP remain at risk for ongoing BP elevation for at least 6 months from delivery, highlighting a need for improved recognition and documentation of antenatal HTN.

Table 1: Patient demographics and outcomes by blood pressure diagnostic criteria

	BP only* (N=11463)	ICD-10** (N=9833)	p-value
Demographics			
Age ≥35	2356 (24.0)	3404 (29.7)	<0.0001
Multiparous	6306 (55.5)	4763 (49.1)	<0.0001
End-pregnancy BMI ≥30 kg/m^2	6527 (66.5)	8859 (77.4)	<0.0001
Pre-gestational diabetes	355 (3.6)	1113 (9.7)	<0.0001
Gestational diabetes	1100 (11.2)	2143 (18.7)	<0.0001
Tobacco use in pregnancy	933 (9.5)	1123 (9.8)	0.4476
Race - ethnicity			<0.0001
Hispanic	2139 (21.8)	2656 (23.2)	
Non-Hispanic White	5062 (51.5)	5052 (44.1)	
Non-Hispanic Black	1944 (19.8)	3118 (27.2)	
Non-Hispanic Asian	411 (4.2)	344 (3.0)	
Other or unspecified	277 (2.8)	293 (2.6)	
Unmarried status	3831 (39.0)	4956 (43.2)	<0.0001
Public or uninsured status	4140 (42.1)	5454 (47.6)	<0.0001
Fetal demise	56 (0.6)	92 (0.8)	0.0412
Peripartum magnesium sulfate	189 (1.9)	2285 (19.9)	<0.0001
Preterm birth <37 weeks	724 (7.4)	1868 (16.4)	<0.0001
Mode of delivery			<0.0001
Vaginal delivery	6947 (71.1)	6286 (55.3)	
Cesarean delivery	2827 (28.9)	5091 (44.8)	
Neonatal intensive care admission	1734 (17.6)	3150 (27.5)	<0.0001
Primary and secondary outcomes			
Attendance at any postpartum visit	6446 (65.6)	9282 (81.0)	<0.0001
Attendance at ≥1 hypertension-focused visit	250 (2.5)	4167 (36.4)	<0.0001
ACC hypertension staging at 6 months postpartum‡			<0.0001
Lost to follow up	3312 (33.7)	3434 (30.0)	
Normotensive	3553 (36.1)	2833 (24.7)	
Elevated	1291 (13.1)	1529 (13.3)	
Stage 1	1447 (14.7)	2593 (22.6)	
Stage 2	230 (2.3)	1074 (9.4)	

BP: blood pressure; ICD-10: International Classification of Diseases, Clinical Modification, 10th revision; ACC: American College of Cardiology; BMI: body mass index

** BP only: ≥2 BP of ≥140/90 mmHg from 0-20 weeks and/or 20 weeks to delivery discharge without a corresponding ICD-10 diagnosis code for chronic hypertension or hypertensive disorder of pregnancy. Presented as total number (N) and percentage (%) of patients having the listed characteristic within the BP only group.*
*** ICD-10: Possessing an ICD-10 code for chronic hypertension or hypertensive disorder of pregnancy. Presented as total number (N) and percentage (%) of patients having the listed characteristic within the ICD-10 group.*

Table 2: Postpartum visit attendance by blood pressure diagnostic criteria

	Attendance at any postpartum care visit		Attendance at a hypertension-focused care visit	
	OR*	aOR**†	OR*	aOR**‡
BP only	Ref	Ref	Ref	Ref
ICD-10	2.2 (2.1-2.4)	2.0 (1.8-2.1)	21.9 (19.2-25.0)	17.3 (15.1-19.8)

** Crude odds ratio, with 95% confidence intervals*
*** Adjusted odds ratio, with 95% confidence intervals*

† Adjusted for significant covariates: maternal age ≥35, parity, BMI ≥30, marital status, gestational diabetes, pre-gestational diabetes, tobacco use, insurance status, fetal demise, magnesium sulfate administration, mode of delivery, neonatal intensive care unit admission, and preterm birth <37 weeks
‡ Adjusted for significant covariates: maternal age ≥35, BMI ≥30, race and ethnicity, preterm birth <37 weeks, gestational diabetes, pre-gestational diabetes, neonatal intensive care unit admission, mode of delivery, and magnesium sulfate administration

884 | Association of IVF with Preeclampsia with Severe Features Among Very Advanced Maternal Age Patients

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10:30 AM - 12:30 PM

Objective: This study aims to evaluate the association between in-vitro fertilization (IVF) and preeclampsia with severe features (sPEC) among very advanced maternal age (vAMA) patients.

Study Design: Retrospective cohort study of vAMA patients who delivered at a large academic health system in New York between January 2019 and December 2022. vAMA was defined as ≥ 45 years old at delivery. Rates of sPEC and other hypertensive disorders of pregnancy were determined for IVF versus non-IVF patients. A multivariate logistic regression was used to estimate the relationship between IVF and sPEC while controlling for obesity, nulliparity, race and ethnicity, public insurance, and primary language using R version 4.3.1. A p-value of < 0.05 was considered statistically significant.

Results: A total of 591 vAMA pregnancies were included, of which 218 (37%) were IVF pregnancies and 373 (63%) were non-IVF pregnancies. Rates of hypertensive disorders were similar between groups (24.7% in the non-IVF cohort and 29.4% in the IVF cohort, $p = 0.212$). The sPEC rate among IVF vAMA patients IVF was 16.1%, compared to 9.7% in the non-IVF group ($p = 0.021$). IVF was associated with an increased likelihood of sPEC among vAMA patients in an unadjusted model, OR 1.79 (95% CI, 1.09 - 2.95); however this was not the case after adjusting for potential confounders, aOR 1.57 (95% CI 0.92 - 2.67).

Conclusion: Although vAMA and IVF have each been independently associated with an increased risk of sPEC, this is the first study to evaluate whether IVF is specifically linked to an increased risk of sPEC and hypertensive disorders of pregnancy in vAMA patients. In this cohort of patients with vAMA, IVF did not independently increase the risk of sPEC or hypertensive disorders of pregnancy.

885 | Increases in Routinely Measured Red Cell Indices During Pregnancy are Associated with Obstetric Complications

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10:30 AM - 12:30 PM

Objective: Pregnancy alters hematological indices, but intra-pregnancy changes in complete blood count (CBC) values have not been rigorously evaluated as markers of pregnancy health.

Study Design: We retrospectively analyzed CBCs routinely measured at 7-14 and 26-29 weeks' gestation to determine the association of rare changes in nine CBC indices (hematocrit, hemoglobin, red cell count, white cell count, platelets, mean red cell volume, mean red cell hemoglobin, red cell volume distribution width, and mean red cell hemoglobin concentration) with a composite outcome (hypertensive disorders of pregnancy, small for gestational age birthweight, preterm birth [both indicated and spontaneous]) and its individual components. Rare changes, defined as statistically uncommon changes in magnitude and direction, were identified in a discovery cohort of 29,162 pregnancies. Direction was chosen as the least frequent variation exceeding established non-pregnant biological variation, and magnitude as the threshold of change with the highest positive predictive value and significant OR ($p < 9\times10^{-6}$ with Bonferroni correction). Identified associations were tested in an out-of-sample validation cohort of 50,603 pregnancies.

Results: In validation, increases in red cell indices between 7-14 and 26-29 weeks' gestation were associated with the composite outcome with an OR [95% CI] of 1.49 [1.30, 1.70] for hematocrit, 1.57 [1.33, 1.86] for hemoglobin and 1.69 [1.48, 1.93] for red cell count. The strongest association with individual outcomes was observed for increases in hemoglobin (>0.67 g/dL, OR 2.03 [1.58, 2.59]) or red cell count (>0.07 106/mm3, OR 2.13 [1.74, 2.6]) and preterm birth (Table 1). These rare increases in hemoglobin and red cell count were observed on average 7 weeks before preterm birth; we did not observe a bias for detection of either spontaneous or indicated preterm birth.

Conclusion: Deviations of routinely measured red blood cell indices from typical longitudinal trajectories during pregnancy may allow for early detection of obstetric complications.

Table 1

		Rare longitudinal behavior	Discovery cohort: Prevalence of rare behavior (%)	Discovery cohort: OR [95% CI]	Validation cohort: OR [95% CI]
Composite outcome	Hematocrit	Increase greater than 1.8%	1.8	1.59 [1.31, 1.94]	1.49 [1.30, 1.70]
	Hemoglobin	Increase greater than 0.67 g/dL	1.1	1.99 [1.57, 2.52]	1.57 [1.33, 1.86]
	Red cell count	Increase greater than 0.07 10^6/mm^3	1.8	1.94 [1.60, 2.35]	1.69 [1.48, 1.93]
	Platelet count	Decrease of less than 0.05 10^9/L or any increase	23.9	1.20 [1.12, 1.29]	1.13 [1.08, 1.20]
	Mean red cell volume	Decrease greater than 0.75fL	11.5	1.32 [1.20, 1.45]	1.34 [1.24, 1.45]
Preterm birth	Hematocrit	Increase greater than 0.26%	7.4	1.47 [1.24, 1.74]	1.45 [1.28, 1.64]
	Hemoglobin	Increase greater than 0.67 g/dL	1.1	2.28 [1.62, 3.20]	2.03 [1.58, 2.59]
	Red cell count	Increase greater than 0.071 10^6/mm^3	1.8	2.33 [1.77, 3.07]	2.13 [1.74, 2.60]
	Mean red cell volume	Decrease greater than 0.75fL	11.5	1.41 [1.22, 1.63]	1.51 [1.33, 1.70]
Preeclampsia	Red cell count	Decrease of less than 0.068 10^6/mm^3 or any increase	6.2	1.40 [1.21, 1.62]	1.36 [1.23, 1.51]
	Mean red cell volume	Increase of less than 0.081fL or any decrease	21.9	1.66 [1.36, 2.02]	1.26 [1.17, 1.36]
SGA	Hematocrit	Increase greater than 1.19%	3.4	1.67 [1.35, 2.05]	1.54 [1.34, 1.78]
	Hemoglobin	Increase greater than 0.22 g/dL	3.4	1.64 [1.34, 2.01]	1.53 [1.32, 1.78]
	Red cell count	Increase greater than 0.071 10^6/mm^3	1.8	1.92 [1.47, 2.51]	1.76 [1.45, 2.13]

Only significant associations ($p<9x10^{-6}$ with Bonferroni correction) are reported. SGA=Small for Gestational Age. Composite outcome includes any pregnancy with preterm birth, hypertensive disorders including preeclampsia or SGA.

886 | The Predictive Value of Angiogenic Factors in Suspected Preeclampsia

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10:30 AM-12:30 PM

Objective: To evaluate the ability of circulating maternal levels of angiogenic factors–soluble FMS-like tyrosine kinase 1 (sFlt-1) and placental growth factor (PlGF)–to predict the development of preeclampsia with severe features (SPE).

Study Design: This was a single-center prospective observational study of pregnant patients admitted for evaluation of hypertensive disorders of pregnancy (HDP) between 24 0/7 weeks and 36 6/7 weeks. At enrollment, a single plasma sample was obtained for the measurement of sFlt-1 and PlGF. All patients underwent standardized evaluation for HDP and were diagnosed with SPE based on standard laboratory and clinical criteria. Patients were examined in two cohorts: those who developed SPE within 1 week (Cohort 1) and those who did not (SPE > 1 week or never, Cohort 2). The predictive value of sFlt-1, PlGF and sFlt-1:PlGF ratio for the development of SPE was analyzed using logistic regression. Demographic, maternal, and neonatal outcomes were compared between cohorts.

Results: From Nov 2022 to May 2023, 152 patients were enrolled, including 60 (39%) diagnosed with SPE, 14 (9%) within 1 week of enrollment (Cohort 1). There were no demographic differences between groups. Patients in Cohort 1 had higher levels of sFlt-1 (43.4 vs 20.3 ng/mL, p-value < 0.001), lower levels of PlGF (150.9 vs 319.0 pg/mL, p-value < 0.001), and higher sFlt-1:PlGF (460 vs 79, p-value < 0.001) versus patients in Cohort 2 (Figure 1). Levels of sFlt-1 and sFlt-1:PlGF were predictive of the development of SPE within 1 week (AUC 0.85 (95%CI 0.74, 0.95) and 0.82 (95%CI 0.71, 0.93), respectively) (Figure 2). At a cutoff of 28 ng/mL, sFlt-1 was associated with a negative predictive value of 0.97, effectively ruling out SPE in these patients.

Conclusion: In pregnant patients with elevated blood pressure between 24 and 36 weeks gestation, elevated sFlt-1 and low PlGF levels are associated with the development of SPE. Levels of sFlt-1 below 28 ng/mL may serve as a triage tool to rule out SPE within 1 week.

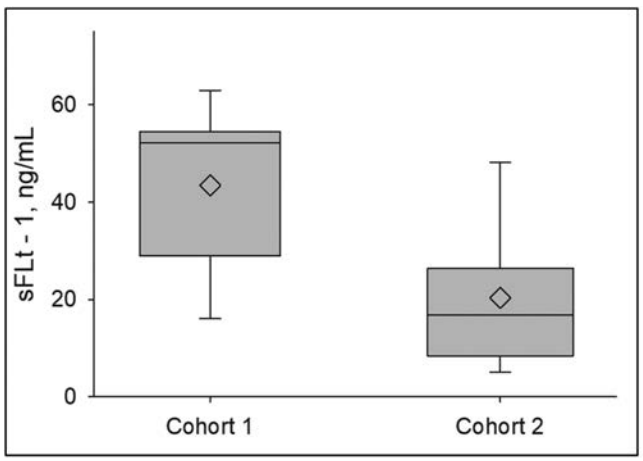

Figure 1: Maternal sFlt-1 level in patients diagnosed with and without preeclampsia within 1 week of evaluation for hypertensive disorders of pregnancy.
Cohort 1: preeclampsia with severe features (SPE) within 1 week; Cohort 2: without SPE within 1 week. Data is represented as: interquartile range (box), mean (◇) and median (horizontal line). Whiskers represent values within 1.5x the interquartile range.

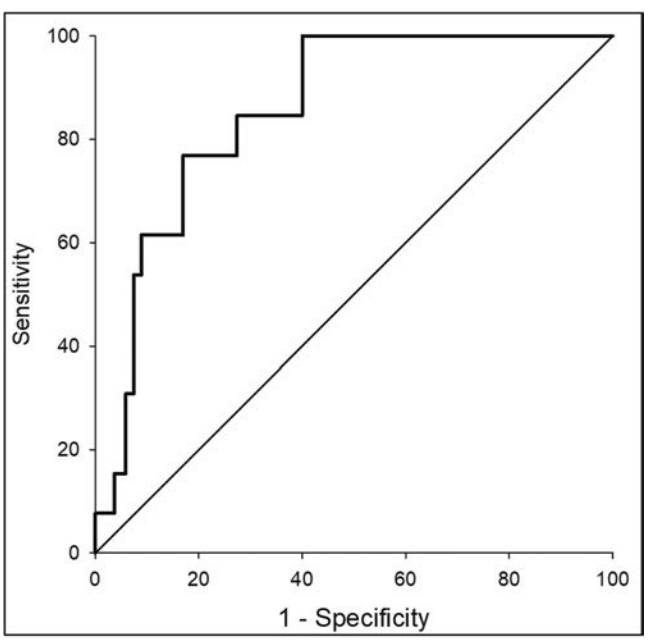

Figure 2: Predictive performance of maternal sFlt-1 level for the diagnosis of preeclampsia within 1 week.
AUC (95% CI): 0.85 (0.74, 0.95)

887 | Association of Features of Fetal Heart Rate Tracings and Adverse Neonatal Outcomes at Term

Rachel L. Wiley[1]; Kristen A. Cagino[2]; Aaron W. Roberts[3]; Claudia J. Ibarra[4]; Shareen Patel[4]; Christina Cortes[4]; Khalil M. Chahine[4]; Natalie L. Neff[5]; Kimen S. Balhotra[4]; Tala Ghorayeb[4]; Holly Flores[6]; Hector M. Mendez-Figueroa[4]; Suneet P. Chauhan[7]
[1]University of California, San Diego, San Diego, CA; [2]UT Houston, Houston, TX; [3]McGovern Medical School at UTHealth Houston, Houston, TX; [4]McGovern Medical School at UTHealth, Houston, TX; [5]McGovern Medical School at UT Health, Houston, TX; [6]University of Texas Health Science Center, Houston, TX;

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10:30 AM - 12:30 PM

Objective: To ascertain if independent features of term fetal heart rate tracings (FHRT) are associated with adverse neonatal outcomes.

Study Design: FHRTs of consecutive deliveries within 15 months at a Level IV center were reviewed by physicians blinded to outcomes. In 20-min segments, the last 60 minutes available before delivery of all term (≥ 37 weeks), non-anomalous singletons who labored were included. Each feature (variability, decelerations, accelerations) was independently categorized as present < vs. ≥ 50% of the time 60 minutes before delivery. The primary outcome was the rate of composite adverse neonatal outcome (CANO; defined in Table 1). Odds ratio (OR), likelihood ratio (LR) with post-test probability (PTB).

Results: Of 5,160 deliveries, 3,166 (61%) met the inclusion criteria for analysis, of which 49 (1.5%) had CANO. Baseline characteristics differed by age, hypertensive disorders, and neuraxial anesthesia use (Table 1). Individually, absent variability (0.2% vs. 2.0%, unadjusted OR 10.8, 95% CI 1.28-91.5), marked variability (0.4% vs. 6.1%, unadjusted OR 14.5, 95% CI 4.02–52.0) and severe variable decelerations (4.5% vs 16.3%, unadjusted OR 4.18, 95% CI 1.92-9.09) were associated with CANO if present the majority of the time. Moderate variability or the presence of accelerations were not associated with reduced CANO. Moderate variable decelerations were associated with reduced CANO (15.4% vs. 4.1%, OR 0.24, 95% CI 0.06–0.97). LR varied from 0.2 (moderate variables) to 14 (marked variability), with post-test probability being 0 and 18%, respectively (Table 2).

Conclusion: Among term deliveries, during the last 60 min of labor, some FHT elements are individually associated with adverse outcomes. CANO is possible for every 1 in 7 for minimal variability, 1 in 5 for marked variability and 1 in 18 for severe variable decelerations. The presence of majority of time with moderate variability or accelerations were not associated with reduced rates of CANO. Further exploration of the elements of FHRTs that predict adverse outcomes and interventions that mitigate them are warranted.

	Without CANO[1]		With CANO[1]		P
	N	%	N	%	
Maternal age (years)					**0.037**
< 20	177	5.7%	2	4.1%	
20 - 35	2464	79.1%	33	67.3%	
35 or more	476	15.3%	14	28.6%	
Nulliparous	1311	42.1%%	27	55.1%	0.067
Race / ethnicity—self reported					0.791
Black / African-American	1166	37.4%	19	20.4%	
Hispanic / Latina	761	24.4%	14	38.8%	
White	713	22.9%	10	28.6%	
Asian	160	5.1%	4	8.2%	
Others	317	10.2%	2	4.1%	
Body mass index > 30 kg / m²	1981	56.0%	36	73.5%	0.157
Private Insurance	1372	44.0%	17	34.7%	0.192
Tobacco use during pregnancy	87	2.8%	1	2.0%	0.751
Hypertensive disorder of pregnancy*	1035	33.2%	27	55.1%	**0.001**
Diabetes mellitus^	274	8.8%	4	8.2%	0.878
Induction	1719	55.1%	29	59.2%	0.573
Magnesium Sulfate at Delivery	214	6.9%	8	16.3%	0.060
Neuraxial Anesthesia	2828	98.6%	38	79.2%	**<0.001**

Data presented as N (%)

*CANO, composite adverse neonatal outcomes, which included any of the following: Apgar < 7 at 5 min, mechanical ventilation > 6 hours, bronchopulmonary dysplasia ,intraventricular hemorrhage, necrotizing enterocolitis, seizures, sepsis, brachial plexus palsy, hypoxic ischemic encephalopathy or neonatal death

*Includes chronic hypertension, pregnancy induced hypertension without or with severe features

^Includes gestation or pre-gestational diabetes

Table 1 Maternal and intrapartum characteristics associated with adverse neonatal outcomes.

Table 2. Individual Features of Fetal Heart Rate Tracings with Neonatal Outcomes

	Without CANO[1]		With CANO[1]			Likelihood ratio (+)	Post-test Probability[4]
	n=3,117	%	n= 49	%	p-value		
Variability							
Absent	6	0.2%	1	2.0%	**0.006**	**10 (1-83)**	**14% (2-57%)**
Minimal	393	12.6%	5	10.2%	0.614		
Moderate	2,632	84.4%	38	77.6%	0.188		
Marked	14	0.4%	3	6.1%	**< 0.001**	**14 (4-46)**	**18% (6-42%)**
Acceleration Present	1,980	63.5%	31	63.3%	0.970		
Prolonged	5	0.2%	0	0.0%	0.779		
Decelerations							
with > 50% of contractions	981	31.5%	15	30.6%	0.898		
Early Decelerations[2]							
Minimal	60	1.9%	2	4.1%	0.280		
Moderate	44	1.4%	0	0.0%	0.402		
Severe	28	0.9%	0	0.0%	0.505		
Late Decelerations[2]							
Minimal	260	8.3%	5	10.2%	0.640		
Moderate	136	4.4%	3	6.1%	0.551		
Severe	51	1.6%	1	2.0%	0.825		
Variable Decelerations[3]							
Minimal	641	20.6%	7	14.3%	0.280		
Moderate	479	15.4%	2	4.1%	**0.029**	**0.2 (0.1-1)**	**0 (0-2%)**
Severe	139	4.5%	8	16.3%	**< 0.001**	**4 (2-7)**	**5% (3-10%)**
Prolonged Decelerations							
> 2 min < 6 min	77	2.5%	2	4.1%	0.473		
≥ 6 min < 10 min	3	0.1%	0	0.0%	0.828		

[1]CANO, composite adverse neonatal outcomes, which included any of the following: Apgar < 7 at 5 min, mechanical ventilation > 6 hours, bronchopulmonary dysplasia ,intraventricular hemorrhage, necrotizing enterocolitis, seizures, sepsis, brachial plexus palsy, hypoxic ischemic encephalopathy or neonatal death

[2]Minimal are below baseline by < 15, moderate are <30, severe are <45 bpm

[3]Minimal are present, but nadir > 80 bmp; moderate are 30-60 seconds in duration with <80 bpm nadir; marked are >60 seconds in duration < 80 bmp nadir

[4]Assumes a pre-test probability of composite adverse neonatal outcomes: 2%

888 | Changes in Risk-Appropriate Care After Implementation of Maternal Level of Care Designation in Texas

Rajesh Reddy[1]; Justin A. Drake[2]; Corwin Zigler[2]; Jeny Ghartey[2]; Alison G. Cahill[3]; Lorie M. Harper[1]

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10:30 AM - 12:30 PM

Objective: Perinatal regionalization rests on the assumption that designating hospital levels of care can direct patterns of appropriate site of delivery to improve patient outcomes. We evaluate if a state-mandated maternal level of care program increased risk-appropriate site of care in Texas.

Study Design: Retrospective cross-sectional analysis of all delivery hospitalizations in Texas from 2016-2023 using quarterly

discharge data in the Texas Inpatient Public Use Data File. Of 221 designated hospitals, we included the 215 that reported deliveries in the study period (32 Level IV, 43 Level III, 86 Level II, 54 Level I). As 99% of facilities received their requested designation level, the pre-mandate level was assumed to be the same. Deliveries at sites that were not designated maternal facilities (89 total) were categorized as Undesignated. We organized comorbidities by minimum recommended level of care (highest Level IV, lowest Level I) using criteria in the Texas Administrative Code, ACOG/SMFM Consensus, and literature. We chose a baseline of 2016(Q1) to 2018(Q4) due to (Q4)2015 introduction of ICD-10 and 2018 Texas rule adoption, then a post-intervention of 2021(Q4) to 2023(Q3) based on the September 2021 implementation deadline. We categorized patients into minimum level of care by their highest risk comorbidity and used two-proportion z-tests to compare rates of deliveries at inappropriately low facilities per each risk category. Undesignated site deliveries were considered low level.

Results: The proportion of births at inappropriate level facilities increased for all risk categories (Figure 1). Level III risk and severe maternal cardiac disease patients were more likely to deliver at inappropriately low facilities (Table 1). The exception was a 4.12% decrease for placenta previa with prior uterine surgery. The proportion of undesignated hospital births decreased for all maternal risk groups.

Conclusion: Despite statutory adoption of levels of care, the proportion of deliveries at inappropriately low level facilities increased for all risk groups. Access barriers and transfer behavior may limit efforts.

Figure 1. Deliveries at inappropriately-low level of care facilities per year

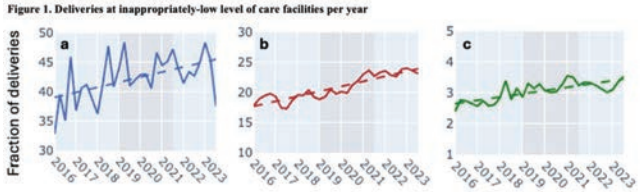
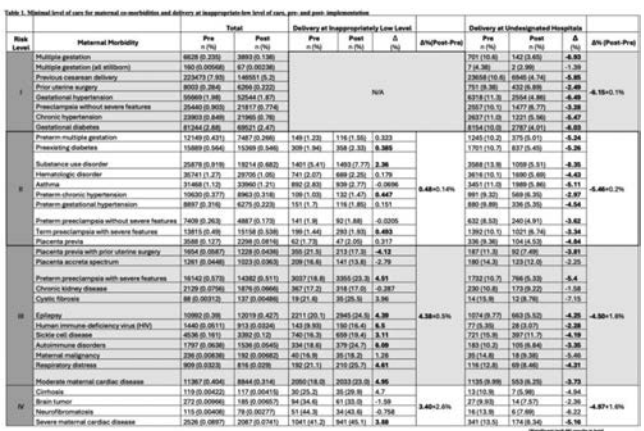


Figure 1. Fraction of deliveries at inappropriately-low level facilities from 2016(Q1)-2023(Q3).
(a) Level IV risk patients delivered at Levels I-III facilities.
(b) Level III risk patients delivered at Levels I-II facilities.
(c) Level II risk patients delivered at Level I facilities.



889 | Changes in Severe Maternal Morbidity Rates in Texas After State-Mandated Perinatal Regionalization

Rajesh Reddy[1]; Justin A. Drake[2]; Corwin Zigler[2]; Jeny Ghartey[2]; Alison G. Cahill[3]; Lorie M. Harper[1]

[1]Dell Medical School, Austin, TX; [2]University of Texas at Austin, Austin, TX; [3]Dell Medical School Health Transformation Research Institute, Dell Medical School, The University of Texas at Austin, Austin, TX

10:30 AM - 12:30 PM

Objective: Seeking to curb severe maternal morbidity (SMM) and mortality, Texas adopted statutory levels of maternal care rules. We evaluated if the state-mandated maternal level of care designation law decreased SMM.

Study Design: Retrospective cross-sectional analysis of all delivery hospitalizations in Texas from 2016-2023 using quarterly discharge data in the Texas Inpatient Public Use Data File. Out of 221 designated hospitals, we included the 215 that reported deliveries in the study period (32 Level IV, 43 Level III, 86 Level II, 54 Level I). As 99% of facilities received their requested designation level, we assumed the same pre-mandate level. Deliveries at sites that were not designated maternal facilities (89 total) were categorized Undesignated. We organized comorbidities by minimum recommended level of care (highest Level IV, lowest 'No risk') using criteria in the Texas Administrative Code, ACOG/SMFM Consensus, and literature. We chose a baseline of 2016(Q1) to 2018(Q4) due to (Q4)2015 introduction of ICD-10 and 2018 Texas rule adoption, then a post-intervention of 2021(Q4) to 2023(Q3) based on the September 2021 implementation deadline. We used the CDC's definition of SMM and ICD-10 codes to calculate SMM rates. We categorized patients into minimum level of care by their highest risk comorbidity and used a z-test for two proportions to compare the SMM rates for each risk group by delivery at appropriate or inappropriate level of care.

Results: SMM rates increased overall during the study period. SMM decreased among patients with maternal risk levels II-IV regardless of appropriate level of care, except for a stable rate in risk level IV patients at inappropriate level facilities (Figure 1). Maternal risk level I patients and those with no risks experienced increases in SMM (Table 1).

Conclusion: SMM decreased for high-risk patients, particularly when delivered at appropriate level facilities, while SMM increased for low-risk patients and overall. As low-risk patients constitute the overwhelming share of births, this cohort may benefit from targeted policies.

Figure 1. SMM rates (per 10,000 deliveries) over time by maternal risk group, with and without blood transfusions

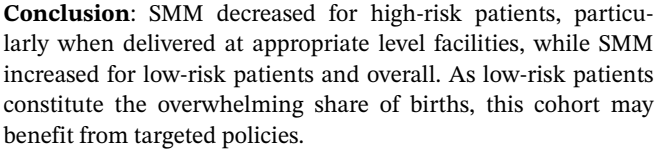
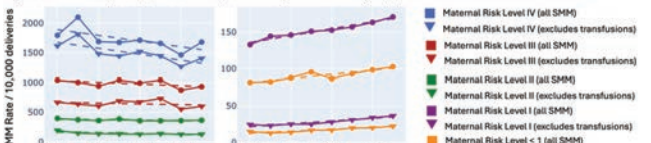


Table 1. Percent of patients by risk category who experienced SMM at each maternal level of care



890 | Development of a Novel Machine-Learning-Based Prediction Model to Stratify Risk for Adverse Perinatal Outcomes

Rajet Vatsa[1]; Siguo Li[2]; Jessica L. Cohen[3]; Mark A. Clapp[2]
[1]Harvard University, Boston, MA; [2]Massachusetts General Hospital, Boston, MA; [3]Harvard T.H. Chan School of Public Health, Boston, MA

10:30 AM - 12:30 PM

Objective: An effective risk assessment tool for perinatal deaths is critically needed, given that over one-third of stillbirths after 28 weeks of gestation are potentially preventable. While current guidelines emphasize the role of clinical risk factors (e.g., medical comorbidities), the value of geographic, sociodemographic, and utilization-related factors in risk stratification is less known.
Study Design: We utilized electronic health records data from a large integrated healthcare system between 4/2017 and 6/2023. The analysis was restricted to births ≥ 28 weeks. We developed and internally validated two classes of machine learning models to predict a composite adverse outcome, including stillbirth, early newborn death, and 5-minute Apgar < 7, using features known before 28 weeks. The first class ("clinical") only leveraged clinical risk factors (e.g., chronic hypertension) known to be associated with perinatal death, while the second class ("clinical+") added additional geographic (e.g., distance to hospital), sociodemographic (e.g., household income), and utilization-related (e.g., prenatal care use) features. We tested and compared the top-performing models in each class with respect to their ability to prospectively stratify the risk of adverse perinatal outcomes.
Results: The clinical+ model (AUC: 0.63 [95%-CI: 0.59-0.69]) had modest discrimination overall, similar to the clinical model (AUC: 0.58 [95%-CI: 0.53-0.64]). However, the clinical+ model stratified pregnancies into quartiles of predicted risk with significantly different rates of the composite adverse outcome compared to the clinical model, which did not. For the clinical+ model, the adverse outcome rate was 0.6% (95%-CI: 0.3-0.9%) in the lowest and 4.6% (95%-CI: 3.9-5.3%) in the highest risk quartile.
Conclusion: A machine-learning-based model developed using clinical, geographic, sociodemographic, and utilization-related factors known at the start of the third trimester may more accurately stratify risk than using clinical factors alone. Prospective and external validation studies are needed to demonstrate its utility in practice.

Figure 1: Risk Stratification Performance of Top-Performing Clinical Model

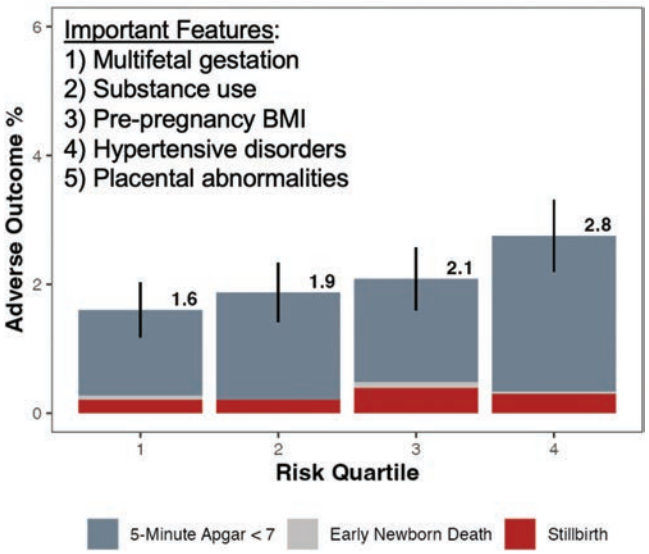
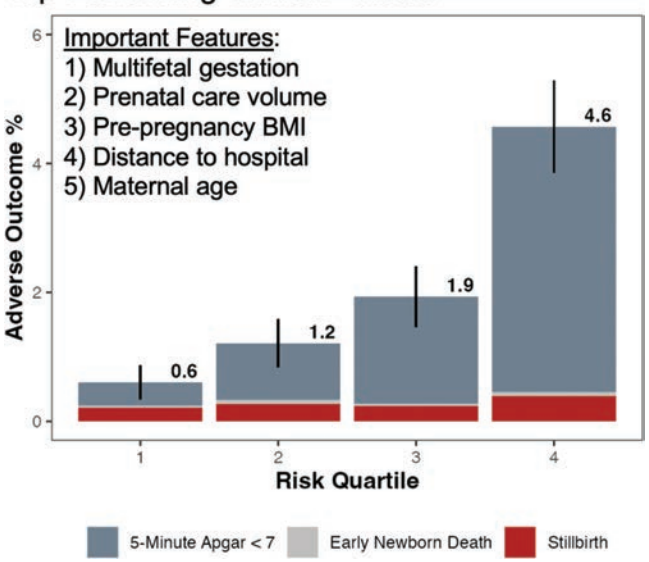


Figure 2: Risk Stratification Performance of Top-Performing Clinical+ Model



891 | Antepartum Fetal Surveillance Use and Rates of Stillbirth by Predicted Risk of Adverse Perinatal Outcomes

Rajet Vatsa[1]; Siguo Li[2]; Jessica L. Cohen[3]; Mark A. Clapp[2]
[1]Harvard University, Boston, MA; [2]Massachusetts General Hospital, Boston, MA; [3]Harvard T.H. Chan School of Public Health, Boston, MA

10:30 AM - 12:30 PM

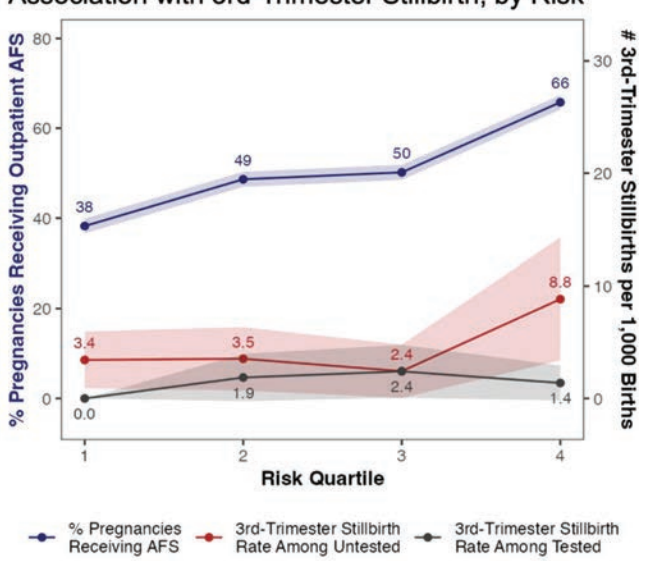
Objective: Over a third of stillbirths after 28 weeks of gestation are thought to be potentially preventable, with antepartum fetal surveillance (AFS) constituting the primary clinical tool for prevention. We sought to compare the rates of stillbirths among those who did and did not receive AFS, stratified by their baseline risk.
Study Design: We utilized electronic health records data from a large integrated healthcare system between 4/2017 and 6/2023

to evaluate the association between AFS, specifically biophysical profiles and nonstress tests conducted in the outpatient setting prior to one's admission for childbirth, and stillbirths occurring after 28 weeks of gestation. Patients were stratified into quartiles of risk for an adverse perinatal outcome using a machine-learning-based model that incorporated information known by the start of the third trimester. Characteristics of patients at highest risk were compared between those who did and did not receive AFS.

Results: Overall, 51% of pregnancies received at least one AFS test. After prospectively stratifying pregnancies into risk quartiles, rates of AFS utilization ranged from 38% in the lowest-risk to 66% in the highest-risk quartile. Among pregnancies at highest risk, there was a significant negative association between receipt of AFS and rates of stillbirth: 8.8 per 1,000 births (95% CI: 3.4-14.3) among un-surveilled pregnancies vs. 1.4 per 1,000 births (95% CI: 0.0-2.9) among surveilled pregnancies (p = 0.01). High-predicted-risk individuals who did not receive AFS lived further from the hospital and obtained less prenatal care but had lower rates of nearly all traditional clinical risk factors.

Conclusion: Using a machine-learning-based model to stratify risk of adverse perinatal outcomes, we demonstrated that AFS was associated with an over 80% lower rate of third-trimester stillbirth among those at highest risk. Further studies are required to causally identify the effect of AFS by risk; however, these findings suggest a potential role for policies to address barriers that may prevent high-risk individuals from accessing AFS to prevent stillbirth.

Figure 1: Antepartum Fetal Surveillance Use and Association with 3rd-Trimester Stillbirth, by Risk



892 | Maternal Mental Health After Stillbirth Delivery

Rana Jawish; Amanda A. Allshouse; Robert M. Silver
University of Utah, Salt Lake City, UT

10:30 AM - 12:30 PM

Objective: Stillbirth has a significant impact on maternal mental health. The decision to pursue autopsy following stillbirth can yield knowledge about cause of death (COD), both of which may impact subsequent mental health outcomes for parents. Our objective was primarily to examine associations between autopsy decision and known cause of death with subsequent poor mental health after stillbirth, and secondarily to determine characteristics and factors associated with poor mental health after stillbirth.

Study Design: This was a secondary analysis of singleton stillbirth cases in the Stillbirth Collaborative Research Network case-control study. Primary exposures were decision to perform autopsy (none, partial, full) and autopsy results (known COD, otherwise.) The primary outcome was a mental health composite assessed 1-3 years after the index pregnancy (Edinburgh depressive scale, elevated grief, elevated distress, low post-traumatic growth, or self-reported increase in drinking or smoking).

Results: Of 620 parents, 272 participated in the follow up interview (44%), with autopsy decision full (66%), partial (19%), and none (14%), and known COD 57% (82% of full autopsy, 52% of partial, 0% of no autopsy). 54% had poor mental health at follow up including depression (26%), elevated distress (25%), grief (18%), increased smoking or drinking (15%), and low resilience (11%).) Neither autopsy decision nor knowledge from autopsy were associated with mental health at follow up (Table 1). Factors associated with poor mental health after stillbirth were childhood physical/emotional abuse/trauma, angry feeling internalization, chronic autoimmune conditions, prior mental health conditions, low income, and feeling blamed for stillbirth (Table 2). When modeled jointly, only childhood trauma (OR: 4.1 (1.6-10.7)) and low income (2.3 (1.3-4.0)) remained significantly associated with poor mental health.

Conclusion: Adverse mental health outcomes were remarkably high after stillbirth and were associated with low income, and prior trauma. Additional follow-up and screening tools could optimize mental health after stillbirth.

Abstract Table 1. Study outcomes by autopsy decision and known/unknown cause of death from autopsy

Outcome	Autopsy Decision				Cause of death findings		
	No Autopsy	Partial	Full	p	Known	Unknown	p
	N=39	N=52	N=181		N=157	N=115	
Mental Health Composite	19(48.72)	28(53.85)	101(55.80)	0.73	85(54.14)	63(54.78)	0.99
▪ EPDS >=11	11(28.95)	17(32.69)	44(24.31)	0.45	37(23.57)	35(30.70)	0.21
▪ Any grief subscale high score	6(15.38)	9(17.31)	36(19.89)	0.78	33(21.02)	18(15.65)	0.28
o Active Grief subscale high score	6(15.79)	9(17.31)	34(18.78)	0.92	32(20.38)	17(14.91)	0.27
o Difficulty Coping subscale high score	6(15.79)	9(17.31)	34(18.78)	0.92	32(20.38)	17(14.91)	0.27
o Despair subscale high score	0(0.00)	1(1.92)	3(1.66)	0.85	3(1.91)	1(0.88)	0.64
▪ Severe Stress: (IES) total score > 44	10(26.32)	13(25.00)	44(24.31)	0.98	39(24.84)	28(24.56)	0.99
▪ Low PTGI (<42)	2(5.26)	4(7.69)	23(12.71)	0.29	19(12.10)	10(8.77)	0.43
▪ Self-reported increased smoking/drinking	5(13.51)	7(13.46)	27(15.43)	0.90	19(12.50)	20(17.86)	0.29
# components MH composite Mean ± SD	0.87± 1.2	0.96± 1.2	0.96± 1.1	0.90	0.94± 1.1	0.97± 1.2	0.83
▪ Zero	20(51.28)	24(46.15)	80(44.20)	0.39	72(45.9)	52(45.2)	0.73
▪ 1	11(28.21)	15(28.85)	53(29.28)		44(28.0)	35(30.4)	
▪ 2	2(5.13)	8(15.38)	30(16.57)		26(16.6)	14(12.2)	
▪ 3	5(12.82)	2(3.85)	11(6.08)		9(5.7)	9(7.8)	
▪ 4	1(2.56)	2(3.85)	7(3.87)		6(3.8)	4(3.5)	
▪ 5	0(0.00)	1(1.92)	0(0.00)		0(0.0)	1(0.9)	
Total EPDS	7.82± 5.6	8.37± 5.0	6.96± 5.2	0.19	7.06± 5.0	7.75± 5.5	0.29
Active Grief subscale total score	27.1± 6.4	27.2± 5.4	27.3± 6.5	0.98	27.6± 6.6	26.8± 5.9	0.29
Difficulty Coping subscale total score	19.2± 5.4	20.0± 6.1	19.6± 6.4	0.81	19.6± 6.5	19.6± 5.8	0.91
Despair subscale total score	19.1± 5.8	18.4± 5.6	19.2± 6.2	0.69	19.2± 6.1	18.9± 6.0	0.78
Total Impact of Events Scale (IES) score	34.6± 16.0	30.1± 18.0	30.6± 18.6	0.42	31.0± 18.3	31.2± 18.0	0.94
Total PTGI	71.9± 20.3	73.2± 18.8	69.1± 22.4	0.42	68.8± 21.7	72.3± 21.0	0.19

Abstract Table 2. Differences between people with poor Mental Health (MH) vs otherwise after SB

Factor	Poor MH	Otherwise	p
	N=148	N=124	
Childhood emotional or physical abuse or neglect	24 (16.2)	6 (4.8)	0.003
STAXI-2: Anger Expression-In Scale (internalizing anger)	13.59 ± 3.9	12.43 ± 3.7	0.017
Mental health concerns during pregnancy	14 (10.1)	3 (2.5)	0.015
Autoimmune medical condition	5 (3.4)	0 (0.0)	0.039
Any income assistance in last 12m	58 (42.6)	29 (25.0)	0.003
Feel blamed for loss	30 (20.3)	14 (11.3)	0.045
Professional Support from a counselor	16 (10.8)	5 (4.0)	0.037

Values presented as frequency (column %) or Mean ± Standard Deviation

893 | Obstetric Emergencies, When to Provide Abortions, and State Restrictions: a Survey of Us Emergency Physicians

Rauvynne N. Sangara[1]; Priscilla Garza[2]; Emma Lantos[2]; Sophie Terp[2]; Sarah Axeen[2]; Brian Nguyen[2]
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10:30 AM - 12:30 PM

Objective: To explore emergency medicine (EM) provider attitudes about obstetric emergencies, the appropriateness of their management via abortion, and the influence of abortion restrictions on clinical decision making.

Study Design: We distributed an anonymous, cross-sectional, electronic survey to EM providers nationwide using social media platforms and specialty listservs. Using Likert-type scales, the survey listed several obstetric presentations; participants then reported (1) which might qualify as obstetric emergencies, (2) the appropriateness of abortion as management for these conditions, (3) the availability of abortion at their site, and (4) their beliefs on obligation to provide abortion if against state law. We examined variations based on the abortion permissiveness or restrictiveness of the participant's state of practice via bivariate analysis.

Results: Most respondents (N = 203) identified as non-Hispanic white (69%), female (57%), attending physicians (74%), in abortion-permissive states (61%). A majority thought that ruptured ectopic pregnancy (96%), hemorrhage (82%), septic abortion (59%), pulmonary embolism (51%), and hypertensive disease (51%) were obstetric emergencies requiring immediate, life-saving intervention. Abortion was viewed as often/always appropriate for ectopic pregnancy (97%), septic abortion (89%), incomplete abortion (83%), hemorrhage (65%), hypertensive disease (52%), pregnancy loss (50%), infection (45%), preterm premature rupture of membranes (38%), and pulmonary embolism (11%). Many (21%) believed legal restrictions would prevent EM providers from considering abortion for obstetric emergencies; 9% reported that abortion restrictions personally affected their clinical decision-making. Most (84%) agreed that EM clinicians must provide and/or facilitate abortion for obstetric emergencies, even if prohibited by state law. Responses did not vary by abortion permissive versus restrictive states (p = 0.48).

Conclusion: EM providers consider many diagnoses to be obstetric emergencies with abortion being an appropriate treatment in many cases, even if prohibited by state law.

894 | Does First Trimester Blood Pressure Affect Uterine Artery Doppler Changes During Pregnancy?

Rebecca Horgan[1]; Erkan Kalafat[2]; Elena Sinkovskaya[1]; Alfred Z. Abuhamad[1]; George R. Saade[1]
[1]Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA; [2]Koc University Hospital, Istanbul, Istanbul

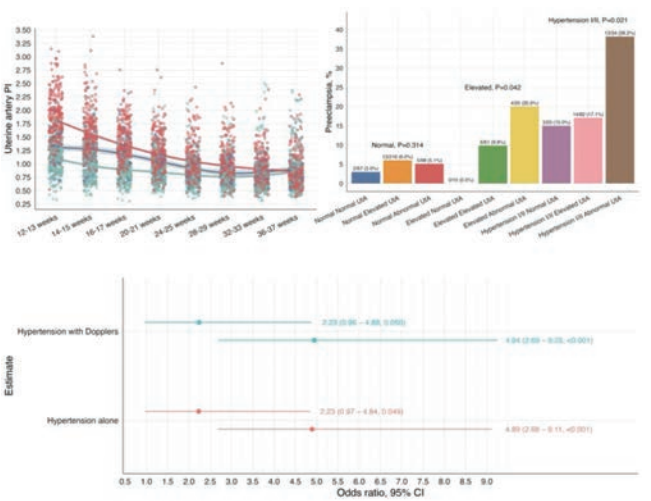
10:30 AM - 12:30 PM

Objective: First trimester blood (BP) has been shown to have an association with preeclampsia (PE) development later in pregnancy. Our objective was to determine whether this association is dependent on change in uterine perfusion which is also known to be associated with PE.

Study Design: This was a prospective longitudinal cohort study within the Human Placenta Project which enrolled patients at ≤ 13+6 weeks' gestation. Data was obtained by trained research coordinators. At the 1st trimester study visit, BP was measured and categorized according to the American Heart Association (AHA) classification as normal, elevated, or hypertension which included stage 1 and stage 2. Uterine artery Doppler pulsatility index (UtA-PI) was obtained at eight timepoints during pregnancy beginning in the first trimester (Figure). Doppler values were modeled with mixed-effects regression and longitudinal trajectories were formed with k-means clustering. Additive effect of Doppler values to blood pressure was assessed with Cochrane-Armitage test for trend. A mediation analysis was undertaken to elucidate how much of the effect of blood pressure (BP) is exerted over Doppler values.

Results: 608 pregnancies were included in the analysis, with 60 developing PE. Longitudinal assessment of UtA-PI revealed 3 trajectory groups (normal, elevated, abnormal, Figure). Addition of UtA-PI to first trimester blood pressure categorization improved the risk classification for AHA elevated BP (PE developed in 0.0%, 9.8%, 20.0% of UtA normal, elevated, and abnormal, P = 0.042) and AHA hypertension categories (PE developed in 15.0%, 17.1%, 38.2% of UtA normal, elevated, and abnormal, P = 0.021) (Figure). On the mediation analysis, the odds ratio of elevated BP (OR: 2.23, 95% CI: 0.96-4.88 vs. 2.23, 95% CI: 0.97-4.84) and hypertension categories (OR: 4.94, 95% CI: 2.69-9.25 vs. 4.89, 95% CI: 2.68-9.11) changed very little with the addition of Doppler values.

Conclusion: First trimester BP categorization according to AHA is an independent risk factor for preeclampsia and related risk is not exerted over uterine artery function.



895 | First and Third Trimester Ultrasound Markers for Prediction of Placenta Accreta Spectrum & Clinical Outcomes

Rebecca Horgan[1]; Elizabeth Miller[2]; Yara Hage Diab[1]; Juliana Martins[3]; George R. Saade[1]; Camille Kanaan[1]; Jerri A. Waller[1]
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School at Old Dominion University, Norfolk, VA; [3]Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medial School at Old Dominion University, Virginia Beach, VA

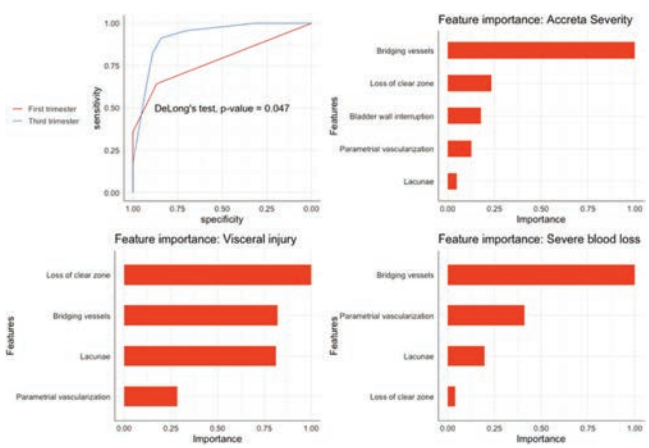
10:30 AM - 12:30 PM

Objective: To evaluate the predictive accuracy of ultrasound markers for placenta accreta spectrum (PAS) and associated clinical outcomes in patients with prior cesarean delivery and placenta previa.

Study Design: This retrospective cohort study included patients with prior cesarean delivery and placenta previa who received prenatal care at our tertiary center from Jan 2015 to June 2022. Ultrasound markers evaluated in the first and third trimester included lacunae presence/count, bladder wall interruption, loss of retroplacental clear zone, bridging vessels, and parametrial vascularization. Ultrasounds were reviewed blindly by an MFM physician. Primary outcome was PAS and secondary outcomes included PAS severity (accreta, increta, percreta), visceral injury during surgery (bladder, ureter, bowel), and severe blood loss (EBL >1000 mL or blood transfusion). Shallow gradient booster models assessed prediction model performance with area under the curve (AUC) values and feature importance plots.

Results: Of 111 pregnancies, the final diagnosis was PAS in 33 and placenta previa without PAS in 78. Third-trimester ultrasound markers were highly predictive of PAS (AUC: 0.92, 95% CI: 0.86-0.98) vs. first-trimester markers (AUC: 0.79, 95% CI: 0.63-0.93) (P = 0.047). The most predictive feature of PAS severity was bridging vessels, followed by loss of clear zone. Increta or percreta diagnosis rates were 34.4% (both features present), 18.2% (one feature), and 4.4% (absent). Visceral injury prediction was highest with loss of clear zone, followed by bridging vessels: 21.9% (both present), 18.2% (one), 2.9% (absent). Severe blood loss predictors were bridging vessels and parametrial vascularization: 89.7% (both present), 82.1% (one), 44.4% (absent).

Conclusion: Third-trimester ultrasound is an excellent predictor of PAS diagnosis. PAS ultrasound features vary in predictive potential for clinical outcomes. Top predictors of PAS severity, visceral injury, and severe blood loss are bridging vessels, loss of clear zone, and parametrial vascularization.



896 | Machine Learning Prediction of Gestational Hypertensive Complications at Point-of-Care

Reetam Ganguli[1]; Julia Sroda Agudogo[2]; Stephen Wagner[2]

[1]Elythea, San Jose, CA; [2]Beth Israel Deaconess Medical Center, Boston, MA

10:30 AM - 12:30 PM

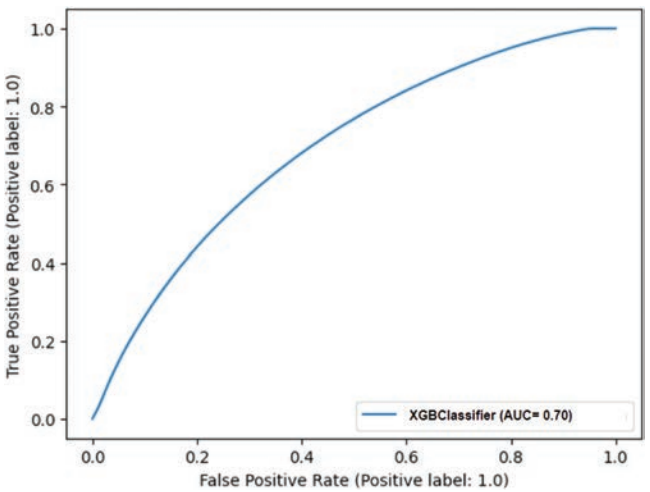
Objective: Hypertensive disorders of pregnancy (HDP) pose significant risks to both maternal and fetal health, potentially leading to early induction and NICU admission. Early identification and intervention have been shown to prevent up to 80% of preeclampsia cases. This study aims to develop and evaluate a machine learning model to predict preeclampsia using routinely collected prenatal variables.

Study Design: An extreme gradient boosting model was developed to predict the risk of HDP, inclusive of preeclampsia and gestational hypertension. The model was trained on data from the American College of Surgeons National Surgical Quality Improvement Program database comprising prenatal and demographic variables from a large cohort of pregnant women from 2018 to 2021 and tested on data from 2022.

Inclusion criteria were term deliveries without missing data for hypertensive complications. Patients missing hypertensive complication data were excluded. The model incorporated clinical history, demographic information, and early-stage comorbidities. To address class imbalance, weight scaling algorithms were utilized and patients from 2014-2017 with hypertensive complications to enhance the representation of the positive class, with the exception of 2015 patients due to corrupted data.

Results: 35 factors across 11,298,212 patients were used to develop the model. Of these patients, 1,551,321 (13.7%) had prenatal hypertensive complications, The model was tested on 3,258,442 total patients, of which 907,974 (27.9%) had hypertensive complications. The XGBClassifier model achieved an AUC-ROC of 0.70, with a 74.9% accuracy, 48.2% sensitivity and 0.75 F1 score.

Conclusion: Early-stage predictive models used at the point of care can detect nearly half of all hypertensive complications at the point of care with discriminative ability. Early identification through such models may allow for targeted clinical interventions, harboring potential for the prevention of hypertensive cases and cost savings for payors.



897 | Transfer Status and Severe Hemorrhage Risk in Cesarean Section Patients

Reetam Ganguli[1]; Joshua Woo[2]; Alice Lin[2]; Maguire Anuszewski[2]; Julia Sroda Agudogo[3]; Stephen Wagner[3]
[1]Elythea, San Jose, CA; [2]Warren Alpert Medical School, Brown University, Providence, RI; [3]Beth Israel Deaconess Medical Center, Boston, MA

10:30 AM - 12:30 PM

Objective: Transfer status influences severe hemorrhage risk in cesarean section patients, highlighting the importance of tailored preoperative management strategies to mitigate complications. This study evaluated the association between transfer indications and severe hemorrhage necessitating transfusion in patients undergoing cesarean sections.

Study Design: A retrospective cohort study was conducted using data from the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) database from January 2009 to December 2021. Included were patients undergoing cesarean sections identified by Current Procedural Terminology (CPT) codes 59510, 59514, 59515, 59618, 59620, and 59622. Exclusion criteria included missing data for the outcome variable indicating severe hemorrhage necessitating transfusion. Chi-square tests determined statistical significance, and odds ratios (OR) with 95% confidence intervals (CI) quantified the risk of severe hemorrhage for patients with different transfer statuses compared to patients who were not transferred.

Results: In our cohort of 43,713 patients, 61.27% were not transferred (admitted from home). Transfers from home/permanent residence had a significantly lower risk of severe hemorrhage (OR = 0.755, 95% CI: 0.677-0.842, $p < 0.001$). Conversely, transfers from outside emergency departments (OR = 4.307, 95% CI: 2.057-9.020, $p < 0.001$) and other facilities (OR = 5.653, 95% CI: 1.263-25.302, $p = 0.079$) exhibited markedly higher risk. Acute care hospital transfers were also associated with a significantly lower risk of severe hemorrhage (OR = 0.336, 95% CI: 0.218-0.517, $p < 0.001$). Transfers from acute care hospital inpatient and unknown transfer reasons did not show statistically significant differences.

Conclusion: Cesarean deliveries transferred from outside emergency departments and other facilities are at higher hemorrhage risk, making enhanced preoperative management vital. These findings emphasize considering transfer status in risk stratification and preoperative planning to mitigate hemorrhage risks in cesarean section patients.

Transfer Reason	Count	Percentage (%)	p-value	OR	95% CI Lower	95% CI Upper
Not transferred (admitted from home)	26782	61.27	-	Reference	-	-
Home/Permanent residence	15567	35.61	<0.0001	0.755	0.677	0.842
From acute care hospital inpatient	830	1.90	0.335	0.814	0.558	1.188
Acute care hospital	285	0.65	<0.0001	0.336	0.218	0.517
Transfer from other	118	0.27	0.087	2.139	0.993	4.607
Outside emergency department	71	0.16	<0.0001	4.307	2.057	9.020
Unknown	41	0.09	0.216	2.678	0.825	8.694
Other facility	14	0.03	0.078	5.653	1.263	25.302

898 | Weighing the Options: A Six-Year Single-Center Analysis of Second No-Call Non-Invasive Prenatal Testing Results

Ronan Daly[1]; Fianat Bligh[2]; Sirisha Bellamkonda[2]; Claire O'Rourke[2]; Elizabeth Tunney[1]; Patrick Dicker[1]; Sieglinde Mullers[3]; Fergal D. Malone[4]; Karen Flood[5]
[1]Royal College of Surgeons in Ireland, Dublin, Dublin; [2]RCSI Rotunda Hospital, Dublin, Dublin; [3]Rotunda Hospital Dublin, Dublin, Dublin; [4]Royal College of Surgeons in Ireland, Dubiln, Dublin; [5]Royal College of Surgeons in Ireland, Dublin, DE

10:30 AM - 12:30 PM

Objective: While a low-risk Non-invasive Prenatal Screening (NIPS) can offer reassurance for expectant parents, a no-call result (NCR) can cause significant anxiety. A definitive result is not guaranteed with repeat NIPS and a second NCR may compound patient uncertainty. This study aims to inform clinical practice and counselling for patients who receive NCRs by analyzing the demographics and outcomes of NCRs over the past six years.

Study Design: This retrospective cohort study was conducted at a large obstetric hospital in Ireland, utilizing a SNP-based cell-free fetal DNA test. We identified NCRs through an integrated electronic healthcare record. Data were collected on all patients who received NCRs from November 2017 to January 2024.

Results: 10,025 NIPS were conducted with 376 of patients receiving an initial NCR (3.8%). The median gestational age at first NIPS draw was 10.4 weeks [IQR: 9.7,11.7] with no significant difference across weight groups ($p = 0.566$). 354 (94%) underwent a second NIPS with a result yielded in 76% (n = 269) and 85 patients (24%) receiving a second NCR. A significant difference was found in the distribution of second NCRs by weight ($p = 0.001$), with 40% of patients in the > 90 kg group receiving a further NCR. Fetal fraction (FF) at second NIPS decreased significantly according to maternal weight, with a median FF of 6.5% [IQR: 4.3,10.0] in patients < 65kgs and a median FF of 3.1% [IQR: 2.5,4.3] in those > 90kgs ($p = 0.001$). 24% of second NCRs (n = 20) underwent invasive testing, with half of these pregnancies affected by fetal aneuploidy. Table 1 summarizes the trends in NCRs and FF according to maternal weight.

Conclusion: Despite repeat NIPS often providing a definitive result following an initial NCR, our study shows a significant correlation between maternal weight above 90kgs and the likelihood of a second NCR. Given this 40% risk of a further NCR and the underlying risk of fetal aneuploidy, we recommend offering invasive diagnostic options following an initial NCR to provide certainty for this patient group.

Table 1.

Outcome		All (N=376)	Weight Group (Quartiles) < 65 kg	65–75 kg	75-90 kg	> 90 kg	P-value†
No result on 1st NIPS		376	104	88	86	98	n/a
Gestational age at 1st NIPS (weeks)		10.4 [9.7,11.7]	10.6 [9.6,11.7]	10.4 [9.7,11.6]	10.4 [9.7,11.3]	10.6 [10.0,12.0]	0.566
Fetal fraction of 1st NIPS		2.2 [0.0,2.7]	0.0 [0.0,2.7]	1.9 [0.0,2.7]	2.3 [0.0,2.7]	2.3 [1.6,2.7]	0.165
2nd NIPS	No	22 (6%)	8 (8%)	7 (8%)	4 (5%)	3 (3%)	0.398
	Yes	354 (94%)	96 (92%)	81 (92%)	82 (95%)	95 (97%)	
Result of 2nd NIPS	Result	269 (76%)	86 (90%)	63 (78%)	63 (77%)	57 (60%)	0.001
	No result	85 (24%)	10 (10%)	18 (22%)	19 (23%)	38 (40%)	
Gestational age at 2nd NIPS (weeks)		12.4 [11.6,14.0]	12.7 [11.7,13.9]	12.3 [11.4,13.6]	12.3 [11.6,13.7]	12.6 [11.7,14.3]	0.886
Fetal fraction of 2nd NIPS		4.3 [2.8,6.7]	6.5 [4.3,10.0]	5.0 [2.9,7.0]	4.0 [2.7,5.3]	3.1 [2.5,4.3]	<0.001

† Chi-square test or Brown-Mood test for median scores, as appropriate.

899 | Assessing Antenatal and Postnatal Growth in Severe and Non-Severe Fetal Growth Restriction

Roopjit K. Sahi; Manesha Putra; John Hobbins
University of Colorado Anschutz Medical Campus, Aurora, CO

10:30 AM - 12:30 PM

Objective: Our aim was to determine if severity of fetal growth restriction (FGR) is related to growth trajectory after birth, and whether an in-utero marker of body composition, including thigh volume, correlates with growth after birth.

Study Design: In this retrospective observational study, FGR pregnancies were included, and subdivided as severe or non-severe (severe FGR indicating estimated fetal weight, EFW or abdominal circumference, AC less than 3rd percentile, with or without Doppler abnormalities). Measures of EFW, AC, total thigh volume (TTV), lean mass volume (LMV) were extracted from antenatal scans. Fat mass volume (FMV) was calculated by subtracting TTV from LMV. Postnatally, weight (and z-scores) was measured at birth, 1-3 months, 6 months, 1-year, 3 years, and 5 years of age. Median values (and interquartile range) of indices were compared between both groups. Using Pearson correlation analysis, correlation coefficients (r) were calculated between antenatal and postnatal parameters.

Results: The cohort includes 42 severe and 14 non-severe FGR pregnancies. In the severe FGR group, median values of TTV, LMV, FMV, EFW, EFW percentile, and AC percentile were lower compared to those in non-severe group (p< 0.05); ultrasounds done at the median gestational age of 35.93 weeks in both groups. Incidence of 'accelerated growth' (increase in weight z-score greater than 0.8) was higher in severe FGR group (80.9% versus 35.7%, p 0.01), typically observed between 6 months-3 years of age (Figure 1(a), 1(b)). By 5 years of age, weight (and z-score) of infants from severe group was lower than non-severe group (p 0.04). Birthweight (BW) correlated well with TTV (r 0.62, p < 0.01), and EFW percentile (r 0.69, p < 0.01). However, no significant correlations were observed during subsequent follow-ups.

Conclusion: In severe FGR group, despite accelerated growth of infants between 6 months-3 years, the median weight is lesser compared to non-severe group at 5 years of age, which could result in false reassurance in earlier years. In-utero markers, TTV and EFW, correlate significantly and similarly with BW.

Figure 1 (b). Scatter plot depicting the infant growth as weight (kgs) between birth and 5-years of age in severe and non-severe FGR groups, with associated trendlines.

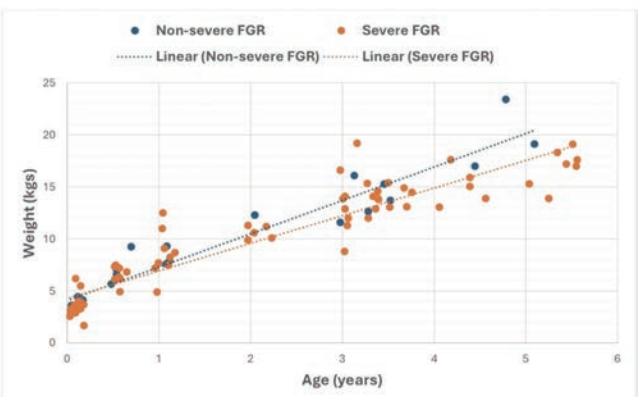
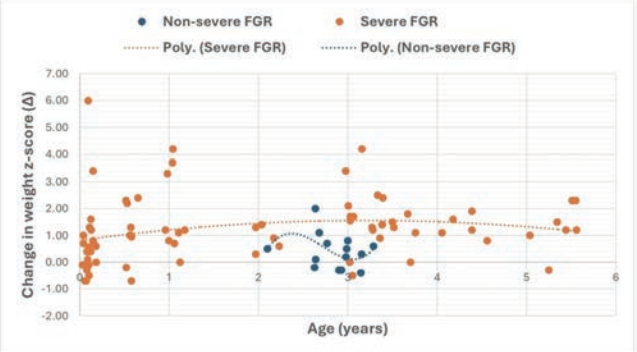


Figure 1 (b). Scatter plot depicting the infant growth as z-scores between birth and 5-years of age in severe and non-severe FGR groups, with associated trendlines.



900 | Prediction Model for Spontaneous Onset of Active Labor After Pre-Labor Rupture of Membranes at Term

Roza Berkovitz-Shperling[1]; Omri Dominsky[2]; Yariv Yogev[3]; Shai Ram[4]
[1]Tel Aviv Sourasky Medical Center, Tel Aviv Sourasky Medical Center, Tel Aviv; [2]Tel Aviv Sourasky Medical Center, Tel Aviv Sourasky Medical Center, HaMerkaz; [3]Lis Maternity Hospital, Sourasky Medical Center, Tel Aviv University, Tel Aviv Sourasky Medical Center, Tel Aviv; [4]ICHILOV, Tel Aviv, HaMerkaz

10:30 AM - 12:30 PM

Objective: Term pre-labor rupture of membranes (PROM) is a significant event that may pose risks for maternal and fetal complications. We aimed to develop a predictive model for the spontaneous onset of active labor within 24 hours following membrane rupture at term.

Study Design: 1. 1. A retrospective cohort study in a single, university-affiliated tertiary medical center which included women who presented at term (37-41 weeks) with PROM and were managed conservatively upon patient request, without induction of labor, (January 2011–December 2023).

2. The primary outcome was spontaneous onset of active labor, defined as cervical dilation to 6 centimeters (cm), within 24 hours after membrane rupture.

3. Exclusion criteria included: women who received oxytocin during the 24 hours after PROM and before reaching active labor (6 cm dilatation), women with non-clear amniotic fluid, the necessity for cesarean delivery, suspected infection and non-reassuring fetal monitoring.

4.Potential risk factors including demographic, medical and obstetric characteristics were examined.

5. Repeat amniotomy was defined as the need for additional amniotomy, after admission with PROM.

6. Prediction model was built using a backward variable selection based upon significant risk factors which were found in the multivariable logistic regression ($P < .05$).

Results: 1. Overall, during the study period 10,633 women met the inclusion criteria and were enrolled.

< 2.Within 24 hours after PROM, 6,961 (65.4%) had spontaneous onset of active labor.

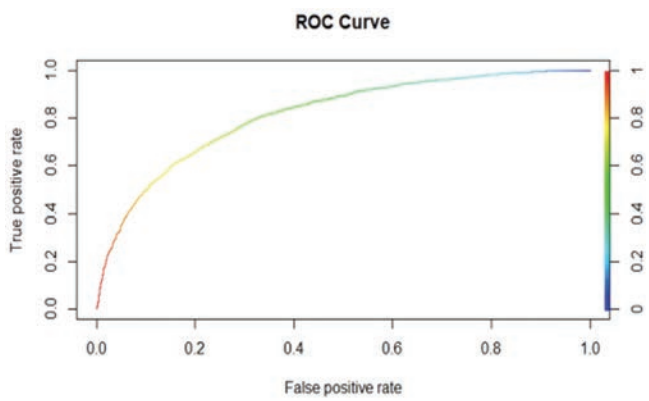
< 3. Spontaneous onset of labor after PROM was associated with parity, cervical dilatation and cervical length at admission, repeat amniotomy, and GBS status.

< !4. The prediction model for onset of labor within 24 hours after PROM had an area under the curve (AUC) of 0.813 with accuracy of 75.94%

Conclusion: The predictive model effectively identifies women at higher chance of spontaneous active labor within 24 hours following PROM. This model may improve clinical decision-making and labor management strategies after term PROM.

Table 1 – Prediction model for spontaneous labor within 24 hours following PROM

Variable	OR	95% OR	P -value
Gestational age at delivery (weeks)	0.91	0.87-0.95	<.001
Gestational weight gain (kg)	0.98	0.97-0.99	<.001
Pre-gestational BMI	0.95	0.94-0.96	<.001
Parity	1.5	1.42-1.59	<.001
Artificial reproductive treatments	0.84	0.72-0.99	.037
Smoking status	0.67	0.52-0.87	.003
GBS positive	0.61	0.55-0.68	<.001
GBS unknown	1.23	1.09-1.39	<.001
Need for repeat amniotomy	0.54	0.42-0.67	<.001
Hemoglobin level at admission (gr/dl)	1.08	1.02-1.14	.0101
Neutrophils (thousands)	1.09	1.07-1.12	<.001
Membrane rupture to admission (hours)	0.83	0.82-0.84	<.001
Cervical dilatation at admission (cm)	2.11	1.98-2.24	<.001



901 | Birth Location and Risk of Infant Death in Twin Pregnancies

Rang Kim[1]; Stephen Contag[2]; Kriti N. Vedhanayagam[3]; Sergio Karageuzian[4]; Ilish Gedestad[5]; Synia Chunn[3]; Megan Marquez[1]; Ruofan Yao[3]

[1]*Loma Linda University School of Medicine, Loma Linda University, CA;* [2]*University of Minnesota, Minneapolis, MN;* [3]*Loma Linda University School of Medicine, Loma Linda, CA;* [4]*Loma Linda University School of Medicine, Pasadena, CA;* [5]*Loma Linda University School of Medicine, Redlands, CA*

10:30 AM - 12:30 PM

Objective: To evaluate the association between birth location (birth center vs. hospital) and the risk of infant death in twin pregnancies.

Study Design: This retrospective cohort study analyzed data from the NCHS linked multiple birth and infant death database from 2016 to 2020. Inclusion criteria were matched twin pregnancies without congenital anomalies. Infant mortality was the primary outcome. Chi-square tests and logistic regression models were used to assess the association between birth location and infant mortality, adjusting for gestational age at delivery (GA ≤ 34 weeks and GA > 34 weeks) and order of birth (Twin A and Twin B).

Results: Among 607,355 twin births, the overall rate of neonatal death was 0.97%. Neonatal death was higher in birth centers (3.04%) compared to hospitals (0.96%) (p < 0.001). For GA > 34 weeks, neonatal death was 0.82% in birth centers vs. 0.18% in hospitals (p < 0.001, OR 4.59 [95% CI 2.75-7.67]). For GA ≤ 34 weeks, neonatal death was 13.68% in birth centers vs. 4.24% in hospitals (p < 0.001, OR 3.58 [95% CI 2.67-4.81]). In Twin A, neonatal death was 3.65% in birth centers vs. 0.93% in hospitals (p < 0.001, OR 4.06 [95% CI 3.00-5.50]), while in Twin B, neonatal death was 2.30% in birth centers vs. 1.00% in hospitals (p < 0.001, OR 2.32 [95% CI 1.53-3.52]).

Conclusion: Birth center delivery is associated with a significantly higher risk of infant mortality in twin pregnancies compared to hospital delivery. This increased risk persists across different gestational ages and the order of birth. These findings suggest that hospital deliveries might offer safer outcomes for twins, particularly those at higher risk of neonatal complications.

Table: Birth location and risk of infant death in twins

	Birth Center	Hospital	P Value	OR (95% CI)
All twins	67/2,203 (3.04%)	5,836/605,152 (0.96%)	<0.001	3.584 (2.671 - 4.809)
GA > 34 weeks	15/1,823 (0.82%)	880/488,155 (0.18%)	<0.001	4.594 (2.752 - 7.669)
GA ≤ 34 weeks	52/380 (13.68%)	4,956/116,997 (4.24%)	<0.001	3.584 (2.671 - 4.809)
Twin A	44/1,204 (3.65%)	2,802/302,863 (0.93%)	<0.001	4.062 (2.999 - 5.501)
Twin B	23/999 (2.30%)	3,034/302,289 (1.00%)	<0.001	2.324 (1.535 - 3.520)

902 | is Expectant Management of Late Pprom an Option in Patients with Gbs Colonization?

Sabina Razdolsky; Elior Eliasi; Elana Minic; Hadel Jamal; Ariel Mani; Miriam Lopian

Mayanei Hayeshua Medical Center, Mayanei Hayeshua Medical Center, Tel Aviv

10:30 AM - 12:30 PM

Objective: To determine if carriers of group B streptococcus (GBS) have adverse obstetric and neonatal outcomes when preterm premature rupture of membranes (PPROM) occurs between 34 to 37 weeks of pregnancy.

Study Design: A retrospective cohort study was conducted at a single university-affiliated medical center between 2012 and 2022. Patients who had preterm premature rupture of membranes (PPROM) between 34 to 37 weeks of pregnancy carrying a singleton gestation, with no contraindications to expectant management were included in the study group. According to the department protocol, all patients with PPROM receive 1G of IV Azithromycin once and 4g of IV penicillin every 4 hours. Antibiotics are discontinued in patients negative for GBS and continued for one week in GBS positive patients. Outcomes were compared to those with a negative GBS culture. Baseline demographic characteristics were compared between the groups. The primary outcome was latency from PPROM till delivery. Secondary outcomes included cesarean delivery, composite adverse maternal outcome (PPH, chorioamnionitis, abruption of

placenta) and composite neonatal outcome (NICU admission, respiratory distress syndrome, early onset GBS disease).

Results: Two hundred and seventeen patients were included in the study. 98(45.2%) were GBS carriers and 119 (54.8%) were noncarriers. There were no significant between group differences in mean maternal age (27.3±6,29.7±6.1;p = 0.37) or gestational age at delivery (252 days±5,252 days±6;p = 0.4), rate of diabetes (10.1%,10.2%;p = 0.97) neonatal mean birthweight (2602g,2698g;p = 0.32).

There were no significant differences between the groups for the primary outcome of duration from membrane rupture until delivery (2.83 ± 2.9 days,3.03 ± 2.9 days;*P* = 0.98) nor the rate of cesarean delivery (9.8%,10.9%;p = 0.45) or in composite maternal (2.7%,1.9%;p = 0.26) or neonatal outcomes(23%,22%;p = 0.34).

Conclusion: Expectant management of late PPROM in GBS carriers is not associated with an increased risk of adverse maternal or neonatal outcomes.

baseline demographic characteristics			
	GBS carriers	noncarriers	P value
Mean maternal age	27.3±6	29.7±6.1	0.37
Gestational age at delivery	252 days±5	252 days±6	0.4
Rate of diabetes	10.1%	10.2%	0.97
Hypertension disease	2%	1.7%	0.84
Neonatal mean birthweight	2602g±36	2698g±55	0.32
Maternal and neonatal outcomes			
Rate of cesarean delivery	9.8%	10.9%	0.45
PPH	4.2%	1.7%	0.27
Chorioamnionitis	2.1%	0.8%	0.45
Abruption of placenta	4.1%	3.4%	0.79
Composite maternal outcomes	2.7%	1.9%	0.26
NICU admission	30.6%	30.3%	0.95
Respiratory distress syndrome	17.3%	14.3%	0.53
Phototherapy	23.5%	22.7%	0.89
Early onset GBS disease	0	0	
Composite neonatal outcomes	23%	22%	0.34
Duration from membrane rupture until delivery	2.83 ± 2.9 days	3.03 ± 2.9 days	0.98

903 | Perinatal Mortality and Other Severe Outcomes Following Planned Birth at 39 Weeks Versus Expectant Management

Kylie Crawford[1]; Waldemar A. Carlo[2]; Anthony O. Odibo[3]; Aris T. Papageorghiou[4]; William Tarnow-Mordi[5]; Sailesh Kumar[6]; On behalf of the Mater Research Institute and The University of Queensland

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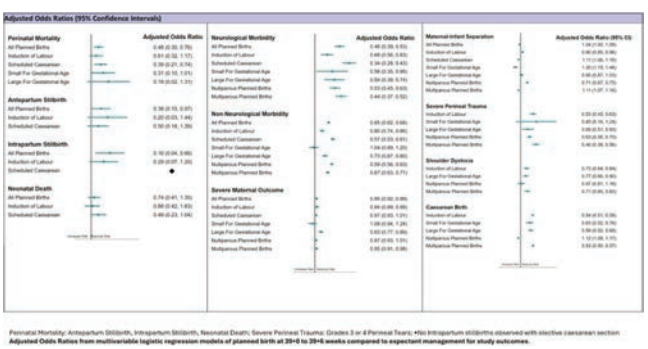
10:30 AM - 12:30 PM

Objective: To investigate differences in perinatal and maternal outcomes in low-risk women following **any type of planned birth** (induction of labour or scheduled caesarean section) at 39^{+0}–39^{+6} weeks versus expectant management.

Study Design: Retrospective cohort study. Study outcomes were perinatal mortality, severe neonatal neurological morbidity, severe neonatal non-neurological morbidity, severe maternal outcome, maternal-infant separation, severe perineal trauma, shoulder dystocia, and caesarean birth. Subgroup analyses according to parity and birthweight were also performed.

Results: Of 472,520 low-risk pregnancies $\geq 39^{+0}$ weeks planned birth at 39^{+0}–39^{+6} weeks occurred in 97,438 (20.6%) women of whom 39,697 (40.7%) underwent induction of labour and 57,741 (59.3%) had scheduled caesarean delivery. Compared with expectant management, planned birth at 39^{+0}–39^{+6} weeks was associated with lower odds of perinatal mortality (aOR 0.48; 95%CI 0.30, 0.76, p = 0.002), antepartum stillbirth (aOR 0.38; 95%CI 0.15, 0.97, p = 0.04), and intrapartum stillbirth (aOR 0.16; 95%CI 0.04, 0.66, p = 0.01). Planned birth was also associated with reduction in the odds of severe neonatal neurological morbidity (aOR 0.46; 95%CI 0.39, 0.53, p = 0.00004), severe neonatal non-neurological morbidity (aOR 0.65; 95%CI 0.62, 0.68, p = 0.00004), severe maternal outcome (aOR 0.95; 95%CI 0.92,0.99, p = 0.008) and increased odds of maternal-infant separation (aOR 1.04; 95%CI 1.00, 1.08, p = 0.075). Planned birth by induction of labour was associated with reduced odds of caesarean delivery (aOR 0.54; 95%CI 0.51, 0.58, p = 0.00004), severe perineal trauma (aOR 0.53; 95%CI 0.45, 0.63, p = 0.00004), and shoulder dystocia (aOR 0.73; 95%CI 0.64, 0.84, p = 0.00004).

Conclusion: Planned birth between 39^{+0}–39^{+6} weeks in low-risk women compared to expectant management was associated with lower odds of perinatal mortality, severe neonatal neurological and non-neurological morbidity and severe maternal outcome. For women who were induced, it was associated with lower odds of severe perineal trauma, shoulder dystocia, and caesarean birth.



904 | Twin Twin Transfusion Syndrome (TTTS) Stage 1: Do We Manage Expectantly vs. Treat Immediately?

Sami Backley[1]; Eric P. Bergh[2]; Jimmy Espinoza[1]; Felicia V. LeMoine[1]; Neha Agarwal[3]; Gustavo Vilchez[4]; Percy N. Pacora-Portella[5]; Anthony Johnson[6]; Edgar A. Hernandez-Andrade[7]; Ashley Salazar[8]; Sen Zhu[9]; Ramesha Papanna[7]

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School at UTHealth Houston, Houston, TX; [6]McGovern Medical School University of Texas Health Science Center at Houston (UThealth), Houston, TX; [7]McGovern Medical School at UTHealth Houston, Houston, TX; [8]Division of Fetal Intervention, Department of Obstetrics, Gynecology and Reproductive Sciences, McGovern Medical School at UT Health Houston, Houston, TX; [9]McGovern Medical School at the University of Texas, Houston, TX

10:30 AM - 12:30 PM

Objective: Randomized controlled trial (RCT) for twin-twin transfusion syndrome (TTTS) Stage 1 showed no difference in survival between expectant management and immediate fetoscopic laser surgery (FLS). However, higher perinatal survival with immediate FLS for TTTS Stage 1 has been reported and may justify immediate treatment. We aimed 1) to compare perinatal survival between expectant management and immediate treatment in TTTS Stage 1 and 2) to compare perinatal survival across TTTS Stages 1-4 who underwent FLS for treatment of TTTS.

Study Design: Perinatal survival of TTTS Stage 1 undergoing expectant management reported by Stirnemann et al, were compared to perinatal survival rates at our center utilizing prospective data from 90 monochorionic, diamniotic twin pregnancies complicated by TTTS Stage 1. All pregnancies underwent immediate FLS between 2011-2024. Pregnancies with cervical length < 1.5cm, non-isolated TTTS, missing delivery or neonatal outcomes were excluded. The primary outcome was dual perinatal survival. Survival outcomes for TTTS Stage 1 were also compared to TTTS stages 2-4.

Results: Our center's dual survival to birth was higher than the previously reported rates with expectant management of TTTS Stage 1 (Table 1). There was no difference in dual perinatal survival between our center and the previously reported rates in expectantly managed TTTS Stage 1 (Table 1); however, the sample size was not sufficient to detect the 10% difference in dual perinatal survival. Perinatal survival was higher in TTTS Stage 1 with immediate FLS when compared to other TTTS stages with FLS (Table 2).

Conclusion: Perinatal outcomes following immediate FLS for TTTS Stage 1 are more favorable when compared to other TTTS Stages and similar, or better, than expectant management. Immediate FLS should be considered a viable treatment option for TTTS stage 1, though a larger randomized trial to test the efficacy of immediate FLS should be considered.

Table 1: RCT* Expectant Management compared to UT-Houston Immediate FLS

	RCT-Expectant*	UTH-Immediate Treatment	p-value
Survival to Birth			
2	48 (83%)	82 (91%)	0.04
1	9 (15%)	7 (8%)	
0	1 (2%)	1 (1%)	
Perinatal survival			
2	44 (76%)	78 (87%)	0.15
1	8 (14%)	9 (10%)	
0	6 (10%)	3 (3%)	
PPROM < 32 weeks	6 (10.3%)	18 (20%)	0.12
PTB <32 weeks	23 (39.6%)	41 (46%)	0.48
PTB <28 weeks	11 (18.9)	16 (18%)	0.86

Stirnemann J,et al. Intrauterine fetoscopic laser surgery versus expectant management in stage 1 twin-to-twin transfusion syndrome: an international randomized trial. Am J Obstet Gynecol. 2021 May;224(5):528.e1-528.e12

PPROM, premature prelabor rupture of membranes; PTB, preterm birth

Table 2: UT-Houston outcomes by TTTS stages undergoing FLS*

	Stage 1	Stage 2	Stage 3	Stage 4	P-Value
Dual survivor	78 (87%)	154 (83%)	278 (70%)	23 (66%)	<0.001
One survivor	9 (10%)	16 (8.9%)	79 (19%)	7 (20%)	0.09
Dual demise	3 (3%)	15 (8.1%)	42 (11%)	5 (14%)	0.09

Cervical length <1.5cm were excluded.

905 | Risk Factors for PPROM Following Laser Surgery in Twin-to-Twin Transfusion Syndrome

Sami Backley[1]; Eric P. Bergh[2]; Felicia V. LeMoine[1]; Neha Agarwal[3]; Gustavo Vilchez[4]; Ashley Salazar[5]; Edgar A. Hernandez-Andrade[6]; Anthony Johnson[7]; Ramesha Papanna[6]; Jimmy Espinoza[1]

[1]Division of Fetal Intervention, Department of Obstetrics, Gynecology and Reproductive Sciences, McGovern Medical School at UTHealth Houston, Houston, TX; [2]UT Health, Houston, TX; [3]Division of Fetal Intervention, Department of Obstetrics, Gynecology and Reproductive Sciences, UTHealth McGovern Medical School, Houston, TX, USA, Houston, TX; [4]UTHealth Houston, Houston, TX; [5]Division of Fetal Intervention, Department of Obstetrics, Gynecology and Reproductive Sciences, McGovern Medical School at UT Health Houston, Houston, TX; [6]McGovern Medical School at UTHealth Houston, Houston, TX; [7]McGovern Medical School University of Texas Health Science Center at Houston (UThealth), Houston, TX

10:30 AM - 12:30 PM

Objective: Preterm prelabor rupture of membranes (PPROM) is the most frequent complication of in-utero surgery. The intraoperative use of distention media, such as lactated Ringer's, is thought to be caustic to the amniotic membrane. We sought to identify risk factors of PPROM following fetoscopic laser surgery (FLS) for twin-twin transfusion syndrome (TTTS).

Study Design: This single-center prospective cohort study included monochorionic-diamniotic twin pregnancies who underwent FLS between 2011 and 2024 for management of TTTS. PPROM was defined as PROM < 34 weeks' gestation. Pregnancies with missing delivery or neonatal outcomes were excluded. Maternal characteristics and perioperative factors were compared using comparative statistics. Multiple logistic regression was performed to evaluate the relationship between PPROM and the following factors: gestational age (GA) at FLS, amnioinfusion, and other confounders. Cox proportional hazard modeling was performed to evaluate factors influencing the procedure-to-delivery interval (days).

Results: PPROM occurred in 292 (39%) of 748 eligible pregnancies. Clinical characteristics are displayed in Table 1. GA at delivery was earlier and smaller amnioreduction volumes were seen in pregnancies with PPROM compared pregnancies without PPROM (Table 1). GA at FLS (adjusted odds ratio [aOR] 0.85, 95% confidence interval [CI] 0.77-0.94), pre-operative cervical length (aOR 0.98, 95% CI 0.96-0.99), placental abruption (aOR 1.94, 95% CI 1.01-3.72), collagen plug placement (aOR 2.17, 95% CI 1.18, 3.98) and chorioamnion membrane separation (CAS) (aOR 5.42, 95% CI 2.54-11.56) were associated with the diagnosis of PPROM. PPROM, CAS, cervical length prior to FLS, placental abruption, and GA at FLS independently influenced procedure-to-delivery interval (Figure 1).

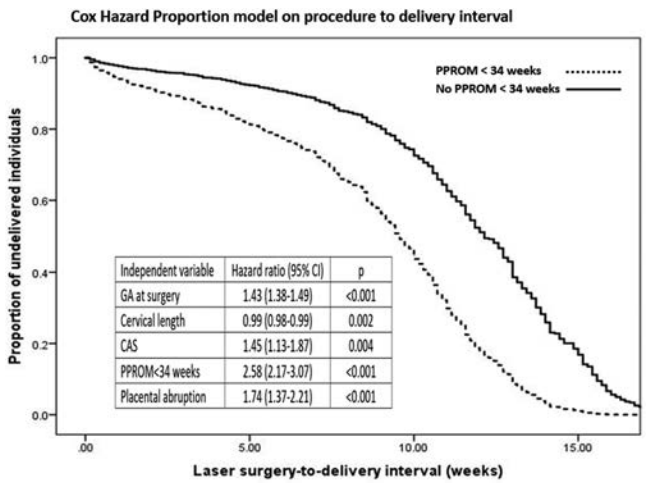
Conclusion: PPROM remains a major complication of FLS resulting in an earlier GA at delivery. CAS is the most important risk factor for PPROM after FLS surgery while amnioinfusion of ≥1 L is not a risk factor for PPROM following FLS for the management of TTTS.

Table 1. Comparing patients with and those without preterm prelabor rupture of membranes (PPROM) after fetoscopic laser surgery (FLS) for twin–twin transfusion syndrome

	PPROM (n=292)	No PPROM (n=456)	p-value
Maternal age (years)	28.7 ± 5.58	28.7 ± 5.53	0.21
BMI	28.55 ± 7.78	27.91 ± 7.65	0.27
Quintero Stage			0.16
I	28	63	
II	87	108	
III	154	244	
IV	13	22	
GA at FLS	19.98 ± 2.67	21.02 ± 2.81	<0.001
Anterior placenta	141 (49.1)	198 (43.8)	0.16
Cervical length (mm)	37.4 ± 27.11	37.87 ± 22.39	0.81
Recipient MVP (cm)	10.9 ± 2.95	11.13 ± 3.16	0.56
Weight Discordance > 25%	122 (42.4)	203 (44.9)	0.50
Seldinger entry	192 (65.8)	305 (66.8)	0.89
Amnioinfusion > 1L	32 (11)	47 (10.3)	0.76
Amnioreduction (ml)	1217.42 ± 894.19	1433.42 ± 919.31	0.003
Solomonization	277 (94.2)	420 (95.2)	0.54
Procedure time (min)	49.17 ± 21.23	49.66 ± 21.28	0.76
Septostomy	22 (7.5)	19 (4.2)	0.14
Collagen plug placement	36 (12.2)	34 (7.7)	0.03
Chorioamnion membrane separation	53 (18.7)	25 (5.7)	<0.001
Placental abruption	50 (17.8)	38 (8.5)	<0.001
Procedure to delivery (weeks)	8.69 ± 4.89	11.19 ± 5.14	<0.001
GA at delivery (wks)	28.69 ± 4.48	32.11 ± 4.00	<0.001

Data expressed as: n (%), mean (± standard deviation).

Abbreviations: GA- Gestational age, FLS- fetal laser surgery, BMI - body mass index, PPROM - preterm prelabor rupture of membranes, sFGR - selective fetal growth restriction



906 | Rurality is Associated with Increased Risk for Severe Maternal Morbidity Among Socially Vulnerable Communities

Sara EK Phillips; Bharti Garg; Sophie Neuner Weinstein; Aaron B. Caughey
Oregon Health & Science University, Portland, OR

10:30 AM - 12:30 PM

Objective: To evaluate the association between severe maternal morbidity (SMM) and rural residence among communities of high social vulnerability.

Study Design: We performed a retrospective cohort study using California's linked vital statistics-hospital discharge data (2018-2020). The study population composed of individuals with singleton, non-anomalous pregnancies delivered between 20-44 weeks' gestation with maternal residence (at time of birth) in communities deemed high on the Center for Disease Control's (CDC) Social Vulnerability Index (SVI) in 2020. Our primary outcome was a composite of SMM, defined using the CDC's published list of 21 indicators. Multivariable Poisson regression was used to calculate an adjusted risk ratio to assess whether rural residence in socially vulnerable communities was associated with SMM.

Results: Of the 605,301 births meeting inclusion criteria, 38,350 (6.3%) were from rural California. Rural Californians were more likely to be Non-Hispanic White (34.2% vs 21.8%), less than 20 years of age (6.4% vs 4.3%), publicly insured (71.2% vs. 55.9%) and have an education level of high school or below (54.1% vs 41.9%). Compared to urban centers, the prevalence of SMM was greater in rural communities of high SVI (1.75% vs. 1.46%, p< 0.001). The indicator with the highest proportion was maternal blood transfusion (1.5% for rural, 1.1% for urban, p< 0.001). There was an increased risk of SMM in rural communities after adjusting for maternal race/ethnicity, age, education, insurance, parity, and preexisting diabetes and hypertension (aRR 1.21; 1.12-1.31).

Conclusion: SVI reflects a community-level resilience for combating external stressors. Our findings suggest that individuals from rural communities with high social vulnerability may face additional disadvantages compared to their urban counterparts. More research is needed to explore the root causes of rural maternal disparities, so we may design meaningful interventions to optimize the health of our rural patients.

Table 1. Severe maternal morbidity and its indicators among rural and urban socially vulnerable communities in California, 2018-2020

	Urban	Rural	p-value
	N=566,807	N=38,350	
Severe maternal morbidity composite	**8,249 (1.4553%)**	**671 (1.7497%)**	**<0.001**
Individual indicators:			
Acute myocardial infarction	35 (0.0062%)	1 (0.0026%)	0.73
Aneurysm	11 (0.0019%)	0 (0.0000%)	1.00
Acute renal failure	767 (0.1353%)	40 (0.1043%)	0.11
Cardiac arrest	46 (0.0081%)	7 (0.0183%)	0.08
Acute respiratory distress syndrome	526 (0.0928%)	32 (0.0834%)	0.66
Amniotic fluid embolism	23 (0.0041%)	2 (0.0052%)	0.67
Conversion of cardiac rhythm	54 (0.0095%)	10 (0.0261%)	0.01
Disseminated intravascular coagulation	1,249 (0.2204%)	53 (0.1382%)	<0.001
Eclampsia	424 (0.0748%)	39 (0.1017%)	0.07
Heart failure	6 (0.0011%)	0 (0.0000%)	1.00
Puerperal cerebrovascular disorders	90 (0.0159%)	4 (0.0104%)	0.53
Pulmonary edema	311 (0.0549%)	23 (0.0600%)	0.65
Severe anesthesia complications	24 (0.0042%)	3 (0.0078%)	0.24
Sepsis	1,191 (0.2101%)	37 (0.0965%)	<0.001
Shock	374 (0.0660%)	31 (0.0808%)	0.26
Sickle cell disease with crisis	23 (0.0041%)	1 (0.0026%)	1.00
Air and thrombotic embolism	130 (0.0229%)	13 (0.0339%)	0.17
Blood products transfusion	6,319 (1.1148%)	582 (1.5176%)	<0.001
Hysterectomy	411 (0.0725%)	24 (0.0626%)	0.55
Temporary tracheostomy	10 (0.0018%)	0 (0.0000%)	1.00
Assisted ventilation	134 (0.0236%)	8 (0.0209%)	0.86

Table 2. Adjusted risk ratio (aRR) of SMM by rural maternal residence among high SVI communities in California, 2018-2020.

	Urban proportion (%)	Rural proportion (%)	aRR (95% CI)*
Severe maternal morbidity	1.46	1.75	1.21 (1.12-1.31)

* Adjusted for maternal race/ethnicity, age, education level, insurance, parity, and preexisting diabetes and hypertension.

907 | Rurality is Associated with Decreased Risk for Adverse Neonatal Outcomes Among Socially Vulnerable Communities

Sara EK Phillips; Bharti Garg; Sophie Neuner Weinstein; Aaron B. Caughey
Oregon Health & Science University, Portland, OR

10:30 AM - 12:30 PM

Objective: To assess the relationship between rural residence and adverse neonatal outcomes among socially vulnerable communities.

Study Design: This is a retrospective cohort study using California's linked vital statistics-hospital discharge data (2018-2020). Our study population included all singleton, non-anomalous pregnancies delivered between 20-44 weeks' gestation with maternal residence in communities deemed high on the Center for Disease Control's (CDC) Social Vulnerability Index (SVI). The outcome of interest was an adverse neonatal composite including preterm delivery, neonatal intensive care unit (NICU) admission, small for gestational age, low birth weight, seizures, birth injury, and neonatal sepsis. Adjusted risk ratios were calculated using multivariable Poisson regression to assess whether rural residence in socially vulnerable communities was associated with the neonatal composite.

Results: Of the 605,301 births within high SVI communities, 38,350 (6.3%) were from rural California. The rural cohort were more likely to be Non-Hispanic White (34.2% vs 21.8%), younger than 20 years of age (6.4% vs 4.3%), publicly insured (71.2% vs. 55.9%) and have an education level of high school or below (54.1% vs 41.9%). The adverse neonatal composite was significantly higher among urban communities compared to their rural counterparts (23.8% vs 21.8%, P< 0.001). After adjusting for maternal race/ethnicity, age, education level, insurance status, parity, and preexisting diabetes and hypertension, the risk of the adverse neonatal composite was lower among the rural cohort (aRR = 0.94; 95% CI: 0.92-0.95).

Conclusion: Social Vulnerability measures a community's ability to face external stressors and public health emergencies. Our analysis suggests that rural communities with high SVI may have protective factors that positively impact reproductive outcomes compared to their urban counterparts. However, more research is needed to better understand disparities in health outcomes between rural and urban birthing individuals.

Table 1. Adverse neonatal outcomes among rural and urban socially vulnerable communities in California, 2018-2020

	Urban	Rural	P*
	N=566,807	N=38,350	
Neonatal composite	**134,885 (23.80%)**	**8,369 (21.82%)**	**<0.001**
Individual indicators:			
Preterm delivery<37 weeks	39,471 (6.96%)	2,653 (6.92%)	0.73
NICU admission	54,169 (9.56%)	3,075 (8.02%)	<0.001
Small for gestational age	49,941 (8.81%)	3,127 (8.15%)	<0.001
Birthweight<2500	29,083 (5.13%)	1,788 (4.66%)	<0.001
Neonatal seizures	355 (0.06%)	28 (0.07%)	0.43
Birth injuries	19,081 (3.37%)	1,133 (2.95%)	<0.001
Neonatal sepsis	6,253 (1.10%)	312 (0.81%)	<0.001

*Chi-square test

Table 2. Adjusted risk ratios* of adverse neonatal outcomes by rural maternal residence among high SVI communities in California, 2018-2020

	Urban	Rural	
	Proportion (%)	Proportion (%)	aRR (95% CI)
Adverse neonatal composite	23.4	21.7	0.94 (0.92-0.95)

*Adjusted for maternal race/ethnicity, age, education level, insurance, number of prenatal visits, parity, and preexisting diabetes and hypertension.

908 | Blood Pressure Patterns in Pregnancy using In-Clinic and Remote Monitoring and Hypertensive Disorders of Pregnancy

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10:30 AM - 12:30 PM

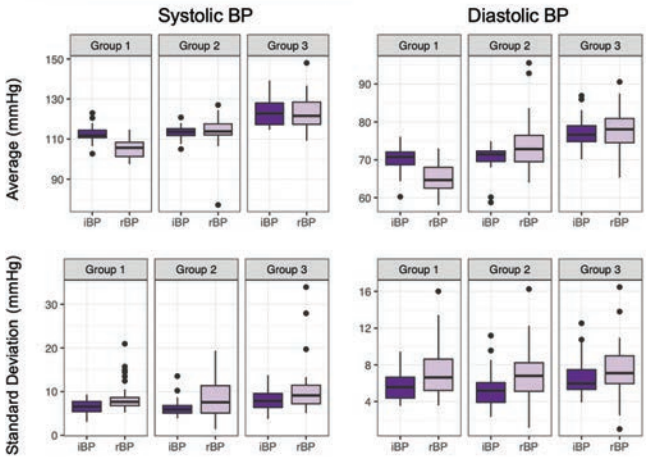
Objective: Despite the established association of in-clinic blood pressure (iBP) with hypertensive disorders of pregnancy (HDP) and the increasing use of remote blood pressure monitoring (rBP), integrating both modalities of BP monitoring to inform HDP risk remains understudied. We identified BP pattern groups in early pregnancy using both iBP and rBP measures and examined their collective ability to predict HDP.

Study Design: Prospective cohort study of pregnant individuals without chronic hypertension who delivered at one of three clinics enrolled in a digital health platform from 2022-2024. BP data < 20 weeks gestation was transformed into a total of 30 summary statistics characterizing centrality, spread, trends, and concordance of iBP and rBP measures. These BP summary statistics were computed separately for iBP versus rBP data and systolic versus diastolic data. The outcome was HDP. K-means clustering identified BP pattern groups, and the association between these groups and HDP was estimated using logistic regression. Area under the curve (AUC) was used to assess predictive performance.

Results: Using both iBP and rBP measures from 106 assessed individuals, we identified three BP pattern groups. Individuals in group 1 (n = 35, 2.9% with HDP) were more likely to have within range BP values and different values between rBP and iBP (Figure 1). Individuals in group 2 (n = 38, 7.9% with HDP) generally had within range BP values and similar values between rBP and iBP. Individuals in group 3 (n = 33, 33.3% with HDP) were more likely to have high average BP, high BP variability, and concordance between rBP and iBP. BP pattern groups arising from both iBP and rBP data were able to accurately predict subsequent HDP diagnosis (AUC = 0.77, 95% CI: 0.66, 0.89).

Conclusion: K-means clustering of BP measures based on iBP and rRP identified three distinct BP pattern groups that were predictive of HDP. Further research is needed to determine the optimal integration of rBP with iBP to inform HDP risk and care delivery.

Figure 1. Average and standard deviation of BP measures from three identified BP pattern groups: 1) BP within range and different values between rBP and iBP (n=35, 2.9% with HDP), 2) BP within range and similar values between rBP and iBP (n=38, 7.9% with HDP), 3) high BP with high variability and concordance between rRB and iBP (n=33, 33.3% with HDP). Note: for ease of exposition, only 8 of the 30 features included in the K-means clustering algorithm are shown.



iBP: in-clinic blood pressure; rBP: remote blood pressure monitoring

909 | Prevalence of Undiagnosed Placenta Accreta Spectrum After Unplanned Postpartum Hysterectomy

Sarah T. Mehl[1]; Abigail S. Zamorano[2]; Beatrice Valentini[3]; Zakaria Doughan[4]; Elias Kassir[5]; Edgar A. Hernandez-Andrade[1]; Sean C. Blackwell[1]; Baha M. Sibai[1]; Farah H. Amro[1]

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10:30 AM - 12:30 PM

Objective: Antenatal diagnosis of placenta accreta spectrum (PAS) is crucial for maternal counseling and surgical planning. There is minimal data describing frequency of missed diagnosis of PAS by ultrasound, particularly in those without risk factors. Our objective was to identify rate and reason of undiagnosed PAS in unplanned postpartum hysterectomy.

Study Design: A retrospective cohort study of pregnancies resulting in unplanned postpartum hysterectomy from 2019–2024 and delivered within our institution's hospital system. Pregnancy outcomes were evaluated in two groups: PAS and no PAS. Maternal characteristics, pre-existing risk factors for PAS, antenatal ultrasound findings, and outcomes including PAS severity by pathology were analyzed.

Results: A total of 45 unplanned postpartum hysterectomies were reviewed. All but 1 patient had prenatal care. PAS by pathology was identified in 14 (31%) patients. Table 1 describes characteristics including prior uterine surgery and placenta previa. Similar risk factors were seen between those with PAS and without. Among the 14 cases of PAS, 11 (79%) did not have placenta previa, 8 (57%) did not have prior CD, and 5 (42%) did not have anterior placenta. All 8 cases without prior CD also did not have placenta previa yet had PAS. Table 2 further describes additional risk factors among those with PAS. Accreta was the most common pathology finding, seen in 10 (71%) cases.

Conclusion: In this cohort, approximately 30% of unplanned postpartum hysterectomies were due to PAS. Routine risk factors such as previa and prior CD were not present in 57% of cases. Our findings suggest a need for detailed placental evaluation for all pregnant women regardless of prior uterine surgery or previa.

Unscheduled Postpartum Hysterectomy n = 45		
	Accreta n = 14 (%)	**No Accreta** n = 31 (%)
Age ≥35	8 (57)	12 (39)
Parity ≥ 3	0	1 (3)
BMI ≥30	7 (50)	14 (45)
IVF	3 (23)	2 (6)
Prior CD	6 (43)	18 (58)
Prior D&C	4 (29)	5 (16)
Prior Myomectomy	2 (14)	3 (9)
No Prior Uterine Surgery	2 (14)	8 (26)
Previa	3 (21)	4 (12)
GA at delivery ≥ 37 weeks	10 (71)	16 (52)
Mode of Delivery		
Vaginal	2 (14)	4 (13)
CD	12 (86)	27 (87)
Indication for Hysterectomy		
Adherent placenta	4 (29)	2 (6)
Hemorrhage	10 (71)	29 (94)
Latency to Hysterectomy		
Immediately following delivery	9 (64)	9 (29)
<12 hours	3 (21)	10 (32)
<24 hours	2 (14)	5 (16)
>24 hours	0	7 (23)

Table 1. Description of patient clinical characteristics and outcomes among those with and without PAS.

Unscheduled Postpartum Hysterectomy	
	Placenta Accreta Spectrum n = 14 (%)
Placenta Location*	
Anterior	7 (58)
Posterior	5 (42)
Previa	3 (21)
Anterior	2
Posterior	1
No CD and no Previa	8 (57)
IVF**	4
D&C**	2
Myomectomy**	2
None	2
PAS Pathology	
Accreta	10 (71)
Increta	4 (29)

Table 2. Description of surgical risk factors and PAS severity.
**2 pregnancies are excluded as they did not have antenatal ultrasound available to review*
***2 pregnancies had a combination of these risk factors*

910 | Severe Neonatal Morbidity Among Preterm Infants After Standard Versus Accelerated Betamethasone Dosing

Frank I. Jackson; Sarah H. Abelman; Nathan A. Keller; Luis A. Bracero; Annemarie Stroustrup; Matthew J. Blitz
Northwell, New Hyde Park, NY

10:30 AM - 12:30 PM

Objective: For patients expected to deliver before 34 weeks, betamethasone is usually given in two doses, 24 hours apart, to promote fetal lung maturity. If delivery is anticipated in less than 24 hours, some providers use an accelerated dosing regimen, but evidence for this practice is limited. Our objective was to determine the rate of severe neonatal morbidity (SNM) among early preterm deliveries (< 34 weeks) that occurred < 24 hours after the first dose of betamethasone was administered, and to compare the group that received one dose (standard) versus two doses (accelerated).

Study Design: This is a retrospective cohort study of singleton preterm deliveries from 2019-2023 at two tertiary hospitals in New York. Patients were included if they delivered at less than 34-0/7 weeks of gestation, received at least one dose of betamethasone prior to delivery, and delivered less than 24 hours after the first dose of betamethasone was administered. The primary outcome was SNM, a composite neonatal adverse outcome indicator which includes diagnoses and procedures indicative of severe morbidity. A logistic regression model was used to compare the rates of SNM among individuals who received one (standard) or two doses (accelerated) of betamethasone within the 24 hours prior to delivery, controlling for gestational age at birth, as well as race and ethnicity group.

Results: A total of 79 patients were included for analysis: 45 (56%) received standard betamethasone dosing and 34 (43%) received an accelerated dosing regimen. On adjusted analysis, there was no difference in composite SNM between the two groups (OR 1.16, 0.39-3.42, P = 0.79). There was also no difference in rates of neonatal respiratory distress syndrome (OR 2.78, 0.81-10.35, P = 0.11).

Conclusion: For infants born before 34 weeks who delivered within 24 hours of a first betamethasone dose, there was no difference in SNM between those who received an accelerated second dose and those who did not.

911 | Maternal and Neonatal Morbidity after Prolonged Latent Labor

Sarah Heerboth; Emma Trawick Roberts; Joy McNeal; Tracy A. Manuck
University of North Carolina, Chapel Hill, NC

10:30 AM - 12:30 PM

Objective: Cesarean delivery (CD) is often recommended after 12-18h of latent labor (LL) due to concern for futility/risk of morbidity. We sought to quantify the odds of morbidity and CD among individuals with prolonged LL.

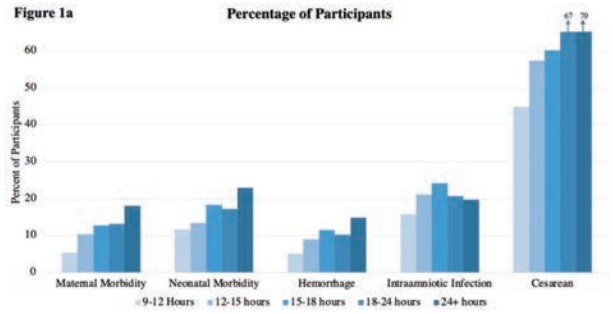
Study Design: Secondary analysis of two MFMU labor studies: (1) APEX and (2) ARRIVE. We included those with singleton pregnancies ≥37w admitted for IOL who had LL ≥9h. We defined LL as <5cm dilated with rupture of membranes and exposure to oxytocin. Participants with LL 9-12h were compared to those with LL >12h (prolonged LL). The primary outcome was maternal morbidity (ICU admission, sepsis, postpartum hemorrhage [PPH], unplanned procedure during hospitalization other than CD, thromboembolism); secondary outcomes were neonatal morbidity, PPH, intraamniotic infection (IAI), and CD. We used Liu cutpt methodology to evaluate the duration of LL that optimized sensitivity and specificity for morbidity.

Results: We included 2193 participants, 1000 of which had LL >12h. Of those with LL ≥12h, 12% had maternal and 16% had neonatal morbidity. Clinical characteristics are in Table 1. In the prolonged LL group, 61% delivered by CD. Outcomes are shown in Fig 1a. Those with LL >12h had increased odds of maternal morbidity (aOR 2.4, 95% CI 1.7-3.2), neonatal morbidity (aOR 1.4, 95% CI 1.1-1.8), IAI (aOR 1.4, 95% CI 1.1-1.7), PPH (aOR 2.1, 95% CI 1.5-2.9), and CD (aOR 1.9, 95% CI 1.6-2.2). However, the duration of LL alone was a poor predictor of maternal morbidity (AUC 0.61 at 12h). Because the alternative to prolonged LL is CD, outcomes after >12h of LL were compared to a referent group of those having CD after 9-12h LL: there were increased odds of maternal morbidity and PPH among those who had a CS after >12h LL; there were not significantly increased odds of maternal morbidity, neonatal morbidity, PPH, or IAI among those who ultimately delivered vaginally. (Fig1b)

Conclusion: Prolonged LL was associated with increased overall morbidity, and CD may increase the risks associated with prolonged LL. The time point when morbidity associated with prolonged LL can be best mitigated with CD remains unknown.

		Latent Labor 9-12 hours N=1193	Latent Labor ≥12 hours N=1000	p-value
Demographics	Advanced Maternal Age	157 (13)	121 (12)	0.46
	Race Asian Black Other White	49 (4) 295 (25) 156(13) 693 (58)	41 (4) 305 (30) 121 (12) 533 (53)	0.012
	Hispanic	218 (18)	198 (20)	0.32
	Private Insurance	641 (54)	467 (47)	0.002
	Obesity	790 (66)	712 (71)	0.012
Comorbidities	Nulliparous	566 (47)	470 (47)	0.84
	Prior Cesarean Section	24 (2)	21 (2)	0.88
	Chronic Hypertension	52 (4.4)	45 (4.5)	0.87
	Diabetes (any)	104 (9)	95 (9.5)	0.53
	Hypertensive Disorder of Pregnancy	245 (20)	238 (23.8)	0.066
Labor Course	Elective Induction	233 (19)	162 (16)	0.043
	Group B Strep Positive	310 (26)	287 (29)	0.15
	Required Cervical Ripening	630 (53)	538 (54)	0.64
	Total number of hours with oxytocin exposure	16.2 (13-20.7)	22.3 (13.1-17.7)	<0.001
	Total number of hours with rupture of membranes	14.6 (12-18)	20.3 (16-25	<0.001
	Length of latent phase	10.2 (9-11)	14.9 (13-18)	<0.001

Table 1: Characteristics by duration of latent labor



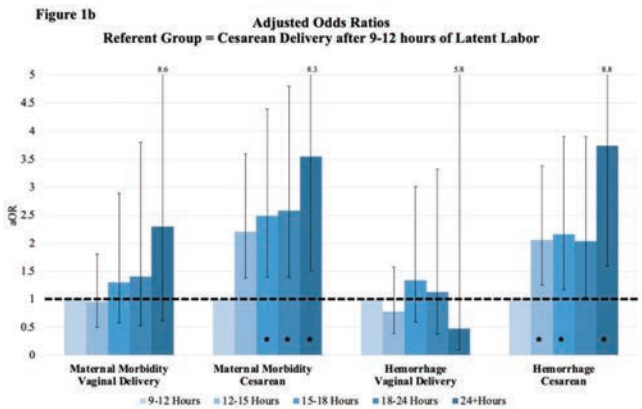


Figure 1a: Percentage of participants experiencing investigated outcomes by length of latent labor. p<0.05 for all outcomes. Figure 1b: Adjusted odds ratios for maternal morbidity and postpartum hemorrhage, stratified by mode of delivery (vaginal delivery after ≥12hrs latent labor: n=394, cesarean delivery after ≥12hrs latent labor: n=606). Referent group is those who underwent cesarean section after 9-12hrs of latent labor (n=534). Adjusted odds of neonatal morbidity and intraamniotic infection were not significantly different between those having cesarean after 9-12hrs of latent labor and those delivering by vaginal delivery or cesarean after ≥12hrs latent labor. * denotes p-value <0.05

912 | Interval to Ultrasound-Indicated Cerclage Placement and Delivery Timing in Patients with Prior Preterm Birth

Sarah H. Abelman; Frank I. Jackson; Nathan A. Keller; Julie Chen; Luis A. Bracero; Cara S. Wetcher; Matthew J. Blitz
Northwell, New Hyde Park, NY

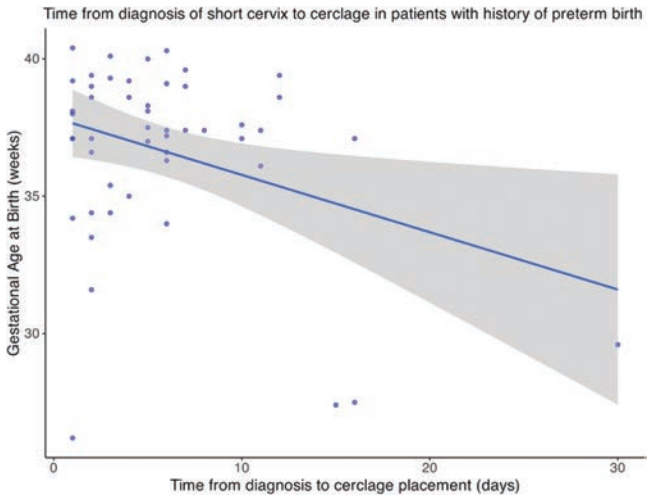
10:30 AM - 12:30 PM

Objective: Patients with a history of preterm birth and a cervical length less than 25mm benefit from cerclage to prevent recurrence. The urgency of cerclage placement after diagnosing a short cervix varies. This study aimed to determine if the time from diagnosis to cerclage placement affects delivery timing.

Study Design: This was a retrospective cohort study of all patients with a history of preterm birth who received an ultrasound-indicated cerclage in a subsequent pregnancy from 2018-2023 within a large health system in New York. The primary exposure was time interval from diagnosis of short cervix (< 25mm) to cerclage placement. The primary outcome was gestational age at delivery. Outcomes were compared using a linear mixed model regression analysis and were then adjusted for obesity, gestational age at diagnosis of a short cervix and cervical length at diagnosis.

Results: A total of 49 patients were included for analysis. The mean time interval for cerclage placement after diagnosis was 5.9 days and mean gestational age at cerclage placement was 19.0 ± 2.6 weeks. The mean cervical length on ultrasound at time of diagnosis of a short cervix was 1.8 ± 0.6 cm. The mean gestational age at delivery was 36.6 ± 3.3 weeks. Overall, for each additional day that elapsed between diagnosis of a short cervix and cerclage placement, pregnancy on average was shortened by 1.6 days (P = 0.01) (figure 1).

Conclusion: For patients with a history of preterm birth receiving an ultrasound-indicated cerclage, earlier placement after diagnosis of short cervix significantly benefited pregnancy length, resulting in a later gestational age at delivery.



913 | Impact of Nurse Support on Readmission Rates Among Patients in a Postpartum Blood-Pressure Monitoring Program

Sarah Shim[1]; Jeanne Larson Moore[1]; Sarah Fladhammer[1]; Karen Wutolia[1]; Tiffany Corlin[1]; Martina S. Burn[2]; Sarah A. Wernimont[1]; Bethany Sabol[1]
[1]University of Minnesota, Minneapolis, MN; [2]University of Minnesota, Minneapolis,, MN

10:30 AM - 12:30 PM

Objective: To assess the impact of nursing support on postpartum readmission rates for patients participating in our home observation of postpartum elevated blood pressure (HOPE-BP) monitoring program.

Study Design: HOPE-BP is a 6-week postpartum remote monitoring program for patients with hypertensive disorders of pregnancy (HDP) discharging after birth from our institution. It was implemented in 2023 and uses Epic Care Companion and a registered nurse (RN) driven protocol, with physician oversight, for antihypertensive medication initiation/titration. Blood pressures (BPs) are monitored by the RN team Monday-Friday from 8AM-5PM. Outside of these hours, patients are directed to call the on-call provider for severe hypertension or escalating symptoms; however, active surveillance or response to increasing BPs does not occur during this unsupported time. We hypothesized that readmission rates would be higher during times when RN support was unavailable.

Results: We evaluated postpartum readmissions for all patients participating in HOPE-BP from the start of the program in November 2023 through June 2024. Among those enrolled in HOPE-BP (N = 280; 75% of eligible patients), 2.8% were readmitted (N = 8). 7 of the 8 were admitted for a new diagnosis of preeclampsia with severe features based on blood pressure criteria (chronic hypertension N = 3, gestational hypertension N = 3, and preeclampsia without severe features N = 1). We observed, that as hypothesized, 75% (N = 6) of these readmissions occurred at times without RN coverage. Figure 1 demonstrates the

impact of HOPE-BP on the reduction of postpartum readmissions during RN-supported hours.

Conclusion: Our data uniquely demonstrates the impact RN support has on reducing postpartum readmissions. Supported BP surveillance and management is critical to the program's success in the prompt recognition and treatment of worsening hypertension and reducing preventable readmissions.

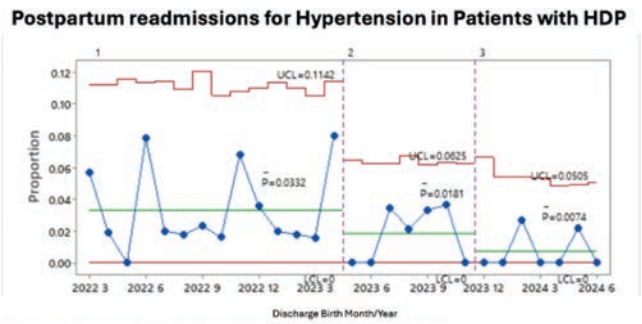


Figure 1: Postpartum Readmissions for Hypertension in patients with HDP
Box 1 represents baseline postpartum readmissions for hypertension in patients discharging with HDP
Box 2 indicates implementation of a system-wide HDP improvement project
Box 3 represents readmissions for hypertension in HOPE-BP patients during RN-support hours

914 | Impact of Maternal Anxiety and Depression on Perinatal Outcomes

Sarah K. Dzubay; Bharti Garg; Aaron B. Caughey
Oregon Health & Science University, Portland, OR

10:30 AM - 12:30 PM

Objective: To investigate whether anxiety, depression, or both anxiety and depression have differential impacts on perinatal outcomes relative to those without anxiety or depression.

Study Design: We performed a retrospective cohort study among singleton, non-anomalous births delivered at 23-42 weeks in California between 2008 and 2020. We compared perinatal outcomes between pregnant individuals without depression or anxiety to those with anxiety, depression, or both anxiety and depression. Births were excluded if the mother had bipolar disorder. We performed a multivariable Poisson regression, controlling for race/ethnicity, age, pre-pregnancy BMI, parity, insurance type, education level, and smoking during pregnancy.

Results: Of the 5,048,487 births meeting inclusion criteria, 97.12% of mothers had no anxiety or depression, 1.17% had depression, 1.25% had anxiety, and 0.47% had anxiety and depression (Table 1). Individuals with anxiety had higher risk of gestational hypertension (aIRR = 1.62; 95% CI: 1.57-1.67), preeclampsia (aIRR = 1.48 (1.43-1.53)), and SMM (aIRR = 2.00 (1.90-2.11)); however, individuals with depression had higher risk of gestational diabetes (aIRR = 1.20 (1.17-1.23) and postpartum hemorrhage (aIRR = 1.77 (1.71-1.83)) (Table 2). With regards to neonatal outcomes, individuals with both depression and anxiety had higher risk of preterm birth < 37 weeks (aIRR = 1.27 (1.23-1.33)), NICU admission (aIRR = 1.11 (1.07-1.15)), lower Apgar scores (aIRR = 2.34 (2.15-2.54)), respiratory distress syndrome (aIRR = 1.65 (1.49-1.81)), hypoglycemia (aIRR = 1.96 (1.83-2.09) and low birth weight (aIRR = 1.15 (1.06-1.24)).

Conclusion: Individuals with anxiety, depression, or both had higher risk of maternal and neonatal outcomes relative to those without a mood disorder. Interestingly, individuals with depression or anxiety had higher risk of maternal outcomes while individuals with both depression and anxiety had higher risk for neonatal outcomes. Prenatal screening and treatment for anxiety and depression may be beneficial in protecting against adverse outcomes.

Table 1: Unadjusted IRR (with 95% CI) of perinatal outcomes in pregnant patients with no depression or anxiety, depression, anxiety, or depression and anxiety

	No Depression or Anxiety	Depression	Anxiety	Depression and Anxiety
Total (N= 5,048,487)	97.12%	1.17%	1.25%	0.47%
Maternal Outcomes				
Gestational Diabetes	Reference	1.33 (1.30, 1.36)	1.24 (1.21, 1.27)	1.28 (1.24, 1.33)
Gestational Hypertension	Reference	1.66 (1.60, 1.71)	2.06 (2.00, 2.12)	1.99 (1.90, 2.09)
Preeclampsia	Reference	1.53 (1.48, 1.58)	1.76 (1.70, 1.81)	1.79 (1.71, 1.88)
SMM	Reference	1.62 (1.53, 1.72)	2.00 (1.90, 2.11)	1.83 (1.68, 2.00)
Postpartum Hemorrhage	Reference	1.80 (1.74, 1.86)	1.80 (1.75, 1.86)	1.75 (1.66, 1.84)
Neonatal Outcomes				
Preterm Delivery < 37w	Reference	1.36 (1.32, 1.39)	1.40 (1.35, 1.42)	1.54 (1.49, 1.61)
Preterm Delivery < 32w	Reference	1.54 (1.42, 1.68)	1.67 (1.55, 1.81)	1.67 (1.47, 1.89)
NICU admission	Reference	1.15 (1.21, 1.18)	1.10 (1.07, 1.12)	1.17 (1.13, 1.22)
APGAR < 7 at 5 minutes	Reference	2.36 (2.22, 2.50)	2.33 (2.20, 2.47)	3.10 (2.86, 3.35)
Respiratory Distress Syndrome	Reference	1.65 (1.55, 1.77)	1.76 (1.65, 1.87)	2.16 (1.97, 2.36)
Infant Death	Reference	1.49 (1.28, 1.75)	1.26 (1.07, 1.49)	1.54 (1.20, 1.96)
Hypoglycemia	Reference	1.75 (1.67, 1.84)	2.14 (2.05, 2.24)	2.58 (2.42, 2.75)
Birthweight < 2500g	Reference	1.28 (1.24, 1.32)	1.37 (1.32, 1.41)	1.42 (1.35, 1.49)

Table 2: Adjusted IRR (with 95% CI) of perinatal outcomes in pregnant patients with no depression or anxiety, depression, anxiety, or depression and anxiety

	No Depression or Anxiety	Depression	Anxiety	Depression and Anxiety
Total (N= 5,048,487)	97.12%	1.17%	1.25%	0.47%
Maternal Outcomes				
Gestational Diabetes	Reference	1.20 (1.17, 1.23)	1.18 (1.15, 1.21)	1.15 (1.11, 1.20)
Gestational Hypertension	Reference	1.32 (1.28, 1.37)	1.62 (1.57, 1.67)	1.48 (1.40, 1.55)
Preeclampsia	Reference	1.31 (1.26, 1.36)	1.48 (1.43, 1.53)	1.44 (1.37, 1.51)
SMM	Reference	1.59 (1.50, 1.69)	2.00 (1.90, 2.11)	1.82 (1.66, 1.99)
Postpartum Hemorrhage	Reference	1.77 (1.71, 1.83)	1.74 (1.69, 1.80)	1.72 (1.63, 1.81)
Neonatal Outcomes				
Preterm Delivery < 37w	Reference	1.15 (1.11, 1.18)	1.13 (1.10, 1.17)	1.27 (1.22, 1.33)
Preterm Delivery < 32w	Reference	1.1 (1.00, 1.22)	1.05 (0.95, 1.15)	1.23 (1.08, 1.41)
NICU admission	Reference	1.09 (1.06, 1.11)	1.05 (1.04, 1.06)	1.11 (1.07, 1.15)
APGAR < 7 at 5 minutes	Reference	1.96 (1.85, 2.08)	1.80 (1.70, 1.91)	2.34 (2.15, 2.54)
Respiratory Distress Syndrome	Reference	1.26 (1.17, 1.36)	1.27 (1.19, 1.36)	1.65 (1.49, 1.81)
Infant Death	Reference	1.15 (0.98, 1.34)	1.03 (0.88, 1.20)	1.27 (1.00, 1.62)
Hypoglycemia	Reference	1.43 (1.36, 1.50)	1.69 (1.62, 1.77)	1.96 (1.83, 2.09)
Birthweight < 2500g	Reference	1.07 (1.00, 1.15)	1.04 (0.97, 1.12)	1.15 (1.06, 1.24)

915 | Fetal Doppler Progression and Outcomes in Pregnancies with Late Onset Fetal Growth Restriction and Preeclampsia

Scott Infusino; Jeanette Larson; Natalia Gontarczyk Uczkowski; Amy Godecker; Jacquelyn H. Adams; Jesus Iruretagoyena
University of Wisconsin Hospitals and Clinics, Madison, WI

10:30 AM - 12:30 PM

Objective: To determine if fetal Doppler abnormalities, as well as pregnancy outcomes, in late onset fetal growth restriction (FGR) are impacted by preeclampsia.

Study Design: This was a retrospective cohort study from 2016 to 2021 at a single academic center evaluating singleton, nonanomalous pregnancies with a diagnosis of late onset FGR (≥32 weeks) who underwent serial fetal Doppler evaluation. Doppler evaluation included umbilical artery (UA) pulsatility index (PI) and characterization of UA end diastolic flow (forward, absent, or reversed). Pregnancy outcomes were also collected.

Results: Five hundred forty-five pregnancies were diagnosed with late onset FGR and met inclusion criteria. Ten percent of pregnancies (n = 56) developed preeclampsia. When compared to patients with only a diagnosis of FGR, those with both FGR and preeclampsia were more likely to have an earlier diagnosis of FGR (34.3 vs 35.2 weeks, p = 0.003), deliver at an earlier gestational age (36.2 vs 38.2 weeks p< 0.001), and have a shorter interval from diagnosis of FGR to delivery (13.5 vs 21 days, p< 0.001). Pregnancies with both FGR and preeclampsia were more likely to have an elevated UA PI at the time of delivery (p< 0.001). When an elevated UA PI was diagnosed, the interval from diagnosis to delivery was significantly shorter in the preeclamptic group (6.8 vs 22.3 days, p< 0.001).

Conclusion: Pregnancies complicated by both late onset fetal growth restriction and preeclampsia were more likely to have an elevated UA PI at the time of delivery, an earlier gestational age at delivery, and a shorter interval to delivery. This information can

help providers appropriately manage these complex pregnancies and adequately counsel patients.

Table 1: Fetal Doppler Characteristics and Pregnancy Outcomes

	FGR (n=489)	FGR and Preeclampsia (n=56)	p value
Gestational age at diagnosis of FGR (wks)	35.2 (2.1)	34.3 (1.8)	0.003**
Fetal Doppler at diagnosis of FGR, n (%) Normal Elevated PI AEDF	 424 (86.7) 64 (13.1) 1 (0.2)	 44 (78.6) 12 (21.4) 0 (0.0)	0.195*
Fetal Doppler prior to delivery, n (%) Normal Elevated PI AEDF	 454 (92.8) 34 (7.0) 1 (0.2)	 41 (73.2) 15 (26.8) 0 (0.0)	<0.001*
Interval from FGR Diagnosis to Delivery (days), mean(sd)	21.0 (15.3)	13.5 (11.1)	<0.001**
Gestational age at delivery (wks), mean(sd)	38.2 (1.3)	36.2 (1.8)	<0.001**
Mode of Delivery, n (%) Vaginal Cesarean Section	 350 (71.7) 138 (28.3)	 31 (55.4) 25 (44.6)	<0.001
Birthweight (g), mean(sd)	2100.0 (398.9)	1904.5 (319.0)	<0.001**

*Fisher's Exact Test
**t-test

Table 2: Gestational age at diagnosis of elevated UA PI and interval to delivery

	FGR (n=94)	FGR with preeclampsia (n=18)	p value
Gestational age at diagnosis (wks), mean (sd)	34.5 (1.7)	34.2 (1.3)	0.382
Interval to delivery (days), mean (sd)	22.3 (13.7)	6.8 (7.1)	<0.001

916 | Middle Cerebral Artery Pulsatility Index and Cerebroplacental Ratio in Late Onset Growth Restriction and Preeclampsia

Scott Infusino; Jeanette Larson; Natalia Gontarczyk Uczkowski; Amy Godecker; Jacquelyn H. Adams; Jesus Iruretagoyena
University of Wisconsin Hospitals and Clinics, Madison, WI

10:30 AM - 12:30 PM

Objective: To determine if the presence of preeclampsia impacts the rate of abnormal middle cerebral artery (MCA) pulsatility index (PI) and cerebroplacental ratio (CPR) in pregnancies complicated by late onset fetal growth restriction (FGR).

Study Design: A retrospective cohort study was performed from 2016 to 2021 at a single academic medical center of singleton, nonanomalous pregnancies with a diagnosis of late onset FGR (>32 weeks) who underwent weekly fetal Doppler evaluation. MCA PI and CPR were considered abnormal if they were noted to be less than the 5th percentile for gestational age. Gestational age at delivery was recorded for all patients.

Results: Five hundred forty-five pregnancies were diagnosed with late onset FGR and met inclusion criteria. Fifty-six (10%) patients were also diagnosed with preeclampsia (Table 1). When compared to pregnancies with only a diagnosis of FGR, those with both FGR and preeclampsia were more likely to have an abnormal MCA PI (31.7% vs 11.5%, p = 0.001) or CPR (39.0% vs 16.0%, p< 0.001). Patients with both preeclampsia and FGR had an earlier diagnosis of abnormal CPR (34.4 vs 35.5 weeks, p = 0.028) and delivered at an earlier gestational age (35.7 vs 37.6 weeks p< 0.001). Gestational age at diagnosis of abnormal MCA PI did not significantly differ between groups.

Conclusion: Pregnancies complicated by both late onset FGR and preeclampsia were more likely to have abnormal MCA PI and CPR, than pregnancies only complicated by FGR. An abnormal cerebroplacental ratio was associated with the greatest difference in findings between groups. Future work should evaluate neonatal outcomes related to these Doppler characteristics in the presence of fetal growth restriction and preeclampsia.

Table 1: Doppler Characteristics

	Late Onset Fetal Growth Restriction (n=489)	Late Onset Fetal Growth Restriction and Preeclampsia (n=56)	p value
Abnormal CPR, n (%)	51 (16.0)	16 (39.0)	<0.001
Abnormal MCA PI, n (%)	36 (11.5)	13 (31.7)	0.001
Abnormal MCA PI & CPR, n (%)	20 (4.0)	12 (19.7)	<0.001*

* Fisher's Exact Test

Table 2: Gestational Age at Diagnosis and Delivery Timing with Doppler Abnormality

	Gestational Age at Diagnosis			Gestational Age at Delivery		
	Late Onset FGR	Late Onset FGR and Preeclampsia	p value	Late Onset FGR	Late Onset FGR and Preeclampsia	p value
Normal Doppler, mean(sd)	N/A	N/A	-	38.2 (1.3)	36.4 (2.0)	<0.001
CPR < 5%, mean (sd)	35.5 (1.8)	34.4 (1.4)	0.028	37.6 (1.2)	35.7 (1.6)	<0.001
MCA PI < 5%, mean (sd)	35.7 (1.6)	34.9 (1.1)	0.084	37.9 (1.5)	36.3 (1.5)	0.003
CPR & MCA PI < 5%, mean (sd)	35.8 (1.7)	34.9 (1.2)	0.098	37.9 (1.4)	36.1 (1.4)	0.001

917 | Non-Invasive Prenatal Detection of Copy-Number Variations Based on Maternal Cfdna Fragmentomics

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10:30 AM - 12:30 PM

Objective: Cell-free DNA (cfDNA) based prenatal screening determines the risk of genetic abnormalities using cfDNA of fetal origin circulating in maternal plasma. Current methods detect chromosomal scale aberrations or very large (>1 Mb) copy number variants (CNVs), missing smaller ones which account for up to 15% of developmental disorders in children. To identify shorter CNVs, we developed a whole genome sequencing (WGS) approach that utilizes both read coverage and fragmentomics features.

Study Design: Our cohort includes 10 women with singleton pregnancies for whom WGS was performed on cfDNA and maternal gDNA. Seven out of the ten pregnancies were sampled in the 1st trimester, with a median fetal fraction (FF) of 7.7%. CNVs causing genetic disorders are typically de novo and dominant, or,

in the case of a recessive condition, inherited alongside another pathogenic variant from the other parent, resulting in compound heterozygosity. Therefore we focused on the detection of *de novo* CNVs >0.1 Mb and smaller CNVs that could cause compound heterozygosity. Paternal CNVs are detected in a similar manner to de novo variants and so were also included in the analysis.

Results: We implemented an algorithm which calculates a Z-score for the difference in cfDNA read lengths across the genome. Two deletions, of size 690 KB and 209 KB were detected in two families. Validation with fetal WGS confirmed the deletions as true positives, with no other relevant deletions found. In a third family, the mother is a known carrier of a pathogenic ~5 KB deletion in the CERS3 gene, and the father carries a pathogenic SNV in the same gene. Our algorithm successfully determined that the fetus did not inherit the maternal CNV (Figure 1).

Conclusion: We present a method to identify CNVs in a cfDNA-based prenatal screening and show that combining read length with coverage data allows reliable CNV detection. Importantly, we demonstrate our method on mostly 1st trimester pregnancies with a low FF, representing a clinically relevant scenario, thus enhancing the potential scope and resolution of noninvasive prenatal screening.

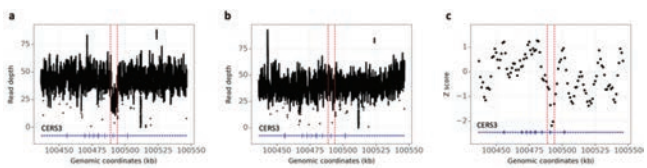

Figure 1: Sequencing read depth for the gene CERS3 in (a) the maternal gDNA sample and (b) the fetal amnio gDNA sample. Red lines represent the deletion borders. (c) CNV detection algorithm Z-scores for the gene CERS3 in the cfDNA sample. Red lines represent the deletion borders.

918 | Can Blood Pressure Monitoring Reduce Racial Disparities in Healthcare Utilization and Morbidity Among Postpartum Patients?

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10:30 AM - 12:30 PM

Objective: Remote self-measured blood pressure (SMBP) monitoring programs have been shown to reduce racial inequity in postpartum blood pressure ascertainment. However, their effect on disparities in healthcare utilization and severe maternal morbidity (SMM) is less clear. We aimed to compare outcomes between participants in our remote SMBP program who self-identified as Black versus non-Hispanic White.

Study Design: Postpartum individuals with hypertension (HTN) at our tertiary hospital are offered enrollment in our remote SMBP program. For this analysis, participants who did not self-identify as Black or non-Hispanic White were excluded. The primary outcome was a composite of HTN-related postpartum readmission or ED visit within 30 days of delivery. Secondary outcomes were individual components of the primary composite, HTN-related SMM, and anti-hypertension medication initiation or titration. A log-link binomial generalized linear model was used to estimate relative risks (aRR) adjusting for potential confounders.

Results: Among 2003 participants in the SMBP program from 2022 - 2024, 1363 met inclusion criteria. Of these, 988 (49.3%) self-identified as non-Hispanic White and 375 (18.7%) as Black. Compared to non-Hispanic White participants, Black participants were younger, and more likely to have public insurance and gestational HTN (**Table 1**). After adjusting for these factors, there was no significant difference in the composite of HTN-related postpartum readmission or ED visit between Black and non-Hispanic White participants (19.2% vs 16.7%; aRR 1.29, 95% CI 0.98, 1.69). Risk of HTN-related readmission alone was significantly higher among Black participants (12.2% vs 9.9%; aRR 1.48, 95% CI 1.03, 2.11). There was no significant difference in HTN-related SMM (12.5% vs 11.7%; aRR 1.00, 95% CI 0.72, 1.42). There was also no difference in anti-hypertensive medication initiation or titration (**Table 2**).

Conclusion: Our remote SMBP program for postpartum patients with HTN eliminated racial disparities in overall HTN-related healthcare utilization and HTN-related SMM.

Table 1: Demographics of participants

Variable	Black (n=375)	Non-Hispanic White (N= 988)	P value
Age	32 (29, 36)	31 (26, 35)	**0.001**
Primary insurance type			**<0.001**
Private	127 (33.9)	732 (74.2)	
Medicaid/Medicare	245 (65.3)	250 (25.4)	
None	3 (0.8)	4 (0.4)	
Hypertension diagnosis prior to delivery			
Gestational hypertension	82 (21.9)	318 (32.2)	**0.0002**
Preeclampsia with severe features	75 (20.0)	202 (20.5)	0.88
Preeclampsia without severe features	37 (9.9)	124 (12.6)	0.19
Chronic HTN with superimposed preeclampsia	28 (7.5)	56 (5.7)	0.26
Eclampsia	0 (0.0)	3 (0.3)	0.56
Chronic HTN alone	63 (16.8)	128 (13.0)	0.08
Gestational age (weeks) at delivery	37.9 (36.6, 39.3)	38.3 (36.6, 39.3)	0.09
Mode of delivery			0.46
Vaginal	188 (50.5)	470 (48.2)	
c-section	184 (49.5)	506 (51.8)	
Postpartum day of discharge	3 (2, 4)	3 (2, 4)	0.92

Data presented as n (%) or median (interquartile range)

Table 2: Outcomes

	Black (n=375)	Non-Hispanic White (N= 988)	P value	Relative Risk (95% CI)	Adjusted RR (95% CI)
Primary Outcome					
Composite of hypertension-related ED visit or Hospital Readmission	71 (19.2)	162 (16.7)	0.29	1.15 (0.89, 1.48)	1.29 (0.98-1.69)
Secondary Outcomes					
ED visit for hypertension	69 (18.7)	161 (16.6)	0.37	1.13 (0.87, 1.45)	1.26 (0.96, 1.65)
Hospital readmission for hypertension	45 (12.2)	96 (9.9)	0.23	1.23 (0.88-1.72)	**1.48 (1.03, 2.11)**
Hypertension-related severe maternal morbidity	47 (12.5)	116 (11.7)	0.71	1.06 (0.78, 1.47)	1.00 (0.72, 1.42)
Anti-hypertensive medication initiation or titration	117 (31.3)	296 (30.5)	0.79	1.03 (0.86, 1.23)	1.07 (0.88, 1.30)

919 | The Effect of Pre-Pregnancy and Delivery Bmi on Tolac Success in a High-Risk Cohort

Shannon R.O Moran; James A. Shelton; Dawei David Wang

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10:30 AM - 12:30 PM

Objective: Rates of trial of labor after cesarean section (TOLAC) and obesity have increased in today's population. Vaginal birth after cesarean section (VBAC) has been shown to reduce maternal morbidity. Published predictive models for VBAC success take into account both body mass index (BMI) and chronic hypertension. However, no previous studies have specifically analyzed the effect of BMI on TOLAC success in those with any form of hypertension. Therefore, we sought to investigate whether pre-pregnancy BMI or delivery BMI has a greater effect on TOLAC success rate in this high-risk cohort.

Study Design: This was a retrospective cohort study of national birth certificate data from 2022. We included all singleton, vertex livebirths with no fetal anomalies who had 1 prior cesarean delivery and a diagnosis of either chronic hypertension or a hypertensive disorder of pregnancy who attempted TOLAC. Those with prior vaginal deliveries were excluded. Patients were divided into 6 groups by pre-pregnancy and delivery BMI. Two logistic regression models, one for pre-pregnancy and one for delivery BMI, were created. These were compared using Akaike Information Criterion (AIC) and receiver operating characteristic (ROC) curves. Confounding variables included were maternal age and race, maternal weight gain, chronic and gestational diabetes, gestational age, birthweight, and induction of labor.

Results: 5,144 patients were included. 2,382 had a repeat cesarean section. 2,762 had a VBAC. For both pre-pregnancy and delivery BMI, the rate of VBAC decreased as obesity class increased. In the AIC analysis, pre-pregnancy BMI and delivery BMI produced almost identical results (6685 versus 6670, respectively). Furthermore, in the ROC curve, again pre-pregnancy BMI and delivery BMI produced almost identical results (0.631 versus 0.634, respectively).

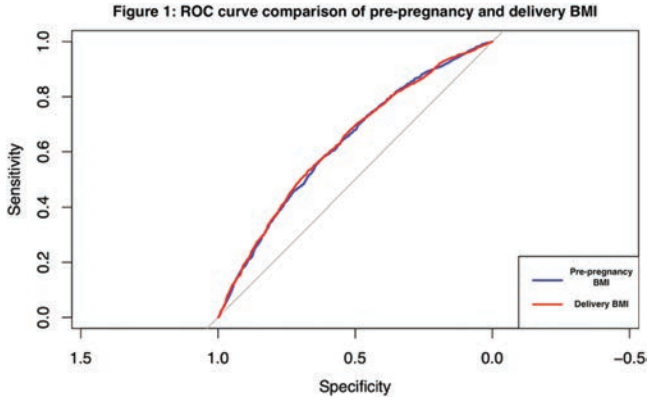
Conclusion: Pre-pregnancy BMI and delivery BMI have similar effects on TOLAC success in those with hypertension of any form, with decreased rates of VBAC seen with increasing BMI. Both should be used to counsel patients on TOLAC in this high-risk cohort throughout the antepartum period.

Table 1: VBAC and failed TOLAC rates by pre-pregnancy and delivery BMI

Characteristic	Failed TOLAC, N = 2,382[1]	VBAC, N = 2,762[1]	p-value[2]
Pre-pregnancy BMI			<0.001
Underweight	19 (35%)	36 (65%)	
Normal Weight	362 (35%)	662 (65%)	
Overweight	538 (41%)	772 (59%)	
Class I Obesity	560 (49%)	580 (51%)	
Class II Obesity	398 (50%)	394 (50%)	
Class III Obesity	505 (61%)	318 (39%)	
Delivery BMI			
Underweight	0 (NA%)	0 (NA%)	
Normal Weight	56 (30%)	131 (70%)	
Overweight	269 (32%)	567 (68%)	
Class I Obesity	580 (40%)	855 (60%)	
Class II Obesity	617 (52%)	575 (48%)	
Class III Obesity	860 (58%)	634 (42%)	

[1]n (%)

[2]Pearson's Chi-squared test



920 | The Impact of Pre-Pregnancy Anxiety Or Depression and Adverse Neonatal Outcomes

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10:30 AM - 12:30 PM

Objective: Nearly 30% of females are affected by mental illness, particularly anxiety and depression. Prior studies investigating the relationship between prenatal anxiety and depression and adverse neonatal outcomes have inconsistent findings. We sought to examine the relationship between pre-pregnancy anxiety or depression or a dual diagnosis and adverse neonatal outcomes.

Study Design: This is a secondary analysis of a prospective cohort study of singleton pregnancies at single tertiary medical center from 2017 to 2020. The primary outcomes were preterm birth and composite neonatal morbidity (Table 1). The secondary outcomes were spontaneous preterm birth, small for gestational age (SGA), and 5-minute APGAR< 7. Secondary analyses compared dual diagnosis of anxiety and depression to patients with no diagnosis. Multivariable logistic regression was used to estimate adjusted odds ratios (aOR) and 95% confidence intervals (CI) after adjusting for potential confounders.

Results: Of 1220 patients with live births, 253 (20.7%) had pre-pregnancy anxiety or depression and 967 (79.3%) did not. After adjusting for maternal race and advanced maternal age, patients with pre-pregnancy anxiety or depression were significantly more likely to have preterm birth [19.8% vs 10.9%, aOR 2.07 95% CI 1.42, 3.02] and composite neonatal morbidity [35.2% vs 23.2%, aOR 1.80 95% CI 1.31, 2.41]. Spontaneous preterm birth, SGA, and 5-minute APGAR< 7 were significantly more likely among patients with anxiety or depression. Secondary analyses comparing dual diagnosis to no diagnosis showed an even greater likelihood of preterm birth, 5-minute APGAR< 7, and composite neonatal morbidity compared to patients without anxiety or depression (Table 2).

Conclusion: Patients with pre-pregnancy anxiety or depression are at higher risk of adverse neonatal outcomes. This risk is further increased with concurrent diagnoses. Further research is

needed to determine if optimization of pre-pregnancy anxiety and depression can improve neonatal outcomes.

Table 1: Pre-pregnancy anxiety or depression and neonatal outcomes

	Pre-pregnancy Depression or Anxiety Diagnosis (n=253)	No Pre-pregnancy Depression or Anxiety Diagnosis (n=967)	p-value	OR (95% CI)	aOR (95%CI)
Preterm Birth	50 (19.8)	105 (10.9)	**<0.01**	2.01 (1.39, 2.91)	**2.07** (1.42, 3.02)
Spontaneous Preterm Birth	24 (9.5)	51 (5.3)	**0.01**	1.91 (1.15, 3.18)	**2.06** (1.23, 3.44)
Small for Gestational age	48 (19.1)	127 (13.2)	**0.02**	1.48 (1.03, 2.15)	**1.59** (1.09, 2.32)
5-minute Apgar <7	27 (10.7)	30 (3.1)	**<0.01**	3.63 (2.12, 6.24)	**3.53** (2.04, 6.11)
Composite Neonatal Morbidity	89 (35.2)	225 (23.2)	**<0.01**	1.78 (1.32, 2.40)	**1.80** (1.31, 2.41)

*Adjusted for maternal race and advanced maternal age
*Composite neonatal morbidity: respiratory distress syndrome, seizures or seizure-like activity, suspected sepsis, meconium aspiration syndrome, hypoxic-ischemic encephalopathy, need for hypothermic (cooling treatment), mechanical ventilation, neonatal death, 5-minute Apgar<7 and umbilical arterial pH<7.1, NICU admission

Table 2: Dual verses single diagnosis of anxiety and depression and neonatal outcomes

	Dual Pre-pregnancy Depression and Anxiety Diagnosis (n=90)	Single Pre-pregnancy Depression or Anxiety Diagnosis (n=167)	No Pre-pregnancy Depression or Anxiety Diagnosis (n=967)	p-value
Preterm Birth	20 (22.2)	30 (18.4)	105 (10.9)	<0.01
OR (95% CI)	2.37 (1.38, 4.07)	1.82 (1.17, 2.85)	ref	
aOR (95% CI)	**2.68** (1.55, 4.65)	1.80 (1.15, 2.82)	ref	
Spontaneous Preterm Birth	8 (8.9)	16 (9.8)	51 (5.3)	0.01
OR (95% CI)	1.80 (0.83, 3.94)	1.97 (1.09, 3.55)	ref	
aOR (95% CI)	2.10 (0.95, 4.66)	2.03 (1.12, 3.69)	ref	
5-minute Apgar <7	13 (14.4)	14 (8.6)	30 (3.1)	<0.01
OR (95% CI)	5.22 (2.61, 10.44)	2.83 (1.47, 5.47)	ref	
aOR (95% CI)	**5.39** (2.63, 11.03)	2.69 (1.38, 5.23)	ref	
Small for Gestational age	15 (16.7)	33 (20.4)	127 (13.2)	0.04
OR (95% CI)	1.21 (0.66, 2.21)	1.64 (1.07, 2.51)	ref	
aOR (95% CI)	1.51 (0.81, 2.79)	1.63 (1.06, 2.52)	ref	
Composite Neonatal Morbidity	33 (36.7)	56 (34.4)	225 (23.2)	<0.01
OR (95% CI)	1.97 (1.25, 3.12)	1.68 (1.17, 2.40)	ref	
aOR (95% CI)	**2.03** (1.28, 3.23)	1.65 (1.15, 2.37)	ref	

*Adjusted for maternal race
*Composite neonatal morbidity: respiratory distress syndrome, seizures or seizure-like activity, suspected sepsis, meconium aspiration syndrome, hypoxic-ischemic encephalopathy, need for hypothermic (cooling treatment), mechanical ventilation, neonatal death, 5-minute Apgar<7 and umbilical arterial pH<7.1, NICU admission

921 | Impact of Maternal Age on Likelihood of Cesarean Delivery

Shaun R. Wesley; Sarah Crimmins
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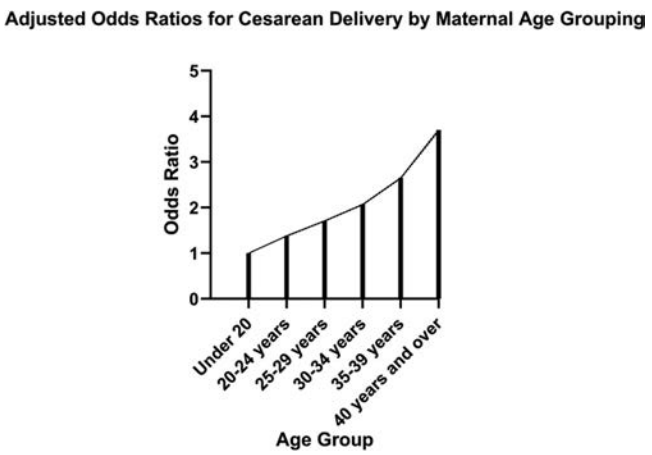
10:30 AM - 12:30 PM

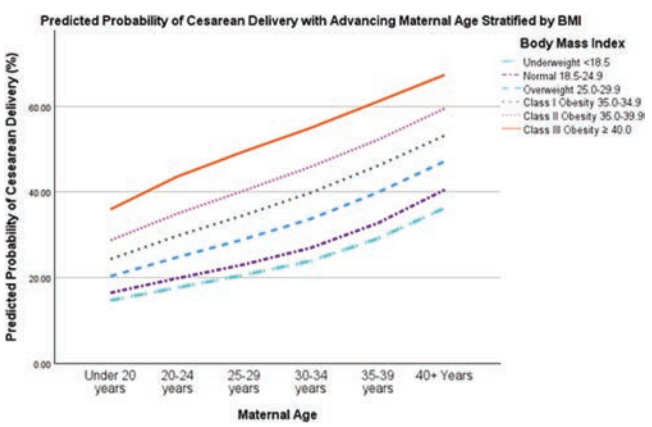
Objective: To evaluate the impact of maternal age on the likelihood of undergoing cesarean delivery (CD) while adjusting for clinical and demographic confounders, focusing on clinically meaningful odds ratios.

Study Design: This retrospective cohort study utilized the United States Vital Statistics Natality Birth Data from 2018 to 2022, comprising 18,524,899 births. Multivariable logistic regression was performed to analyze the association between maternal age and CD, adjusting for body mass index (BMI), pre-pregnancy hypertension, pre-pregnancy diabetes, previous cesarean section, parity, and chorioamnionitis. The analysis highlights odds ratios greater than 2.0 or less than 0.5, indicating clinical significance in delivery outcomes.

Results: The final analysis included 18,062,643 cases after excluding missing data. Compared to individuals under 20, cesarean delivery rates increased with age. Individuals aged 35-39 had significantly increased odds of CD (aOR: 2.65, 95% CI: 2.63, 2.66), and those aged 40 and older had even higher odds (aOR: 3.70, 95% CI: 3.67, 3.73). Previous cesarean delivery strongly predicted future CD (aOR: 35.74, 95% CI: 35.60, 35.88). Conversely, being multiparous significantly decreased odds of CD (aOR: 0.32, 95% CI: 0.32, 0.33). Notably, individuals with Class III obesity (BMI ≥ 40.0) had more than double the odds of CD with all other covariates held constant (aOR: 3.36, 95% CI: 3.33, 3.39).

Conclusion: Maternal age is a significant predictor of CD, especially for those over 35, showing a clinically significant increase in CD likelihood. Our data emphasizes factors representing meaningful clinical thresholds, aiding healthcare providers in decision-making and patient counseling. These findings enhance risk assessment strategies and inform future research on targeted interventions for higher risk populations.





922 | Association of Ultrasound Determined Hysterotomy Thickness and Intraoperative Scar Thinning/Dehiscence After Fetal Spina Bifida Closure

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10:30 AM - 12:30 PM

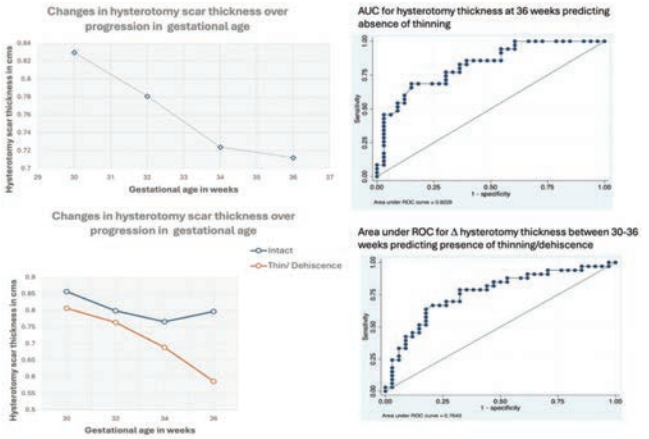
Objective: To study the association between ultrasound determined myometrial thickness and intraoperative findings of scar thinning or dehiscence at the time of cesarean delivery in patients undergoing open maternal fetal surgery (OMFS) for fetal spina bifida (fSB) closure.

Study Design: A retrospective review of all cases of OMFS for fSB closure from 2016-2022. Hysterotomy scar thickness was measured on archived images at 30 weeks, 32 weeks, 34 weeks and 36 weeks. Three measurements of myometrial thickness were taken for every timepoint in sagittal plane. The group with intact hysterotomy was compared to those with scar thinning/ dehiscence.

Results: 111 patients met the inclusion criteria. The average hysterotomy scar thickness was 0.83 ± 0.18 cm, 0.78 ±0.19 cm, 0.72 ± 0.18 cm and 0.71 ± 0.22 cm at 30, 32, 34 and 36 weeks, respectively. 54.1% patients had at least some degree of scar thinning and 6.3% patients had some degree of dehiscence including focal. Scar thickness was significantly lower at 34 weeks (p = 0.02) and 36 weeks (p< 0.0001) in patients that had thinning/dehiscence. δ scar thickness between 30 and 36 weeks was significantly more in patients with scar thinning/dehiscence (p = 0.0009). AUC was 0.63 with a p-value of 0.02 for hysterotomy thickness at 34 weeks predicting absence of thinning. AUC was 0.82 with a p-value of < 0.0001 for hysterotomy thickness at 36 weeks predicting absence of thinning. A thickness of ≥ 0.71 cm was 68.6% sensitive and 84.9% specific in predicting absence of thinning. AUC was 0.76 with a p-value of 0.0003 for ð hysterotomy thickness between 30-36 weeks predicting presence of thinning/dehiscence. A change of ≥ 0.13 cm was 69.7% sensitive and 73.5% specific in predicting presence of thinning/dehiscence.

Conclusion: In patients undergoing OMFS for fSB repair, gradual thinning of hysterotomy scar was observed with significantly less scar thickness at 34 and 36 weeks in patients diagnosed with scar thinning/ dehiscence. δ scar thickness between 30 and 36 weeks can be used to predict presence of thinning/dehiscence.

	Intact (N=51)	Thin/ Dehiscence (N=60)	P value
Maternal age, years	28 [24-33]	28 [24-31.2]	0.78
BMI, kg/m²	29.9 [28.5-32.1]	29.9 [25.2-29.9]	0.08
Multiparous, N(%)	40 (78.4)	42 (70)	
Previous CD, N(%)	3 (5.9)	4 (6.7)	
Female sex, N(%)	14 (27.5)	13 (21.7)	
Gestational age at prenatal surgery, weeks	24.1 [24.1-24.6]	24.1 [23.6-24.4]	0.15
Total operative time, mins	70 [70-75]	70 [70-77]	0.51
Gestational age at delivery, weeks	36 [34.4-37]	36.3 [35.3-37]	0.25
Anterior hysterotomy, N(%)	30 (58.8)	27 (45)	
Global membrane separation, N(%)	11 (21.6)	9 (15)	
Oligohydramnios, N(%)	3 (5.9)	5 (8.3)	0.72
Preterm labor, N(%)	15 (29.4)	20 (33.3)	0.67
Birth weight, grams	2275 [2340-2940]	2375 [2392.5-2910]	0.75
30 weeks scar thickness, cms	0.83 [0.7-0.97]	0.77 [0.66-0.93]	0.1
32 weeks scar thickness, cms	0.76 [0.64-0.93]	0.72 [0.6-0.95]	0.18
34 weeks scar thickness, cms	0.74 [0.63-0.87]	0.66 [0.6-0.78]	0.02
36 weeks scar thickness, cms	0.85 [0.65-0.89]	0.56 [0.49-0.7]	<0.0001
Δ 30-32 weeks scar thickness, cms	0.06 [-0.04-0.16]	0.06 [-0.04-0.16]	0.98
Δ 30-34 weeks scar thickness, cms	0.08 [-0.04-0.18]	0.11 [0.02-0.19]	0.65
Δ 30-36 weeks scar thickness, cms	0.02 [-0.07-0.13]	0.19 [0.1-0.28]	0.0009



924 | The Accuracy of the sFlt-1/PlGF Ratio Assay in Predicting Time-to-Delivery in Patients with Preeclampsia

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10:30 AM - 12:30 PM

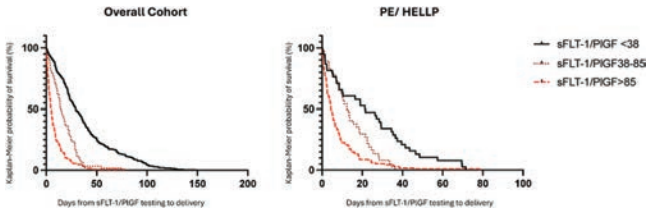
Objective: Preeclampsia (PET) is a leading cause of maternal and fetal morbidity and mortality, but the clinical course of PET is often difficult to predict. This can make management decisions such as the administration of antenatal corticosteroids (ACS) challenging, given that the optimal ACS timing is 1-7 days before birth. Abnormal levels of the angiogenic proteins soluble fms-like tyrosine kinase (sFLT-1) and placental growth factor (PlGF) have been shown to improve the diagnostic accuracy for PET. However, data on their accuracy in predicting time to delivery are limited. The objective of the current study was to evaluate the accuracy of these proteins in predicting the time-to-delivery in patients with PET.

Study Design: A retrospective cohort study of patients with a singleton pregnancy evaluated in a single center for suspected preeclampsia using the Roche Elecsys sFlt1/pPlGF Ratio Assay between 2020-2023. Modified Poisson regression was used to estimate the associations of the sFlt1/PlGF ratio with the risk of delivery within 3 and 7 days. Time-to-event analysis was used to describe the cumulative risk of delivery by the sFlt1/PlGF ratio result.

Results: Of the 509 patients who met the study criteria, 40.6% had a final diagnosis of PET. Compared with a low-risk result (≤ 38), a high-risk ratio (> 85) was associated with an increased risk of preterm birth < 32 weeks (RR 16.4 [95%-CI 6.2-42.6]) and delivery within 3 or 7 days (RR 3.5 [2.3-5.2] and 3.6 [2.6-4.9], respectively). A moderate-risk (38-85) and high-risk (> 85) ratios were associated with a shorter time-to-delivery compared to a low-risk ratio (p< .001) (Figure 1). The positive predictive value of a high-risk ratio and the negative predictive value of a low-risk ratio for delivery within 7 days were 63% and 99%, respectively.

Conclusion: The sFLT-1/PlGF ratio is a useful prognostic tool to predict the time to delivery in patients with PET, and can

therefore guide management decisions such as the administration of antenatal corticosteroids.



925 | A New Reference for Umbilical Artery Doppler in the Second and Third Trimesters

Sophia Rahimi[1]; John C. Kingdom[2]; Arietta Vayenas[3]; Vasilica Stratulat[4]; Nir Melamed[5]
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10:30 AM - 12:30 PM

Objective: Umbilical artery (UA) Doppler is a key component in the diagnosis of early-onset fetal growth restriction (FGR). However, the interpretation of UA Doppler is complicated by the considerable variability of available UA Doppler references, which can have a profound impact on the proportion of small fetuses diagnosed with FGR. Our aim was to explore the methodological factors contributing to the heterogeneity of existing references and develop a UA Doppler pulsatility index (UA-PI) reference using an approach that addresses some of the limitations of prior studies.

Study Design: This was a retrospective longitudinal study of individuals with an uncomplicated singleton pregnancy who underwent assessment of UA Doppler at a single academic center (2012-2022) where UA Doppler is measured routinely in all ultrasound exams. We explored the effect of estimated fetal weight (EFW) percentile threshold (>10th, >25th, or >50th centile), parity, and statistical modeling approach (LMS, quantile regression, and quantile sheets) on the reference values. Based on these findings, a final UA-PI chart was developed and compared to existing charts.

Results: A total of 25,069 UA-PI measurements from 12,394 patients were analyzed. The study population's EFW percentile threshold had a considerable impact on the UA-PI reference (**Figure 1**), whereas the effect of parity was minimal. LMS and quantile regression methods yielded similar UA-PI reference charts, unlike the quantile sheets method. Therefore, our final UA-PI reference was based on observations from fetuses with EFW >50th percentile using the LMS method. The differences between the new chart and previously published charts in the UA-PI 95th percentile are illustrated in **Figure 2**.

Conclusion: To our knowledge, this study is the first to explore the impact of methodological factors on a UA-PI reference chart. The newly developed chart addresses several limitations of previous studies. As such, it may reflect more accurately the distribution of UA-PI in uncomplicated singleton pregnancies and improve the accuracy of FGR diagnosis.

Figure 1.

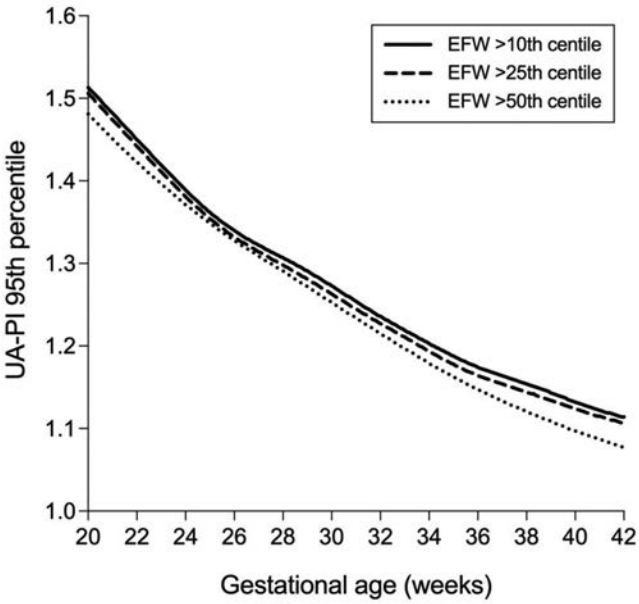
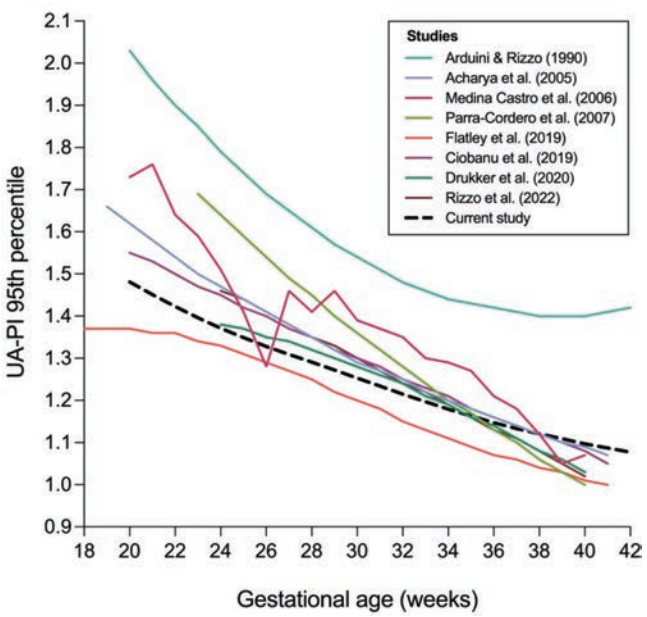


Figure 2.



926 | a Fetal Blood-Brain-Barrier Microphysiological System to Study the Effect of In-Utero Toxicant Exposure

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10:30 AM - 12:30 PM

Objective: Glutamate dysregulation resuling in neuronal damage is associated with the development of many neurological disorders. The lack of physiologically relevant in-vitro models has limited our mechanistic understanding. This study evaluated the effect of environmental pollutant Polybrominated Diphenyl Ethers (PBDE), using a microphysiologic (MPS) model of human fetal blood-brain-barrier (FB).

Study Design: The FB-OOC is composed of 3-cell culture chambers, connected by microchannels, containing 1)brain microvessel endothelial cells, 2)human vascular pericytes, and 3)a triculture of neurons, astrocytes, and microglia in a 5:2:1 ratio, respectively. To assess the effect of toxicants on glutamate dysregulation and neuroinflammation, endothelial cells were exposed to PBDE(150ng/ml). To mimic the passage of PBDE through the placenta, endothelial cells were exposed to conditioned PDBE media from a placenta-OOC (1:1). In parallel, triculture cells were directly treated in a 96-well plate. Dextran propagation over 72 hours and zonula occludens-1 expression confirmed FB barrier function. Cell morphology (microscopy), cell cytotoxicity, and cytokines were measured. Statistical significance was determined by unpaired t-tests (N = 5; p< 0.05).
Results: Control FB-OOC were characterized by 1)viable cell cultures expressing standard cell morphologies and cell-specific markers, 2)barrier formation confirmed by lack of dextran propagation over 72 hours, and 3) baseline pro-inflammatory cytokines. On-chip PBDE and placenta-derived metabolites of PBDE treatment in the endothelial chamber induced cell cytotoxicity and upregulation of glutamate in the triculture but did not induce neuroinflammation. Conversely, 2D triculture experiments showed direct PBDE treatment-induced neuroinflammation compared to PBDE placenta-derived metabolites or controls.
Conclusion: This study established a model of FB that assessed the role of glutamate dysregulation independent of neuroinflammation. Advanced MPS models are needed to evaluate the impact of various exposures at the FB, as 2D neuronal cultures cannot model intercellular interactions.

927 | Prenatal Anemia: Examining Trends and Racial Disparities Before and After Standardized Clinical Interventions

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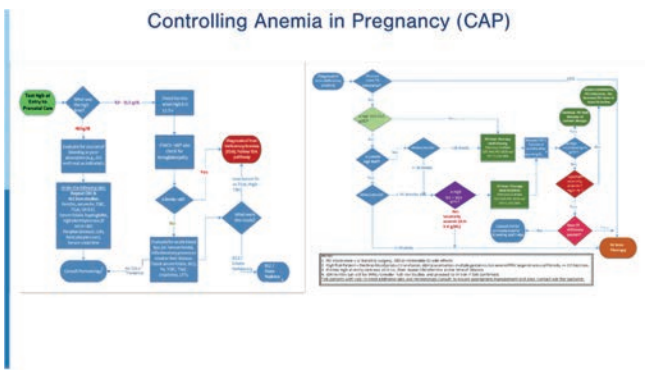
10:30 AM - 12:30 PM
Objective: Anemia is a common complication of pregnancy that disproportionately affects Black women and is linked to adverse maternal outcomes including cesarean delivery, postpartum hemorrhage, intraamniotic infections and need for blood transfusions. The Controlling Anemia in Pregnancy (CAP) project introduced a clinical algorithm that standardized diagnosis and treatment of anemia across a large healthcare institution. We sought to assess the impact of this algorithm on the incidence of prenatal anemia and identify racial disparities.
Study Design: We conducted a retrospective cohort study of adult pregnant patients with term, singleton live-born deliveries. Data was collected from two cohorts: Cohort 1 (January-December 2016) pre-CAP and Cohort 2 (January-December 2019) post-CAP implementation. Primary outcomes included incidence of both prenatal anemia overall and on admission to labor and delivery. Secondary outcomes included prenatal ferritin and IV iron orders. Outcomes were stratified by ethnicity.
Results: 68,839 patients were included in the study. The incidence of anemia was 38.7%. After the CAP project, diagnosis of anemia increased across all ethnicities 1,344 (3.8%) in 2016 vs. 4,901 (14.4%) in 2019 (P< 0.0001). The percentage of patients with anemia on admission to labor and delivery decreased 4,723 (36%) in 2016 vs. 4,398 (32.6%) in 2019 (P< 0.0001). Ferritin orders increased 2,802 (21.3%) in 2016 vs. 7,377 (54.6%) in 2019 (P< 0.0001) and IV iron infusions increased 407 (3.1%) in 2016 vs. 1,392 (10.3%) in 2019 (P< 0.0001). Black women had a 1.8 times higher incidence (IRR [95%CI]:1.8 [1.7-1.9], p< 0.001) of anemia compared to white women. Identification of anemia increased in both black and white women after implementation of the CAP project 218 (8.9%) in 2016 vs 642 (25.2%) in 2019 in black women and 295 (2.2%) in 2016 vs 1290 (10.6%) in 2019.
Conclusion: The CAP protocol effectively improved the identification and treatment of prenatal anemia, with increased ferritin orders and IV iron treatments. Despite this, Black women remain disproportionately affected by anemia.



Outcomes of Patients with Prenatal Anemia, 2016 vs 2019

	Overall N = 26,630	2016 N = 13,130	2019 N = 13,500	P-value
Hgb < 11.0 g/dL on admission to Labor and Delivery	9,121 (34.3)	4,723 (36.0)	4,398 (32.6)	<.0001
Ferritin orders during pregnancy IV	10,179 (38.2)	2,802 (21.3)	7,377 (54.6)	<.0001
Iron use during pregnancy	1,799 (6.8)	407 (3.1)	1,392 (10.3)	<.0001

928 | Association Between Gestational Weight Gain and Short-term Pregnancy Outcomes

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10:30 AM - 12:30 PM
Objective: Despite established Institute of Medicine (IOM) gestational weight gain (GWG) guidelines, there is ongoing debate as to whether these cutoffs are too liberal or strict, especially for pregnant people with obesity. We aimed to evaluate

short-term adverse pregnancy outcomes by GWG above or below IOM guidelines.

Study Design: Secondary analysis of a prospective cohort study of nulliparous, singleton pregnancies (2010-2013). Pregnancies > 20 weeks' were included while those with genetic or structural anomalies or missing outcome data were excluded. The exposure was GWG classified as below, within, or above IOM guidelines. Primary outcomes were composites of maternal and neonatal morbidity and mortality (Table), and secondary outcomes were their individual components. Those above or below recommended GWG were compared with those within IOM guidelines. Rates of outcomes by GWG category are reported. Multivariable modeling estimated the association between GWG and the selected outcomes.

Results: Of 8,997 pregnancies analyzed, 449 (32.2%) were below, 741 (30.5%) were within, and 2,205 (43.2%) were above IOM guidelines. Individuals within guidelines were more likely to have a normal pre-pregnancy body mass index. The overall prevalence of composite maternal morbidity was 38.1% and composite neonatal morbidity was 24.0%. GWG above IOM guidelines was associated with higher maternal morbidity (43.2% vs 30.5%, aOR 1.48 95% CI 1.33-1.65; Table). GWG above IOM guidelines was associated with a lower odds of neonatal morbidity (26.3% vs 27.2%, aOR 0.85, 95% CI 0.76-0.95), with preterm delivery and SGA driving this relationship. GWG below IOM guidelines was associated with higher neonatal morbidity (aOR 1.55, 95% CI 1.34-1.78; Figure).

Conclusion: While there is an association between GWG above IOM guidelines and maternal morbidity, there was an inverse relationship with neonatal morbidity. A better understanding of both short and long-term adverse pregnancy outcomes based on GWG is needed.

Table. Association between gestational weight gain (GWG) below and above compared with within Institute of Medicine (IOM) recommendations and maternal and neonatal morbidity

	Below Guidelines N=1,394	Within Guidelines N=2,425	Above Guidelines N=5,101	Below vs Within Guidelines	Above vs Within Guidelines
	N (%)			aOR* (95% CI)	
Maternal morbidity composite†	449 (32.2)	741 (30.5)	2205 (43.2)	1.00 (0.86–1.15)	1.48 (1.33–1.65)
Cesarean delivery	308 (22.1)	543 (22.4)	1596 (31.3)	0.92 (0.78–1.08)	1.36 (1.21–1.53)
Hypertensive disorder of pregnancy	133 (9.5)	205 (8.5)	843 (16.5)	1.02 (0.81–1.29)	1.80 (1.52–2.12)
Gestational diabetes	86 (6.2)	87 (3.6)	193 (3.8)	1.57 (1.15–2.14)	0.80 (0.61–1.05)
Postpartum hemorrhage (requiring transfusion)	14 (17.9)	15 (13.3)	60 (20.9)	1.44 (0.64–3.24)	2.14 (1.13–4.06)
Neonatal morbidity composite‡	526 (37.7)	661 (27.2)	1340 (26.3)	1.55 (1.34–1.78)	0.85 (0.76–0.95)
NICU (> 2 day stay)	152 (10.9)	252 (10.4)	630 (12.4)	0.83 (0.66–1.04)	1.18(1.00–1.40)
Preterm delivery (< 37 weeks)	218 (15.6)	198 (8.2)	335 (6.6)	2.00 (1.62–2.47)	0.64 (0.52– 0.77)
Neonatal death	13 (0.9)	5 (0.2)	4 (0.1)	2.72 (0.94–7.88)	0.48 (0.12–1.86)
Respiratory distress syndrome	62 (4.4)	71 (2.9)	138 (2.7)	1.09 (0.75–1.57)	0.83 (0.60–1.13)
Small for GA	390 (28.0)	386 (15.9)	531 (10.4)	1.77 (1.48–2.11)	0.59 (0.50–0.69)
Large for GA	18 (1.3)	41 (1.7)	235 (4.6)	0.73 (0.41–1.27)	2.36 (1.67–3.33)
≥ 4500g	3 (0.2)	5 (0.2)	77 (1.5)	1.02 (0.24–4.28)	6.48 (2.60–16.19)
Stillbirth	23 (1.6)	6 (0.2)	15 (0.3)	3.98 (1.58–10.06)	1.44 (0.54–3.84)

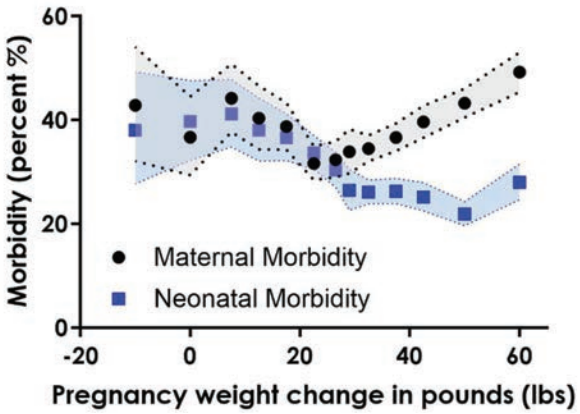
aOR. adjusted odds ratio; CI, confidence interval; NICU, neonatal intensive care unit; GA, gestational age; NICU, neonatal intensive care unit

*Adjusted for body mass index, maternal age, chronic hypertension, diabetes, active tobacco or tetrahydrocannabinol (THC) use. Neonatal outcomes adjusted further by gestational diabetes, hypertensive disorders of pregnancy, and gestational age (with exception that preterm birth was not adjusted for gestational age)

†Maternal morbidity composite included cesarean delivery, hypertensive disorders of pregnancy, gestational diabetes, postpartum hemorrhage requiring transfusion

‡Neonatal morbidity composite included NICU admission for greater than 2 days, preterm delivery, neonatal death, respiratory distress syndrome, small for gestational age or large for gestational age birth weight, and stillbirth

Figure. Rate of maternal and neonatal morbidity and mortality composites by gestational weight gain



929 | Association Between the Intensity and Type of Exercise and the Risk of Gestational Diabetes

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10:30 AM - 12:30 PM

Objective: While some studies have shown that exercise reduces the incidence of gestational diabetes mellitus (GDM), the recommended intensity of exercise has been anecdotal. Our objective was to examine the rate of (GDM) according to exercise intensity during pregnancy.

Study Design: We analyzed data from the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-Be (nuMoM2b), in which patients were enrolled prospectively starting in the first trimester, and data was obtained by trained research coordinators. Individuals with pregestational diabetes or delivery < 20 weeks were excluded. The primary exposure was the intensity of exercise performed in the first trimester categorized according to metabolic equivalent hours per week (MET-hr/week) into: none, low-intensity (< 7.5 MET-hr/week), moderate-intensity (7.5-14.9 MET-hr/week), or high intensity (≧15 MET-hr/week). Our primary outcome was GDM. We also examined a composite of adverse pregnancy outcomes, including preeclampsia, gestational hypertension, preterm birth, small-for-gestational-age birth, and stillbirth. Adjusted relative risks (aRR) with 95% confidence intervals (95% CI) were calculated using modified Poisson regression, adjusting for potential confounders.

Results: Of 9,551 individuals, 3,132 (29.7%) had no exercise, 2,531 (26.5%) had low-intensity exercise, 1,959 (20.5%) had moderate-intensity exercise, and 2,223 (23.3%) had high-intensity exercise. Demographics and socioeconomic status were different across the groups (Table 1). Compared to individuals with no exercise, those who performed high-intensity exercise had a lower risk of GDM (5.1% vs. 2.8%; aRR 0.61; 95% CI 0.45-0.82). However, other secondary outcomes remained similar (Table 2). Moderate and low-intensity exercise compared to no exercise were not associated with significant differences in GDM or other outcomes.

Conclusion: High-intensity exercise was associated with a lower risk of GDM compared to no exercise. Future intervention studies focusing on exercise to prevent GDM are warranted.

Table 1. Demographics

	No exercise	Low intensity	Moderate intensity	High intensity	P-value
N	2891	2243	1778	2488	
Age (yr)	25.4 (5.7)	26.7 (5.5)	27.9 (5.4)	28.4 (5.5)	0.13
Early pregnancy BMI (kg/m^2)	26.8 (6.5)	27.0 (6.9)	25.9 (5.6)	25.2 (5.4)	<0.001
Race					<0.001
White	1341 (46.4)	1388 (61.9)	1204 (67.7)	1762 (70.8)	
Black	556 (19.2)	319 (14.2)	174 (9.8)	228 (9.2)	
Hispanic	736 (25.5)	353 (15.7)	215 (12.1)	271 (10.9)	
Asian	115 (4.0)	75 (3.3)	93 (5.2)	98 (3.9)	
Other	143 (4.9)	108 (4.8)	92 (5.2)	129 (5.2)	
Married	1295 (44.9)	1343 (59.9)	1207 (67.9)	1809 (72.7)	<0.001
Insurance					<0.001
Government	1186 (41.5)	601 (26.9)	367 (20.8)	457 (18.4)	
Military	11 (0.4)	23 (1.0)	10 (0.6)	15 (0.6)	
Commercial	1553 (54.3)	1509 (67.6)	1319 (74.6)	1925 (77.6)	
Self	75 (2.6)	72 (3.2)	56 (3.2)	62 (2.5)	
Other	36 (1.3)	26 (1.2)	16 (0.9)	21 (0.8)	
Education					<0.001
Less than high school	352 (12.2)	165 (7.4)	100 (5.6)	123 (4.9)	
Chronic hypertension	67 (2.3)	74 (3.3)	33 (1.9)	34 (1.4)	<0.001
High perceived stress	129 (4.5)	74 (3.3)	41 (2.3)	70 (2.8)	<0.001
EPDS ≥10	602 (21.6)	419 (19.2)	255 (14.7)	316 (13.2)	<0.001
Smoking before pregnancy	618 (21.4)	387 (17.3)	269 (15.1)	368 (14.8)	<0.001

Abbreviations: BMI (body mass index); EPDS (Edinburgh Postnatal Depression Scale)
Data presented as mean (SD) or n (%) as appropriate.

Table 2. Outcomes

	No exercise	Low intensity		Moderate intensity		High intensity	
	n (%)	n (%)	adjusted RR (95%CI)	n (%)	adjusted RR (95%CI)	n (%)	adjusted RR (95%CI)
Gestational diabetes	140 (4.9)	110 (4.9)	0.97 (0.75-1.25)	75 (4.2)	0.87 (0.66-1.16)	69 (2.8)	0.61 (0.45-0.82)
Adverse pregnancy outcomes	701 (24.5)	541 (24.4)	1.01 (0.91-1.12)	356 (20.2)	0.91 (0.80-1.02)	537 (21.9)	1.01 (0.91-1.12)
Preeclampsia	283 (9.9)	198 (8.9)	0.94 (0.78-1.12)	126 (7.1)	0.81 (0.65-1.00)	189 (7.7)	0.94 (0.78-1.13)
Gestational hypertension	139 (4.9)	131 (5.9)	1.08 (0.85-1.38)	89 (5.0)	1.05 (0.80-1.37)	129 (5.2)	1.08 (0.84-1.39)
Preterm birth	276 (9.5)	202 (9.0)	0.97 (0.81-1.17)	128 (7.2)	0.88 (0.71-1.09)	180 (7.2)	0.85 (0.70-1.04)
Spontaneous preterm birth	153 (5.3)	117 (5.2)	1.04 (0.81-1.34)	86 (4.8)	1.05 (0.80-1.39)	113 (4.5)	0.96 (0.74-1.26)
Small for gestational age	138 (4.8)	98 (4.4)	1.03 (0.78-1.35)	74 (4.2)	1.02 (0.76-1.37)	108 (4.3)	1.10 (0.84-1.44)
Stillbirth	19 (0.7)	15 (0.7)	1.14 (0.52-2.50)	10 (0.6)	1.00 (0.41-2.43)	8 (0.3)	0.66 (0.25-1.71)

Adjusted RRs were controlled for maternal age, body mass index, chronic hypertension, pregestational diabetes, marital status, education, insurance, high stress, EPDS ≥10, and smoking before pregnancy.
APO was defined as preterm birth, preeclampsia, gestational hypertension, small for gestational age <5th %ile, or stillbirth.

930 | Glycemic Status and Fetal Growth in Twin Gestations

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10:30 AM - 12:30 PM

Objective: In this study, we compared fetal growth curves in twin pregnancies affected by gestational diabetes with normoglycemic twin pregnancies. We hypothesized that fetal growth curves in twin gestations affected by gestational diabetes mellitus (GDM) would be significantly different from fetal growth curves for normoglycemic twin gestations, given the well-established fetal growth acceleration which occurs in singleton pregnancies affected by GDM.

Study Design: This study is a secondary analysis of a retrospective cohort study of twin pregnancies conducted at 17 centers in the US. Our primary exposure group was GDM, and our primary outcome was estimated fetal weight (EFW) as a function of gestational age. Dichorionic twin pregnancies with data from at least one ultrasound were included in the study. Demographic data were collected and compared between the two groups. The means of EFW at each gestational week were calculated for both groups, plotted onto curves, and subsequently compared.

Results: Our results demonstrated no statistically significant difference between groups in terms of demographic characteristics. However, the comparison between fetal growth curves also revealed no significant difference between the two groups, so we were unable to reject our null hypothesis after this initial analysis of the primary outcome.

Conclusion: We aimed to evaluate the association of GDM with longitudinal fetal growth in twin pregnancies. Contrary to our hypothesis, we did not find a statistically significant difference in longitudinal fetal growth between normoglycemic twin pregnancies and twin pregnancies affected by GDM. These results are not entirely inconsistent with what has been demonstrated in prior literature; namely, that GDM likely does not affect fetal growth in twin pregnancies nearly as dramatically as it has been shown to affect fetal growth in singleton pregnancies. This may be because any accelerated growth caused by GDM in twins would be masked by the expected growth deceleration that has been demonstrated in twins in the third trimester.

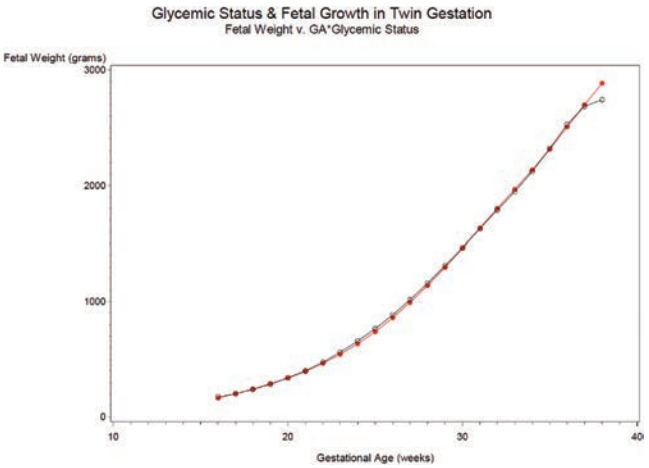

Table 1. Characteristics of the study population

Variable		Normoglycemic (n=825)	Gestational Diab Mellitus (n=119)	P-value
Maternal age (years)	Mean (SD)	35.5 (4.31)	36.4 (3.87)	0.020
	<19 years	2 (0.2%)	0 (0%)	0.215
	20-24 years	16 (2%)	0 (0%)	
	25-29 years	42 (5%)	5 (4%)	
	30-34 years	253 (31%)	29 (24%)	
	35-39 years	402 (49%)	59 (50%)	
	40-44 years	94 (11%)	22 (18%)	
	>44 years	16 (2%)	4 (3%)	
Body Mass Index	Mean (SD)	26.4 (6.03)	28.1 (6.74)	0.006
BMI	Normal	408 (49%)	48 (40%)	0.173
	Underweight	15 (2%)	1 (1%)	
	Overweight	208 (25%)	32 (27%)	
	Obese	194 (24%)	38 (32%)	
Patient race	White	579 (70%)	70 (59%)	0.004
	Black	87 (11%)	11 (9%)	
	Other	159 (19%)	38 (32%)	
Ethnicity	Non-Hispanic	718 (87%)	96 (81%)	0.201
	Hispanic	66 (8%)	15 (13%)	
	Ashkenazi Jewish	41 (5%)	8 (7%)	
Parity	Parous	346 (42%)	43 (36%)	0.224
	Nulliparous	479 (58%)	76 (64%)	
Insurance	Commercial/Private	711 (86%)	104 (87%)	0.773
	Public/Government	114 (14%)	15 (13%)	
ART	No	339 (41%)	34 (29%)	0.015
	Yes	486 (59%)	85 (71%)	
Chronic hypertension	No	777 (94%)	111 (93%)	0.674
	Yes	48 (6%)	8 (7%)	
Tobacco use*	No	793 (96%)	116 (97%)	1.000
	Yes	32 (4%)	3 (3%)	
Twin A sex	Male	445 (54%)	74 (62%)	0.109
	Female	380 (46%)	45 (38%)	
Twin B sex	Male	426 (52%)	59 (50%)	0.689
	Female	399 (48%)	60 (50%)	

*Fishers Exact p-value provided

ART, assisted reproductive technology; *BMI*, body mass index

931 | Food Desert Proximity and Gestational Weight Gain During Pregnancy

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10:30 AM - 12:30 PM

Objective: A lack of access to healthy and nutritious food has been identified as an independent risk factor for pregnancy morbidity, but there is a lack of evidence outlining the relationship between gestational weight gain (GWG) and food desert (FD) proximity. In this study, we sought to evaluate the impact of living in FDs on GWG during pregnancy.

Study Design: This single-center, retrospective study examined patients undergoing cesarean delivery (CD) at MedStar Washington Hospital Center from July 2021 to December 2022. Exclusion criteria included multifetal gestation, prenatal care outside of our hospital system, and entry into prenatal care after 14 weeks of gestation. Patients were classified as having low food access (LFA) if they lived more than 1 mile (urban) or 10 miles (rural) from the nearest supermarket. GWG was defined as inadequate, adequate, or excessive weight gain based on pre-pregnancy BMI as delineated by ACOG recommendations. Multivariate multinomial logistic regression models compared patients with LFA and GWG as the primary outcome, adjusting for insurance type, marital status, and low income area.

Results: A total of 370 patients were included in the study, of whom 73 (19.7%) lived in an LFA neighborhood. Women in the LFA category had an average weight gain of 13.4 kg as compared to 11.84 kg for those that lived in food secure neighborhoods, although this difference was not statistically significant (p = 0.105). When assessed by pre-pregnancy BMI category, we found a directional trend suggesting that living in LFA neighborhood was associated with excessive weight gain, but this result was also not statistically significant (aOR: 0.60 [0.324-1.101]).

Conclusion: Living in a LFA community showed no statistically significant correlation for excessive weight gain when compared to patient's living in communities with adequate food access. This study emphasizes the need for further exploration of alternative factors that may be impacting the discrepancy in pregnancy morbidity in these populations.

Table 5: Average Gestational Weight Gain (kgs) by Pregnancy BMI Category and Food Desert Status

	Food Desert			
	Yes (N = 73)	*No (N = 297)*	*Total (N = 370)**	*P*
<18.50 (underweight) [SD]	-	17.41 [+/- 5.11]	17.41 [+/- 5.11]	0.105
18.50-24.99 (normal weight) [SD]	16.10 [+/- 2.56]	14.11 [+/- 5.31]	14.32 [+/- 5.13]	
25-29.99 (overweight) [SD]	15.29 [+/- 8.01]	13.06 [+/- 7.27]	13.53 [+/- 7.45]	
>30 (obese) [SD]	11.68 [+/- 7.69]	8.94 [+/- 8.42]	9.65 [+/- 8.30]	
Total	13.44 [+/- 7.45]	11.84 [+/- 7.53]	12.16 [+/- 7.53]	

Table 7: Unadjusted and Adjusted Odds Ratio of Gestational Weight Gain Outcomes by Food Desert Status

	Food Desert			
	Unadjusted [CI]	*P*	*Adjusted [CI]**	*P*
Inadequate	1.97 [0.841-4.593]^	0.119	1.70 [0.719-4.023]	0.227
Adequate	**Reference**			
Excess	0.626[0.343-1.142]^^	0.127	0.60 [0.324-1.101]	0.099

932 | Association between Social Vulnerability Index and Adverse Pregnancy Outcomes

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10:30 AM - 12:30 PM

Objective: To examine the association between the social vulnerability index (SVI) and adverse pregnancy outcomes, including maternal mortality.

Study Design: This was a cross-sectional study of county-level data analysis of individuals who delivered in the United States from 2016 to 2021. The study population includes individuals aged 10-44 at the time of delivery who gave live births, stillbirths, or suffered maternal death. The SVI ranges 0-1, with 1 being the highest vulnerability. Counties were categorized based on the SVI quartile (Q1 < 25th percentile, Q2 25-49th percentile, Q3 50-74th percentile, Q4 75th or greater). Our primary outcome was maternal mortality, defined as "the death of a woman while pregnant or within 42 days of termination of pregnancy." Secondary outcomes included maternal mortality up to one year postpartum, stillbirth, and preterm birth < 37 weeks. We conducted Bayesian spatial models with Conditional Autoregressive Priors to calculate log relative risk (RR) with 95% confidence intervals (95%CI), which considered spatial autocorrelation.

Results: Of 22,667,460 births, there were 6,731 maternal mortalities, 9,702 mortalities up to one year postpartum, 275,884 stillbirths, 2,285,797 preterm births, and 7,225,076 cesarean deliveries from 3,012 counties. Maternal mortality rate (MMR) per 100,000 births and SVI categories are shown in Figure 1. As the SVI increases, incidences of maternal mortality increase (Q1 22.8; Q2 25.7; Q3 31.1; and Q4 34.5 per 100,000 births) (Table 1). Higher SVI groups had increased risks of maternal mortality (Q2 RR 1.10, 95%CI 0.99-1.22; Q3 RR 1.27, 95%CI RR 1.15-1.41; Q4 RR 1.54, 95%CI 1.39-1.72). Higher SVI groups also had increased risks of other adverse pregnancy outcomes (Table 1).

Conclusion: High SVI is associated with an increased risk of adverse pregnancy outcomes. The SVI could be used to identify counties that need policies to address health disparities.

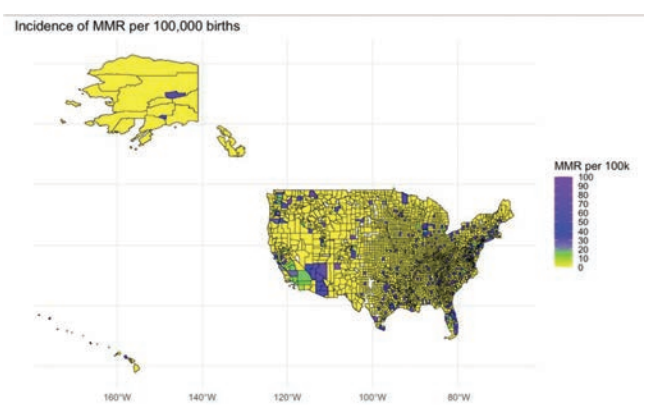

Table 1 Outcomes

		MMR		PRM		Stillbirth		PTB	
SVI	Births	n (per 100K)	RR (95%CI)	n (per 100K)	RR (95%CI)	n (per 1000)	RR (95%CI)	n (%)	RR (95%CI)
Q1	2835796	647 (22.8)	Reference	969 (34.2)	Reference	32494 (11.5)	Reference	235742 (8.3)	Reference
Q2	5689712	1463 (25.7)	1.10 (0.99; 1.22)	2153 (37.8)	1.04 (0.95; 1.13)	64821 (11.4)	1.04 (0.99; 1.09)	551823 (9.7)	1.21 (1.18; 1.24)
Q3	7633348	2376 (31.1)	1.27 (1.15; 1.41)	3356 (44.0)	1.19 (1.09; 1.30)	96466 (12.6)	1.08 (1.02; 1.14)	793057 (10.4)	1.26 (1.23; 1.29)
Q4	6508604	2245 (34.5)	1.54 (1.39; 1.72)	3224 (49.5)	1.45 (1.31; 1.59)	82103 (12.6)	1.20 (1.13; 1.28)	705175 (10.8)	1.37 (1.33; 1.41)

Abbreviations: CD (cesarean delivery); MMR (maternal mortality rate); PRM (pregnancy-related mortality); PTB (preterm birth); SVI (social vulnerability index)

933 | Association Between the Dietary Inflammatory Index and Adverse Pregnancy Outcomes

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10:30 AM - 12:30 PM

Objective: The impact of pre-conception inflammatory load has not been adequately evaluated. We sought to determine whether a pre-conception diet that promotes inflammation, as measured by the dietary inflammatory index (DII), is associated with adverse pregnancy outcomes.

Study Design: This is a secondary analysis of data from the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-Be (nuMoM2b) study, in which dietary habits were assessed for three months before conception via a food frequency questionnaire. Data was obtained through patient interviews and chart abstraction. Individuals with spontaneous abortion or missing dietary data were excluded. DII was calculated from 28 pro-and anti-inflammatory food items. Participants were classified into DII quartiles, with the highest quartile indicating the most pro-inflammatory diet. The primary outcome was a composite of adverse pregnancy outcomes including preeclampsia, preterm birth less than 37 weeks, small for gestational age less than 5th percentile, and stillbirth. Adjusted relative risks (aRR) along with the 95% confidence intervals (CI) were calculated for all outcomes, using modified Poisson regression while controlling for confounders.

Results: Of the 7,911 participants included in this analysis, 1,443 (18.2%) had an adverse pregnancy outcome. Demographics and socioeconomic factors including age, race, marital status, insurance, education, and depression varied across the groups (Table 1). Outcomes according to DII quartiles are presented in Table 2. Individuals in the highest DII quartile compared with those in the lowest quartile had an increased risk of the primary outcome (20.8% vs 17.4%, aRR: 1.17, 95% CI: 1.02-1.34) as well as stillbirth (0.9% vs. 0.3%; aRR 2.94, 95% CI: 1.04-8.32). Other secondary outcomes were not statistically significant.

Conclusion: A pro-inflammatory diet in the immediate pre-conception period is associated with a composite of adverse pregnancy outcomes. Investigation of pre-pregnancy nutritional interventions is warranted.

Table 1. Demographics and socioeconomic factors

	DII <25th percentile	DII 25-49th percentile	DII 50-74th percentile	DII 75th percentile	P-value
	n=1999	n=1998	n=1999	n=1998	
Age (yr)	28.1 (± 5.5)	28.0 (± 5.5)	27.2 (± 5.4)	25.9 (± 5.5)	0.69
Early pregnancy BMI (kg/m2)	26.1 (± 6.2)	26.1 (± 6.0)	26.0 (± 6.0)	26.7 (± 6.5)	<0.01
Race					<0.001
White	1265 (63.3)	1341 (67.1)	1272 (63.6)	1178 (59.0)	
Black	239 (12.0)	212 (10.6)	190 (9.5)	262 (13.1)	
Hispanic	330 (16.5)	285 (14.3)	348 (17.4)	357 (17.9)	
Asian	74 (3.7)	76 (3.8)	94 (4.7)	92 (4.6)	
Other	90 (4.5)	84 (4.2)	95 (4.8)	108 (5.4)	
Marital status					<0.001
Single	671 (33.6)	634 (31.7)	683 (34.2)	854 (42.8)	
Married	1297 (64.9)	1341 (67.1)	1294 (64.7)	1121 (56.2)	
Widowed/divorced/separated	29 (1.5)	23 (1.2)	22 (1.1)	21 (1.1)	
Insurance					<0.001
Government	493 (24.8)	445 (22.4)	491 (24.7)	615 (31.0)	
Military	12 (0.6)	7 (0.4)	11 (0.6)	17 (0.9)	
Commercial	1407 (70.7)	1464 (73.6)	1415 (71.1)	1278 (64.5)	
Self	65 (3.3)	51 (2.6)	55 (2.8)	50 (2.5)	
Other	13 (0.7)	21 (1.1)	17 (0.9)	21 (1.1)	
Education					<0.001
Less than high school	132 (6.6)	111 (5.6)	120 (6.0)	182 (9.1)	
High school graduation	187 (9.4)	190 (9.5)	212 (10.6)	282 (14.1)	
Some college	283 (14.2)	314 (15.7)	392 (19.6)	473 (23.7)	
Associate or technical degree	186 (9.3)	177 (8.9)	185 (9.3)	257 (12.9)	
Completed college	589 (29.5)	646 (32.3)	634 (31.7)	485 (24.3)	
Degree beyond college	621 (31.1)	560 (28.0)	456 (22.8)	319 (16.0)	
Chronic hypertension	52 (2.6)	47 (2.4)	35 (1.8)	56 (2.8)	0.15
Pregestational DM	33 (1.7)	29 (1.5)	20 (1.0)	35 (1.8)	0.21
High perceived stress	62 (3.1)	47 (2.4)	55 (2.8)	72 (3.6)	0.11
Depression	331 (16.9)	305 (15.4)	298 (15.1)	369 (18.8)	<0.01
Smoking before pregnancy	330 (16.5)	331 (16.6)	332 (16.6)	343 (17.2)	0.94

Table 2: Outcomes

Outcomes	DII <25th percentile	DII 25-49th percentile		DII 50-74th percentile		DII 75th percentile	
	n (%)	n (%)	adjusted RR (95%CI)	n (%)	adjusted RR (95%CI)	n (%)	adjusted RR (95%CI)
Adverse pregnancy outcomes	344 (17.4)	354 (17.9)	1.07 (0.93-1.23)	333 (16.9)	0.99 (0.86-1.14)	412 (20.8)	1.17 (1.02-1.34)
Preeclampsia	157 (7.9)	182 (9.2)	1.17 (0.95-1.44)	157 (7.9)	1.02 (0.82-1.27)	186 (9.4)	1.09 (0.88-1.35)
Preterm birth (overall)	160 (8.0)	151 (7.6)	1.05 (0.84-1.31)	162 (8.1)	1.09 (0.87-1.37)	188 (9.4)	1.21 (0.98-1.51)
Small for gestational age	82 (4.1)	82 (4.1)	1.02 (0.75-1.38)	78 (3.9)	0.91 (0.66-1.24)	105 (5.3)	1.23 (0.92-1.65)
Stillbirth	6 (0.3)	12 (0.6)	1.81 (0.62-5.34)	8 (0.4)	1.03 (0.30-3.57)	17 (0.9)	2.94 (1.04-8.32)
Gestational hypertension	110 (5.6)	106 (5.3)	0.87 (0.66-1.14)	99 (5.0)	0.86 (0.66-1.13)	116 (5.8)	1.02 (0.79-1.31)
Gestational diabetes	89 (4.5)	85 (4.3)	0.99 (0.74-1.31)	68 (3.4)	0.81 (0.59-1.10)	83 (4.2)	0.95 (0.71-1.28)
Cesarean delivery	546 (27.6)	554 (27.9)	1.03 (0.93-1.14)	554 (28.0)	1.07 (0.97-1.19)	521 (26.2)	1.00 (0.90-1.11)

Adverse pregnancy outcomes included preeclampsia, preterm birth less than 37 weeks, small for gestational age less than 5th percentile, and stillbirth.
Adjusted RRs were controlled for maternal age, race, BMI, chronic hypertension, pregestational diabetes, marital status, education, insurance, high stress, depression, and smoking before pregnancy

934 | Association between Stillbirth and the Social Vulnerability Index

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10:30 AM - 12:30 PM

Objective: To examine the association between stillbirth and the social vulnerability index using electronic data from a large health system.

Study Design: This was a retrospective cohort study of pregnant individuals aged 18-50 who delivered singleton fetuses at any of 6 hospitals within our healthcare system from 2015 to 2022 and were 20 weeks or greater. We excluded pregnancies with known major fetal anomalies or chromosomal abnormalities and intrapartum stillbirth. Individuals with their unavailable addresses were also excluded. Stillbirth was defined as the birth of a fetus without signs of life at 20 weeks' gestation or greater. The social vulnerability index (SVI) was obtained based on the census tract that pregnant individuals lived in. The overall SVI and the four domains of SVI (Socioeconomic status, household characteristics, racial and ethnic minority status, and housing type and transportation) were compared between stillbirths and live births. Multivariable logistic regression was used to calculate adjusted odds ratios (aOR) with 95% confidence intervals (95%CI), adjusting for confounders (1st quartile as referent).

Results: Of 61,323 pregnancies, 603 (1.0%) had stillbirths and 60720 (99.0%) had live births. The distribution of the SVI in our region is presented in Figure 1. Compared to live births, stillbirths were associated with increased odds of higher overall SVI quartiles (3rd quartile aOR 1.54, 95%CI 1.22-1.96; 4th quartile

aOR 1.45, 95%CI 1.13-1.87; Table 1). In the socioeconomic status domain, stillbirths were associated with increased odds of 3rd quartile SVI (but not 4th quartile). Household characteristics status domain SVI was not associated with increased odds of stillbirth. In the racial and ethnic minority status domain and housing type and transportation domain, stillbirth was associated with 4th quartile SVI.

Conclusion: The overall SVI and the socioeconomic status, racial and ethnic minority status, and housing type and transportation SVI domains are significantly associated with increased odds of stillbirth.

Figure 1. Social vulnerability index distribution in health system region

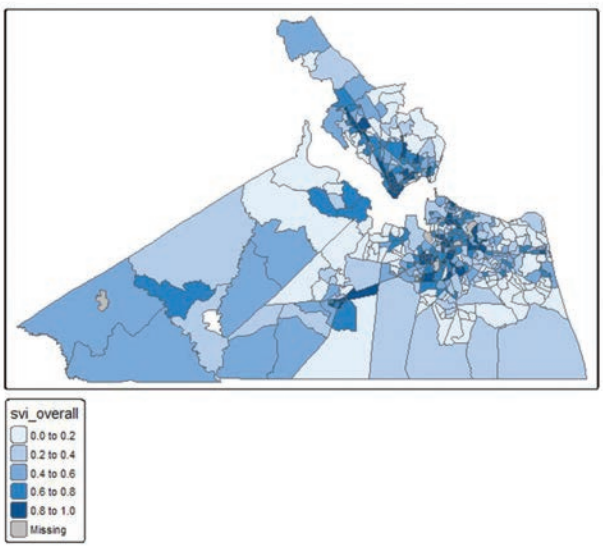

Table 2. Association between social vulnerability index and stillbirth.

	Stillbirth (n=603)	Live birth (n=60718)	aOR (95%CI)
SVI overall			
SVI Q1	127 (21.1)	17930 (29.5)	Reference
SVI Q2	136 (22.6)	15411 (25.4)	1.17 (0.92-1.50)
SVI Q3	180 (29.9)	14595 (24.0)	1.54 (1.22-1.96)
SVI Q4	160 (26.5)	12782 (21.1)	1.45 (1.13-1.87)
SVI domain 1 (socioeconomic)			
SVI theme 1 Q1	101 (16.7)	13381 (22.0)	Reference
SVI theme 1 Q2	138 (22.9)	17087 (28.1)	1.01 (0.78-1.31)
SVI theme 1 Q3	176 (29.2)	14277 (23.5)	1.44 (1.13-1.86)
SVI theme 1 Q4	188 (31.2)	15973 (26.3)	1.26 (0.98-1.64)
SVI domain 2 (household characteristics)			
SVI theme 2 Q1	151 (25.0)	15495 (25.5)	Reference
SVI theme 2 Q2	171 (28.4)	20336 (33.5)	0.83 (0.66-1.03)
SVI theme 2 Q3	162 (26.9)	14456 (23.8)	1.07 (0.85-1.34)
SVI theme 2 Q4	119 (19.7)	10431 (17.2)	1.01 (0.79-1.29)
SVI domain 3 (race and ethnic minority status)			
SVI theme 3 Q1	26 (4.3)	3787 (6.2)	Reference
SVI theme 3 Q2	83 (13.8)	12238 (20.2)	0.96 (0.63-1.53)
SVI theme 3 Q3	283 (46.9)	28258 (46.5)	1.34 (0.91-2.06)
SVI theme 3 Q4	211 (35.0)	16435 (27.1)	1.52 (1.02-2.37)
SVI domain 4 (housing type and transportation)			
SVI theme 4 Q1	199 (33.0)	24474 (40.3)	Reference
SVI theme 4 Q2	145 (24.0)	14622 (24.1)	1.14 (0.92-1.42)
SVI theme 4 Q3	137 (22.7)	12307 (20.3)	1.24 (0.99-1.55)
SVI theme 4 Q4	122 (20.2)	9315 (15.3)	1.47 (1.08-1.73)

Abbreviations: CI (confidence interval); OR (odds ratio); SVI (social vulnerability index); Q (quarter).

Data presented as n (%) unless otherwise indicated.

aORs were adjusted for maternal age and marital status.

935 | Ethnic/Racial Differences in Pregnancy Outcomes for Patients Requiring Antepartum Antihypertensive Maintenance for Non-severe Hypertension

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10:30 AM - 12:30 PM

Objective: This study aimed to determine differences in pregnancy outcomes and hypertension control for pregnant patients requiring antepartum antihypertensive maintenance across race/ethnicity groups.

Study Design: Patients who received prenatal care at an academic institution with a non-severe hypertensive disorder (chronic, gestational, preeclampsia) requiring oral antihypertensive maintenance medications were included. Medications had to be initiated prior to 34 weeks for a minimum of 2 weeks. Pregnancies with fetal anomalies and multiples were excluded. Patients were stratified by self-identified race/ethnicity. Hypertension outcomes included dosage changes and adherence, escalation in hypertension diagnosis (i.e. chronic to preeclampsia), and acute management of severe hypertension intrapartum. Pregnancy outcomes included mode of delivery, composite peripartum complications, GA at delivery, and BW. Statistics done with significance level of $p < 0.05$.

Results: 121 patients met inclusion criteria: 86 (71.1%) White, 16 (13.1%) Black, 6 (5.0%) Asian, and 10 (8.3%) Hispanic. Non-White patients experienced higher rates of antenatal dosage changes (80% v 55%, p = 0.046), escalation in hypertensive diagnosis (64% v 38%, p = 0.02), and need for acute antihypertensives intrapartum (42% v 21%, p = 0.02) compared to White patients (Table 1). Black patients had higher rates of medically-indicated preterm delivery (69% v 36%, p = 0.01), peripartum complications (31% vs 11%, p = 0.04), and medication non-adherence (33% v 8%, p = 0.01) compared to non-Black patients (Table 2). Asian patients had higher initial diastolic pressures upon delivery (99.5±26.1 v 85.8±13.9, p = 0.03) compared to non-Asian patients. Hispanic patients were less likely to have cesarean delivery (30% v 64.9%, p = 0.04) compared to all others.

Conclusion: Non-White patients have a higher risk for inadequate blood pressure control, requiring more antihypertensive medication, along with greater difficulty with medication adherence. To optimize maternal outcomes equally across all racial/ethnic groups, understanding specific risks and needs remain paramount.

Table 1: Pregnancy Outcomes Across White and Non-White Patients

	White (n=86)	Non-white (n=35)	p
Antihypertensive Maintenance Regimen			
Labetalol	48 (61)	20 (64)	0.72
Nifedipine	8 (10)	3 (10)	1.00
Other	11 (14)	3 (10)	0.80
Multiple	12 (15)	5 (16)	1.00
Hypertensive diagnosis at time of medication initiation			
Chronic hypertension	69 (80)	29 (83)	0.80
Gestational hypertension	11 (13)	4 (11)	1.00
Preeclampsia with severe features	8 (9)	4 (11)	0.74
Preeclampsia without severe features	6 (7)	2 (6)	1.00
Escalation in hypertensive diagnosis	29 (38)	21 (64)	**0.02**
Medication dosage changes	31 (55)	20 (80)	**0.046**
Acute management of severe hypertension intrapartum	18 (21)	15 (43)	**0.02**
Birthweight (g)	2924.2± 802.9	252.2 ± 901.2	**0.02**

*Data represented as n(%) or mean(SD)

Table 2: Pregnancy Outcome Differences Between Black and Non-Black Patients

	Black (n=16)	Non-Black (n=105)	p
Multiple Antihypertensive Medications	3 (19)	14 (13)	0.93
Medically indicated preterm delivery (<37 weeks)	11 (69)	37 (36)	**0.02**
Gestational age at delivery (weeks)	34.3 ± 4.2	36.6 ± 2.78	**0.049**
Medication non-adherence	5 (33)	7 (8)	**0.01**
Escalation in hypertensive diagnosis	10 (67)	40 (42)	0.10
Composite peripartum complications	5 (31)	11 (11)	**0.04**
Birthweight (g)	2230.8 ± 915.8	2896.4 ± 806.5	**0.003**

*Data represented as n(%) or mean(SD)

936 | The Impact of Inter-Pregnancy-Interval After Delivery of SGA Fetus on Recurrence Rate - Multicenter Study

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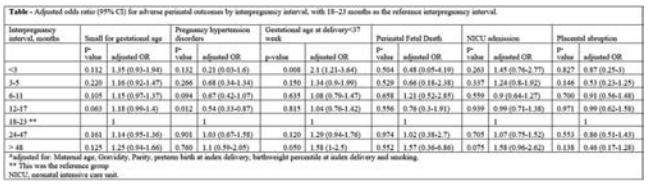
10:30 AM - 12:30 PM

Objective: To evaluate the association between IPI after delivering an SGA infant and the recurrence of this condition in the subsequent pregnancy. This study aims to identify high-risk populations for recurrence and provide counseling on the recommended waiting period before the next pregnancy.

Study Design: **Methods**: A multi-center retrospective cohort study. The study population included all women who delivered a live SGA infant between 24-42 weeks of gestation and subsequently conceived and delivered in all university-affiliated obstetrical centers in a single geographic area between 2003 and 2021. The study population was divided into several IPI groups, with an IPI of 18 to 23 months serving as the reference group. The primary outcome measured was the recurrence rate of SGA in the subsequent pregnancy.

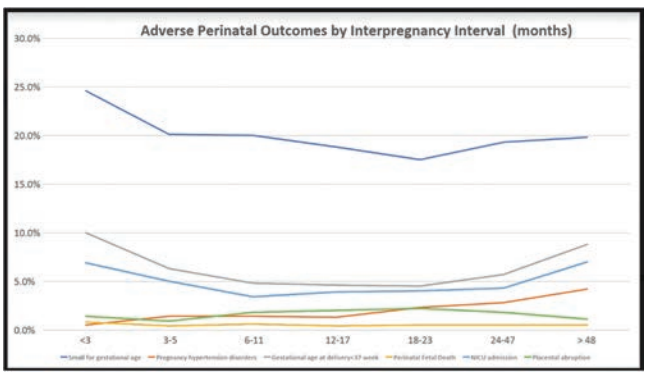
Results: During the study period, 12,689 women who delivered an SGA infant and subsequently delivered again were identified. The control group (IPI between 18-23 months) included 1,765 women. The overall recurrence rate of SGA in the study population was 19.3%. Univariate analysis showed that an IPI of less than 3 months and an IPI between 6 to 11 months were associated with higher rates of SGA recurrence (24.6% vs. 17.5%, p< 0.01 and 20% vs. 17.5%, p = 0.03, respectively). However, multivariate analysis controlling for confounders such as maternal age, gravidity, parity, birthweight percentile at first delivery, and smoking showed no significant association between different IPI groups and SGA recurrence compared to the control group.

Conclusion: Approximately one-fifth of women with a previous SGA child will experience a recurrence. No significant association was found between IPI and SGA recurrence. Further studies are needed to identify factors that can prevent SGA recurrence.



Interpregnancy interval, months	Small for gestational age		Pregnancy hypertension disorders		Gestational age at delivery<37 week		Perinatal Fetal Death		NICU admission		Placental abruption	
	p-value	adjusted OR	p-value	adjusted OR	p-value	adjusted OR	p-value	adjusted OR	p-value	adjusted OR	p-value	adjusted OR
<3	0.112	1.35 (0.93-1.94)	0.132	0.21 (0.03-1.6)	0.008	2.1 (1.21-3.64)	0.504	0.48 (0.05-4.19)	0.263	1.45 (0.76-2.77)	0.827	0.87 (0.25-3)
3-5	0.220	1.16 (0.92-1.47)	0.266	0.68 (0.34-1.34)	0.150	1.34 (0.9-1.99)	0.529	0.66 (0.18-2.38)	0.337	1.24 (0.8-1.92)	0.146	0.53 (0.23-1.25)
6-11	0.105	1.15 (0.97-1.37)	0.094	0.67 (0.42-1.07)	0.635	1.08 (0.79-1.47)	0.658	1.21 (0.52-2.85)	0.559	0.9 (0.64-1.27)	0.700	0.91 (0.56-1.48)
12-17	0.063	1.18 (0.99-1.4)	0.012	0.54 (0.33-0.87)	0.815	1.04 (0.76-1.42)	0.556	0.76 (0.3-1.91)	0.939	0.99 (0.71-1.38)	0.971	0.99 (0.62-1.58)
18-23 **		1		1		1		1		1		1
24-47	0.161	1.14 (0.95-1.36)	0.901	1.03 (0.67-1.58)	0.120	1.29 (0.94-1.76)	0.974	1.02 (0.38-2.7)	0.705	1.07 (0.75-1.52)	0.553	0.86 (0.51-1.43)
> 48	0.125	1.25 (0.94-1.66)	0.780	1.1 (0.59-2.05)	0.050	1.58 (1-2.5)	0.552	1.57 (0.36-6.86)	0.075	1.58 (0.96-2.62)	0.118	0.46 (0.17-1.28)

*adjusted for: Maternal age, Gravidity, Parity, preterm birth at index delivery, birthweight percentile at index delivery and smoking.
** This was the reference group
NICU, neonatal intensive care unit.



937 | Clinical Outcomes and Placental Findings in Pregnant Women with Covid-19 Wild-Type, Delta, and Omicron Waves

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10:30 AM - 12:30 PM

Objective: To compare placental histologic findings to perinatal outcomes from pregnant patients with COVID-19 based on predominant SARS-CoV-2 variant at time of infection.

Study Design: Retrospective cohort study of pregnant patients between March 1, 2020 to February 28, 2023 with confirmed PCR-positive COVID-19 in singleton pregnancy > 6 weeks and available placental pathology. Exclusion criteria: patients with preexisting risk factors for abnormal placentation. Exposures: COVID-19 wild-type, Delta and Omicron strains. Primary outcomes: placental findings [maternal vascular malperfusion (MVM), fetal vascular malperfusion (FVM), and infectious/inflammatory findings], development of hypertensive disorders of pregnancy (HDP), and spontaneous or indicated preterm birth. Placental findings were categorized by strain, infection severity, trimester. Delivery timing was categorized by placental findings. Univariate techniques were utilized.

Results: 708 out of 1536 patients met inclusion criteria. COVID symptoms and placental findings were similar across strains (Table 1). The three cases of severe placental findings were

seen in patients with Omicron that were asymptomatic or had mild symptoms. Four patients with severe/critical symptoms had non severe placental findings. HDP after COVID infection was similar across all strains (Table 1). The proportion of patients with placental findings was similar across all trimesters (Table 2). MVM was more common in full-term deliveries, likely explained by the common finding of villous infarction < 5%. Placental inflammatory/infectious findings were significantly associated with spontaneous preterm birth (45.9% vs. 24.5% full-term, 20.0% indicated preterm; p = 0.01).

Conclusion: Our data does not suggest a difference in placental findings based on COVID strain, infection severity, or trimester. Placental inflammatory/ infectious findings were most common in patients who experienced spontaneous preterm birth.

Table 1. Patient Demographics and Outcomes by COVID strain

	Wild-type strain (n=205)	Delta Strain (n=104)	Omicron Strain (n=399)	p-value
Age at delivery *mean (standard deviation)*	29.0 (5.4)	29.7 (5.7)	29.2 (5.3)	0.612[a]
Race *n(%)*				0.102[b]
White	109 (53.2)	65 (62.5)	211 (52.9)	
Black	6 (2.9)	9 (8.7)	32 (8.0)	
Ethnicity *n(%)*				0.159[c]
Hispanic or Latino	93 (45.4)	32 (30.8)	163 (40.9)	
Pre-pregnancy BMI *n(%)* (n=673)				0.046[b]
Obesity (30-39.9)	64 (33.7)	24 (24.0)	128 (33.4)	
Morbid obesity (40+)	20 (10.5)	14 (14.0)	24 (6.3)	
Gestational age at delivery *median (IQR)*	39.1 (38.3, 39.6)	39.1 (38.6, 39.9)	39.1 (38.4, 39.9)	0.539[d]
COVID vaccination prior to diagnosis *n(%)*	8 (3.9)	25 (24.0)	215 (53.9)	<0.001[b]
Trimester of COVID diagnosis *n(%)*				0.083[b]
1st Trimester	43 (21.0)	18 (17.3)	72 (18.0)	
2nd Trimester	96 (46.8)	44 (42.3)	151 (37.8)	
3rd Trimester	66 (32.2)	42 (40.4)	176 (44.1)	
ICU admission for COVID *n(%)*	0 (0.0)	0 (0.0)	1 (0.3)	1.000[c]
COVID symptoms *n(%)*	186 (90.7)	97 (93.3)	346 (86.7)	0.100[b]
Critical COVID symptoms *n(%)*	0 (0.0)	2 (1.9)	1 (0.3)	0.082[c]
Severe COVID symptoms *n(%)*	4 (2.0)	2 (1.9)	2 (0.5)	0.145[c]
Moderate COVID symptoms *n(%)*	17 (8.3)	11 (10.6)	23 (5.8)	0.185[b]
Mild COVID symptoms *n(%)*	186 (90.7)	97 (93.3)	345 (86.5)	0.082[b]
Maternal vascular malperfusion *n(%)* (n=494)	136 (66.3)	77 (74.0)	281 (70.4)	0.346[b]
Fetal vascular malperfusion *n(%)* (n=98)	24 (11.7)	19 (18.3)	55 (13.8)	0.287[b]
Placental inflammatory or infectious findings *n(%)* (n=180)	54 (26.3)	32 (30.8)	94 (23.6)	0.303[b]
Severe placental findings[e] *n(%)* (n=414)	0 (0.0)	0 (0.0)	3 (1.3)	0.738[c]
Gestational hypertension after COVID diagnosis *n(%)*	24 (11.7)	15 (14.4)	54 (13.5)	0.751[b]
Preeclampsia in current pregnancy after COVID diagnosis *n(%)*	23 (11.2)	9 (8.7)	39 (9.8)	0.753[b]

Maternal vascular malperfusion: Trophoblast necrosis, chronic intervillositis, perivillous fibrin deposition, intervillous thrombi, villous necrosis, villous infarction, accelerated villous maturation, distal villous hypoplasia
Fetal vascular malperfusion: Chorioangiosis, thrombosis of fetal arteries, avascular villi, delayed villous maturation
Placental inflammatory or infectious findings: Acute villitis, acute intervillositis, chorioamnionitis, funisitis, deciduitis

a. One-way ANOVA
b. Chi-square test of independence
c. Fisher's exact test
d. Kruskal-Wallis H test
e. Defined as >25% of the parenchyma with histologic findings and/or global findings

Table 2. Trimester of Covid Infection, Delivery Status and Placental Findings

	First Trimester (n=133)	Second Trimester (n=291)	Third Trimester (n=284)	p-value
Maternal vascular malperfusion *n(%)*	85 (63.9)	214 (73.5)	195 (68.7)	0.117[a]
Fetal vascular malperfusion *n(%)*	18 (13.5)	40 (13.7)	40 (14.1)	0.987[a]
Placental inflammatory or infectious findings *n(%)*	34 (25.6)	73 (25.1)	73 (25.7)	0.985[a]
	Full-term (n=641)	**Indicated Preterm (n=30)**	**Spontaneous Preterm (n=37)**	**p-value**
Maternal vascular malperfusion *n(%)*	458 (71.5)	18 (60.0)	18 (48.6)	0.007[a]
Fetal vascular malperfusion *n(%)*	91 (14.2)	4 (13.3)	3 (8.1)	0.579[a]
Placental inflammatory or infectious findings *n(%)*	157 (24.5)	6 (20.0)	17 (45.9)	0.011[a]

a. Chi square test of independence

938 | Perinatal Outcomes Following Implementation of a Remote Patient Monitoring Program for Hypertensive Disorders in Pregnancy

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10:30 AM - 12:30 PM

Objective: Telehealth and remote patient monitoring programs (RPM) are used increasingly in obstetrics to improve care and decrease hospital admissions. Our goal was to evaluate the impact on perinatal outcomes of an RPM for management of antepartum hypertensive disorders of pregnancy (HDP).

Study Design: Retrospective cohort study of singleton gestations with HDP < 37 weeks expectantly managed before and after implementation of an RPM for HDP (controls 6/2020-5/2022, RPM 6/2022-4/2024). Patients were excluded if they had severe features or an indication for immediate delivery. RPM management was outpatient and included remote vital signs, nurse phone visits, and fetal surveillance. Control group management was both inpatient and outpatient at the discretion of the obstetrician. Primary outcome was gestational age (GA) at delivery. Secondary outcomes were readmission rates and select perinatal outcomes.

Results: 162 patients were identified: 66 RPM and 96 controls (Table 1). Median GA at enrollment and duration in RPM was 32.9 wks (IQR 29.9-34.6) and 20.0 days (IQR 9-31), respectively. RPM patients were more likely to have underlying chronic hypertension (cHTN); demographics were otherwise similar. Controls were more likely to deliver during the index hospitalization and develop severe features; RPM were more likely to be readmitted. RPM participants had a longer latency period between HDP diagnosis and delivery (27.5 vs 14.0 days, p = 0.0036), delivered at a later GA (35.9 vs 35.4 wks, p = 0.0051), and were more likely to have a planned delivery at 37 wks (31.8% vs 0%, p< 0.0001). NICU admission rate was higher in the control group (78.1% vs 57.6%, p = 0.0051), primarily due to prematurity. After adjusting for cHTN, preeclampsia history and BMI, RPM was associated with pregnancy prolongation of 0.949 wks (95% CI 0.188, 1.710), an 83% reduction in development of severe features [AOR 0.169 (95% CI 0.073, 0.391), p< 0.0001] and a 60% reduction in NICU admission [AOR 0.398 (95% CI 0.191, 0.833), p = 0.0144).

Conclusion: Use of RPM for outpatient management of preterm HDP is safe and may improve select perinatal outcomes.

Table 1. Maternal Demographics and Hypertensive Disorders of Pregnancy (HDP) Characteristics (n=162)

	Control (n=96)	AP CARES (n=66)	p-value
Age at Diagnosis, years *mean±sd*	30.0±5.7	31.3±5.7	0.1650[a]
Race *n(%) (n=157)*			0.7039[b]
White	65 (69.2)	43 (68.3)	
Black	7 (7.5)	7 (11.1)	
Other	22 (23.4)	13 (20.6)	
Ethnicity *n(%) (n=160)*			0.0671[c]
Hispanic or Latino	33 (34.7)	13 (20.0)	
Nulliparous *n(%) (n=161)*	40 (41.7)	25 (38.5)	0.6842[b]
Pregestational BMI, kg/m² *median(IQR) (n=151)*	34.0±9.2	34.1±8.6	0.9388[a]
Chronic Hypertension *n(%)*	25 (26.0)	30 (45.5)	0.0104[b]
Prior Antihypertensives *n(%) (n=54)*	12 (50.0)	20 (66.7)	0.2155[b]
Low Dose Aspirin *n(%) (n=161)*	56 (59.0)	36 (54.5)	0.5788[b]
History of Preeclampsia or Gestational HTN *n(%)*	34 (35.4)	24 (36.9)	0.7269[b]
History of Fetal Demise *n(%)*	4 (4.2)	3 (4.6)	0.9211[c]
Location when Diagnosed *n(%)*			<0.0001[b]
Triage	34 (35.4)	6 (9.1)	
Hospital	40 (41.7)	51 (77.3)	
Office	22 (22.9)	9 (13.6)	
GA at HDP Diagnosis, weeks *median(IQR)*	32.1 (29.0-34.4)	32.1 (29.3-34.0)	0.4113[d]
Diagnosis at Admission for HDP *n(%)*			
Gestational Hypertension	42 (43.8)	17 (25.8)	0.0194[b]
Preeclampsia	27 (28.1)	18 (27.3)	0.9053[b]
Chronic Hypertension	13 (13.5)	10 (15.2)	0.7730[b]
Chronic Hypertension w/ Superimposed Preeclampsia	13 (13.5)	20 (30.3)	0.0092[b]
Index Triage Visit Post-Diagnosis *n(%)*	35/88 (39.7)	31/65 (47.6)	0.5442[b]
Index Inpatient Readmission Post-Diagnosis *n(%)*	15/88 (17.0)	21/65 (32.3)	0.0278[b]

Abbreviations: SD=standard deviation. IQR=interquartile range. BMI=body mass index. HTN=hypertension. N/A=not applicable. GA=gestational age. HTN=hypertension.

a. *P-value generated using the Independent samples t-test*
b. *P-value generated using the Chi square test of independence*
c. *P-value generated using the Fisher's exact test*
d. P-value generated using the Mann-Whitney U test.

Table 2. Delivery Information, Maternal and Neonatal Outcomes (n=162)

	Control (n=96)	AP CARES (n=66)	P-value
Corticosteroids Administered *n(%) (n=161)*	81 (84.4)	57 (87.7)	0.0003[a]
Days Between HDP Diagnosis and Delivery *median(IQR)*	14.0 (7.5-29.0)	27.5 (10.0-44.0)	0.0036[b]
Gestational Age at Delivery *median(IQR)*	35.4 (33.5-36.1)	35.9 (34.1-37.3)	0.0051[b]
Indication for Delivery *n(%)*			
Severe Features	83 (86.5)	34 (51.5)	<0.0001[a]
Fetal Growth Restriction	6 (6.3)	5 (7.6)	0.7594[c]
Abnormal Fetal Testing	3 (3.1)	2 (3.0)	1.0000[c]
37w Planned Delivery	0	21 (31.8)	<0.0001[a]
Spontaneous Preterm Labor	6 (6.3)	3 (4.6)	0.7392[c]
HDP Same at Delivery *n(%) (n=155)*	37 (39.0)	46 (76.7)	<0.0001[a]
Mode of Delivery *n(%)*			0.7724[a]
Cesarean	56 (58.3)	40 (60.6)	
Maternal ICU Admission *n(%)*	1 (1.0)	2 (3.0)	0.5673[c]
Indication for ICU Admission *n(%)*			--
Severe HTN	1 (1.0)	1 (1.5)	
Eclampsia	0	1 (1.5)	
Total ICU Days *median(IQR)*	1.0 (1.0-1.0)	0.5 (0-1.0)	1.0000[b]
LOS from Delivery to Discharge *median(IQR)*	3.0 (2.0-3.0)	3.0 (2.0-4.0)	0.2973[b]
LOS from Admission to Discharge *median(IQR)*	4.5 (3.0-7.0)	4.0 (3.0-5.0)	0.1868[b]
Neonatal Birthweight, grams *mean±sd (n=161)*	2363.5±736.6	2541.9±745.9	0.1356[d]
Fetal Growth Restriction *n(%) (n=160)*	13 (13.5)	9 (14.1)	0.9253[a]
APGAR-5 *median(IQR)*	9.0 (8.0-9.0)	9.0 (8.0-9.0)	0.9938[b]
Cord pH *mean±sd (n=159)*	7.2±0.08	7.2±0.08	0.1122[d]
NICU adm *n(%)*	75 (78.1)	38 (57.6)	0.0051[a]
NICU LOS *median(IQR) (n=113)*	13.0 (3.0-32.0)	13.0 (2.0-35.0)	0.5430[b]
Neonate LOS *median(IQR)*	8.0 (3.0-23.5)	4.0 (2.0-17.0)	0.0766[b]
Neonatal Mortality within 28 days *n(%) (n=161)*	1 (1.0)	0	--

Abbreviations: IQR=interquartile range. GA=gestational age. LOS=length of stay. RUQ= right upper quadrant. FGR=fetal growth restriction. Adm=admission. NICU=neonatal intensive care unit.
a. P-value generated using the chi-square test of independence.
b. P-value generated using the Mann-Whitney U test.
c. P-value generated using Fisher's exact test.
d. P-value generated using the Independent samples t-test.

939 | Randomized Trial of Postpartum Aspirin and Impact on Nt-Probnp as a Marker of Maternal Health

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10:30 AM - 12:30 PM

Objective: To compare levels of NT-proBNP, a marker of cardiac dysfunction, and clinical outcomes in patients at risk of preeclampsia randomized to continuation of low-dose aspirin (LDA) or placebo for 6 weeks postpartum.

Study Design: This double-blinded randomized-controlled trial included patients at risk of preeclampsia randomized in a 1:1 fashion to LDA (81 mg) versus an identical-appearing placebo continued for 6 weeks postpartum (Table 1). The primary outcome was NT-proBNP levels at the postpartum visit. A sample size of 90 was required to detect a clinically significant difference in NT-proBNP between LDA and placebo with 80% power. A sample size of 110 subjects was planned due to anticipated loss to follow-up in the postpartum period. Pre-specified secondary outcomes were postpartum preeclampsia, eclampsia, hospital readmission, initiation or titration of blood pressure medications, and blood transfusion. The primary outcome was compared using the Wilcoxon rank sum test. Secondary outcomes are reported as counts (%) and were compared using Fisher's exact test after adjusting for multiple testing using Bonferroni correction.

Results: From July 2023 to March 2024, 110 participants were randomly assigned to LDA (n = 55) or placebo (n = 55). Baseline demographics were similar between groups (Table 1). There was no difference in the primary outcome of NT-proBNP levels between groups (median (IQR), 36.5 ng/mL (36.0, 61.0) vs. 39.5 ng/mL (36.0, 74.0), p = 0.49). Rates of postpartum preeclampsia in patients randomized to LDA vs. placebo (5.6% vs. 12.7%) were numerically but not statistically significantly lower, with similar rates of hospital readmission and bleeding complications (Table 2). There were no cases of postpartum eclampsia or blood transfusion. Adherence was higher in the LDA (75% vs. 69%) than the placebo group.

Conclusion: Continuation of LDA after delivery was not associated with decreased NT-proBNP levels compared to placebo. Additional studies powered to detect differences in maternal outcomes are needed to evaluate the role of LDA in the postpartum period.

Table 1: Baseline demographics

	Low-dose aspirin (n=55)	Placebo (n=55)
Maternal age (years)	31.8 (5.4)	32.2 (5.9)
Gestational age at delivery (weeks)	37.9 (1.0)	38.5 (1.1)
Nulliparity	9 (16.4)	10 (18.2)
BMI at delivery (kg/m^2)	40.2 (8.7)	39.5 (9.8)
Highest level of education		
Less than high school	6 (10.9)	2 (3.6)
Completed high school	23 (41.8)	20 (36.4)
College graduate	14 (25.5)	16 (29.1)
Advanced degree	9 (16.4)	15 (27.3)
Unknown	3 (5.5)	2 (3.6)
Insurance information		
Medicaid	26 (47.3)	20 (36.4)
Individual health insurance or group health insurance	27 (49.1)	33 (60.0)
VA/Military	0 (0.0)	2 (3.6)
Uninsured	2 (3.6)	0 (0.0)
Ethnicity		
Non-Hispanic/Non-Latina	45 (81.8)	51 (92.7)
Hispanic/Latina	10 (18.2)	4 (7.3)
Maternal race		
Asian	0 (0.0)	4 (7.3)
Black or African American	21 (39.6)	24 (43.6)
White	31 (58.5)	26 (47.3)
Unknown	3 (5.5)	1 (1.8)
Pregestational diabetes	10 (18.2)	7 (12.7)
Gestational diabetes	12 (21.8)	9 (16.4)
Chronic hypertension	40 (72.7)	39 (70.9)
Gestational hypertension	12 (21.8)	16 (29.1)
Asthma	8 (14.5)	7 (12.7)
Heart disease	4 (7.3)	6 (10.9)
Renal disease	0 (0.0)	0 (0.0)
Liver disease	1 (1.8)	2 (3.6)
Thyroid disease	11 (20.0)	3 (5.5)
Alcohol use	0 (0.0)	1 (1.8)
Tobacco use	4 (7.3)	1 (1.8)
Illicit drug use	0 (0.0)	0 (0.0)
Type of delivery		
Vaginal delivery	19 (34.5)	32 (58.2)
Cesarean delivery	36 (65.5)	23 (41.8)

Data represent n (%) or mean (standard deviation)

Table 2: Primary and secondary outcomes

	Low-dose aspirin (n=55)	Placebo (n=55)	Total (n=110)	p value
NT-proBNP level (pg/mL)	36.5 (36.0, 61.0) n=44	39.5 (36.0, 74.0) n=50	38.9 (36.0, 70.0)	0.49
Postpartum preeclampsia	3 (5.6)	7 (12.7)	10 (9.2)	0.32
Postpartum eclampsia	0 (0.0)	0 (0.0)	0 (0.0)	--
Hospital readmission rates for blood pressure monitoring or cardiovascular indications	3 (5.5)	3 (5.5)	6 (5.5)	>0.99
Initiation or increase in blood pressure medication	3 (5.5)	4 (7.3)	7 (6.4)	>0.99
Hospital readmission rates for bleeding-related complications	0 (0.0)	1 (1.8)	1 (0.9)	>0.99
Blood transfusion	0 (0.0)	0 (0.0)	0 (0.0)	--
Adherence (% of pills taken)	75.0 (54.8, 88.1)	69.0 (35.7, 88.1)	72.6 (50.0, 88.1)	--

Data represent n (%) or median (IQR)

940 | Concordance of Clinical GBS Status with Bacterial Culture Obtained at Delivery Admission

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10:30 AM - 12:30 PM

Objective: To evaluate the vaginal microbiome at term and compare routine prenatal GBS screening with culture data obtained through specimen collection at delivery hospital admission.

Study Design: This prospective cohort study, funded by an institutional Human Health and Wellness grant, enrolled 50 term-pregnant patients to assess the vaginal microbiome through culture and 16S full-length sequencing approaches at delivery admission. Following consent, a sterile speculum examination was performed for vaginal swab and lavage. Records were reviewed for demographics, clinical GBS status, and obstetric outcomes.

Results: Clinical GBS status was ascertained from routine antenatal care records, and bacterial culture data were obtained from vaginal swab at the time of delivery admission for 39 participants. Of these, 9/38 (24%) were GBS-positive and 19/38 (50%) were GBS-negative by both sampling methods, giving concordant results in 28/38 patients (74%). Four (11%) participants had negative routine GBS screening but were GBS-positive by culture at admission, three (8%) had positive GBS clinical screens without GBS detected by culture at admission, and three (8%) were missing either data point (Figure 1). One participant with GBS bacteriuria followed by negative routine GBS screen was GBS-positive by culture on admission. Twenty-eight (74%) patients were colonized with opportunistic pathogens including *S. agalactiae, E. faecalis, E. faecium, S. aureus, S. epidermidis* and *E. coli*.

Conclusion: While ~75% of clinical GBS status and admission cultures agreed, 14% likely received unnecessary antibiotics during labor. More importantly, 11% of participants did not receive antibiotic prophylaxis due to negative routine screening; however, were found to be colonized with GBS by culture. Future work includes complete microbiome analyses to evaluate unrecognized GBS colonization due to opportunistic pathogen overgrowth and determination of GBS capsular serotype distribution for downstream molecular analyses. Clinical questions still exist regarding the optimal method, timing, and cost efficiency for determining GBS status.

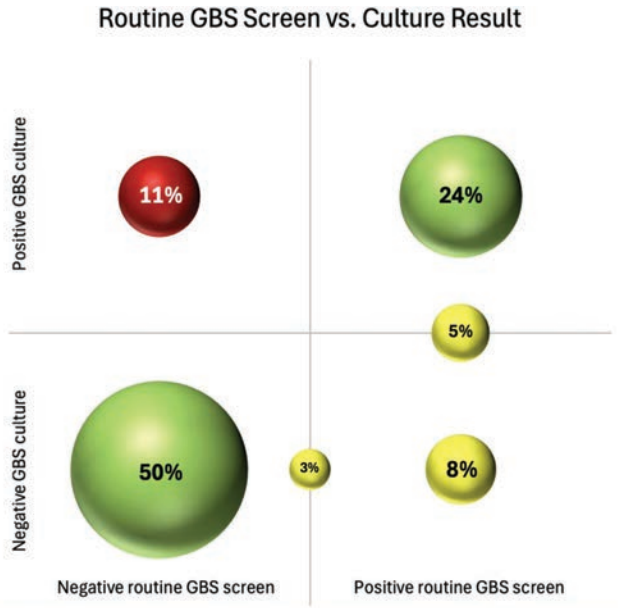

Figure 1. Plot of routine prenatal care GBS screening results compared to GBS culture obtained on admission for delivery.

941 | Race, Ethnicity, and Outcomes in Pregnancies with Gestational Diabetes: a Secondary Analysis of Numom2B Dataset

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10:30 AM - 12:30 PM

Objective: Studies have demonstrated higher rates of gestational diabetes in racial and ethnic minorities. Management of gestational diabetes requires various dietary and lifestyle changes in pregnancy. This study evaluates the association between race, ethnicity, specific risk factors and outcomes in nulliparous pregnancies affected by gestational diabetes.

Study Design: This study is a secondary analysis of the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-be (nuMoM2b), a prospective cohort study following nulliparas throughout pregnancy. Patients diagnosed with gestational diabetes were analyzed by racial/ethnic groups. Primary outcome was neonatal hypoglycemia. Secondary outcomes were selected neonatal and maternal morbidities. ANOVA test and Fisher's exact were used for analysis of difference in race/ethnicity group. Multivariate logistic regression was used to adjust for confounders.

Results: Of the cohort of 10,037 patients, 396 were diagnosed with gestational diabetes, with 54.5% patients identifying as non-Hispanic White, 10.4% non-Hispanic Black, 18.7% Hispanic, and 16.4% all other. Variance by race/ethnicity was found for multiple characteristics such as age, body mass index, dietary caloric and carbohydrate intake, chronic hypertension, socioeconomic status, health literacy, and experience of racism (all p values < 0.047). After adjusting for these potential confounders, rates of neonatal hypoglycemic were not statistically significant. However, rate for cesarean was higher for non-Hispanic Black patients (aOR 2.18,

95% CI 1.02-4.70) and macrosomia higher for Hispanic patients (aOR 2.98, 95% CI 1.10-8.09).

Conclusion: Variance was observed in racial/ethnic groups for multiple characteristics including dietary caloric intake and carbohydrate intake in patients with gestational diabetes. Although odds of neonatal hypoglycemia were not significant between groups, differences in cesarean delivery and macrosomia rates were seen. These findings may impact developing culturally individualized care in counseling and management of gestational diabetes.

Table 1: Gestational diabetes patient's characteristics by race/ethnicity

Patient characteristics	Total (n=396)		NH- White (n=216)		NH- Black (n=41)		Hispanic (n=74)		All others (n=65)		p-value
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	
Maternal age (years)	29.6	5.9	30.3	5.5	28.2	6.2	27.6	6.5	30.5	5.6	0.0016
BMI (kg/m^2)	30.1	7.7	29.7	7.6	36.4	8.5	30.6	6.6	26.6	6.2	<0.0001
Caloric Intake (kcal)	1814	1223.1	1699	765.7	2916	2737.3	1688	1003.5	1638	749.7	<0.0001
Carbohydrate Intake (grams)	221.5	143.9	204.6	95.9	355.5	292.8	208	125.2	207.8	113.7	<0.0001
Physical Activity (average mins per time)	40.9	31.3	39.6	18.9	37.4	21.2	49.9	63.4	38.2	13.7	0.1104
	n	%	n	%	n	%	n	%	n	%	
BMI (kg/m^2) at visit 1											0.0002
Underweight or normal weight (<25)	121	30.6%	69	31.9%	4	9.8%	16	21.6%	32	49.2%	
Overweight (25 - <30)	96	24.2%	53	24.5%	7	17.1%	23	31.1%	13	20.0%	
Obese (30+)	171	43.2%	92	42.6%	29	70.7%	32	43.2%	18	27.7%	
Unknown	8	2.0%	2	0.9%	1	2.4%	3	4.1%	2	3.1%	
Chronic hypertension											0.0477
Yes	27	6.8%	12	5.6%	7	17.1%	6	8.1%	2	3.1%	
Insurance											<0.0001
Commercial insurance only	212	53.5%	130	60.2%	16	39.0%	25	33.8%	41	63.1%	
Government insurance only	107	27.0%	40	18.5%	16	39.0%	39	52.7%	12	18.5%	
Other insurance	77	19.4%	46	21.3%	9	22.0%	10	13.5%	12	18.5%	
Education											<0.0001
High school or less	73	18.4%	22	10.2%	12	29.3%	30	40.5%	9	13.8%	
Some college	119	30.1%	64	29.6%	16	39.0%	24	32.4%	15	23.1%	
Completed college	97	24.5%	58	26.9%	8	19.5%	10	13.5%	21	32.3%	
Higher than college	104	26.3%	72	33.3%	5	12.2%	9	12.2%	18	27.7%	
Health literacy using REALM-SF scale											<0.0001
Less than 9th grade health literacy	55	13.9%	14	6.5%	11	26.8%	22	29.7%	8	12.3%	
9th grade or higher health literacy	324	81.8%	197	91.2%	29	70.7%	43	58.1%	55	84.6%	
Unknown	17	4.3%	5	2.3%	1	2.4%	9	12.2%	2	3.1%	
Experience of racism using Krieger racism scale											<0.0001
Yes	116	29.3%	41	19.0%	24	58.5%	23	31.1%	28	43.1%	

NH = Non-Hispanic; BMI = Body Mass Index

Table 2: Adjusted odds ratios for race/ethnicity for selected pregnancy outcomes

	Adjusted OR	95% C.I.		p-value
Neonatal Hypoglycemia				
NH- White	Referent			
NH- Black	2.66	0.83	8.57	0.1014
Hispanic	1.32	0.41	4.31	0.6435
All others	0.89	0.25	3.11	0.8517
Pre-eclampsia/ Gestational Hypertension				
NH- White	Referent			
NH- Black	1.73	0.80	3.76	0.163
Hispanic	0.68	0.35	1.33	0.2602
All others	1.02	0.52	2.02	0.9511
Preterm delivery (<37 weeks)				
NH- White	Referent			
NH- Black	0.68	0.24	1.94	0.4727
Hispanic	0.53	0.21	1.32	0.1703
All others	0.60	0.23	1.57	0.2956
Cesarean delivery				
NH- White	Referent			
NH- Black	2.18	1.02	4.70	0.0457
Hispanic	1.69	0.89	3.21	0.1068
All others	1.51	0.79	2.88	0.2117
Macrosomia (birthweight > 4000grams)				
NH- White	Referent			
NH- Black	1.61	0.48	5.35	0.4404
Hispanic	2.98	1.10	8.09	0.032
All others	0.23	0.03	1.88	0.1703
Large for Gestational Age				
NH- White	Referent			
NH- Black	2.20	0.58	8.28	0.2448
Hispanic	1.96	0.60	6.42	0.265
All others	1.46	0.36	5.86	0.594

*Multivariate logistic regression model also included age, BMI category, chronic hypertension, insurance, education, health literacy, experiences of racism

NH = non-Hispanic

943 | Betamethasone for Preterm Premature Rupture of Membranes at Late Prematurity

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10:30 AM - 12:30 PM

Objective: As of 2020, the American College of Obstetricians and Gynecologists extended the upper limit of expectant management of preterm premature rupture of membranes (PPROM) to 36 weeks. Treatment with betamethasone (BMZ) in the subset of patients with PPROM in the late preterm period has not been well studied. Therefore, we sought to investigate this.

Study Design: A secondary analysis of the Antenatal Late Preterm Steroids (ALPS) trial. All individuals enrolled in the parent trial were included. The primary outcome was a composite of respiratory support at 72 h, including continuous positive airway pressure or high flow nasal cannula ≥ 2 h, oxygen with an inspired fraction of ≥ 30% for ≥ 4 h, or mechanical ventilation, together with extracorporeal membrane oxygenation, or stillbirth or neonatal death within 72 h after delivery. Poisson regression was implemented to adjust for confounders.

Results: Overall, 22% (620/2,831) had PPROM upon enrollment. Among individuals with PPROM, compared to those without, the median latency period was 15.6 hours (IQR 8.3-24.1) versus 45.0 hours (IQR 20.0-158.0; P< 0.001) (Figure). Among the patients who received BMZ, two doses were given to 26% (83/316) of those with PPROM vs. 70% (775/1,110; P< 0.001) of those without. Latency ≥ 48 hours, compared to < 48 hours, was associated with a lower primary outcome rate: 9% (94/1,078) vs. 16% (273/1,749); P< 0.001.

Among patients with PPROM, 49% (304) received BMZ and 51% (316) received placebo. The BMZ and placebo groups had similar baseline characteristics. In this subgroup, there was no difference in the primary respiratory outcome rate (adjusted RR 0.91, 95% CI 0.60-1.38) between BMZ and placebo (Table). Secondary neonatal and maternal outcomes did not differ as well.

Conclusion: Compared to those without, individuals with PPROM in the late preterm period had shorter latency; three out of four delivered within 24 hours from randomization. Among individuals with PPROM, there were no differences in neonatal morbidity following treatment with BMZ compared to placebo. However, our study was underpowered to detect such differences.

Table – Neonatal outcomes among individuals with preterm premature rupture of membranes at risk for late preterm birth, following treatment with betamethasone vs. placebo

Outcome	Placebo (N=304)	BMZ (N=316)	Unadjusted RR [a] (95% CI)	Adjusted RR (95% CI)
Primary respiratory outcome [b]	13.2	11.7	0.89 (0.59-1.35)	0.91 (0.60-1.38)
CPAP / HFNC ≥ 2h	12.2	10.1	0.83 (0.53-1.29)	0.84 (0.54-1.31)
Inspired oxygen fraction ≥ 30% for ≥ 4 h	3.3	2.8	0.86 (0.35-2.09)	0.97 (0.40-2.38)
Mechanical ventilation	3.3	1.9	0.57 (0.21-1.56)	0.62 (0.23-1.68)
Severe respiratory complication [b,c]	10.9	8.2	0.76 (0.46-1.24)	0.78 (0.48-1.28)
CPAP / HFNC ≥ 12 continuous hours	8.9	7.0	0.78 (0.45-1.34)	0.81 (0.47-1.40)
Inspired oxygen fraction ≥ 30% for ≥ 24 h	2.6	0.9	0.36 (0.10-1.34)	0.40 (0.10-1.56)
Respiratory distress syndrome	4.6	5.1	1.10 (0.55-2.21)	1.15 (0.56-2.34)
Neonatal sepsis	0.7	1.3	1.91 (0.35-10.36)	1.88 (0.36-9.78)
NICU hospitalization	54.6	53.5	0.98 (0.85-1.13)	1.03 (0.91-1.17)
Cesarean delivery	13.2	11.1	0.86 (0.56-1.32)	0.85 (0.57-1.27)
Chorioamnionitis	5.3	2.5	0.48 (0.21-1.10)	0.46 (0.20-1.05)
Endometritis	2.0	0.6	0.32 (0.06-1.57)	0.29 (0.06-1.49)

Data presented as %.
CPAP, continuous positive airway pressure; HFNC, high flow nasal cannula; NICU, neonatal intensive care unit.
[a] Adjusted for gestational diabetes mellitus, gestational age at randomization < 35 weeks, and pre-randomization scheduled cesarean delivery.
[b] If occurred within the first 72 hours after birth.
[c] A severe respiratory complication was defined as any of the following: CPAP or high-flow nasal cannula for at least 12 hours, supplemental oxygen with a fraction of inspired oxygen of 0.30 or more for at least 24 hours, or mechanical ventilation.

Figure – Individuals with versus without preterm premature rupture of membranes and the randomization-to-delivery interval

Log rank < 0.001.

944 | Novel Roles of Et-1 in Superimposed Preeclampsia

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10:30 AM - 12:30 PM

Objective: This study aims to determine if low maternal endothelin-1 (ET-1) expression causes preeclampsia-like phenotypes during pregnancy using mice with modified *Edn1* alleles (L) that have ~30% of the wild type (WT) circulating ET-1 levels.

Study Design: At 8-10 weeks of age, $Edn1^{L/L}$ females were mated with $Edn1^{L/L}$ males, and WT females were mated with WT males. One batch of dams from each group was sacrificed at 18.5 days post coitus (dpc) and maternal urine, plasma, and kidneys were collected. Urine albumin, and serum markers of preeclampsia—soluble fms-like tyrosine kinase 1 (sFlt-1), vascular endothelial growth factor (VEGF), and soluble endoglin (sENG)—were measured using ELISA kits. Electron microscopy of the glomeruli was examined at 18.5 dpc. A separate batch of dams from each group was reared through term delivery (19.5 to 21.5 dpc). Tail-cuff blood pressure measurement was performed on WT and $Edn1^{L/L}$ female mice before pregnancy, at 13.5 dpc, at 17.5 dpc, and at 7 days postpartum.

Results: Virgin $Edn1^{L/L}$ females were hypertensive but did not demonstrate any other obvious abnormalities. $Edn1^{L/L}$ females developed the full spectrum of preeclampsia-like phenotypes during pregnancy, including elevated systolic blood pressure and urinary albumin secretion, and glomerular endothelial damage. On the day of delivery, $Edn1^{L/L}$ dams had fewer live neonates. At 18.5 dpc, $Edn1^{L/L}$ dams also had fewer live fetuses and reduced fetal weight. The placental weights were not different between $Edn1^{L/L}$ and WT dams. Interestingly, all serum markers of PE were lower in $Edn1^{L/L}$ dams compared to WT dams.

Conclusion: Our results show low maternal ET-1 expression causes preeclampsia-like phenotypes during pregnancy and leads to adverse pregnancy outcomes in mice.

945 | Evaluating Associations Between a Continuous Measure of Midtrimester Cervical Length and Gestational Age at Delivery

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10:30 AM - 12:30 PM

Objective: A dichotomous measure of short cervical length (CL) (< 25 mm) is correlated with spontaneous preterm birth (sPTB) but cannot predict gestational age (GA) at delivery. Our aim was to examine the relationship between continuous CL and delivery GA.

Study Design: This was a retrospective cohort study of 1,000 patients who delivered at a single tertiary, urban academic hospital from January 2013-August 2023 after transvaginal CL was measured at 16w0d-24w6d GA. We abstracted delivery GA and CL taken closest to 20w0d from the electronic medical record. We used linear regression to model associations between a 1 mm increase in CL and mean change in GA at delivery for the full cohort as well as a sub-cohort with CL < 25 mm. We used model r^2 to measure the proportion of variance in GA explained by CL in each group.

Results: 1,038 pregnancies in 1,000 patients met inclusion criteria. 21.4% of pregnancies were in patients with prior sPTB (Table 1), consistent with a high-risk population. 13.3% of index pregnancies ended in sPTB. CLs were normally distributed with a mean (standard deviation) of 38 (7) mm (Table 2). The median (min, max) delivery GA was 39.0 (21.0, 42.0) weeks. CL and GA were weakly positively correlated (Spearman r = 0.07, p = 0.02). In the overall cohort, 1 mm CL increase was associated with a mean increase of 0.5 (95% confidence interval (CI) 0.4-0.7) days GA at delivery (r^2 = 0.06). In the short cervix cohort, 1 mm increased CL was associated with increased GA of 2.7 (95% CI 0.9-4.4) days (r^2 = 0.25).

Conclusion: Continuous CL was positively associated with delivery GA in all patients, but small changes in CL explained more variation in GA at delivery in patients with CL < 25 mm. Because every additional day of gestation improves neonatal outcomes in sPTB, further research should investigate the use of continuous CL along with other predictors for risk stratification in high-risk patients.

Table 1: Demographics		
	Total = 1038	
Characteristic	**N**	**%**
Age at Delivery		
≤ 25	209	20.13
26 - 30	268	25.82
31 - 35	327	31.50
36 - 40	174	16.76
> 40	60	5.78
Race and Ethnicity		
Asian, Native Hawaiian, Pacific Islander	44	4.24
Black or African American	256	24.66
Hispanic or Latina	463	44.61
White	185	17.82
Other	79	7.61
Missing	11	1.06
Insurance Coverage		
Public	503	48.46
Private	457	44.03
None	78	7.51
Pre-Pregnancy BMI		
<= 30	650	62.62
30-35	209	20.13
35-40	96	9.25
> 40	76	7.32
Missing	7	0.67
Tobacco Use in Pregnancy	27	2.60
Alcohol Use in Pregnancy	3	0.29
Substance Use in Pregnancy	20	1.93
History of Spontaneous Preterm Birth	222	21.39
Prescribed Progesterone in Pregnancy	199	19.17
Cerclage Placed during Pregnancy	48	4.62

Table 2. Relationship between cervical length and gestational age at delivery

	Mean difference (95% CI) in GA at delivery (days)	Model r^2
Full Cohort (n=1038) Cervical length, mm	0.5 (0.4-0.7)	0.06
Short cervix (n=32) Cervical length, mm	2.7 (0.9-4.4)	0.25

946 | Cesarean Section Rates and Maternity Populations at Risk: a Single Center 16 Year Follow Up

Maxim Shapiro[1]; Zvi Ehrlich[2]; Rivka Farkash[1]; Yael Lerner[1]; Ronit Calderon Margalioth[1]; Sorina Grisaru Granovsky[3]
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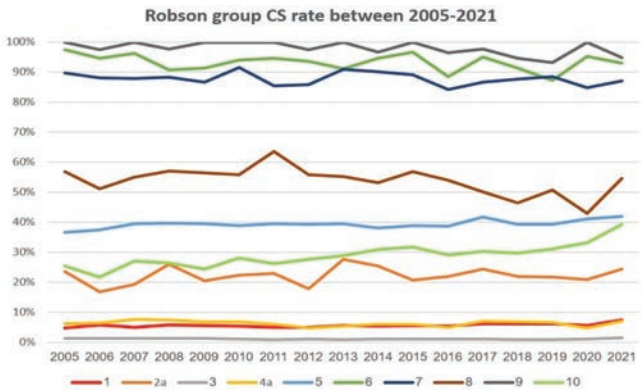
10:30 AM - 12:30 PM

Objective: To estimate the association between CS rates and the different maternity populations as classified Robson 10-group Classification (RGC) at a single large maternity center with uniform clinical protocols, between 2005-2021.

Study Design: 235,280 recorded births were categorized using RGC. CS risk was assessed by logistic regressions using both univariate and adjusted multivariate models. All models were re analyzed for parity groups in the RGC, nulliparous and multiparous. Within the nulliparous groups, RG1 was a reference for RG 2a, 2b, 6 and 8-10, and for multiparous, RG 3 was a reference for RG 4, 5, 7 and 8-10).

Results: CS rate increased from 11.0% to 13.8% during the study period (Figure). The largest groups were nulliparous and multiparous women with single cephalic, spontaneous labor at term (RG1 and RG3, respectively); 71.1%. The group that contributed the most to overall CS rate was RG 5 (multiparous, single cephalic pregnancy at term with prior CS), 33.6% of CS. RG5 also had the highest risk among the multiparous analysis (aOR = 45.2, 95% CI: 42.5-48.0). Apart from malpresentations, the groups with the highest risk for CS were RG8 (all multifetal pregnancies at any gestational age) overall and among nulliparous women (aOR = 6.1 95% CI: 5.4-6.8, and aOR = 24.7 95% CI: 20.4-29.8, respectively). Notably, labor induction increased the risk for CS in both nulliparous and multiparous (aOR = 3.5 95% CI: 3.5-4.0, and aOR = 3.7 95% CI: 3.2-3.9, respectively). (Table)

Conclusion: CS rates are still rising, even in populations with a basic low rate. Interventions to reduce CS rates should be focused on decreasing multifetal pregnancies rate in the setting of assisted reproduction and a careful revision of the limited trial of labor after cesarean. Labor induction was shown to increase the risk for CS in both nulliparous and multiparous groups, warranting inspection of this rising practice.



Robson group	CS (OR, 95% CI) Main model	Nulliparous comparison*	Multiparous comparison**
	n=235,280	n=55,172	n=180,108
1 (nul, spont')	REF	REF	-
2a (nul' ind')	3.5 (3.3-3.8)	3.7 (3.5-4.0)	-
2b (nul' prelabor CS)	-	-	-
3 (mult' spont')	0.1 (0.1-0.1)	-	REF
4a (mult' ind')	0.5 (0.4-0.6)	-	3.5 (3.2-3.9)
4b (mult' prelabor CS)	-	-	-
5 (mult' prior CS)	5.9 (5.4-6.6)	-	45.2 (42.5-48)
6 (nul' breach)	-	-	-
7 (mult' breach)	-	-	-
8 (multifetal)	6.1 (5.4-6.8)	24.7 (20.4-29.8)	30.1 (26.9-33.7)
9 (transverse lie)	-	-	-
10 (preterm)	2.4 (2.1-2.7)	4.5 (3.5-5.8)	15.8 (13.6-18.3)

Table - CS risk by RGC, heat-chart, adjusted for confounders

Color coding for each column- green through yellow: OR<1, yellow through red: OR>1, yellow=1.0. Intensity of color relative to highest and lowest OR.

*** RG1 as reference, **RG3 as reference**

RG 2b, 4b, 6, 7 and 9- not shown due to very high CS rates in these groups (87.7-100%)

nul- nulliparous, mult- multiparous, spont- spontaneous, ind- labor induction

947 | Association between Robson 10 Group Classification (RGC) and the risk adverse maternal and neonatal outcomes

Maxim Shapiro[1]; Zvi Ehrlich[2]; Rivka Farkash[1]; Liav Berkovits[1]; Ronit Calderon Margalioth[1]; Sorina Grisaru Granovsky[3]
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10:30 AM - 12:30 PM

Objective: To analyze the association between the different maternity women groups classified by Robson 10 Group Classification (RGC) and the risk for adverse maternal and neonatal outcomes, at a single large maternity center.

Study Design: An observational study including 235,280 births. Outcomes included post-partum hemorrhage (PPH), puerperal fever, extended length of hospitalization (LOH ≥4 days), maternal readmission within 42 days, in-hospital neonatal mortality, 5-minutes APGAR score< 7 and NICU ≥3 days. The associations and risks were assessed by adjusted logistic regression models for the entire populations as well as by maternal age, background medical condition prior to delivery, GDM, hypertensive disorder during pregnancy, prior miscarriage, gestational age. Analysis was conducted separately by parity. For nulliparous groups, RG1 was a reference for RG 2a, 2b, 6 and 8-10, and for multiparous, RG 3 was a reference for RG 4, 5, 7 and 8-10). In these comparisons, groups 8-10 were selected by their appropriate parity for each analysis.

Results: All multifetal pregnancies (RG8) had the higher risk for PPH (aOR = 1.7, 95% CI: 1.4-2.0) and extended LOH (aOR = 4.7, 95% CI: 4.0-5.5). RG 2b and 4b; Nulliparous and multiparous pre-labor CS at term, respectively, as well as RG 6; nulliparous breech (unrelated to the mode of delivery), had the highest risk for neonatal mortality (aOR = 9.1, 8.0 and 8.0, 95% CI, respectively). Both RG2a and RG4a groups; nulliparous and multiparous single cephalic labor induction at term, markedly showed that labor induction was significantly associated with low 5' APGAR and neonatal mortality, both for nulliparous and multiparous (RG2a low APGAR aOR = 1.7 95% CI: 1.4-2.0, mortality aOR = 4.2 95% CI: 2.6-6.7. RG4a- low APGAR aOR = 3.3 95% CI: 2.7-3.9, mortality aOR = 7.7 95% CI: 6.0-9.9) Tables 1 & 2.

Conclusion: The maternal and neonatal risk for adverse perinatal outcome is strongly associated with breech presentation, multifetal pregnancies at any gestational age and labor induction. Focused interventions to these groups may reduce the perinatal adverse outcomes in specific populations.

Robson group / Parity	Neonatal mortality (OR, 95% CI)		5' APGAR <7 (OR, 95% CI)		NICU hospitalization ≥3 days (OR, 95% CI)		Registered neonatal diagnoses (OR, 95% CI)		One or more adverse neonatal outcomes (OR, 95% CI)	
	N n=55,172	M n=180,108	N n=55,172	M n=180,108	N n=55,172	M n=180,108	N n=55,172	M n=180,108	N n=55,172	M n=180,108
2a (nul' ind')	4.2 (2.6-6.7)	-	1.7 (1.4-2.0)	-	1.4 (1.1-1.7)	-	1.1 (1.0-1.1)	-	1.1 (1.1-1.2)	-
2b (nul' prelabor CS)	11.1 (4.0-31.0)	-	2.4 (1.6-3.8)	-	NS	-	NS	-	NS	-
4a (mult' ind')	-	7.7 (6.0-9.9)	-	3.3 (2.7-3.9)	-	1.8 (1.6-2.1)	-	1.2 (1.1-1.2)	-	1.2 (1.2-1.3)
4b (mult' prelabor CS)	-	9.8 (5-19.2)	-	6.5 (4.8-8.8)	-	2.3 (1.9-2.8)	-	NS	-	1.2 (1.1-1.4)
5 (mult' prior CS)	-	3.3 (2.5-4.3)	-	2.0 (1.7-2.4)	-	1.3 (1.1-1.4)	-	NS	-	1.1 (1.0-1.1)
6 (nul' breach)	10.9 (5.1-23.1)	-	NS	-	0.5 (0.4-0.7)	-	0.7 (0.6-0.8)	-	0.7 (0.6-0.8)	-
7 (mult' breach)	-	9.2 (5.8-14.4)	-	3.6 (2.7-4.8)	-	NS	-	NS	-	NS
8 (multifetal)	7.0 (3.2-15.3)	2.4 (1.5-3.9)	NS	NS	NS	NS	0.7 (0.6-0.8)	0.8 (0.7-0.9)	0.7 (0.6-0.8)	0.8 (0.7-0.8)
9 (transverse lie)	8.9 (2.6-30.1)	7.7 (4.2-14.3)	NS	3.0 (2.0-4.6)	NS	NS	NS	NS	NS	NS
10 (preterm)	3.5 (1.7-7.4)	4.4 (2.8-7.0)	NS	2.7 (2.0-3.7)	NS	NS	NS	NS	0.7 (0.5-0.9)	NS

Table-1 Adverse neonatal outcomes by RGC heat-chart, nuliparous and multiparous comparison, adjusted for confounders
Color coding for each column- green through yellow: OR<1, yellow through red: OR>1, yellow=1.0. Intensity of color relative to highest and lowest OR
RG1 as refrence for nulliparous (N), RG3 as refrence for multiparous (M)
Values at p≥0.05 (NS) redacted
nul- nuliparous, mult- multiparous, spont- spontaneous, ind- labor induction

Robson group / Parity	CS (OR, 95% CI)		Post partum hemorrhage (OR, 95% CI)		Puerperal Fever (OR, 95% CI)		Maternal LOS ≥ 4 days (OR, 95% CI)		Re-admission within 42 days (OR, 95% CI)		One or more adverse maternal outcome (OR, 95% CI)	
	N n=55,172	M n=180,108	N n=55,172	M n=180,108	N n=55,172	M n=180,108	N n=55,172	M n=180,108	N n=55,172	M n=180,108	N n=55,172	M n=180,108
2a (nul' ind')	3.7 (3.5-4.0)	-	NS	-	NS	-	1.2 (1.1-1.3)	-	NS	-	1.1 (1.1-1.2)	-
2b (nul' prelabor CS)	-	-	0.3 (0.2-0.5)	-	NS	-	NS	-	NS	-	0.7 (0.6-0.9)	-
4a (mult' ind')	-	3.5 (3.2-3.9)	-	NS	-	NS	-	1.5 (1.3-1.6)	-	1.7 (1.3-2.1)	-	1.3 (1.2-1.4)
4b (mult' prelabor CS)	-	-	-	NS	-	NS	-	1.5 (1.3-1.7)	-	NS	-	1.3 (1.2-1.5)
5 (mult' prior CS)	-	45.2 (42.5-48.0)	-	1.4 (1.3-1.5)	-	NS	-	1.2 (1.1-1.3)	-	NS	-	1.2 (1.2-1.3)
6 (nul' breach)	-	-	0.4 (0.2-0.5)	-	NS	-	NS	-	0.5 (0.3-0.9)	-	NS	-
7 (mult' breach)	-	-	-	NS	-	NS	-	1.7 (1.5-1.9)	-	NS	-	1.5 (1.4-1.7)
8 (multifetal)	24.7 (20.4-29.8)	30.1 (26.9-33.7)	2.9 (2.3-3.8)	1.8 (1.5-2.2)	NS	NS	3.0 (2.4-3.8)	5.7 (4.9-6.5)	NS	NS	3.1 (2.5-3.8)	4.3 (3.8-4.9)
9 (transverse lie)	-	-	NS	2.0 (1.5-2.8)	NS	NS	NS	2.0 (1.7-2.4)	NS	1.9 (1.1-3.5)	NS	1.9 (1.6-2.3)
10 (preterm)	4.5 (3.5-5.8)	15.8 (13.6-18.3)	NS	1.3 (1.0-1.7)	NS	NS	2.2 (1.6-2.9)	2.0 (1.7-2.4)	NS	NS	1.4 (1.1-1.8)	1.5 (1.3-1.8)

Table -2 Adverse maternal outcomes by RGC heat-chart, nuliparous and multiparous comparison, adjusted to confounders
Color coding for each column- green through yellow: OR<1, yellow through red: OR>1, yellow=1.0. Intensity of color relative to highest and lowest OR.
RG1 as refrence for nulliparous (N), RG3 as refrence for multiparous (M)
Values at p≥0.05 (NS) redacted
RG 2b, 4b, 6, 7 and 9- not shown for CS due to very high rates in these groups (87.7-100%)
nul- nuliparous, mult- multiparous, spont- spontaneous, ind- labor induction

Poster Session 4

Abstracts 948–1227

FRIDAY
January 31, 2025
4:00 PM – 6:00 PM

ABSTRACTS OPEN ACCESS

Poster Session 4

Friday, January 31, 2025 4:00 PM – 6:00 PM

948 | Neighborhood Deprivation Associated with Extremely Preterm Birth during COVID-19 Pandemic

Abigail Bell[1]; Megan Foeller[1]; Candice Woolfolk[1]; Emily Dively, BSN[2]; Fan Zhang[1]; Daniel Jackson[3]; Nandini Raghuraman[4]; Indira U. Mysorekar[5]; Jeannie C. Kelly[4]
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4:00 PM - 6:00 PM

Objective: Area Deprivation Index (ADI) is strongly associated with obstetric outcomes but understudied during the COVID-19 pandemic. We sought to evaluate the relationship between ADI and preterm birth during the early pandemic.

Study Design: We performed a secondary analysis of a prospective longitudinal cohort study investigating the impact of COVID-19 exposure in pregnancy on perinatal outcomes. Pregnant patients were recruited 12/23/20-7/18/22 and serially tested with serum antibody testing for COVID-19 exposure during pregnancy. Delivery residence address was used to categorize patients into low ADI ($\leq 50^{th}$ percentile) and high ADI ($\geq 75^{th}$ percentile, indicating high level of deprivation) groups. The primary outcome was preterm birth, using multivariable regression and stratified by gestational age at birth; secondary outcomes included other perinatal complications.

Results: 306 patients were included. Overall, preterm birth rates did not differ between high and low ADI groups; however, low ADI was significantly associated with lower rates of extreme preterm birth < 28 weeks and < 34 weeks (Table 1). After adjusting for obesity and tobacco use, the association persisted at < 28 weeks (aOR 0.26, 95% CI 0.07-0.73) and < 34 weeks (aOR 0.35 95% CI 95% 0.14-0.87; Table 2). There were no other differences found in perinatal outcomes except for a higher rate of neonatal intracranial hemorrhage in the low ADI group (3.2% vs 0%, p = 0.03).

Conclusion: High ADI was associated with increased risk of extremely preterm birth during the early COVID-19 pandemic even when controlling for obesity and tobacco use. The interplay of social determinants of health and preterm birth must be better studied to target interventions to modifiable risk factors.

Table 1. Perinatal outcomes during COVID-19 pandemic, by ADI

	Low ADI (n=124)	High ADI (n=182)	*p* value
Preterm delivery (all)	22 (17.7)	42 (23.1)	0.26
Before 28 weeks	**5 (4.0)**	**22 (12.1)**	**0.01**
Before 34 weeks	**7 (5.7)**	**23 (12.6)**	**0.04**
Mode of delivery			0.11
Vaginal delivery	78 (62.9)	112 (61.5)	
Operative vaginal delivery	2 (1.6)	7 (3.9)	
Scheduled C-section	16 (12.9)	25 (13.7)	
Unscheduled C-section	24 (19.4)	17 (9.3)	
Maternal complications during delivery (composite)	19 (15.3)	16 (8.8)	0.08
Hemorrhage	13 (10.5)	11 (6.0)	0.21
Chorioamnionitis or endomyometritis	2 (1.6)	1 (0.5)	0.58
Shoulder dystocia	3 (2.4)	4 (2.2)	1.00
Spontaneous preterm birth	1 (0.8)	0 (0.0)	0.42
Blood transfusion	2 (1.6)	1 (0.5)	0.58
Average neonate birth weight	3168.2 ± 655.8	3086.9 ± 604.1	0.28
< 2500g	18 (14.5)	39 (21.4)	0.13
< 1500g	7 (5.7)	22 (12.1)	0.06
Neonatal complications following delivery (composite)	14 (11.3)	17 (9.3)	0.58
Necrotizing enterocolitis	1 (0.8)	1 (0.5)	1.00
Chromosomal abnormality	3 (2.4)	0 (0.0)	0.07
Intracranial hemorrhage	**4 (3.2)**	**0 (0.0)**	**0.03**
NICU admission	13 (10.5)	16 (8.8)	0.80
Neonatal death	0 (0.0)	2 (1.1)	0.51

ADI: Area Deprivation Index

Table 2. Multivariable regression of primary outcome

	Low ADI aOR
Preterm birth (with variables obesity, tobacco use)	0.68 (0.38, 1.24)
Before 28 weeks	**0.26 (0.08, 0.73)**
Before 34 weeks	**0.35 (0.14, 0.87)**

ADI = Area Deprivation Index; aOR = adjusted odds ratio

949 | Real-World Accuracy of Angiogenic Factors for Predicting Severe Preeclampsia in Singleton and Twin Gestations

Abraham Tsur[1]; David Nadav Sabag[2]; Ronen Fluss[3]; Amit Huppert[3]; Michal Fishel Bartal[4]; Dan Dominissini[5]; Yoav Yinon[6]; Shali Mazaki Tovi[6]; Rakefet Yoeli-Ullman[7]
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HaMerkaz; [6]The Sheba Medical Center, Ramat Gan, HaMerkaz; [7]Sheba Medical Center, Ramat Gan, HaMerkaz

4:00 PM - 6:00 PM

Objective: To determine real-world accuracy of circulating angiogenic factors in predicting preeclampsia with severe features (sPE) in singleton and twin gestations.

Study Design: This retrospective cohort study consisted of individuals admitted to the antepartum unit of a tertiary academic center from 2023 to 2024. We included individuals with hypertensive disorders of pregnancy (HDP) at 23+0 to 34+6 weeks of gestation with available sFlt-1/PlGF measurements obtained as part of the clinical flow. Exclusion criteria included developing sPE on the day of measurement. The area under the curve (AUC) was used to assess accuracy of the prediction of sPE within two weeks. The discriminatory ratio of ≥40 was evaluated for clinical performance. Similar to the PRAECIS study, measurements were re-included if delivery did not occur within two weeks. In addition, we developed a logistic regression model integrating sFlt-1/PlGF with blood pressure (BP). Prediction of sPE by the integrated model was compared to prediction based on sFlt-1/PlGF alone using AUC and likelihood ratio test (LRT).

Results: The study group included 59 individuals (71 sflt-1/PlGF measurements). In 35% of measurements, the individuals developed sPE within two weeks. Table 1 reports the discriminatory clinical performance of the ≥40 ratio stratified by singleton and twin pregnancies. The ≥40 ratio showed better sensitivity and NPV in twins than in singletons. Moreover, although specificity in twins was lower than in singletons, the PPV was higher in twins due to the increased prevalence of sPE. Integrating sFlt-1/PlGF with BP measurement increased the model accuracy (AUC 0.83 VS 0.88, figure 1) and enhanced the model fit (LRT $p = 0.005$).

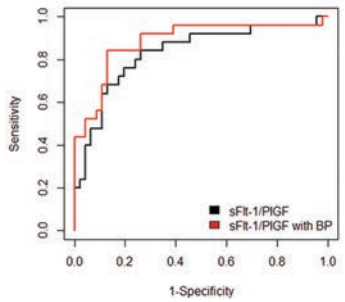
Conclusion: Real-world evidence supports extending the clinical use of the sFlt-1/PlGF ratio to assess the risk of developing sPE in twin pregnancies as well. Integrating sFlt-1/PlGF with clinical risk factors like BP can enhance predictive performance and clinical decision-making.

Table 1 – Clinical performance of the sFlt-1/PlGF≥40 ratio in prediction of preeclampsia with severe features within two weeks

	True positive	False positive	False Negative	True Negative	Sensitivity	Specificity	PPV	NPV
Singleton	11	9	4	29	0.73	0.76	0.55	0.88
Twins	10	3	0	4	1.00	0.57	0.77	1.00
All	21	12	4	34	0.84	0.74	0.64	0.89

PPV, positive predictive value; NPV, negative predictive value

Figure 1 – Receiver-operating characteristic (ROC) curve for prediction of preeclampsia with severe features within two weeks. Area under ROC curve =0.83 for sFlt-1/PlGF versus 0.88 for Sflt-1/PlGF integrated with blood pressure (BP) measurement at the same day.



950 | What to Expect of Expectant Management in Preterm Preeclampsia with Severe Features

Ahmed Zaki Moustafa[1]; Beatrice Valentini[2]; Joe Haydamous[3]; Cabrina Becker[4]; Jasmin Abdeldayem[5]; Khalil M. Chahine[6]; Sean C. Blackwell[7]; Baha M. Sibai[7]

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4:00 PM - 6:00 PM

Objective: Despite common practice in the US, Level I data from RCT's of expectant management of preterm preeclampsia with severe features (PSF) is limited. Of the three RCT's conducted, only one was performed in the US 30 years ago. There is also limited evidence guiding management in the setting of fetal growth restriction (FGR). Our objective was to describe maternal and perinatal outcomes with expectant management of early onset PSF by gestational age (GA) at diagnosis and by presence of FGR.

Study Design: This is a retrospective cohort study of pregnant individuals with a diagnosis of PSF between 24-34 weeks at a single Level 4 center between January 2022 to April 2024. Exclusion criteria was delivery < 24 hours of admission. We compared the latency period (time interval from diagnosis to delivery) by GA at diagnosis and presence or absence of FGR. Indications for delivery, maternal and perinatal outcomes were evaluated.

Results: Over the study period, 241 patients were admitted with PSF < 34 weeks and 73% (n = 175) met criteria for analysis. Patients were divided by GA: 24w0d–27w6d (n = 43), 28w0d–31w6d (n = 90), and 32w0d–33w-6d (n = 42). There were no significant differences in maternal characteristics.

Latency was longer with earlier GA at PSF diagnosis. The median (IQR) latency in days was 6.4 (2.7–14.2) in group 1, 4.2 (2.5-11.0) in group 2, and 3.0 (1.7-6.4) in group 3 (p = 0.024).

Rate of FGR was significantly higher with earlier onset at 51%, 46%, and 21% in groups 1, 2, and 3 (p = 0.01) and was associated with decreased latency though it did not reach statistical

significance (Figure 1). Latency when PSF is diagnosed beyond 32 weeks in the presence of FGR was only 1.7 days (1.5–7.6). Fetal indications for delivery were higher in group 1 (65 vs 47, and 24%, p = 0.002) (Table 1).

Conclusion: In pregnancies complicated by preterm PSF, latency decreased with advancing gestational age at diagnosis especially in the setting of FGR. Further studies are needed to evaluate if there is a benefit in attempting expectant management beyond administration of corticosteroids when PSF is diagnosed beyond 32 weeks with FGR.

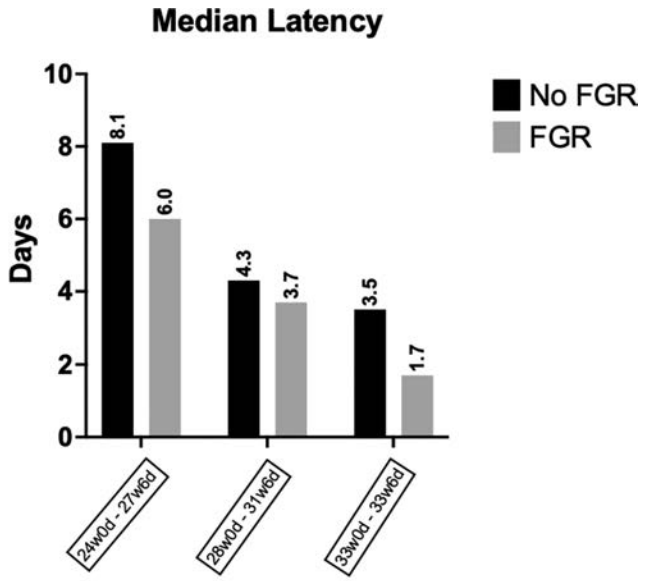

Figure 1. Median latency in days by groups and presence of FGR (p= 0.08).

Table 1. Maternal and perinatal outcomes.

	24w0-27w6d N= 43	28w0d-31w6d N= 90	33w0d-34w0d N= 42	P value
Latency (days)	6.4 (2.7–14.2)	4.2 (2.5-11.0)	3.0 (1.7-6.4)	**0.02**
Latency				
> 7 days	21 (49)	38 (42)	9 (21)	**0.022**
> 14 days	11 (26)	19 (21)	4 (10)	0.147
FGR	22 (51)	41 (46)	9 (21)	**0.01**
Indication(s) for delivery				
Completed 34 weeks	1 (2)	8 (9)	11 (26)	**0.001**
Worsening/difficult to control Bps	12 (28)	38 (42)	18 (43)	0.23
CNS symptoms	9 (21)	13 (14)	7 (17)	0.64
HELLP syndrome	1(2)	2 (2)	0	0.62
Pulmonary edema	3 (7)	9 (10)	4 (10)	0.85
Fetal indications	28 (65)	42 (47)	10 (24)	**0.0007**
Cesarean Delivery	43 (100)	75 (83)	38 (90)	0.01
Maternal ICU admission	2 (5)	3 (3)	1 (2)	0.85

Data are presented as number (percentage) or median (interquartile range).
FGR fetal growth restriction. *Bps* blood pressures. *Fetal indications* for delivery included abnormal fetal testing or fetal Doppler studies in cases of FGR. *ICU* intensive care unit.
There were no cases of eclampsia, stroke, or maternal mortality in our cohort.

951 | Early Anatomic Ultrasound to Detect Fetal Anomalies in High Risk Patients at 12-14 Weeks Gestation

Akos Herzeg[1]; Yili Zhao[1]; Mary E. Norton[2]
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4:00 PM - 6:00 PM

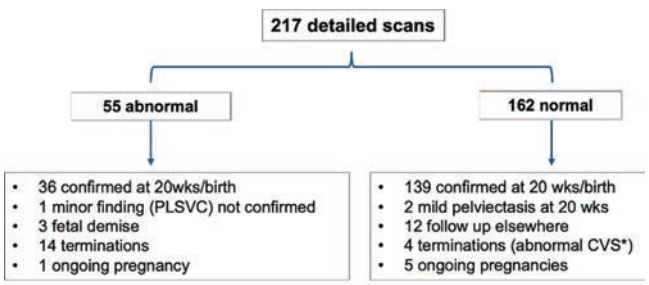
Objective: Detailed evaluation of the fetus in the late first trimester is now possible. We report on the outcomes of a cohort of high-risk patients who underwent detailed fetal evaluation at 12-14 weeks' gestation (WG).

Study Design: Patients referred for early anatomy scans underwent detailed evaluation using a protocol based on AIUM practice parameters. Outcomes of all referred patients from 01/2021 through 07/2024 were collected. Variables included referral indications, maternal age, gestational age, need for endovaginal scan, detection of minor and major anomalies, genetic testing results, and outcomes based on second-trimester anatomy scan, fetal echo, or at birth.

Results: In all, 217 patients were included. Indications included prior pregnancy with genetic or structural anomalies (34%), maternal age or patient request (14%), abnormal screening (10%), suspected abnormalities on a routine scan (8%), teratogen exposure (7%), perinatal risk factors (5%), and complicated twins (1%). Median gestational age was 13+2 weeks' (IQR 1+1), 1.4% were twins and 2.8% required an endovaginal scan. In all, 55 (25.3%) had abnormal results: 36 of these were confirmed, 1 minor finding was not confirmed, 3 had fetal demise, 14 terminated, and 1 pregnancy is ongoing. Terminations without confirmation were for severe limb anomalies (2), acrania (1), abnormal CVS (8), sirenomelia (1), and bladder outlet obstruction (2). In the 162 (74.6%) cases with normal findings, 139 were confirmed normal at 20 WG or birth, 2 had mild pelviectasis at 20 WG, 4 terminated for CVS abnormalities*, 12 had follow-up elsewhere, and 5 have ongoing pregnancies. No major abnormalities were detected, and the only false positive result was a suspected persistent left superior vena cava that was not confirmed on fetal echo.

Conclusion: Dedicated anatomic evaluation at 12-14 weeks' gestation in high-risk patients has a high yield of abnormal findings and a high accuracy. For patients at high-risk, this option can provide earlier detection of significant anomalies as well as earlier reassurance/counseling.

Total Pregnancies	**N=217**
Maternal age (mean, SD)	37.6 years (SD 5.02)
Gestational age (median, IQR)	13+2 weeks' (IQR 1,1)
Endovaginal ultrasound (n, %)	6 (2.8)
Multiple gestation (n, %)	3 (1.4)
Indications	**N (%)**
Prior fetal anomaly	73 (33.6)
Maternal age, screening	30 (13.8)
Positive cfDNA screening	22 (10.1)
Suspected anomaly, NT>3.0mm	18 (8.2)
Teratogen exposure including diabetes	15 (6.9)
Perinatal history or risk factors (e.g. IVF)	10 (4.6)
Complicated twin pregnancies	2 (0.9)
Abnormalities	55 (25.3)
Major	35 (16.1)
Minor	20 (9.2)



PLSVC: persistent left superior vena cava; CVS: chorionic villus sampling
*sex chromosome aneuploidy, copy number variant on microarray (2), familial genetic disorder

952 | Establishing Blood Loss Thresholds Predictive of Transfusion at the Time of Delivery

Alesha M. White[1]; Kristina Fin[1]; Jessica E. Pruszynski[2]; R. Nicholas Burns[2]; Anne M. Ambia[2]; Brenda Anyaehie[1]; Elaine L. Duryea[1]
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[2]*University of Texas Southwestern, Dallas, TX*

4:00 PM - 6:00 PM

Objective: In 2014, the American College of Obstetricians and Gynecologists established a standardized definition of postpartum hemorrhage (PPH) to be blood loss greater than 1000mL from any form of delivery. Prior to this in 1965, Pritchard established the definition of normal blood loss for spontaneous vaginal deliveries (SVD) to be 500mL and for cesarean deliveries (CD) to be 1000mL. Our objective was to establish blood loss thresholds at the time of delivery as they relate to transfusion using quantitative blood loss (QBL).

Study Design: This is a prospective observational study conducted from November 2023 until March 2024 at a single institution that included all SVDs and CDs at which QBL was collected. QBL was calculated and recorded in the electronic medical record by the nursing team, but not reported to providers, who used estimated blood loss (EBL) and clinical indices to guide clinical care, per existing practices. Receiver operating characteristic (ROC) curves were generated based on the probability of transfusion.

Results: QBL data was available for 4,543 deliveries. 3,236 (71%) of total deliveries were via SVD and 1,234 (27%) of deliveries were via CD. Based on an ROC curve for SVDs, the optimal cut point for transfusion was determined to be 449.5mL. This represented a sensitivity of 71% and a specificity of 79% with an AUC of 0.81. Based on an ROC curve for CDs, the optimal cut point for transfusion was determined to be 1012.5mL. This represented a sensitivity of 61% with a specificity of 72% and an AUC of 0.7. The prevalence of transfusion at each respective cut point for type of delivery represented a 10.90% prevalence of transfusion for CDs and a 4.60% prevalence of transfusion for SVDs.

Conclusion: The QBL cut points associated with transfusion in this study are very similar to prior cut points determined to represent normal blood loss at delivery, which is known to differ by mode of delivery. Such that, not all deliveries should be classified as normal based on a 1000mL cut point alone and a heightened awareness should be present when QBL exceeds 500cc for SVD.

Figure. Probability of transfusion based on quantitative blood loss with corresponding ROC curve for spontaneous vaginal deliveries

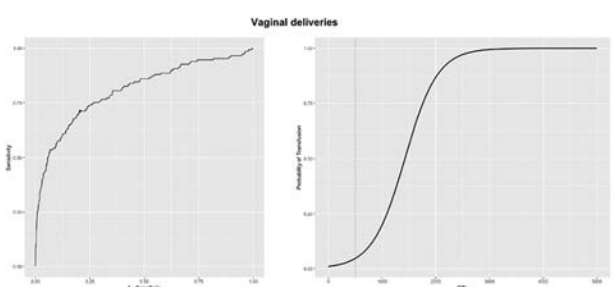
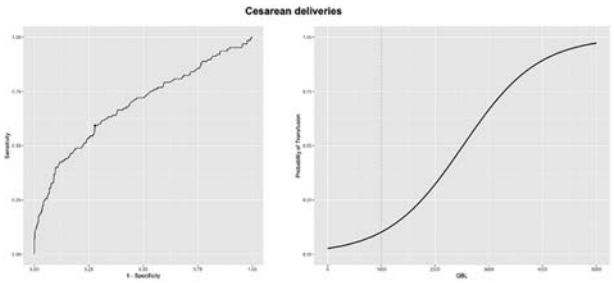


Figure. Probability of transfusion based on quantitative blood loss with corresponding ROC curve for cesarean deliveries



953 | Defining Postpartum Hemorrhage in Vaginal Deliveries Based on Quantitative Blood Loss

Alesha M. White[1]; Kristina Fin[1]; Jessica E. Pruszynski[2]; R. Nicholas Burns[2]; Anne M. Ambia[2]; Brenda Anyaehie[1]; Elaine L. Duryea[1]
[1]*University of Texas Southwestern Medical Center, Dallas, TX;*
[2]*University of Texas Southwestern, Dallas, TX*

4:00 PM - 6:00 PM

Objective: Postpartum hemorrhage (PPH) is a leading cause of maternal mortality across the world. In 2014, the American College of Obstetricians and Gynecologists (ACOG) defined PPH as blood loss ≥ 1000cc regardless of delivery mode. The objective of this study was to compare the sensitivity of various quantitative blood loss (QBL) thresholds for detection of need for transfusion for spontaneous vaginal deliveries (SVD), including maternal anemia status.

Study Design: This is a prospective observational study conducted at a single institution including all SVDs at which QBL was collected. QBL was calculated and recorded in the electronic medical record by the nursing team, but not reported to providers, who used estimated blood loss (EBL) and clinical indices to guide clinical care, per existing practices. Performance characteristics of QBL cut points of 500cc, 750cc, and 1000cc were examined, including examination according to maternal anemia at presentation for delivery antepartum, defined as a hematocrit < 33 based on current recommendations from ACOG.

Results: QBL was available for 3,250 SVDs between November 1st 2023 until March 31st 2024. The prevalence of transfusion for a QBL ≥1,000cc was 4.5%. A universal cut-point of 1,000cc demonstrated a 0.34 sensitivity for transfusion with a positive likelihood ratio (PLR) of 16.35. Maternal anemia was present at admission in 444 (14%) patients. The prevalence of transfusion for patients with and without anemia was 14.20% and 2.9% respectively. PLR reached 10 (a common threshold) at the 750cc cut point for patients with and without anemia, however the sensitivity of this cut point was lower for patients with anemia (0.41) compared to those without (0.6) (Table). A cut point of 500cc in patients with anemia achieved a sensitivity of 0.52.

Conclusion: Use of 1000cc as a definition of PPH for SVD results in a remarkably high PLR for transfusion while failing to detect the majority of patients requiring transfusion. Use of a cut point of 750cc for patients without anemia, and 500cc for patients with anemia is recommended.

Table. Performance characteristics of different cut points for quantitative blood loss as predictive for transfusion.

	Quantitative blood loss threshold								
	1000cc			750cc			500cc		
Hematocrit on arrival to L&D	All SVDs*	(<33)	(≥33)	All SVDs*	(<33)	(≥33)	All SVDs*	(<33)	(≥33)
Transfusion Rate	44%	81%	36%	29%	65%	23%	16%	42%	12%
Sensitivity	0.34	0.27	0.41	0.5	0.41	0.6	0.65	0.52	0.76
Specificity	0.98	0.99	0.98	0.94	0.96	0.94	0.84	0.88	0.83
Positive predictive value	0.44	0.81	0.35	0.3	0.65	0.23	0.16	0.42	0.12
Negative predictive value	0.97	0.89	0.98	0.976	0.91	0.99	0.98	0.92	0.99
Positive likelihood ratio	16.35	25.7	18.22	8.96	11.23	9.99	4.1	4.43	4.58
Negative likelihood ratio	0.67	0.74	0.6	0.53	0.61	0.43	0.41	0.54	0.29

L&D labor and delivery; *performance characteristics for each individual blood loss cut point for all vaginal deliveries regardless of hematocrit.

954 | Oxytocin Requirements Among Patients with a BMI Greater Than 30

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4:00 PM - 6:00 PM

Objective: Patients with obesity undergoing induction of labor (IOL) may require increased oxytocin (OT) administration when compared to normal weight patients. The OT product (mU/min x hours), defined by multiplying the maximum OT rate (mU/min) by the total OT duration (hours), is a labor variable that highly correlates with total OT dose received in labor. We aimed to determine the effect of increasing obesity on the OT product in obese patients undergoing IOL.

Study Design: Secondary analysis of a single center, double-blinded RCT between 6/2022 and 7/2023, which randomized near-term, singleton gestations with a BMI ≥ 30 kg/m^2 undergoing IOL, with a cervical dilation ≤ 3cm, to either 25mcg or 50mcg of vaginal misoprostol. For this analysis, patients were excluded if they did not receive OT during labor. We compared patients with a BMI of 30-39 kg/m^2 to those with a BMI ≥ 40 kg/m^2. The primary outcome was the overall OT product. Multivariable linear regression was used to adjust for randomization group, nulliparity, cervical ripening balloon use, and cervical dilation on admission.

Results: A total of 154 patients received OT with 109 (70.8%) in the BMI 30-39 group versus 45 (29.2%) in the BMI 40+ group. Baseline characteristics were similar. Following adjustment, an increased but non-significant OT product was seen in the BMI 40+ group (143.09 vs. 191.78 mU/min-hours; p = 0.19). Among only those who underwent vaginal delivery, a similar OT product was seen between groups (128.87 vs. 130.17 mU/min-hours; p = 0.96). Patients in the BMI 40+ group did have an increased overall time to delivery (20.38 hrs vs. 24.89 hrs; p = 0.03), increased risk for failed IOL (3.7% vs. 24.4%; p = 0.01), and an increased quantitative blood loss at delivery (345 mL vs. 450 mL; p = 0.04).

Conclusion: Patients in the BMI 40+ group had an increased but non-significant OT requirement when compared to the BMI 30-39 group. This OT difference was reduced when excluding patients who underwent cesarean. Increasing obesity was associated with an increased duration of labor, cesarean due to failed IOL, and increased blood loss at delivery.

Table 1. Demographics by body mass index (kg/m^2)

	BMI 30-39 (n=109)		BMI 40+ (n=45)		p-value
Nulliparous	67	61.5	31	68.9	0.38
Age (y), mean (SD)	27.37	7.50	28.40	6.49	0.42
Gestational age at induction (wk), mean (SD)	38.78	1.45	38.56	1.43	0.40
Dilation at induction, median (IQR)	1.00	0, 1	1.00	0, 1.5	0.97
Modified Bishop score at induction, median (IQR)	1.00	0, 2	1.00	0, 2	0.67
Intent for mechanical dilation	50	45.9	22	48.9	0.73
Randomization group					
25mcg vaginal misoprostol	28	50.9	32	45.7	0.53
50mcg vaginal misoprostol	27	49.1	38	54.3	
Race					
White	94	86.2	40	88.9	
Black	5	4.6	4	8.9	0.62
Asian	2	1.8	0	0	
Native American	1	0.9	0	0	
Not Documented	7	6.4	1	2.2	
Ethnicity					
Hispanic	88	80.7	26	57.8	**<0.01**
Non-Hispanic	20	18.3	18	40.0	
Not Documented	1	0.9	1	2.2	
Group B Colonization (+)	27	24.8	16	35.6	0.39

BMI, Body Mass Index; y, years; wk, weeks; SD, Standard Deviation; IQR, Interquartile Range

Data presented as number (percentage) unless otherwise specified.

Table 2. Primary Outcome and Intrapartum Outcomes

	BMI 30-39 (n=109)		BMI 40+ (n=45)		P
OT Product (mU/min-hours), mean (SD) [a]	143.09	19.64	191.78	30.92	0.19
OT Product among SVD only (mU/min-hours), mean (SD) [b]	128.87	18.84	130.17	34.05	0.96
Time to Delivery (h), mean (SD)	20.38	9.31	24.89	11.82	**0.03**
Time to Vaginal Delivery (h), mean (SD)	19.06	8.78	21.00	12.71	0.38
Time to Active Labor (h), mean (SD)	16.43	7.76	18.38	11.64	0.46
Indication for Cesarean					
Failed induction of labor (< 6 cm)	4	3.7	11	24.4	
Arrest of dilation (≥ 6 cm)	4	3.7	2	4.4	
Non-reassuring fetal heart tracing	11	10.1	1	2.2	**<0.01**
Arrest of descent	3	2.8	3	6.7	
Other	2	1.8	0	0.0	
pRBC Transfusion	2	1.8	3	6.7	0.15
Sepsis	1	0.9	0	0.0	>0.99
Clinical Endometritis	4	3.7	1	2.2	0.65
Wound Complications	1	0.9	0	0.0	>0.99
Intraperitoneal Hematoma	1	0.9	0	0.0	>0.99
Maternal ICU Admission	1	0.9	0	0.0	>0.99
QBL at 24 hrs (mL), median (IQR)	345	175, 576	450	270, 750	**0.04**
Postpartum Hemorrhage	21	19.3	5	11.1	0.25
Maternal Hospital LOS (d), median (IQR)	3.00	3, 4	3.00	3, 5	0.06

[a] *Model adjusted for randomization group, nulliparity, cervical ripening ballon use, and cervical dilation on admission*

[b] *Model excludes those who underwent cesarean, similar adjustments made as described above*

SVD, spontaneous vaginal delivery; SD, standard deviation; pRBC, Packed Red Blood Cell; QBL, Quantitative Blood Loss; LOS, Length of Stay; IQR, interquartile range

Data presented as number (percentage) unless otherwise specified.

955 | Misoprostol Dose Requirements Among Patients with a BMI Greater Than 30

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4:00 PM - 6:00 PM

Objective: Compared to normal weight persons, patients with obesity experience fewer uterine contractions after administration of vaginal misoprostol (VM). Therefore, patients with obesity may require higher doses of VM for induction of labor (IOL). We aimed to determine the effect of increasing obesity on the total VM dose requirement in obese patients undergoing IOL.

Study Design: Secondary analysis of a single center, double-blinded RCT between 6/2022 and 7/2023, which randomized near-term, singleton gestations with a BMI ≥ 30 kg/m^2 undergoing IOL, with a cervical dilation ≤ 3cm, to either 25mcg or 50mcg of VM. For this analysis, we included all patients from the primary study. We compared patients with a BMI of 30-34.9 kg/m^2 to those with a BMI ≥ 35 kg/m^2. The primary outcome was the overall misoprostol dose required during IOL. Multivariable linear regression was used to adjust for randomization group, nulliparity, cervical ripening balloon use, and cervical dilation on admission.

Results: A total of 179 patients were enrolled with 74 (41.3%) in the BMI 30-34.9 group versus 105 (58.7%) in the BMI 35+ group. Baseline characteristics were similar between groups with the majority of patients having an unfavorable cervical exam upon initiation of IOL. Following adjustment, patients in the BMI 35+ group required an increased overall misoprostol dose requirement during IOL (55.0 mcg vs. 66.2 mcg; P = 0.02). While cesarean delivery did not differ between BMI groups, the indication for cesarean was significantly different between groups, with more patients in the BMI 35+ group being diagnosed with failed IOL (4.1% vs. 12.4%; P = 0.04). No other differences in maternal/neonatal outcomes were seen.

Conclusion: In patients undergoing IOL, increasing obesity (BMI ≥ 35 kg/m^2) was associated with an increased overall misoprostol dose requirement as well as an increased risk for cesarean due to failed IOL. These findings highlight the potential pharmacokinetic differences with increasing obesity and vaginal misoprostol which may impact overall IOL efficacy.

Table 1. Demographics by body mass index (kg/m^2)

	BMI 30-34.9 (n=74)		BMI 35+ (n=105)		p-value
Nulliparous	44	59.5	62	59.0	0.96
Age (y), mean (SD)	27.99	6.64	28.12	7.47	0.90
Gestational age at induction (wk), mean (SD)	38.82	1.35	38.71	1.46	0.62
Dilation at induction, median (IQR)	1.00	0, 1	1.00	0, 1	0.83
Modified Bishop score at induction, median (IQR)	2.00	0, 2	1.00	0, 2	0.42
Intent for mechanical dilation	35	47.3	48	45.7	0.83
Randomization group					0.62
25mcg vaginal misoprostol	38	51.4	50	47.6	
50mcg vaginal misoprostol	36	48.6	55	52.4	
Race					0.11
White	65	87.8	91	86.7	
Black	7	9.5	5	4.8	
Asian	0	0.0	2	1.9	
Native American	1	1.4	0	0.0	
Not Documented	1	1.4	7	6.7	
Ethnicity					0.36
Hispanic	57	77.0	72	68.6	
Non-Hispanic	17	23.0	31	29.5	
Not Documented	0	0.0	2	1.9	
Group B Colonization (+)	19	25.7	28	26.7	0.94

BMI, Body Mass Index; y, years; wk, weeks; SD, Standard Deviation; IQR, Interquartile Range

Data presented as number (percentage) unless otherwise specified.

Table 2. Primary Outcome and Intrapartum Outcomes

	BMI 30-34.9 (n=74)		BMI 35+ (n=105)		p-value
Overall misoprostol dose (mcg), mean (SD) [a]	55.0	28.2	66.2	44.0	**0.02**
Cesarean Delivery	18	24.3	31	29.5	0.67
Time to Delivery (h), mean (SD)	18.3	10.24	21.29	10.73	0.31
Time to Vaginal Delivery (h), mean (SD)	17.05	9.90	18.86	10.09	0.22
Time to Active Labor (h), mean (SD)	14.49	8.62	16.31	9.11	0.17
Indication for Cesarean					**0.04**
Failed induction of labor (< 6 cm)	3	4.1	13	12.4	
Arrest of dilation (≥ 6 cm)	2	2.7	5	4.8	
Non-reassuring fetal heart tracing	10	13.5	8	7.6	
Arrest of descent	1	1.4	5	4.8	
Other	2	2.7	0	0.0	
pRBC Transfusion	2	2.7	3	2.9	>0.99
Sepsis	0	0.0	1	1.0	>0.99
Clinical Endometritis	3	4.1	2	1.9	0.65
Wound Complications	0	0.0	1	1.0	>0.99
Intraperitoneal Hematoma	1	1.4	0	0.0	0.41
Maternal ICU Admission	1	1.4	0	0.0	0.41
QBL at 24 hrs (mL), median (IQR)	377.5	175, 665	353.0	205, 700	0.63
Postpartum Hemorrhage	12	16.2	17	16.2	>0.99
Maternal Hospital LOS (d), median (IQR)	3	2, 4	3	3, 4	0.31

[a] Model adjusted for randomization group, nulliparity, cervical ripening ballon use, and cervical dilation on admission

BMI, Body Mass Index; mcg, micrograms; SD, Standard Deviation; h, hours; pRBC, packed Red Blood Cell; mL, milliliters; QBL, Quantitative Blood Loss; LOS, Length of Stay; d, days; IQR, interquartile range

Data presented as number (percentage) unless otherwise specified.

956 | Does Increased Antenatal Depression Screening Impact Postpartum Depression Scale Scores?

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4:00 PM - 6:00 PM

Objective: With mental health disorders a leading cause of maternal mortality, perinatal mental health screening and care is a strategy for prevention. The use of a validated screening tool, including the Edinburgh Postnatal Depression Scale (EPDS) has been recommended, but the optimal timing for screening and the impact of repeated screening has yet to be established. This study aimed to assess whether prenatal screening and identification of depression impacted postpartum EPDS scores.

Study Design: In this retrospective single site study, pregnant persons who enrolled in prenatal care prior to 20w gestation and

delivered at the same institution from 2018-2024 were included (N = 6,735). EPDS screening was performed at postpartum visits only until 2023 when EPDS was given at entry to care, during the third trimester, while inpatient postpartum and at postpartum visits. A score of >12 was considered positive for depression. Prenatal screening, socio-demographic profiles, and PPD prevalence were analyzed pre/post implementation using t-tests, chi-square tests, and multiple variable logistic regression.

Results: Overall, 57.8% of patients delivered prior to the expanded EPDS implementation. The mean age at delivery was 28.5±6.0 years, 46.6% identified as White, 39.6% as Black, and 18.2% were Hispanic. Prior to implementation, 12.7% of all patients had a high postpartum EPDS score compared to 7.4% after (p< 0.001). Adjusting for demographic factors, patients who delivered after the implementation were less likely to have a high postpartum EPDS score (OR: 0.21, 95%CI: 0.19-0.24, p-value< 0.001). This association remained after accounting for additional screening (OR: 0.29, 95%CI: 0.26-0.33, p-value< 0.001).

Conclusion: Serial antenatal depression screening was associated with lower postpartum EPDS scores. Future investigation will examine the relationship between pre-existing mental health disease, prenatal identification, and referral on postpartum depression screening patterns.

957 | The Impact of the SCOTUS Dobbs Decision on Adolescent Postpartum Contraceptive Method Selection

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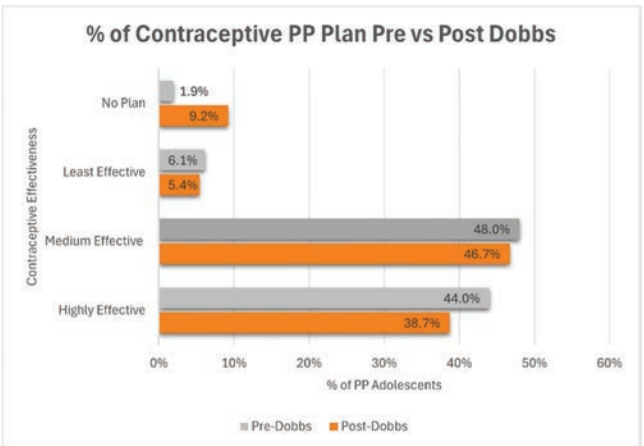
4:00 PM - 6:00 PM

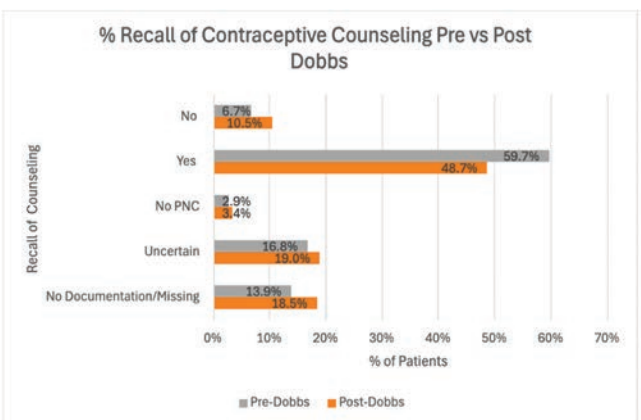
Objective: To investigate the potential impact of the SCOTUS Dobbs Decision on postpartum adolescent contraceptive method selection immediately postpartum in a state with high teen birth rates.

Study Design: This retrospective cohort study used electronic health delivery records two years before (May 2020-April 2022) and after (May 2022-April 2024) the Dobbs Decision leak. Patients < 20 years old were analyzed and those with no documented contraceptive preference were excluded. Contraceptive methods were categorized based on the American College of Obstetricians and Gynecologists efficacy categories: highly effective (implant, IUD, sterilization), medium effective (injection, pill, patch, ring), least effective (condom, fertility awareness-based methods), and no plan/abstinence. Pearson Chi-square tests were performed in SPSS to compare contraceptive methods, recall of prenatal contraceptive counseling, and other demographic characteristics including residence categorized by March of Dimes maternity care access level, race and ethnicity, and insurance status.

Results: Analysis included 786 adolescent births (47.7% pre-Dobbs; 52.3% post-Dobbs). After the Dobbs decision, a higher percentage of postpartum adolescents opted for no contraceptive method (1.9%, 9.2%), while fewer adolescents opted for the highly effective contraception (44.0%, 38.7%), (p< 0.001). Additionally, recall of contraceptive counseling decreased post-Dobbs (59.7% to 48.7%, p = .027). Demographics considered, including maternity care access level, were not significantly different between contraceptive method efficacy categories.

Conclusion: Postpartum adolescents showed a greater tendency to select no contraception post-Dobbs. The decreased recollection of prenatal contraceptive counseling may contribute to that finding. Greater effort is needed to ensure prenatal contraceptive counseling and access to all methods immediately postpartum as this may decrease repeat teen pregnancy.





958 | Maternal Anxiety Moderates the Effect of Exogenous Oxytocin on the HPA axis

Alison M. Stuebe[1]; Katharine Bruce[1]; Anna E. Bauer[1]; Samantha Meltzer-Brody[1]; Nisha O'Shea[2]
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4:00 PM - 6:00 PM

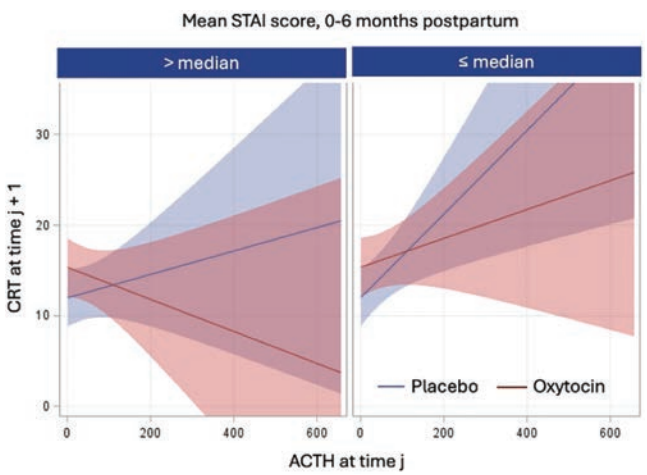
Objective: Oxytocin (OT) has multiple behavioral effects. We sought to quantify the effect of inhaled OT on the HPA axis response to stress among mothers of school-age children.

Study Design: We conducted a double-blind randomized controlled trial of nasal OT embedded within the Mood, Mother, and Infant Study, a longitudinal observational cohort recruited in the 3rd trimester of pregnancy. In the first postpartum year, participants completed periodic assessments, including the Edinburgh Postnatal Depression Scale (EPDS), Spielberger State-Trait Anxiety Inventory (STAI), and Beck Depression Inventory

(BDI-II). At about 6 years postpartum, participants were randomized to 24 IU of nasal OT or placebo, followed by the Trier Social Stress Test (TSST), which is comprised of a speech task and a math task. The TSST reliably induces large and consistent HPA responses. We quantified the extent to which postpartum depression and anxiety symptoms above vs. below the median modified the effect of OT on the lagged association between ACTH and CRT. Mixed effects models were used for repeated measures analysis with $\alpha = .05$.

Results: Of 222 individuals in the parent study, 105 completed the RCT, and measures of ACTH and lagged CRT were available for 85. COVID interrupted data collection, and there were no significant differences between completers and non-completers. In unstratified analysis, we found that OT vs. placebo did not modify the association between ACTH and lagged CRT ($p = 0.21$). We found an interaction between mean STAI (baseline- 6 months postpartum) and ACTH ($p = 0.03$, Figure 1), and between trait anxiety at 12 months and ACTH ($p = 0.04$). The EPDS-ACTH interaction was not significant ($p = 0.06$). We found no effect modification by BDI-II ($p = 0.79$).

Conclusion: Symptoms of postpartum anxiety, but not depression, were associated with modification of the effect of oxytocin on the HPA axis during a standardized social stressor. These findings suggest that dysregulation of oxytocin effects on the HPA axis may contribute to perinatal anxiety symptoms.



959 | Optimizing Postpartum Care in Pregestational Diabetes: Impact of a Comorbidity Index on Follow-Up and Outcomes

ALISSA PRIOR[1]; Lea Almahameed[2]; Megan Weatherborn[3]; Christopher Nau[4]

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4:00 PM - 6:00 PM

Objective: Coordination of postpartum care for patients with pregestational diabetes mellitus (PDM), including timely diabetes follow-up, is imperative for their long-term health. At our institution, only 21% of patients have a postpartum diabetic care visit in the first 6 months postpartum. A maternal comorbidity index (CMI), a published score to summarize the severity of maternal illness, is a tool to identify high risk pregnant parturients (Table 1). In a cohort of patients with PDM, our objective was to compare a patient's CMI and postpartum outcomes. We predict a higher CMI would be associated with suboptimal glycemic control and follow up.

Study Design: This is a retrospective cohort study at a single urban hospital of patients with PDM who attended the center's diabetes in pregnancy clinic from 2009-2018. Patients who delivered at an outside institution were excluded. Our independent variable was the CMI, dichotomized into low (score 1-4) vs high (score ≥5) groups. The primary outcome was attendance of a diabetes care visit, with Primary Care or Endocrinology, in the 1st year postpartum. Secondary outcomes included postpartum HbA1c, contraception, breastfeeding, and a short-interval pregnancy. Outcome data was analyzed with Fisher's exact, Wilcoxon rank sum, and Pearson's Chi-squared tests.

Results: There were 469 patients included; CMI scores ranged from 1-12 with 346 and 123 patients in the low and high groups, respectively. Baseline demographics, diabetes severity and type, and pregnancy outcomes were similar between groups. Attendance rates of a diabetes care visit were similar, with 51% in the low and 52% in the high CMI group (p >0.9). HbA1c median values were 7.30 in the low vs 7.85 in the high CMI group (p = 0.2). All other study outcomes were similar between groups (Table 2).

Conclusion: Maternal CMI was not associated with differing rates of HbA1c or follow up in patients with PDM up to 12 months postpartum. Only 50% of patients had a diabetes visit in the 1st year postpartum. Further research is needed to identify patients at highest risk of poor follow up.

Table 1. Maternal Comorbidity Index, score (0-46) to summarize the severity of maternal illness in pregnant and postpartum patients.

Condition	Weights
Severe preeclampsia/eclampsia	5
Chronic congestive heart failure	5
Congenital heart disease	4
Pulmonary hypertension	4
Chronic ischemic heart disease	3
Sickle cell disease	3
Multiple gestation	2
Cardiac valvular disease	2
Systemic lupus erythematosus	2
Human immunodeficiency virus	2
Mild or unspecified preeclampsia*	2
Drug abuse	2
Placenta previa	2
Chronic renal disease	1
Pre-existing hypertension	1
Previous cesarean delivery	1
Gestational hypertension†	1
Alcohol abuse	1
Asthma	1
Pre-existing diabetes mellitus	1
Maternal age, years	
>44	3
40–44	2
35–39	1
Total:	0-46

Bateman BT, Mhyre JM, Hernandez-Diaz S, et al. Development of a comorbidity index for use in obstetric patients. *Obstet Gynecol*. 2013;122(5):957-965.

Table 2. Study outcomes by low comorbidity index (score 0-4) vs high comorbidity index (score ≥5)

	low CMI, (n = 346)	high CMI (n = 123)	p-value
A1c in 1st year postpartum	7.30 [6.20,10.20]	7.85 [6.93, 10.13]	0.2
Diabetes visit attendance in 1st year	178 (51%)	64 (52%)	>0.9
A1c in 1st year postpartum	7.30 [6.20,10.20]	7.85 [6.93, 10.13]	0.2
Number of diabetes visits	2.00 [1.00, 3.00]	2.00 [1.00, 4.00]	0.082
Insulin at postpartum visit	104 (30%)	42 (34%)	0.4
Breastfeeding at discharge	228 (68%)	71 (60%)	0.10
Breastfeeding at postpartum visit	97 (41%)	28 (34%)	0.2
Contraception at discharge visit	175 (51%)	72 (59%)	0.13
Contraception at postpartum visit	205 (59%)	74 (60%)	0.9
Short interval pregnancy	38 (11%)	11 (9.1%)	0.5

Data are median [interquartile range] or n (%) unless otherwise specified

960 | How Pregnancy Impacts health-Related Quality of Life: Qualitative Study in Five African and Asian Countries

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4:00 PM - 6:00 PM

Objective: To examine how pregnancy-related physical, emotional, social, and financial challenges are conceptualized, discussed, and experienced by pregnant women in six demographic and health surveillance study areas in Africa and Asia and how these challenges impact health and wellbeing during pregnancy.

Study Design: Thirteen focus groups discussions (FGDs) were conducted, with a total of 120 pregnant women in Ghana (2 FGDs, n = 22), Kenya (2 FGDs, n = 20), Zambia (3 FGDs, n = 23), India (4 FGDs, n = 34), and Pakistan (2 FGDs, n = 21) using a semi-structured guide. FGDs were transcribed verbatim in the local language and translated into English. A subset of translated transcripts from each site was coded independently by two coders (one from the country of collection) to develop six preliminary site-specific codebooks, which informed the development of two regional codebooks. All translated transcripts were coded independently by two coordinating site coders using Dedoose; themes and subthemes were identified using thematic analysis and discussed with local site teams, after which refinements were made and representative quotations were selected.

Results: Three overarching themes were identified: 1) Pregnancy symptoms pose a barrier to daily life; 2) Lack of social support exacerbates physical and emotional challenges during pregnancy; and 3) Social support alleviates physical, emotional, and financial challenges of pregnancy. One additional minor theme was that support from the healthcare system impacts health and wellbeing.

Conclusion: These findings demonstrate that pregnant women experience a variety of health and wellbeing challenges during pregnancy, which are exacerbated when social support is not available and alleviated in the context of help from family and community. Additional physical, emotional, and family and community support during pregnancy is needed to alleviate the plethora of complex and multifaceted challenges women face during pregnancy and improve their physical and mental health and overall quality of life.

961 | Risk of Severe Maternal Morbidity and Mortality in Relation to ARRIVE Trial

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4:00 PM - 6:00 PM

Objective: Since the 2018 ARRIVE (A Randomized Trial of Induction versus Expectant Management) trial, the rate of elective 39-week induction has increased. However, the population impact of this trial on obstetric and maternal outcomes is unknown. This study aims to evaluate trends in severe maternal morbidity (SMM) and obstetrical outcomes among low-risk term patients following the ARRIVE trial.

Study Design: This study is a population-based, retrospective cohort analysis of U.S. delivery hospitalizations, utilizing data from the National Inpatient Sample database. Deliveries were identified using ICD-10 codes and categorized into two epochs: Epoch 1, Pre-ARRIVE (2015 Q4 to 2018 Q2), and Epoch 2, Post-ARRIVE (2019 Q2 to 2021 Q4), with the dissemination phase 2018 Q3 to 2019 Q1. Patients with medical indications for induction, outlined by the ARRIVE trial, were excluded. SMM was defined according to the CDC with related subgroups. The primary outcome was the difference in risks (aRR, 95% CI) of SMM and obstetrical outcomes as estimated by multivariate logistic regression analyses.

Results: Among 8,404,920 deliveries, the rate of 39-week delivery increased from 52.4% to 57.7% (P< 0.001) among low-risk patients. The rate of SMM increased (0.31 vs 0.38%, p< 0.001), while cesarean delivery decreased (14.0 vs 13.8%, p = 0.0422) between Epoch 1 and 2. Risk of SMM increased (aRR 1.20, CI 1.12-1.28), as did SMM subgroups including acute renal failure, respiratory SMM, sepsis, shock, and hemorrhagic SMM (Fig. 1). Eclampsia rates decreased (aRR 0.59, CI 0.49-0.72), despite an increase in pregnancy-associated hypertension. There were also reductions in cesarean delivery (aRR 0.97, CI 0.95-0.98), obstetric anal sphincter injury (aRR 0.96, CI 0.94-0.98), and hospital length of stay exceeding the 95th% (aRR 0.91, CI 0.87-0.95) (Fig 2).

Conclusion: Following the ARRIVE trial, there has been an increase in SMM and pregnancy-related hypertension. However, there has been a decrease in the rates of eclampsia, OASIS, and cesarean sections, suggesting a complex potential impact of the ARRIVE trial on outcomes in low-risk patients.

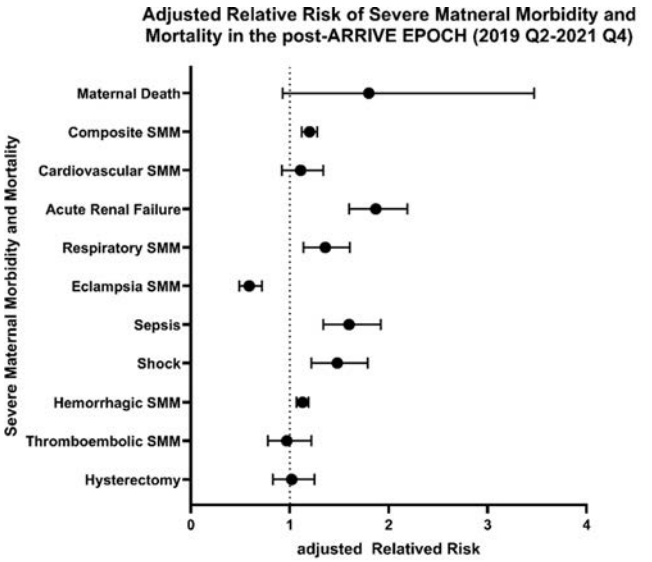

Figure 1: Adjusted relative risk of severe maternal morbidity (SMM) and mortality in the post-ARRIVE trial epoch (2019 Q2 to 2021 Q4) compared to pre-ARRIVE epoch (2015 Q4 to 2018 Q2; dotted line). Composite SMM indicates any event falling within the following categories (excluding blood transfusion): Cardiac SMM: (acute myocardial infarction, aneurysm, cardiac arrest or ventricular fibrillation, conversion of cardiac rhythm, heart failure or arrest during surgery, puerperal cardiovascular disorders, pulmonary edema or acute heart failure), acute renal failure, respiratory SMM (adult respiratory distress syndrome, temporary tracheostomy, ventilation, severe anesthesia complications), eclampsia, sepsis, shock, hemorrhagic SMM (blood transfusion, disseminated intravascular coagulation), thromboembolic SMM (air and thrombotic embolism, sickle cell disease with crisis, amniotic fluid embolism), and hysterectomy. Error bars represent 95% confidence intervals.

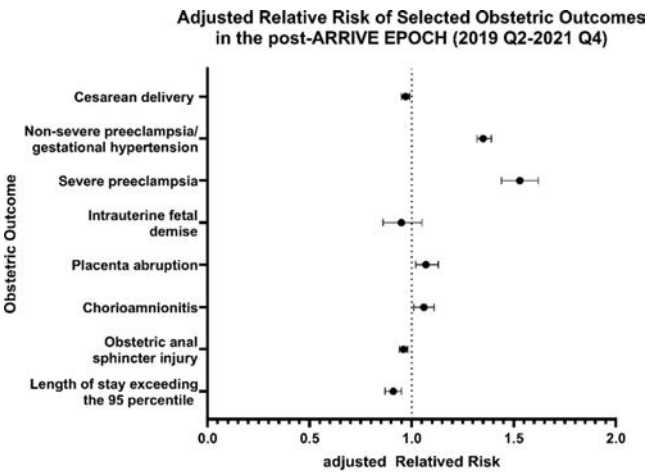

Figure 2: Adjusted relative risk of selected obstetrical outcomes in the post-ARRIVE trial epoch (2019 Q2 to 2021 Q4) compared to pre-ARRIVE epoch (2015 Q4 to 2018 Q2; dotted line). Erros bars represent 95% confidence intervals.

962 | Impact of Emergency Room Abortion Bans on Pregnancies with Previable PPROM: A Cost-Effectiveness Analysis

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4:00 PM - 6:00 PM

Objective: Preterm premature rupture of membranes (PPROM) is a serious condition that affects 0.4-0.7% of all pregnancies. Pregnancies with PPROM are associated with increased neonatal morbidity and mortality. Additionally, children surviving PPROM have higher rates of physical disability and neurode-

velopmental delay. Under the Emergency Medical Treatment and Labor Act (EMTALA), any patient who presents with an emergency medical condition must be appropriately screened and stabilized, including instances in which treatment entails stabilization through emergency abortion. This analysis evaluated the cost-effectiveness of emergency abortions for previable PPROM between 18-22 weeks.

Study Design: In this analysis, a TreeAge model was created to compare outcomes in previable PPROM patients with emergency abortion available to those who do not have access to emergency abortion under EMTALA. The cohort consisted of 1,183 individuals, the estimated number of pregnant people with previable PPROM seeking abortion. Clinical outcomes measured in the model included chorioamnionitis, maternal sepsis, maternal death, stillbirth, neonatal death, and neurodevelopmental delay. Probabilities, utilities and costs were derived from literature. QALYs were discounted at a rate of 3%.

Results: In this theoretical cohort, abortion access under EMTALA was associated with a decrease of 12 cases of maternal sepsis, 1 case of maternal death, 621 cases of stillbirth, 125 cases of neonatal death, and 95 cases of neurodevelopmental delay. Emergency abortion availability was the dominant strategy as it saved $97,131,562 and led to 1,952 additional QALYs.

Conclusion: Restrictive abortion bans that bar emergency abortion as care to treat previable PPROM results in increased maternal morbidity and mortality, as well as increased costs and decreased quality of life.

Table 1. Outcomes in a theoretical cohort of 1,183 pregnancies with PPROM at 18-22 weeks desiring abortion

	Abortion available	Abortion unavailable	Difference (Treatment-No Treatment)
Maternal Chorioamnionitis	0	87	-87
Maternal Sepsis	0	12	-12
Maternal Death	0	1	-1
Stillbirth	0	621	-621
Neonatal Death	0	125	-125
Neurodevelopmental Delay	0	95	-95
Cost ($)	1,661,752	98,793,314	-97,131,562
Effectiveness (QALYs)	31,846	29,894	1,952
Strategy	Dominant	Dominated	

963 | Risk Factors Associated with Antiseizure Medication Discontinuation During Pregnancy

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4:00 PM - 6:00 PM

Objective: Evaluate factors associated with discontinuation of antiseizure medication (ASM) by the first trimester of pregnancy.

Study Design: We constructed a retrospective cohort of births (2007-2019) among Tennessee Medicaid pregnant patients with enrollment from 90 days before conception through delivery. Data included healthcare claims, prescription fills, hospital discharge and birth certificates. We included births ≥ 20 weeks' gestation among patients aged 15-44 years on ASM monotherapy. Among patients with filled prescriptions for ASMs before conception or in the first trimester, we defined discontinuers as those with no ASM prescription filled after the first trimester, and continuous users as those who filled prescriptions after the first trimester. We used logistic regression to model the association between clinical factors and ASM discontinuation overall and among patients with an epilepsy diagnosis, adjusting for relevant confounders.

Results: Of 5279 pregnant patients with ASM exposure before conception or in the first trimester, 54% discontinued by the first trimester (Table 1). Factors associated with ASM discontinuation included the absence of an epilepsy diagnosis, the presence of a psychiatric or other diagnosis, younger age, nulliparity, earlier study delivery year, living in a rural area, and use of older ASM class (Table 2). While 26% of pregnant patients with ASM use had an epilepsy diagnosis, 35% had no diagnosis traditionally associated with ASM use. Among patients with epilepsy, 29% discontinued ASMs by the first trimester. In this group, older ASM class and earlier study delivery year were associated with higher odds of discontinuation. Non-Hispanic Black individuals had lower odds of discontinuation than non-Hispanic White individuals (Table 2).

Conclusion: For patients with indications for ASM use, national guidelines recommend continuing most ASMs during pregnancy or discontinuing with clinician guidance. The majority of pregnant patients in our cohort, including those with epilepsy, discontinued use around pregnancy diagnosis.

Table 1. Demographic and clinical factors of continuous users versus discontinuers of antiseizure medications on monotherapy during pregnancy (N= 5,279)

Clinical Factors	Continuous users (N=2,403)	Discontinuers (N=2,876)	p-value
Age at delivery	26 (22-30)	24 (21-29)	< 0.01
Body mass index (kg/m^2)	26 (22-31)	26 (22-33)	<0.01
Missing	72 (3%)	84 (3%)	
Race and ethnicity			0.01
Non-Hispanic White	1804 (75%)	2260 (79%)	
Non-Hispanic Black	502 (21%)	516 (18%)	
Hispanic	54 (2%)	65 (2%)	
Other	43 (2%)	35 (1%)	
Parity			<0.01
Nulliparous	516 (21%)	757 (26%)	
1 prior pregnancy	776 (32%)	954 (33%)	
2 prior pregnancies	553 (23%)	591 (21%)	
≥3 or more prior pregnancies	558 (23%)	574 (20%)	
Missing	33 (1%)	43 (1%)	
Non-English speaking	49 (2%)	43 (1%)	0.14
Rural[1] residency	1269 (53%)	1670 (58%)	<0.01
Missing	18 (1%)	18 (1%)	
Year of delivery	2014 (2011-2017)	2013 (2010-2016)	< 0.01
Gestational age at delivery	39 (38-40)	39 (38-40)	0.14
ASM-associated diagnosis[2]			< 0.01
Epilepsy alone	624 (26%)	242 (8%)	
Psychiatric alone	499 (21%)	801 (28%)	
Other alone	21 (1%)	45 (2%)	
Multiple	376 (16%)	170 (6%)	
None	842 (35%)	1551 (54%)	
Diabetes or chronic hypertension	39% (935)	38% (1,047)	0.71
ASM class[3]			
Older generation	240 (10%)	360 (13%)	<0.01
Newer generation	2163 (90%)	2516 (87%)	
Timing of ASM discontinuation[4]			
Preconception	-	1020 (35%)	
First trimester	-	1856 (65%)	
Second or delivery day	640 (27%)	-	
Third trimester or delivery day	738 (31%)	-	
Postpartum period	1025 (42%)	-	

All data presented as n (%) or median (interquartile range).
Abbreviations: ASM: antiseizure medication
[1]Rurality defined by the 2013 NCHS Urban-Rural Classification Scheme for Counties
[2]ASM-associated diagnosis categories: Psychiatric diagnosis: mood disorder, depression, anxiety, or schizophrenia | Other diagnosis: trigeminal neuralgia and migraines | Multiple diagnoses: epilepsy with a psychiatric and/or other diagnosis present
[3]ASM class: Newer ASM (levetiracetam, lamotrigine, oxcarbazepine, zonisamide) | Older ASM (carbamazepine, phenytoin, and valproic acid)
[4]Timing of ASM discontinuation: defined as the last day covered by an ASM in the study period based on the last filled prescription's days supply

Table 2: Association between clinical factors and antiseizure medication discontinuation among all patients and those with an epilepsy diagnosis

Clinical Factors	Odds Ratio (95% Confidence Interval)	
	Full Cohort N=5243[1]	Epilepsy diagnosis N=1402[2]
Epilepsy diagnosis	0.21 (0.18, 0.24)	Reference
Psychiatric diagnosis[3]	4.82 (3.97, 5.85)	-
Other ASM associated diagnosis[4]	5.52 (3.15, 9.68)	-
Multiple ASM associated diagnoses	1.28 (1.00, 1.62)	1.27 (0.99, 1.63)
No ASM associated diagnosis	5.36 (4.48, 6.42)	-
Age at delivery	0.97 (0.96, 0.99)	0.98 (0.95, 1.01)
Race or ethnicity, self-identified		
Non-Hispanic White	Reference	Reference
Non-Hispanic Black	1.00 (0.86, 1.17)	0.67 (0.49, 0.92)
Hispanic	0.94 (0.62, 1.42)	1.98 (0.89, 4.42)
Other/Unknown	0.60 (0.32, 1.14)	0.39 (0.08, 1.84)
Parity		
Nulliparous	Reference	Reference
1 prior birth	0.92 (0.78, 1.11)	1.13 (0.82, 1.56)
2 prior pregnancies	0.80 (0.66, 0.97)	1.34 (0.92, 1.95)
≥3 or more prior pregnancies	0.79 (0.64, 0.98)	1.18 (0.77, 1.82)
Year of delivery	0.97 (0.95, 0.98)	0.96 (0.93, 0.99)
Rural[5] residency	1.19 (1.05, 1.34)	0.93 (0.72, 1.20)
Older generation ASM[6]	1.80 (1.47, 2.21)	2.42 (1.79, 3.27)

[1]Patients with any filled ASM prescription from 90 days prior to conception through delivery (<1% missing data)
[2]Patients with epilepsy diagnosis (ICD9, ICD10; <1% missing data)
[3]Mood disorder (ICD9, ICD10), depression (ICD9, ICD10), anxiety (ICD9, ICD10), or schizophrenia (ICD9, ICD10)
[4]Trigeminal neuralgia (ICD9, ICD10), migraines (ICD9, ICD10)
[5]Rurality defined by the 2013 NCHS Urban-Rural Classification Scheme for Counties
[6]Older ASM: carbamazepine, phenytoin, and valproic acid

964 | Changes in Antiseizure Medication use and Discontinuation During Pregnancy

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4:00 PM - 6:00 PM

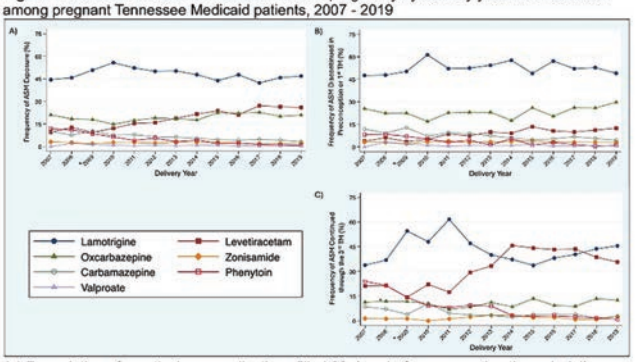
Objective: To evaluate trends in antiseizure medication (ASM) use and discontinuation in pregnancy, by delivery year and medication.

Study Design: We constructed a retrospective cohort of births from 2007 to 2019 among pregnant patients enrolled in Tennessee Medicaid with continuous enrollment from 90 days before pregnancy through delivery. Enrollment files were linked to healthcare encounters, prescription fills, hospital discharges, and birth certificate data. We included births ≥ 20 weeks gestation among patients aged 15 to 44 years with any ASM exposure, defined as ≥ 1 prescription fill for a single ASM (monotherapy) between the 90 days before conception through delivery. We evaluate trends in ASM use, including newer (levetiracetam, lamotrigine, oxcarbazepine, zonisamide) and older (carbamazepine, phenytoin, and valproate) ASM class. We further classified our cohort into two subgroups: 1) ASM exposure only from 90 days before conception through the first trimester (discontinued use) and 2) ASM exposure initiated by the first trimester with continued use through the third trimester or delivery (continued use during pregnancy).

Results: Among 5,278 pregnant patients exposed to ASM monotherapy, lamotrigine was consistently the most used ASM overall, while levetiracetam use increased over the study period (all users, Figure 1A). Lamotrigine was also the most commonly used medication among subgroup 1 (Figure 1B). By 2013, levetiracetam use increased and remained similar to lamotrigine use among subgroup 2 (Figure 1C). Use of all older ASMs decreased over the study period. Valproate exposure was rare (< 1%) and no valproate use was found in subgroup 2.

Conclusion: Starting in 2009, national guidelines recommended continuing most ASMs during pregnancy or discontinuing with clinician guidance based on ASM class, specifically use of valproate, phenytoin, and polytherapy with valproate in pregnancy. This study highlights how practice patterns are slowly changing to reflect the predominance of newer ASM use, but that early pregnancy discontinuation remains common.

Figure 1. Trends in antiseizure medication use in pregnancy by delivery year and medication among pregnant Tennessee Medicaid patients, 2007 - 2019



A) Prescriptions for antiseizure medications filled 90 days before conception through delivery, from 2007-2019 (all users, N=5,278)
B) Filled prescriptions for antiseizure medications with discontinued use before conception or in the first trimester, from 2007-2019 (subgroup 1: N=2,876)
C) Filled prescriptions for antiseizure medications with continued use through the third trimester of pregnancy, from 2007-2019 (subgroup 2: N= 1,220)
Abbreviations: ASM: antiseizure medications; TM: Trimester
*American Academy of Neurology (AAN) and American Epilepsy Society (AES) guidelines published in 2009 recommending against the use of valproate, phenytoin, and phenobarbital monotherapy, or any polytherapy with valproate during pregnancy.

965 | The Effect of Antibiotic Treatment in Late Preterm Premature Rupture of Membranes on pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: To Compare pregnancy outcomes in women with late preterm premature rupture of membranes (PPROM) between 34+0 and 36+6 weeks, treated with antibiotics versus those not receiving antibiotics, to assess its efficacy in the late preterm period

Study Design: Retrospective cohort study at a single tertiary center between 2020 and 2023, included 228 women who presented with late PPROM. The outcomes of 95 treated with antibiotics were compared to 133 untreated with antibiotics. Primary outcomes were duration of latency period, chorioamnionitis and neonatal sepsis. Secondary outcomes included maternal complications (Post partum hemorrhage, Fever, Endometritis, Operative deliveries) and neonatal complications (5-min Apgar< 7, umbilical cord pH< 7.1, and neonatal intensive care unit admission). The groups were compared using demographic and clinical independent variables in a univariate and multivariate analysis

Results: Baseline characteristics did not significantly differ between the groups. In a univariate analysis the group treated with antibiotics demonstrated longer latency period in comparison to the non-treated group (2 vs.1 day, p< 0.001). Despite an earlier gestational age (GA) at PPROM (p = 0.01) in the treated group, no difference was observed at gestational age at delivery. No difference in chorioamnionitis or neonatal sepsis rate was seen between the groups, however the group treated with antibiotic demonstrated less positive placental cultures compared to untreated women (p = 0.04). No other significant adverse maternal or neonatal outcome was significantly different. Same pattern of longer latency but without significant difference in delivery GA was observed in a sub analysis of women who progressed to active labor spontaneously (p = 0.005). A multivariate analysis of the latter which included parity, GBS status, GA and cervical dilatation at diagnosis failed to show that antibiotic treatment prolonged latency (aOR = 0.70, 95% CI 0.27-1.79, p = 0.46)

Conclusion: Antibiotic treatment in the management of late PPROM did not prolong latency period nor influenced maternal and neonatal outcomes

Table 1: Baseline Characteristics and Pregnancy Outcomes for Antibiotic Treatment vs. No Treatment in the Management of Late PPROM

Variables	No Antibiotic Treatment n=95	Antibiotic Treatment N=133	p-value
Baseline characteristics			
Age, years [mean±SD]	32.36±4.95	31.56±5.22	0.249
Body Mass Index, kg/m² [Median (IQR)]	22.57 (24.28-20.42)	22.27 (26.26-19.55)	0.946
Nulliparity, n (%)	39 (41.1)	51 (38.3)	0.680
Past PPROM, n (%)	14 (14.7)	10 (7.5)	0.080
Past PTB, n (%)	16 (16.8)	16 (12.0)	0.302
PPROM related characteristics			
Gestational Age at PPROM Diagnosis, week [Median (IQR)]	36.14 (36.43-35.43)	35.71 (36.36-35.00)	0.010
Cervical dilatation at PPROM, [Median (IQR)]	1.0 (2.5-1)	1 (1-0)	<0.001
GBS, n (%)	Negative 21 (22.1) Positive 6 (6.3) Unknown 68 (71.6)	Negative 14 (10.5) Positive 12 (9.0) Unknown 107 (80.5)	0.055
Delivery characteristics			
Latency period, days [Median (IQR)]	1 (2-0)	2 (5.5-1)	<0.001
Gestational age at delivery, weeks [Median (IQR)]	36.29 (36.71-35.71)	36.41 (36.86-35.71)	0.363
Mode of delivery, n (%)	NVD 64 (67.4) VE 11 (11.6) CS 20 (21.1)	NVD 98 (73.7) VE 5 (3.8) CS 30 (22.6)	0.074
Placental microbiology Fetal, n (%)	Pathogenic 27 (28.4) Not pathogenic 6 (6.3) Negative 36 (37.9) Not taken 26 (27.4)	Pathogenic 19 (14.3) Not pathogenic 8 (6.0) Negative 55 (41.4) Not taken 51 (38.3)	0.054
Placental microbiology Maternal, n (%)	Pathogenic 22 (24.7) Not pathogenic 9 (10.1) Negative 32 (36.0) Not taken 26 (29.2)	Pathogenic 18 (13.6) Not pathogenic 6 (4.5) Negative 57 (43.2) Not taken 51 (38.6)	0.044
Maternal outcomes			
Chorioamnionitis Clinical, n (%)	2 (2.1)	5 (3.8)	0.702
Fever, n (%)	4 (4.2)	4 (3.0)	0.722
Leukocytosis in labor, n (%)	6 (6.3)	11 (8.3)	0.580
Post partum hemorrhage, n (%)	1 (1.1)	3 (2.3)	0.644
Neonatal outcomes			
Newborn weight, grams [Median (IQR)]	2671 (2878-2452)	2634 (2900-2377)	0.483
5-min Apgar<7, n (%)	1 (1.1)	2 (1.5)	1.000
Cord Ph <7.1, n (%)	1 (1.3)	0 (0.0)	0.441
NICU, n (%)	17 (17.9)	24 (18.0)	0.977
Neonatal sepsis, n (%)	1 (1.3)	0 (0.0)	0.418
Neonatal death, n (%)	1 (1.1)	1 (0.8)	1.000
Outcomes for Spontaneous onset of delivery			
Variables	**No Antibiotic Treatment n=50**	**Antibiotic Treatment n=60**	**p-value**
Latency period in days, Median (IQR)	1 (2-0)	1.5 (3-1)	0.005
Latency period < 2 days, n (%)	37 (74.0)	30 (50.0)	0.010
Gestational age at delivery, weeks Median (IQR)	36.14 (36.57-35.71)	36.41 (36.57-35.57)	0.718

966 | Equitable Implementation of Obstetric Life Support in Maternity Care Deserts and Low Access Areas

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4:00 PM - 6:00 PM

Objective: Obstetric Life Support (OBLS) is an evidence-based, interdisciplinary simulation-based curriculum to train prehospital and hospital-based healthcare workers (HCWs) on prevention, recognition, and management of maternal medical emergencies. We aimed to identify barriers and facilitators to implementing OBLS in rural and low-resource settings to inform adaptations for optimizing medical emergency education in these contexts.

Study Design: We conducted a nationwide survey (n = 122) of administrators and HCWs in rural settings, exploring Consolidated Framework for Implementation Research (CFIR) elements that may influence implementation outcomes across multiple levels. Focus groups were conducted with a subset of 15 participants to discuss strategies for promoting OBLS adoption, implementation, and sustainability.

Results: Both prehospital and hospital-based participants found the OBLS learning objectives and content highly appropriate and acceptable but expressed concerns regarding the feasibility of implementation in their work contexts. Salient CFIR domains identified included: 1) Intervention Characteristics: Evidence strength and quality, relative advantage, design quality and packaging, and cost; 2) Inner Setting: Implementation climate and readiness for implementation; 3) Outer Setting: Patient needs and resources, and external policy and incentives.
Resource constraints were perceived to be a significant barrier, especially time, staffing, space, and equipment. Suggested adaptations included the development of eLearning course modules, a shortened in-person component, a web-based megacode evaluation tool, and an implementation toolkit to facilitate planning, progress monitoring, and change management. Participants also highlighted the importance of local champions to drive the implementation process and endorsed a train-the-trainer approach to build local capacity and ensure sustainability.
Conclusion: Equitable scale-up of OBLS requires an implementation plan that considers the training program's context, delivery mechanisms, and resource requirements.

967 | Race and Insurance Disparities in Partner Screening for Autosomal Recessive Conditions During Pregnancy

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4:00 PM - 6:00 PM
Objective: We aim to identify if race and insurance statuses of pregnant people and their partners impact decisions to undergo genetic carrier screening.
Study Design: Retrospective chart review was conducted on pregnant people receiving care at tertiary academic medical center from 6/1/2021-5/31/2024. Inclusion criteria were pregnant people (18+) with singleton pregnancies who tested positive for autosomal recessive conditions in 1st or 2nd trimesters and had genetic counseling. The primary outcome was comparison of uptake rates for genetic screening in partners of pregnant people with abnormal carrier screens by race and insurance status. Continuous variables were summarized with mean and standard deviations. Categorical variables were analyzed by Pearson's Chi square test, summarized with % and frequencies.
Results: Out of 62 pregnant people with abnormal genetic screens, 48% of partners opted for a genetic screen. Table 1 shows race and insurance statuses for pregnant people and partners. There was significant difference in racial makeup of patients ($p < 0.0001$) and partners ($p < 0.0001$) comparing tested and declined groups. There was no significant difference between insurance types of partners who tested vs. did not ($p = 0.422$). More pregnant people identified as Hispanic/Latino (31%) and had Medicaid (63%), while more partners identified as White (31%) and had private insurance (42%). Couples with matching insurance were more likely to have both partners test vs. those with nonmatching insurance ($p = 0.0001$). Couples with Medicaid had highest proportion of tested partners (77%). While there was no association between the insurance type of pregnant patients and whether their partners tested ($p = 0.306$), there was an association between whether their partners tested and whether they were insured ($p < 0.0001$).
Conclusion: Our results suggest a correlation between partner demographics and insurance and uptake rates of partner carrier testing. This shows disparities in uptake rates of genetic carrier screening, suggesting that SES factors may impact the decision for partner to test even with genetic testing access.

Race						
	Tested Partners		Declined Partners		Total	
	Patient	Partner	Patient	Partner	Patient	Partner
White	30%	40%	19%	22%	24%	31%
Black	20%	20%	28%	25%	24%	23%
Hispanic/Latino	23%	13%	38%	25%	31%	19%
Asian	17%	13%	3%	3%	10%	8%
Mixed	10%	13%	13%	13%	11%	13%
Other	0%	0%	0%	13%	0%	6%
Insurance						
Medicaid	60%	33%	69%	9%	65%	21%
Private	40%	53%	31%	28%	39%	40%
None, N/A	0%	13%	0%	63%	0%	39%

Table 1. Race and Insurance Status for Pregnant People with abnormal genetic carrier screenings and their partners

968 | Simulation Training to Improve Dilation and Evacuation Counseling in a Restrictive State

Anjali Nambiar[1]; Courtney C. Baker[1]; R. Nicholas Burns[2]
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4:00 PM - 6:00 PM
Objective: Following restrictive abortion legislation in Texas, OB/GYN residents have reduced exposure to Dilation and Evacuation (D&E). To address this training gap, a simulation and quality improvement initiative was implemented to increase resident familiarity with D&E and improve options counseling for patients with intrauterine fetal demise (IUFD).
Study Design: Residents at a single teaching institution participated in a monthly simulation activity, that included a pre-assessment of perceived barriers to D&E, a didactic video reviewing perioperative considerations and D&E steps, and a case-guided D&E simulation on a low-fidelity uterine model. The rate of complete options counseling (D&E vs medical induction) documented by residents in the electronic medical record and rate of D&E performed for patients with 2nd trimester IUFD (< 22 weeks gestation) was assessed before (9/2023-12/2023) and after (3/2024-6/2024) simulation implementation. Statistical significance was assessed via chi-squared test.
Results: 42 residents participated in the activity. On pre-assessment, most residents (76%) reported "rarely" or "never" discussing D&E with patients. "I do not know how to perform a D&E," "I do not have available staff to supervise me during D&E," and "I do not know how to counsel patients regarding D&E" were the most perceived barriers to D&E, identified by 71%, 67%, and 50% of residents respectively. In the pre-simulation period, 9/19 (47%) patients with IUFD had complete options counseling, and 3/9 (33%) elected for D&E. In the post-implementation period, 24/26 (92%, $p = 0.001$) had complete options counseling and 8/24 (33%) chose D&E.
Conclusion: Documentation of complete options counseling was significantly improved after initiative implementation. Despite

perceived barriers to D&E, residents counseled patients more consistently and performed more D&Es after simulation training. Rate of patient desire for D&E was unchanged. Low-fidelity D&E simulation may be an effective quality improvement initiative to address resident education gaps and improve options counseling for patients that are candidates for D&E.

D&E Simulation Pre-Assessment (N=42)							
PGY1			10 (24%)				
PGY2			8 (19%)				
PGY3			14 (33%)				
PGY4			10 (24%)				
1. How often do you discuss D&E with patients with indication for 2nd trimester uterine evacuation?			Never (0% of patients)	Rarely (25% of patients)	Sometimes (50% of patients)	Often (75% of patients)	Always (100% of patients)
			19 (45%)	13 (31%)	8 (19%)	1 (2%)	1 (2%)
2. Which of the following are barriers to D&E at this institution?	"I do not know how to perform D&E"	"I do not have available staff to supervise me during D&E"	"I do not know how to counsel patients regarding D&E"	"I do not know which patients are appropriate for D&E"	"My patients do not desire D&E"	"I did not know D&E was an option at this institution"	"I have not identified any barriers to performing D&E"
	30 (71%)	28 (67%)	21 (50%)	16 (38%)	11 (26%)	9 (21%)	1 (2%)
Clinical Outcomes Pre and Post Implementation of D&E Simulation							
			PRE (9/2023-12/2023)		POST (3/2024-6/2024)		p-value
Patients with IUFD <22w			19		26		
D&E			3		8		
Medical Induction			16		18		
Complete options counseling documented			9		24		
Complete options counseling NOT documented			10		2		
Options counseling rate (Counseled/All IUFD)			47% (9/19)		92% (24/26)		p=0.001
D&E rate (D&E/Counseled)			33% (3/9)		33% (8/24)		p=1

969 | Black Birthing persons' Perspectives on Factors Leading to Medical Mistrust in Obstetric Settings

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4:00 PM - 6:00 PM

Objective: To examine factors leading to medical mistrust among Black birthing persons.

Study Design: In this prospective qualitative study, 30 Black birthing people participated in semi-structured interviews to elicit their perspectives on factors leading to medical mistrust during their obstetric care. Purposive sampling was used to ensure a cohort diverse in terms of obstetric experiences such as parity, current mode of delivery, and with or without doula support in current pregnancy. Interviews were recorded, transcribed, and coded twice by two different team members in MAXQDA2022. Data were analyzed using thematic analysis to identify patterns and develop and refine themes.

Results: The average age of participants was 28 (range 19-41 years of age); 13% were married, 27% had a high school diploma, 40% were unemployed, 40% had an income of $20-000-$40,000, 77% had public insurance, and 27% had used doula services for the most recent pregnancy. Majority of participants were multiparous (70%), delivered vaginally (53%) and interviewed within 6 weeks postpartum. Five themes contributing to medical mistrust were identified: 1) lack of sufficient education provided to birthing people around possible obstetric complications 2) not feeling heard by the medical team due to lack of time and feeling rushed at prenatal appointments, 3) overuse of the medical terminology and jargon by the medical team, 4) discrepancies in expectations regarding birthing experiences in the hospital, and 5) inadequate support and reassurance after traumatic pregnancy or birth experience.

Conclusion: Perspectives gathered in this analysis identify inadequate communication, and insufficient time and knowledge for shared decision making as key factors leading to medical mistrust among Black birthing persons.

970 | Detection of Individual Bile Acids by Sebum Sampling in Cholestasis of Pregnancy

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4:00 PM - 6:00 PM

Objective: Intrahepatic cholestasis of pregnancy (ICP) is characterized by elevated bile acids and pruritis of palms as a disease unique to pregnancy. There is a paucity of information on the individual bile acids that contribute to palmar pruritis in ICP. We aimed to perform a feasibility study to utilize a novel methodology of extraction of steroids through sebum sampling in those undergoing evaluation for ICP.

Study Design: This was a prospective, observational cohort study of pregnant individuals evaluated for ICP from December 2023 to July 2024 a single academic center. Patients were characterized into pruritis of pregnancy (total BA < 10 mmol/L, referent), ICP (BA ≥10 mmol/L), using a quantitative enzymatic assay. At the time of initial evaluation for ICP, sebum sampling was performed after preparation of the skin to be sampled with an alcohol wipe cleanse. Three-five strips of sebutape were placed for 15 minutes and removed. Extraction of bile acids were performed through liquid chromatography mass spectrometry methods.

Results: There were 5 patients with cholestasis of pregnancy and 2 patients with pruritis of pregnancy whose samples were analyzed. There were no significant demographic differences between those with and without cholestasis of pregnancy. Gestational age at sebum sampling did not differ between the groups 35.9±0.9 vs 36.0±2.4, P = 0.97. The mean total bile acids of those with cholestasis were 52.6±19.1. Corresponding analysis of serum samples from these cholestasis patients detected taurocholic acid as the main analyte. Levels of taurocholic acid, glycolcholic acid, taurochenodeoxycholic acid, cholic acid, glycol-chenodeoxycholic acid, and glycol-deoxycholic acid were detected in both upper back and palmar samples.

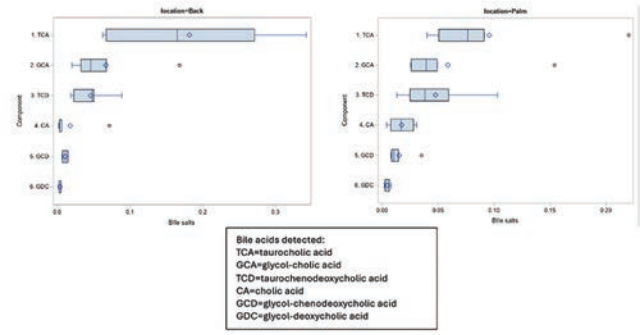
Conclusion: Beyond serum sampling of total bile acids, we have demonstrated a novel methodology of detection of bile acid levels in sebum samples in patients with cholestasis of pregnancy. This may offer further insight into disease characteristics and symptomatology.

Table 1: Demographics of patients undergoing sebum sampling

	No evidence of cholestasis N=2	Cholestasis N=5	P-value
Age	23.5 ±6.4	24.6±7.4	0.86
Race			0.09
Black	1 (50)	0 (0)	
White	1 (50)	5 (100)	
Ethnicity			0.09
Hispanic	1 (50)	5 (100)	
Non-Hispanic	1 (50)	0 (0)	
Parity			0.15
0	0(0)	3 (60)	
1	2(100)	2 (40)	
BMI	32.5±0	23.0±3.3	0.06
GA at sampling (weeks)	35.9±0.9	36.0±2.4	0.97
Total bile acids µmol/L	1±0	52.6±19.1	<0.01

Data as N (percent) or mean±standard deviation
GA=gestational age

Figure 1: Individual bile acids detected on sebum sampling of upper back and palms in those with cholestasis of pregnancy based on serum sampling of ≥10μmol/L



971 | Rates of Cesarean-Delivery and Perinatal Outcomes in OA Verses OP Position by Birth-Weight in Nulliparous

Annika Willy[1]; Bharti Garg[2]; Aaron B. Caughey[2]
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4:00 PM - 6:00 PM

Objective: We aimed to evaluate how birth weight affects cesarean delivery rates and delivery outcomes for fetuses in occiput-anterior (OA) versus occiput-posterior (OP) positions. Specifically, we investigated whether the impact of fetal position on cesarean delivery varies with different birth weight categories and how it influences neonatal outcomes in nulliparous patients.

Study Design: This was a retrospective cohort study of singleton, non-anomalous, term deliveries with vertex presentation in nulliparous individuals of California (2008-2020). Birth weight into eight categories: < 3500g, 3500-3749g, 3750g-3999g, 4000-4249g, 4250-4499g, 4500-4749g, 4750-4999g, ≥5000g. Multivariable Poisson regression model was used to examine the association of OP position and cesarean delivery along with outcomes (shoulder dystocia and scalp injury) for each weight category. Adjusted risk ratios (aRR) with 95% CI were estimated.

Results: In this study, we included 1,781,036 births of which 1.5% (n = 26,943) were in OP position. Cesarean delivery rates were higher in OP presented neonates in all birthweight categories, such as in < 3500 grams (77.6% vs 21.1%; aRR = 3.50; 95% CI: 3.46-3.54), and ≥5000g (100% vs. 76.2%; aRR = 1.29 (1.22-1.38)). Risk of shoulder dystocia was found to be increased in all most all birth weight categories in OP neonates, such as< 3500 g (0.92% vs 0.59%; aRR = 1.51 (1.05-2.19)) and 3750-3999 g (6.25% vs 3.69%;aRR = 1.72(1.23-2.39)). Risk of scalp injuries were found to be higher in OP neonates in birth weight categories such as < 3500 g (12.06 vs 4.69 aRR = 2.53 (2.30-2.78)).

Conclusion: We found that OP fetuses had a higher rate of cesarean delivery in all weight categories compared to OA. The difference between OA and OP cesarean delivery rates decreased as birth weight increased. In regards to perinatal outcomes we found OP neonates in most weight categories had higher rates of shoulder dystocia. Additionally scalp injury was increased in OP neonates compared to OA neonates.

Figure 1: Proportions and adjusted risk ratios of cesarean deliveries in persistent OP vs OA positioned neonates by birthweight

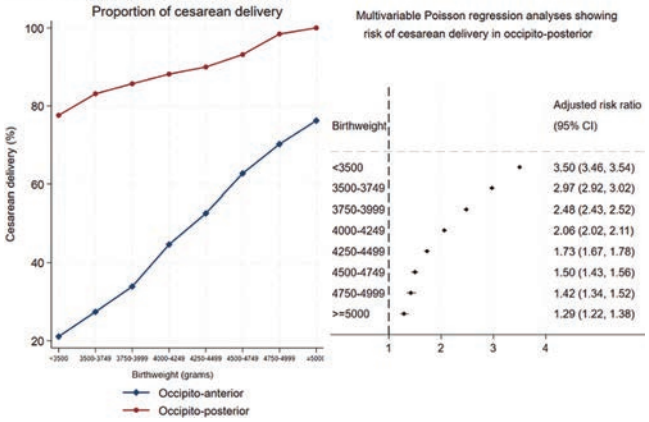

Table 1: Proportions and adjusted risk ratios for adverse neonatal outcomes by birth weight

	Shoulder Dystocia			Scalp Injury		
Birth Weight (g)	OA (%)	OP (%)	aRR (95% CI)	OA (%)	OP (%)	aRR (95% CI)
3000-3500	0.59%	0.92%	1.51 (1.05-2.19)	4.69%	12.06%	2.53 (2.30-2.78)
3500-3749	2.06%	3.30%	1.64 (1.16-2.32)	5.68%	12.77%	2.23 (1.88-2.64)
3750-3999	3.69%	6.25%	1.72 (1.23-2.39)	6.19%	13.05%	2.11 (1.69-2.63)
4000-4249	6.82%	7.91%	1.06 (0.66-1.71)	6.58%	16.28%	2.53 (1.87-3.41)
4250-4499	10.96%	8.11%	0.74 (0.35-1.57)	7.31%	17.57%	2.11 (1.23-3.64)

All models were adjusted for maternal race and ethnicity, age, education, pre-pregnancy BMI, chronic hypertension and pre-existing diabetes.
aRR-Adjusted risk ratio, CI-Confidence interval

972 | Preterm Birth in Patients with Fontan Circulation: Looking to the Placenta for Answers

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University of Michigan, Ann Arbor, MI

4:00 PM - 6:00 PM

Objective: Pregnant patients with Fontan circulation have relative hypoxemia with limited ability to augment cardiac output. Preterm birth (PTB) and fetal growth restriction (FGR) are common complications. We integrate clinical, histopathologic, and spatial transcriptomic data to characterize PTB with and without FGR in this population.

Study Design: 17 live births in 15 patients with Fontan circulation were identified and Cardio-obstetric variables were abstracted from the medical record. Placentas were analyzed by a pathologist. RNA was extracted from 6 preterm (3 normally grown, 3 FGR), formalin fixed, paraffin embedded samples with representative findings for spatial transcriptomics. Samples were sequenced with Visium CytAssist and analyzed in Loupe Browser/R.

Results: Mean pre-pregnancy SpO2 was 93.3±3.5%, where SpO2 at delivery decreased with increasing gestational age (GA, R = -0.48, P = 0.046). Over 1/3 (41.2%, N = 7/17) had FGR and most (82.4%, N = 14/17) had PTBs (mean GA 233.1±24.9 days [33 weeks]). Of PTBs, 64.2% (N = 9/14) labored spontaneously. 64.7% of the placentas (N = 11/17) showed accelerated maturation for GA (Fig 1). Spatial capture spots clustered based on clinical and histopathologic features, contrasting samples from FGR vs normally grown placentas and regions of frank vs minimal pathology (Fig 2). Spots with frank pathology showed upregulation of hypoxia pathways with peri-lesion upregulation of pro-fibrotic transcripts; structural integrity transcripts (PLEC,

SPTAN1, SRGN) were downregulated. Regions without frank pathology in FGR placentas also overexpressed pro-fibrotic markers and markers of placental dysfunction (PSG11, ALPP). Adverse pregnancy outcome markers (PAEP, PAPPA2) were upregulated in early PTB (< 34 weeks) compared to late PTB; PLEC, SPTAN1, SRGN were downregulated.

Conclusion: We identify a transcriptomic profile of consistently downregulated structural genes that unify placentas from early PTB with histopathologic placental findings in patients with Fontan circulation. These markers should be explored as potential mediators of PTB in cases of significant maternal cardiac disease.

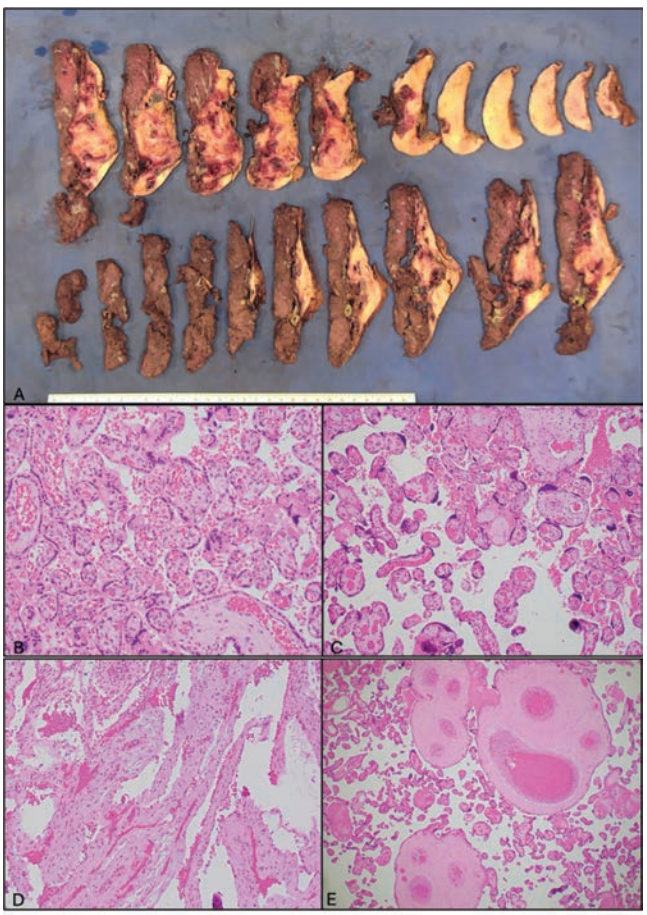

Figure 1. Gross and Microscopic Features of Placentas From Fontan Patients. 17 placentas from 15 patients were examined. Grossly, the weight of the placentas varied widely (from <3rd to 95-97th percentile). Most of the placentas (11/17) showed subchorionic hematomas (A). Microscopically, 6/17 placentas showed appropriate villous maturation for gestational age (B [H&E 200x]). While the remaining 11/17 showed increased syncytial knotting and distal villous hypoplasia, consistent with accelerated maturation for gestational age (C [H&E 200x]). 3/17 placentas showed features of decidual arteriopathy (D [H&E 100x]). 3/17 cases showed features of fetal vascular malperfusion, including 1 case of high grade (E [H&E 40x)].

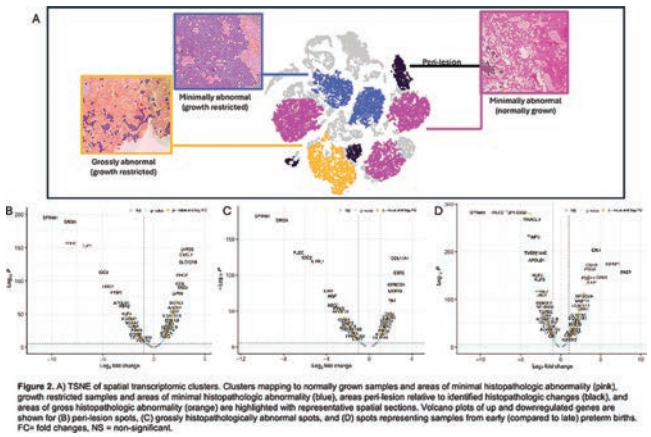

Figure 2. A) TSNE of spatial transcriptomic clusters. Clusters mapping to normally grown samples and areas of minimal histopathologic abnormality (pink), growth restricted samples and areas of minimal histopathologic abnormality (blue), areas peri-lesion relative to identified histopathologic changes (black), and areas of gross histopathologic abnormality (orange) are highlighted with representative spatial sections. Volcano plots of up and downregulated genes are shown for (B) peri-lesion spots, (C) grossly histopathologically abnormal spots, and (D) spots representing samples from early (compared to late) preterm births. FC= fold changes, NS = non-significant.

973 | Uterine Inflammatory Characteristics Following Cesarean Delivery

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4:00 PM - 6:00 PM

Objective: An incomplete healed scar (niche) is a long-term complication of cesarean delivery (CD), and is associated with symptoms including subfertility. One theory refers to inflammatory process at the area of the niche that harms the endometrial environment, however, data is limited. The aim of this study is to compare the inflammatory characteristics of women with cesarean uterine scar to those without.

Study Design: This is a prospective study including all women visiting hysteroscopy ambulatory clinics for diagnostic hysteroscopy. Study population included women with cesarean uterine scar (study group that were compared to those without (controls). A syringe was attached to the outlet of the diagnostic hysteroscope and the first 5 cc of 0.9% normal saline fluid used for hydro dissection were collected. The samples were analyzed for inflammatory factors levels, including: GM-CSF, IFN-gamma, IL-1, IL-2, IL-5, IL-6, IL-7. IL-13, IL-15, IL-17, IL-17F, IL-22, IL-23, IL-31, IL-36 and TNF-alpha. Primary outcome was defined as the difference in inflammatory factors level.

Results: 80 women met inclusion criteria, of them 29(36%) had history of CD and 51(64%) had no uterine scar. No difference was found in the level of any of the 17 factors collected. Analysis by indication to perform the procedure, comparing infertility to all other indications, revealed significantly higher IL33 levels in the infertility group [25.60(2.80-185.83) vs. 5.98((0-43.84pg/ml; p = 0.02]. While comparing the 9 women with infertility to the 20 women without infertility in the CD group, no difference was found in uterine scar characteristics, however, IL 33 was found to be 25 times higher in the infertility group [61.23(19.84-169.44) vs. 4.61(0-33.72) pg/ml;p = 0.004]. This difference was not demonstrated in women without CD (p = 0.29).

Conclusion: Women undergoing evaluation due to infertility with history of uterine scar have significantly higher level of

inflammatory marker IL33. This novel finding might be grounds for future treatment for this population.

974 | Robotic-Assisted Abdominal Cerclage: A Single-Center Journey

Asha Bhalwal; Elio Tahan; Aya Mohr-Sasson
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4:00 PM - 6:00 PM

Objective: Transabdominal cerclage (TAC) is currently considered following unsuccessful transvaginal cerclage. The placement of the cerclage can serve for all future pregnancies as it is not removed once it was placed, and following its placement, women are obligated to deliver by Cesarean delivery. Increasing evidence suggests improved neonatal survival rates following abdominal cerclage compared with repeat vaginal cerclage. The aim of this study is to present patient's characteristics and clinical outcomes of women following robotic assisted abdominal cerclage placed for history indicated cervical insufficiency

Study Design: This is a retrospective study conducted at a single tertiary medical center. All women following robotic assisted abdominal cerclage placement between November 2020 to February 2024 were included in the study. Data were collected from women's' medical files. Primary outcome was defined as the rate of delivery ≥32 weeks of gestation.

Results: 16 women underwent robotic assisted abdominal cerclage during the study period, of them 6 (37.5%) were pregnant during the procedure. Women's mean age and body mass index were 34.4(±4.4SD) years-old and 35.7(±6.9SD) kg/m^2, respectively. The mean gravida was 4(±1.8SD) with parity of 1(±1.0SD). 60% of the women had history of previous vaginal cerclage (n = 9). The mean gestational age of previous miscarriages was 21.5 (±4.6SD). Mean surgical duration was 136 (±40) minutes with minimal blood loss [mean: 50(±40SD) cc]. Two of the procedures performed during pregnancy were converted, one to open approach as the patient did not tolerate Trendelenburg and one to vaginal approach due substantial pelvic adhesions. Four of the seven women (70% of the non-pregnant) attempted to conceive, got pregnant with an average time of 3.1(±3.3SD) months. Six of the women included in the study (36%) had already given birth with an average gestational age of 34.7(±3.4SD).

Conclusion: Robotic assisted abdominal cerclage is a feasible option for the treatment of cervical insufficiency with low complication rate.

975 | Epigenetic Age Acceleration and Blood Pressure in Pregnancy: Findings from the CHAP Study

Bertha A. Hidalgo; Amit Patki; Hemant K Tiwari; Marguerite Ryan Irvin; On behalf of the CHAP Consortium
University of Alabama at Birmingham, Birmingham, AL

4:00 PM - 6:00 PM

Objective: Elevated blood pressure (BP) during pregnancy can have cardiovascular health consequences for the mother in the short and long term. Measures of biological age including DNA methylation age (DNAmAge) and derived epigenetic age acceleration (EAA) have been associated with cardiovascular traits. However, few studies have examined if epigenetic age measures are associated with BP during pregnancy and PreE.

Study Design: We performed a secondary analysis of the Chronic Hypertension and Pregnancy (CHAP) study of n = 2408 individuals with mild hypertension randomized to standard care versus treatment. We measured DNAmAge from blood samples drawn between 6-23 weeks gestation in n = 1310 from the trial. DNAmAge was measured using 4 calculators: 1) Horvath, 2) Hannum, 3) skin and blood, and 4) PhenoAge. We analyzed correlations between the DNAmAge clocks and chronological age, as well as associations between EAA and five BP variables as outcomes 1) PreE; 2) systolic and diastolic BP (SBP/DBP) at baseline (6-23 weeks), 3) visit 2 SBP/DBP (23-34 weeks), 4) delivery SBP/DBP, and 5) 6-weeks post-partum (PP) SBP/DBP). Regression models (linear for BP and logistic for PreE) were adjusted for ancestry and smoking during pregnancy.

Results: The study population was 50% Black, 38% White and 12% other, and the average age was 32.3 ± 5.7 years. DNAmAge was highly correlated with chronological age for each of the 4 calculators. EAA from the skin and blood clock was associated with baseline SBP (p = 0.006), baseline DBP (p = 0.029), and DBP PP (p = 0.029). No EAA estimate was statistically significantly associated with PreE or BP at delivery. See Table 1 for the association of EAA with baseline SBP, DBP and PreE.

Conclusion: There was a cross-sectional association between two EAA measures with early pregnancy BP, but not BP later in pregnancy or PreE. Other epigenetic variables and/or estimates from assays measured at additional time points may give additional insight into the relationship between biological aging and BP during pregnancy in women with chronic hypertension.

Table 1: Epigenetic Age Acceleration Associations with baseline blood pressure and PreE in CHAP

	Epigenetic Age Acceleration	Parameter Estimate* or OR^	SE& or 95% CI#	p-value
SBP	Hannum Clock	0.27*	0.09&	0.002
	Horvath Clock	0.06*	0.07&	0.38
	SkinBlood Clock	0.29*	0.11&	0.006
	PhenoAge Clock	0.08*	0.06&	0.18
DBP	Hannum Clock	0.02*	0.07&	0.80
	Horvath Clock	0.04*	0.05&	0.39
	SkinBlood Clock	0.11*	0.08&	0.03
	PhenoAge Clock	0.06*	0.05&	0.20
PreE	Hannum Clock	1.02^	0.98,1.05#	0.33
	Horvath Clock	1.00^	0.98,1.03#	0.80
	SkinBlood Clock	1.04^	0.99,1.08#	0.07
	PhenoAge Clock	1.02^	0.99,1.04#	0.06

SBP=systolic blood pressure, DBP=diastolic blood pressure, PreE=Preeclampsia, * change in SBP/DBP in mm HG per unit of the EAA, ^ OR per unit change in the EAA

976 | National Prevalence of Healthcare Provider-Recommended Bedrest and Activity Restriction by Pregnancy Condition

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4:00 PM - 6:00 PM

Objective: Bedrest and activity restriction (BAR) are often recommended in pregnancy despite an association with worse pregnancy outcomes. With guidelines recommending against BAR, some consider it an issue of the past, yet the contemporary national prevalence remains unknown. We aimed to determine the contemporary national prevalence of healthcare provider-recommended BAR among pregnant individuals, the pregnancy conditions associated with these recommendations, and adherence to BAR.

Study Design: An internet-based survey was distributed to females aged 18-54 who were pregnant or had been pregnant in the past year. The survey was tested and validated. Participants were asked, "Has anyone recommended bedrest or advised you to do less physical activity?," in addition to details about these recommendations, whether their pregnancy was considered, "high-risk," and their pregnancy conditions. The primary outcome was a recommendation for BAR by an obstetrician-gynecologist or midwife. To account for differential response rates, weighting for age and race/ethnicity was performed based on the target population of all births in the 2022 U.S. Natality Database, and all results presented are weighted. Two-sided p< 0.05 was considered statistically significant.

Results: 1500 survey responses were obtained. After weighting, 539 (38%) participants reported high-risk pregnancies. The frequency of BAR was 40% (95% confidence interval [CI] 37-43%); greater in high-risk pregnancies [61% (95% CI 57-65%)] than low-risk pregnancies [27% (95% CI 24-30%)], p-value< 0.01. Frequency of recommendations and recommendation type varied by pregnancy condition (chi-squared p < 0.01, Table). Adherence to BAR varied by both pregnancy condition and restriction type, with most participants across groups adherent (p values < 0.01, Figure).

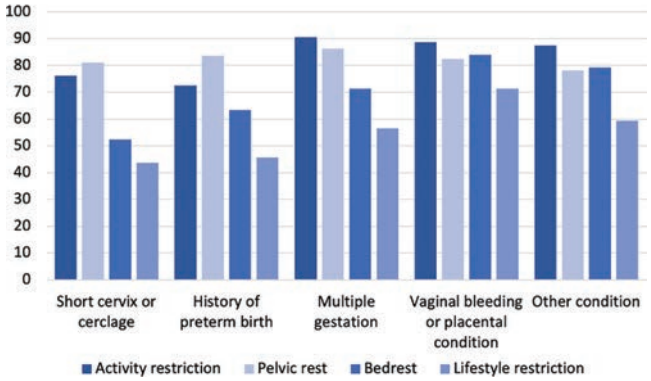
Conclusion: Despite clear national guidelines recommending against BAR, recommendations for BAR practices remain prevalent, especially among high-risk pregnancies but common even among low-risk pregnancies. Future studies should focus on the deimplementation of this prevalent and harmful practice.

Table. Frequency and type of bedrest and activity restriction by pregnancy condition

	Low-risk pregnancy (n=872)	High-risk pregnancy (n=539)				
		Short cervix or cerclage (n=63)	History of preterm birth (n=42)	Multiple gestation (n=26)	Vaginal bleeding or placental condition (n=77)	Other condition (n=356)
No restriction	638 (73%)	15 (37%)	7 (16%)	12 (47%)	19 (24%)	134 (38%)
Activity Restriction[a]	191 (22%)	22 (56%)	32 (75%)	11 (40%)	50 (65%)	195 (55%)
Lifestyle restriction[b]	129 (15%)	18 (46%)	27 (65%)	9 (35%)	39 (50%)	134 (38%)
Pelvic rest	71 (8%)	7 (18%)	22 (52%)	7 (28%)	31 (41%)	73 (21%)
Bedrest	42 (5%)	10 (26%)	12 (28%)	7 (26%)	20 (26%)	60 (17%)

Numbers are weighted for age and race/ethnicity, and do not add to totals due to each participant being included in all applicable categories.
[a] Walking, standing, lifting, exercise
[b] Driving, traveling, working

Figure. Adherence to bedrest and activity restriction by type of restriction and pregnancy condition



977 | Risk Factors for Failing Aspirin Prophylaxis for Preeclampsia Prevention: A Prospective Cohort Secondary Analysis

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4:00 PM - 6:00 PM

Objective: We aimed to identify demographic characteristics and risk factors associated with failure of aspirin (ASA) prophylaxis in a nulliparous population with singleton pregnancies.

Study Design: We conducted a secondary analysis of the prospective NuMom2B cohort of 9289 nulliparous women. We included participants with a gestational age of 20 weeks' gestation or greater. Our sample included 8741 women. The exposure of interest was ASA. The primary outcome was the development of any hypertensive disorder of pregnancy. We compared demographic factors among women who did and did not use aspirin during their pregnancy and outcomes by group.

Results: Patients who used aspirin during pregnancy (n = 117) were older (31 vs. 27, p< 0.001), more likely to be White (87% vs. 65%, p< 0.001), non-Hispanic (87% vs. 73%, p< 0.001) and more likely to have chronic hypertension (HTN) (9% vs 3%, p< 0.001), compared to non-aspirin users (n = 8624). ASA users were more likely to develop preeclampsia (11% vs 6%, p< 0.05), versus the non-aspirin group. There were no notable differences in risk factors between ASA users and non-ASA users for development of hypertensive disorders. There was no significant difference in the gestational age at delivery between the two groups.

Within the ASA group, women who developed hypertensive disorders had a lower mean BMI (24.4 vs 27.4, p< 0.05) and were slightly older (33 vs 31, p = 0.15) compared to those who did not develop hypertensive disorders.

Conclusion: In this study, we found that there is no difference in risk factors for the development of hypertensive disorders between ASA and non-ASA users. We did find a higher incidence of hypertensive disorders in the ASA group. This is possibly due to our relatively small sample size of patients taking ASA, but also could represent a higher apriori risk in this group. The similar gestational ages at delivery amongst ASA and non-ASA also supports the theory that ASA use prevents the onset of hypertensive disorders of pregnancy by delaying the "metabolic clock" of placental maturation during pregnancy.

Table 1. Demographics

	Aspirin use (n=117)	%	No Aspirin (n=8624)	%	Aspirin use v. No Aspirin Use P-Value
Age					
Mean (SD)	30.63 (4.81)		27.24 (5.57)		<0.001
Race					<0.001
American Indian/Alaska Native	0	0.00%	15	0.17%	0.37843
Asian	6	5.13%	365	4.18%	
Native Hawaiian/Other Pacific Islander	0	0.00%	32	0.37%	
Asian/American Indian/ Other PI	6	5.13%	412	4.77%	
Black/African American	3	2.56%	1187	13.58%	
White	102	87.18%	5729	65.54%	
More Than One Race	5	4.27%	520	5.95%	
Unknown/Not Reported	1	0.85%	776	8.88%	
Ethnicity					<0.001
Non-Hispanic White	99	84.62%	5234	59.88%	
Non-Hispanic Black	3	2.56%	1150	13.16%	
Non-Hispanic	102	87.18%	6384	73.04%	
Hispanic	5	4.27%	1471	16.83%	
Asian	6	5.13%	336	3.84%	
Other	4	3.42%	430	4.92%	
BMI (cont.)	27.3 (7.3)		26.36 (6.31)		0.1695
Chronic HTN	11	9.40%	228	2.61%	<0.001
Pregestational Diabetes	1	0.85%	137	1.57%	0.527
Gestational Diabetes	9	7.69%	366	4.19%	0.5021

Table 2. Outcomes

Maternal	Aspirin use (n=117)	%	No Aspirin (n=8624)	%	P-Value
Gestational Age at Delivery (median)	39	-	39	-	n/a
Hypertensive Disorder	36	30.77%	1998	23.17%	0.071
Gestational Hypertension	23	19.66%	1461	16.71%	0.437
Preeclampsia/HELLP	13	11.11%	532	6.17%	0.0281
Eclampsia	0	0.00%	5	0.06%	-
End-organ damage	0	0.00%	8	0.09%	-

979 | Differential Protein Expression Associated with Persistent Hypertension Following a Hypertensive Disorder of Pregnancy

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4:00 PM - 6:00 PM

Objective: Hypertensive disorders of pregnancy (HDP) are associated with future cardiovascular risk, however, the underlying mechanisms are unclear. We sought to identify differentially expressed proteins in individuals who developed chronic hypertension (HTN) in the first year postpartum following a HDP compared to those who remained normotensive.

Study Design: We used data from a randomized clinical trial evaluating lifestyle intervention and home blood pressure (BP) monitoring of individuals with pre-pregnancy body mass index (BMI) ≥25 kg/m^2 and a new-onset HDP. The primary outcome was feasibility and no differences were seen in BP between arms, thus randomization groups were combined. BP was measured at remote research visits at 6 weeks and 1 year postpartum and blood microsamples were collected at the second visit. Mass-spectrometry was used to quantify 381 proteins, from which differential expression and pathway enrichment analyses were performed to detect alterations with persistent HTN (BP ≥140/90 mmHg). All analyses controlled for BMI, tobacco use, and the social construct of race.

Results: Of the 100 randomized individuals, 88 (88%) completed sample collection with 85 yielding usable proteomics data. 4 proteins were differentially expressed in individuals with persistent HTN. Stage 2 HTN was associated with increased levels of Complement C4-B (C4B) and inter-alpha-trypsin inhibitor heavy chain 4 (ITIH4) and decreased levels of Afamin (AFM) and the smooth muscle protein myosin light chain 6 (MYL6) compared with Stage 1 HTN or normalization of BP. Pathway enrichment analysis suggests a shared function of endopeptidase inhibitor activity (such as Neprilysin, which degrades natriuretic peptides) in upregulated proteins and ubiquitin-proteasome mediated proteolysis activity in downregulated proteins.

Conclusion: Home microsampling is a promising methodology for postpartum sample collection. Serum proteomics using this approach suggest that protein homeostasis may be dysregulated in persistent HTN following HDP and provides novel candidates for future interventions to reduce progression to HTN following HDP.

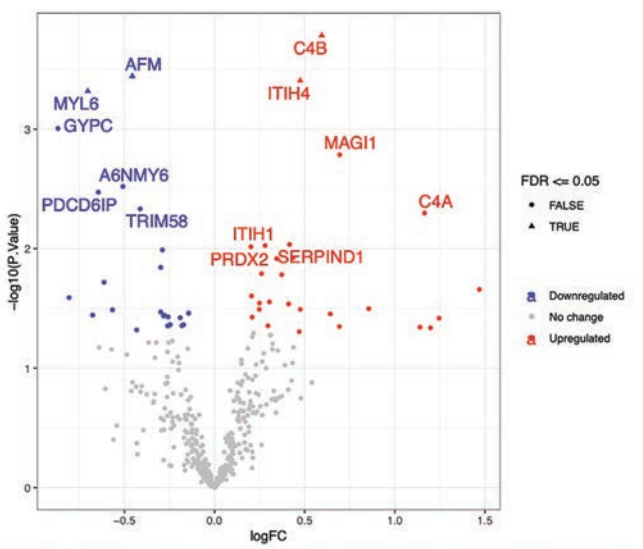

Figure 1. Volcano plot of differential expression analysis results of individuals with Stage 2 hypertension versus individuals with Stage 1 hypertension and normotension. Proteins in red correspond to those upregulated in individuals with Stage 2 hypertension while those in blue are downregulated. FDR = False discovery rate, FC = fold change.

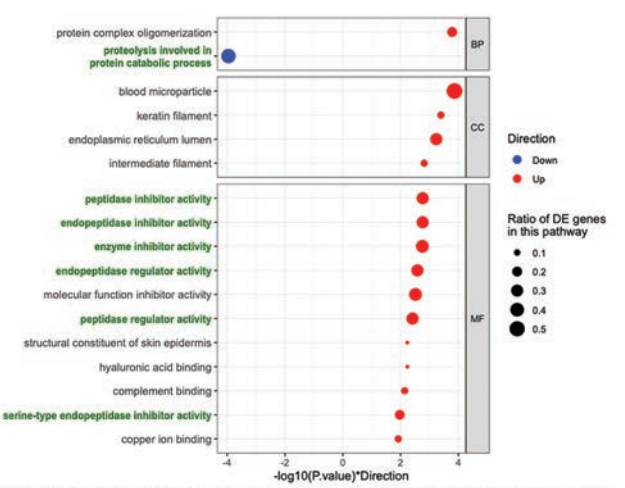

Figure 2: Gene ontology (GO) terms which had p value < 0.01 for being enriched in proteins which were upregulated (red) or downregulated (blue) in serum of individuals with Stage 2 hypertension. GO terms in green relate to protein homeostasis. DE = differentially expressed.

980 | Comparison of Various Community Level Social Indices and their Associations with Adverse Pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: The social vulnerability (SVI), maternal vulnerability (MVI), and area deprivation (ADI) indices measure community-level resilience to stressors, vulnerability to adverse maternal health outcomes, and socioeconomic disadvantage, respectively. Prior work has shown that ADI, SVI, and MVI can identify those at risk for preterm birth. The objective of this study was to compare the three indices and their associations with adverse pregnancy outcomes.

Study Design: This is a nested case control study within a prospective cohort study of singleton pregnancies from 2017 to 2020. The parent study excluded non-English speaking patients and IVF pregnancies. The primary outcome for this analysis was composite adverse obstetric outcomes (Table 1). These outcomes were compared between patients with low SVI, MVI, and ADI (< 75th percentile, representing higher resilience/less vulnerable/prosperity) versus high SVI, MVI, and ADI (≥75th percentile, representing lower resilience/more vulnerable/deprivation) and stratified by race.

Results: Among 1260 birthing people, patients with high SVI and ADI were more likely to have composite obstetric adverse outcomes compared to those with lower SVI and ADI, respectively (aOR 1.86, 95% CI [1.43, 2.42] and aOR 1.36, 95%CI [1.04, 1.78]). High MVI was not associated with adverse outcomes. In the stratified analysis, race did not modify the association between SVI, MVI, ADI and adverse outcomes (P for interaction > 0.05 for all three).

Conclusion: Among the three indices, SVI and ADI might be the most reliable indices to capture community-level determinants of obstetric outcomes. Social vulnerability and community-level deprivation, independent of race, are associated with adverse pregnancy outcomes.

Table 1: Comparison of risk of composite OB adverse outcomes by indices

	No composite OB adverse outcome	Composite OB adverse outcome	OR (95% CI)	aOR* (95% CI)
SVI[1] (n=1055)				
Low SVI (more community resilience)	322 (61.2%)	204 (38.8%)	ref	ref
High SVI (less community resilience)	247 (46.7%)	282 (53.3%)	**1.80 (1.41, 2.30)**	**1.86 (1.43, 2.42)**
MVI[1] (n=1065)				
Low MVI (less adverse maternal health outcomes)	290 (55.3%)	234 (44.7%)	ref	ref
High MVI (more adverse maternal health outcomes)	283 (52.3%)	258 (47.7%)	1.13 (0.89, 1.44)	1.15 (0.9, 1.46)
ADI[2] (n=1029)				
Low ADI (less deprived)	373 (56.3%)	290 (43.7%)	ref	ref
High ADI (more deprived)	175 (47.8%)	191 (52.2%)	**1.40 (1.09, 1.81)**	**1.36 (1.04, 1.78)**

[1]Include race and ethnicity in index
[2]Does not include race and ethnicity in index

*Adjusted for age, BMI>30

Composite obstetric (OB) adverse outcome: hemorrhage or transfusion, wound infection, infectious endomyometritis, hypertensive disorder of pregnancy, unscheduled cesarean section, preterm delivery <37 weeks, maternal death, small for gestational age, and stillbirth

Table 2: Comparison of risk of composite OB adverse outcomes by indices

	Exposure	No composite OB adverse outcome	Composite OB adverse outcome	aOR 95% CI*	P for interaction
SVI[1] (n=1055)					**0.65**
Black	Low (more community resilience)	79 (27.7%)	68 (21.8%)	Ref	
	High (less community resilience)	206 (72.3%)	244 (78.2%)	**1.45 (1.00, 2.13)**	
Non-Black	Low (more community resilience)	243 (85.6%)	136 (78.2%)	Ref	
	High (less community resilience)	41 (14.4%)	38 (21.8%)	**1.68 (1.01, 2.78)**	
MVI[1] (n=1065)					**0.28**
Black	Low (less adverse maternal health outcomes)	122 (42.4%)	125 (39.7%)	Ref	
	High (more adverse maternal health outcomes)	166 (57.6%)	190 (60.3%)	1.18 (0.85, 1.64)	
Non-Black	Low (less adverse maternal health outcomes)	168 (58.9%)	109 (61.6%)	Ref	
	High (more adverse maternal health outcomes)	117 (41.1%)	68 (38.4%)	0.89 (0.6, 1.31)	
ADI[2] (n=1029)					**0.47**
Black	Low (less deprived)	129 (46.9%)	136 (44.0%)	Ref	
	High (more deprived)	146 (53.1%)	173 (56.0%)	1.17 (0.84, 1.63)	
Non-Black	Low (less deprived)	244 (89.4%)	154 (89.5%)	Ref	
	High (more deprived)	29 (10.6%)	18 (10.5%)	0.89 (0.46, 1.68)	

[1]Include race and ethnicity in index
[2]Does not include race and ethnicity in index

*Adjusted for age, BMI>30

Composite obstetric (OB) adverse outcome: hemorrhage or transfusion, wound infection, infectious endomyometritis, hypertensive disorder of pregnancy, unscheduled cesarean section, preterm delivery <37 weeks, maternal death, small for gestational age, and stillbirth

981 | The Effect of Maternal Blood Transfusion History on Alloimmunized Pregnancies

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4:00 PM - 6:00 PM

Objective: To evaluate the impact of prior blood transfusion on diagnosis and severity of maternal alloimmunization.

Study Design: A single-center retrospective cohort study of alloimmunized singleton gestations with antibodies known to be associated with hemolytic disease of the fetus and newborn (HDFN) from 2018 to 2023. We excluded pregnancies if the fetus was determined to be not at risk for HDFN either by negative paternal genotyping or negative invasive diagnostic testing. Multiple gestations were excluded as well. Univariate and multivariate analyses were performed. P-value < 0.05 was considered statistically significant.

Results: 76 patients with alloimmunization were identified who had a documented history of blood transfusion. 40 patients had no prior history of blood transfusion while 36 did report a prior transfusion. The type of antibody present differed significantly between the two groups. Patients with a history of blood transfusion presented with a wider variety of antibodies than those who did not. Patients with a history of blood transfusion predominantly presented with anti-K, whereas those without prior blood transfusion history presented with primarily anti-D. Both groups were equally likely to have more than one antibody present. Patients with a history of blood transfusion had their first titer drawn at a later gestational age (11.02 ± 2.2 vs. 9.6 ± 2.3). However, there was no significant difference between the maximum antibody titer reached during pregnancy (101.5 ± 251.3 vs. 220.2 ± 475.5). Moreover, both groups were equally likely to have MCA Dopplers initiated, reach maximum MCA PSV MoM $\geq$1.5, and require IUT.

Conclusion: Patients who develop alloimmunization due to blood transfusion are more likely to present with a wider variety of antibodies but this does not impact the need for MCA Doppler monitoring or IUT in a clinically significant way.

Table: Characteristics of alloimmunized pregnancies with and without a history of maternal blood transfusion

Variable		History of prior blood transfusion (n=36)	No history of prior blood transfusion (n=40)	P-Value
Had antibody test at start of pregnancy		28/32 (87.5%)	27/38 (71.1%)	0.1
Antibody titer at the start of pregnancy		N=27 44.9 ± 115.25	N=27 39.85 ± 72.8	0.8
GA at the time of the first antibody titer (weeks.days)		N=28 11.02 ± 2.2	N=27 9.6 ± 2.3	**0.02**
Maximum antibody titer reached		N=35 101.5 ± 251.3	N=40 220.2 ± 475.5	0.2
GA at maximum titer (weeks.days)		N=32 18.8 ± 9.2	N=39 22.6 ± 12.6	0.2
Type of alloimmunization	Big M	0/36 (0%)	4/40 (10%)	**<0.001**
	Big D	4/36 (11.1%)	21/40 (52.5%)	
	Big E	7/36 (19.4%)	7/40(17.5%)	
	Little c	2/36 (5.6%)	3/40 (7.5%)	
	Kidd	1/36 (2.8%)	1/40 (2.5%)	
	Big K	13/36 (36.1%)	3/40 (7.5%)	
	Big C	3/36 (8.3%)	0 (0%)	
	Big S	2/36 (5.6%)	1/40 (2.5%)	
	Duffy	3/36 (8.3%)	0 (0%)	
	Little e	1/36 (2.8%)	0	
Presence of multiple antibodies		7/36 (19.4%)	8/39 (20.5%)	1
Required MCA Dopplers		25/36 (69.4%)	28/40 (70%)	1
GA first MCA Dopplers started		N=25 22.3 ± 5.7	N=27 23.04 ± 6.3	0.6
MCA PSV ≥ 1.5 MoM		11/25 (44%)	14/28 (50%)	0.8
GA at which MCA PSV was ≥1.5 MoM		N=11 28.4 ± 7.1	N=14 30.1 ± 4.2	0.5
Requiring IUT		5/11 (45.5%)	6/14 (42.9%)	1
GA at first IUT				

GA: gestational age, MCA: middle cerebral artery, PSV: peak systolic velocity, MoM: multiple of the medians

982 | Association of Breastfeeding and Early Childhood Preventative Dental Care

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4:00 PM - 6:00 PM

Objective: Breastfeeding has established benefits for maternal and childhood health. However, mixed evidence exists on the impact of breastfeeding and childhood dental caries. Preventative pediatric dental care can mitigate the risk of dental caries in this population. Thus, we examined the association of breastfeeding and preventative dental care visits among children age 0-5 years in the United States.

Study Design: We analyzed data from the 2021 National Survey of Children's Health, an annual cross-sectional survey across multiple domains of a family unit's social determinants of health. The primary outcome was preventative dental care visit, defined by presence or absence of a dentist or oral health provider visit in past 12 months (check-ups, education, cleanings, sealants, fluoride, or x-ray). The main exposures were breastfeeding and breastfeeding exclusivity. Established parental and household unit characteristics were explored. A weighted and multivariable logistic regression analysis calculated adjusted odds ratios of preventative dental care visits.

Results: The majority 24,668 (81%) of children age 0-5 years had received breastmilk via direct or expressed breast milk. More than half 14,929 (56%) of these children had a preventative dental care visit. Dental check-up, cleaning, education, x-ray, fluoride, and sealant visits occurred more frequently in those children who were breastfed compared to those who were not (Table 1). After adjusting for differences between groups, breastfeeding or exclusive breastfeeding was not associated with odds of preventative dental visits, while having unmarried parents and less severe household poverty was associated with reduced odds (Table 2).

Conclusion: Social determinants such as family and economic instability–not breastfeeding status–were key drivers of preventative dental care. Dental health care education should be integrated into prenatal care conversations around breastfeeding to dispel myths and promote optimal parental and early childhood health.

Table 1. Preventative dental care visits and specific treatment by children breastfed or fed breast milk from age 0-5 years.

Preventative dental care visit and specific treatment	Received at least some breast milk via direct feeding or expressed breast milk n = 24,668	Did NOT receive at least some breast milk via direct feeding or expressed breast milk n = 4,478	p
Preventative Dental Health Visit			0.04
0	9,739 (44%)	2,032 (48%)	
1 or more visits	14,929 (56%)	2,446 (52%)	
Dental Check Up			0.01
Received	14,152 (54%)	2,232 (49%)	
Did not receive	9,739 (46%)	2,032 (51%)	
Dental Cleaning			0.02
Received	14,669 (55%)	2,387 (51%)	
Did not receive	9,739 (45%)	2,032 (49%)	
Dental Instruction			<0.001
Received	9,145 (42%)	1,209 (31%)	
Did not receive	9,739 (58%)	2,032 (69%)	
Dental X-Ray			0.04
Received	4,546 (27%)	731 (23%)	
Did not receive	9,739 (73%)	2,032 (77%)	
Fluoride			<0.001
Received	8,239 (39%)	1,124 (29%)	
Did not receive	9,739 (61%)	2,032 (71%)	
Sealant			0.23
Received	1,009 (8.4%)	225 (7.0%)	
Did not receive	9,739 (92%)	2,032 (93%)	

Table 2. Associations of breast feeding and preventative dental care visits among children age 0-5 years.

Parental characteristics	No Preventative Dental Visit % (n) 40.4% (n=11,908)	Preventative Dental Visit % (n) 59.6% (n=17,555)	Unadjusted Odds Ratio	Adjusted Odds Ratio[1]
Tooth decay or cavities				
Yes	268 (3.6%)	1,692 (11%)	3.35 [2.36-4.76]*	3.60 [2.54-5.12]*
No	11,604 (96%)	15,813 (89%)	1.00	
Income level of household				
0-199% FPL	1,639 (20%)	1,878 (17%)	0.73 [0.64-0.83]*	0.74 [0.64-0.86]*
200-299% FPL	2,079 (22%)	2,600 (19%)	0.83 [0.71-0.98]*	0.82 [0.70-0.97]*
300-399% FPL	3,752 (29%)	5,273 (29%)	0.84 [0.71-1.00]*	0.81 [0.67-0.97]*
400% FPL or greater	4,438 (29%)	7,804 (35%)	1.00	
At least some breast milk				
Yes	9,739 (80%)	14,929 (82%)	1.00	
No	2,032 (20%)	2,446 (18%)	0.85 [0.73-0.99]*	0.88 [0.73-1.07]
Exclusively breastfeed,				
Never	2,032 (20%)	2,446 (18%)	1.00	
Exclusive, first 6 months	3,327 (27%)	5,538 (30%)	1.24 [1.04-1.47]*	0.91 [0.80-1.04]
Unexclusive, first 6 months	6,354 (53%)	9,310 (52%)	1.09 [0.94-1.28]	2.01 [0.94-4.28]
Premature birth < 37 weeks				
Yes	1,337 (11%)	1,823 (12%)	1.05 [0.87-1.27]	
No	10,480 (87%)	15,584 (87%)	1.00	
Low or very low birth weight				
<1,500 grams	130 (1.1%)	208 (1.3%)	1.18 [0.65-2.14]	
1,500-2,500 grams	920 (8.1%)	1,225 (8%)	1.00 [0.81-1.23]	
Normal weight	10,423 (86%)	15,524 (87%)	1.00	
Family structure of household				
Two parents, married	8,283 (60%)	13,069 (66%)	1.00	
Two parents, not married	994 (10%)	1,085 (7.6%)	0.68 [0.54-0.85]*	0.69 [0.54-0.88]*
Single parent (mother or father)	1,875 (21%)	2,449 (19%)	0.84 [0.73-0.98]*	0.91 [0.77-1.09]
Grandparent	318 (3.6%)	358 (2.8%)	0.71 [0.50-1.01]	0.78 [0.55-1.11]
Other	94 (1.6%)	117 (1.2%)	0.67 [0.41-1.10]	0.61 [0.33-1.12]
Physical health status of mother				
Excellent/very good	7,887 (63%)	12,080 (65%)	1.00	
Good	2,228 (17%)	3,313 (19%)	1.10 [0.96-1.26]	
Poor/very poor	430 (4.9%)	624 (4.9%)	1.02 [0.74-1.41]	
Mental health status of mother				
Excellent/very good	7,264 (60%)	11,131 (63%)	1.00	
Good	2,528 (18%)	3,842 (20%)	1.11 [0.97-1.27]	
Poor/very poor	780 (7.1%)	1,059 (5.9%)	0.84 [0.65-1.07]	
Physical health status of father				
Excellent/very good	7,174 (54%)	10,919 (57%)	1.00	
Good	2,101 (17%)	3,073 (16%)	0.94 [0.80-1.09]	
Poor/very poor	334 (2.8%)	466 (3.4%)	1.21 [0.83-1.77]	
Mental health status of father				
Excellent/very good	7,316 (57%)	11,094 (59%)	1.00	
Good	1,833 (13%)	2,736 (13%)	1.01 [0.87-1.17]	
Poor/very poor	466 (3.3%)	627 (3.2%)	0.98 [0.69-1.38]	

[1]Adjusted for tooth caries, income level of household, presence or absence of breastfeeding, exclusivity of breastfeeding, and family structure
*p-vale <0.05

983 | Longitudinal Change in Short-Term Variation with Intraamniotic Infection After PPROM: A Historical Cohort Study

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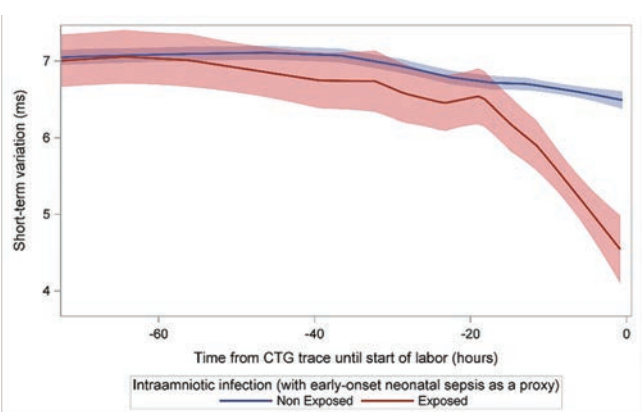
4:00 PM - 6:00 PM

Objective: Currently used diagnostic tools have been shown to have poor diagnostic performance for intraamniotic infection (IAI). In search of better diagnostic tools we have studied short-term variation (STV) in fetal heart rate in pregnancies with preterm prelabor rupture of membranes (PPROM). We have previously shown that in IAI exposed pregnancies, STV was > 20% lower in the last cardiotocography trace before start of labor, as compared to those not exposed. The current study was aimed at further examining this association by examining the longitudinal change in STV in association with IAI after PPROM.

Study Design: We performed a historical cohort study on 628 singleton pregnancies with PPROM, delivering between 24 + 0 to 33 + 6 gestational weeks. The studied exposure was IAI, using early onset neonatal sepsis as a proxy as no easily available method exists for confirming IAI antepartum, and IAI and early onset neonatal sepsis are strongly associated. The main outcome was STV in fetal heart rate. At least two available cardiotocography traces per fetus were required. A total of 9 690 cardiotocography traces were analyzed.

Results: Fetuses exposed to IAI had a 26.5% steeper decline in their STV during the last 24 hours before the start of labor when compared to fetuses not exposed (95% CI -32.9% to -19.4%; $P < 0.001$). After adjustment for antenatal corticosteroids, the decline remained significant. The decline became less prominent but remained significant when also adjusting for the baseline frequency (-12.7% [95% CI -19.3% to -5.5%], $P < 0.001$). In the IAI-exposed group, the baseline frequency increased by 11.1 bpm during the last 12 hours before the start of labor, beyond those who were not exposed (95% CI 8.3 bpm to 13.8 bpm; $P < 0.001$).

Conclusion: In pregnancies affected by IAI the STV has a steeper decline in the last 24 hours before start of labor as compared to pregnancies not affected by IAI, even after adjustment for increasing baseline frequency. The association of STV in relation to IAI needs to be further studied in order to evaluate and establish STVs usefulness in monitoring patients for IAI.



984 | Racial and Ethnic Differences in Delivery Characteristics in Patients with a Cesarean Wound Infection

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Objective: Black race and Hispanic ethnicity have been identified as risk factors for cesarean wound infection. This likely represents systemic bias, as there is no biological explanation for these differences. This study sought to identify differences among self-reported racial and ethnic groups in delivery or postpartum factors that could be targeted to lessen disparities.

Study Design: This was an IRB-approved, retrospective cohort study of patients with post-cesarean wound infections requiring an emergency department or triage wound-related visit from a single healthcare system between 6/1/2013-7/31/2022, excluding patients with placenta accreta or severe preeclampsia. Primary exposure was self-reported race and ethnicity. Outcomes of interest were delivery characteristics predisposing to wound infection (GBS status, cesarean operative time, antibiotics received, estimated blood loss, skin closure with staples, peripartum infection). Bivariate statistics were used to analyze data. Regression models developed to control for confounders.

Results: Of 533 patients with post-cesarean wound infections, 180(33.7%) identified as non-Hispanic Black(NHB), 233(43.7%) non-Hispanic White(NHW), and 80(15.0%) as Hispanic. NHB and Hispanic patients had a significantly higher BMI and were more likely to have public insurance than NHW patients. NHB patients were more likely to use tobacco than NHW patients(Table 1). Hispanic patients had a higher rate of PP endometritis treatment(n = 16,8.7%), compared to NHW(n = 7,3.0%), and NHB(n = 3,3.8%). In regression models, NHB patients were significantly more likely to be GBS positive(OR 1.70 (1.01,2.85)) and were more likely to be diagnosed in triage(OR 1.51 (0.98, 2.33)), though this finding was not statistically significant(Table 2).

Conclusion: Among patients with wound infections after cesarean, PP endometritis, GBS, and diagnosis location differed, yet no modifiable delivery characteristics were noted among racial and ethnic groups. Future research may investigate disparities in peripartum infection as a risk factor for wound infection and differences in postpartum healthcare access.

Table 1. Baseline, Delivery, and Wound Infection Diagnosis Demographics

	Overall (N=533)	Non-Hispanic White (n=233, 44%)	Non-Hispanic Black (n=180, 34%)	Hispanic (n=80, 15%)	p
	Median [25th-75th Percentile] or %				
Maternal Age (years)	31.0 [27.0,35.0]	32.0 [28.0, 35.0]	29.0 [25.0, 34.0]	31.5 [27.0, 36.0]	<0.001
Commercial Insurance	272 (51.0)	158 (67.8)	66 (36.7)	17 (21.2)	<0.001
Multiparous	308 (81.3)	125 (78.1)	112 (83.6)	53 (86.9)	0.25
Prior C-Section	235 (44.1)	97 (41.6)	83 (46.1)	40 (50.0)	0.38
Multiple Gestation	31 (5.8)	15 (6.4)	10 (5.6)	4 (5.0)	0.87
Asthma	79 (14.8)	33 (14.2)	41 (22.8)	2 (2.5)	<0.001
Chronic Hypertension	77 (14.4)	33 (14.2)	36 (20.0)	7 (8.8)	0.05
Any Diabetes	106 (19.9)	44 (18.9)	37 (20.6)	19(23.8)	0.64
Tobacco Use	56 (10.5)	25 (10.7)	29 (16.1)	1 (1.2)	0.002
BMI at admission	37.5 [32.2,45.2]	36.6 [31.4, 43.5]	41.1 [34.5, 51.0]	37.4 [31.9, 42.4]	<0.001
BMI >40	213 (40.0)	81 (34.8)	96 (53.3)	31 (38.8)	<0.001
BMI >50	85 (15.9)	29 (12.4)	47 (26.1)	8 (10.0)	<0.001
Postpartum endometritis treatment	26 (5.0)	7 (3.0)	15 (8.7)	3 (3.8)	0.03
Location of diagnosis					0.005
Clinic	290 (54.4)	142 (60.9)	80 (44.4)	41 (51.2)	
Triage	229 (43.0)	83 (35.6)	97 (53.9)	38 (47.5)	
Before initial discharge	14 (2.6)	8 (3.4)	3 (1.7)	1 (1.2)	

Table 2. Adjusted outcomes

	Non-Hispanic Black aOR(95% CI)*	Hispanic aOR(95% CI)*
GBS culture positive	**1.70 (1.01, 2.85)**	1.00 (0.49, 2.05)
Operative time, min	2.76 (-5.36, 10.9)	7.37 (-3.4, 18.1)
Antibiotics Postpartum	1.36 (0.68, 2.72)	1.83 (0.77, 4.37)
EBL at delivery, cc	25.2 (-119, 170)	187 (-3.2, 378)
Diagnosis in triage	1.51 (0.98, 2.33)	1.16 (0.66, 2.04)
Diagnosis in clinic	0.72 (0.47, 1.11)	0.99 (0.56, 1.74)
Skin closure with staples	1.58 (0.66, 3.82)	2.20 (0.77, 6.29)

*Compared to Non-Hispanic White, controlling for BMI, tobacco use, DM, and insurance status

985 | Tight Versus Standard Postpartum Control Following Hypertensive Disorders of Pregnancy: A Randomized Controlled Feasibility Trial

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Objective: To assess the feasibility of performing a randomized controlled trial (RCT) investigating tight versus standard postpartum blood pressure (BP) control following hypertensive disorder of pregnancy (HDP) through a postpartum remote monitoring program.

Study Design: We performed a single-blinded feasibility RCT from 11/2023-4/2024. Tight BP control was defined as medication initiation consistent with American Heart Association guidelines: inpatient BP (mmHg) ≥140/90 and/or outpatient ≥135/85 for two values at least 4 hours apart. Standard BP control was defined as medication initiation for BP ≥150/100 at least 4 hours apart. Eligible individuals were ≥18 years of age, diagnosed with HDP, and enrolled in our institution's remote BP management program. Individuals were excluded if they were diagnosed with chronic hypertension, pre-gestational diabetes, renal or cardiac disease, a fetal anomaly, or currently used anti-hypertensives. We compared demographics, inpatient medication initiation, and outpatient medication initiation among groups.

Results: We enrolled 60 individuals over a 5-month time course out of 143 who were approached (43%); 29 were randomized to tight control and 31 to standard control. Average age, body mass index, race/ethnicity, health insurance status, and household incomes were similar among groups (Table). Those in the standard control arm were more likely to be diagnosed with preeclampsia, including with severe features (p = 0.04). Antihypertensive medications were initiated at similar rates among groups both inpatient (31% tight vs 25.8% standard, p = 0.65) and outpatient (20.7% tight vs 22.6% standard, p = 0.86).

Conclusion: While a single center trial of tight versus standard postpartum BP control is feasible, there were similar rates of oral anti-hypertensive initiation among groups. This may be due to a differential representation of HDP severity among groups with a trend toward higher enrollment BP in patients randomized to standard control.

Patient Characteristics by Intervention

	Tight Control (N=29)	Standard Control (N=31)	p-value
Age (yrs)	29.4 (4.9)	29.5 (5.5)	0.9
Body mass index (BMI), mean (std)	33.8 (7.4)	34.8 (7.2)	0.47*
N-missing	0	1	
Hypertensive disorder of pregnancy, n (%)			0.04*
Gestational hypertension	24 (82.8%)	18 (58.1%)	
Preeclampsia without severe features	5 (17.2%)	8 (25.8%)	
Preeclampsia with severe features	0 (0%)	5 (16.1%)	
Self-identified race, n (%)			0.14*
Black	3 (10.3%)	8 (25.8%)	
White	26 (89.7%)	22 (71.0%)	
Other	0 (0%)	1 (3.2%)	
Insurance status during pregnancy, n (%)			0.32*
Public (Medicaid/Medicare)	7 (25.0%)	14 (46.7%)	
Insurance through employer	16 (57.1%)	14 (46.7%)	
Private paid out-of-pocket	3 (10.7%)	2 (6.7%)	
More than 1 insurance	2 (7.1%)	0 (0%)	
N-missing	1	1	
Annual household income, n (%)			0.74*
Less than $34,999	7 (25.0%)	9 (30.0%)	
$35,000 to $74,999	5 (17.9%)	6 (20.0%)	
$75,000+	11 (39.3%)	12 (40.0%)	
Prefer not to answer	5 (17.9%)	3 (10.0%)	
N-missing	1	1	
Number of children at home, n (%)			0.94*
1	16 (57.1%)	15 (50.0%)	
2	7 (25.0%)	7 (23.3%)	
3	3 (10.7%)	3 (10.0%)	
4	2 (7.1%)	4 (13.3%)	
5+	0 (0%)	1 (3.3%)	
N-missing	1	1	
Tobacco use, n (%)	2 (7.1%)	4 (13.3%)	0.67*
N-missing	1	1	
Mean enrollment systolic BP (mmHg), mean ± std	124 ± 12.5	129.6 ± 9.7	0.07
Mean enrollment diastolic BP (mmHg), mean ± std	82.9 ± 10.1	86.4 ± 8.5	0.15
Inpatient antihypertensive initiation, n (%)	9 (31.0%)	8 (25.8%)	0.65
Outpatient antihypertensive initiation, n (%)	6 (20.7%)	7 (22.6%)	0.86

*Fisher's exact test (categorical data) or Wilcoxon adjustment (continuous data)

986 | Prenatal Characteristics Predictive of Xylazine Positivity: Who is being Exposed?

Cassandra Trammel[1]; Vahid Azimi[2]; Bridgit Crews[2]; Stephen Roper[2]; Nandini Raghuraman[3]; Antonina I. Frolova[4]; Megan L. Lawlor[2]; Hayley Friedman[2]; Jeannie C. Kelly[3]
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4:00 PM - 6:00 PM

Objective: Xylazine, a non-opioid veterinary sedative, is increasingly present as a contaminant in nonprescribed fentanyl. We sought to assess demographic and prenatal characteristics' association with odds of xylazine positivity in pregnant patients who use fentanyl.

Study Design: We performed a case control study of all patients positive for nonprescribed fentanyl on urine drug screening (UDS) at any point during pregnancy on an urban Midwestern tertiary care center labor unit in 2023. Patients with xylazine on any pregnancy or neonatal UDS were classified as xylazine cases, while fentanyl only patients were controls. Data was collected via chart review and odds ratios calculated. For cells with no occurrences, a Haldane correction was used to approximate an odds ratio.

Results: A total of 65 patients with nonprescribed fentanyl use were identified, with 40 xylazine exposure cases based on testing of the pregnant person or neonate. There were no factors identified that were associated with an increased or decreased odds of xylazine positivity. The majority of patients in both groups reported public insurance (xylazine positive 97.3, negative 100%) concurrent use of a non-opioid substance (100%, 91.3%), and tobacco (100%, 93.3%), and having an antepartum admission (50%, 60%). A large proportion reported intravenous use (41.5%, 16.7%), had evidence of stimulant use (100%, 75%), a comorbid psychiatric condition (61%, 79%) and infection with hepatitis C (53.7%, 29.2%). The majority presented to care after the first trimester (80.5%, 62.5%), and approximately half in both groups were on medication treatment for opioid dependence.

Conclusion: Fentanyl exposure continues to be associated with a high degree of social vulnerability, concomitant use of other substances, comorbid conditions, and limited prenatal care, however none of the background variables evaluated were associated with an increased or decreased odds of xylazine exposure. As xylazine may increase perinatal morbidity, all patients with fentanyl use should be counseled regarding potential risks of xylazine exposure.

Table 1. Odds of exposure to xylazine in pregnant patients with fentanyl use by prenatal characteristics

	Xylazine (N=40)	No xylazine (N=28)	Unadjusted Odds Ratio (95% CI)
Demographics			
Advanced maternal age (%)	10 (24.4)	6 (25)	0.97 [0.26-3.82]
White race	20 (48.8)	11(45.8)	1.12 [0.37-3.49]
Completion of high school	7 (77.8)	2 (100)	*0.88 [0.3-28.25]
Public insurance	36 (97.3)	23 (100)	*0.78 [0.03-24.28]
Permanent housing	10 (52.6)	11 (78.6)	0.30 [0.42-1.75]
Intravenous fentanyl use	17 (41.5)	4 (16.7)	3.54 [0.93-16.53]
Use of any non-opioid substance	40 (100)	21 (91.3)	*7.62 [0.33-176.68]
Substances			
Tobacco Use	31 (100)	14 (93.3)	*4.43 [0.14-139.91]
Stimulant (cocaine, amphetamine)	41 (100)	18 (75)	*27.33 [1.45-515.86]
PCP	1 (2.4)	1 (4.2)	0.575 [0.01-47.08]
Benzodiazepines	11 (26.8)	3 (12.5)	2.57 [0.57-15.85]
Cannabis	14 (34.2)	14 (58.3)	0.37 [0.12-1.17]
Psychiatric comorbidity			
Anxiety	11 (26.8)	5 (20.8)	1.39 [0.37-5.92]
Depression	16 (39)	9 (37.5)	1.07 [0.34-4.47]
Other psychiatric condition	11 (26.8)	5 (20.8)	1.39 [0.37-5.92]
None	16 (39)	5 (20.8)	2.43 [0.68-9.91]
Medical history			
HIV	1 (2.4)	1 (4.2)	0.58 [0.01-47.08]
HCV	17 (53.7)	7 (29.2)	2.81 [0.86-9.71]
Syphilis	8 (19.5)	1 (4.2)	5.58 [0.65-257.93]
Prenatal care			
Any office visit	16 (41)	12 (50)	0.7 [0.22-2.19]
Any triage visit	12 (34.3)	8 (40)	0.78 [0.22-2.87]
Any antepartum admission	18 (50)	12 (60)	0.67 [0.19-2.30]
Any overdose event in pregnancy	3 (15)	2 (18.2)	0.79 [0.8-11.24]
Any ICU admission	1 (5.9)	2 (16.7)	0.21 [0.00-7.02]
Trimester of presentation to care			
1st	8 (19.5)	9 (37.5)	0.40 [0.11-1.46]
2nd	13 (31.7)	7 (29.2)	1.13 [0.33-4.03]
3rd	15 (36.6)	8 (33.3)	1.15 [0.36-3.89]
Postpartum	5 (12.2)	0	*6.67 [0.35-127.71]
Prenatal medication for OUD	18 (45)	15 (62.5)	0.49 [0.15-1.55]

*Haldane correction applied for a cell equal to zero.
CI= Confidence interval, HIV= human immunodeficiency virus, HCV= hepatitis C virus, ICU= intensive care unit, OUD= opioid use disorder, PCP= phenylcyclohexyl piperidine

987 | Fentanyl Exposure in the Era of Xylazine: an Update on Perinatal Outcomes

Cassandra Trammel[1]; Vahid Azimi[2]; Bridgit Crews[2]; Stephen Roper[2]; Nandini Raghuraman[3]; Antonina I. Frolova[4]; Hayley Friedman[2]; Megan L. Lawlor[2]; Jeannie C. Kelly[3]
[1]Washington University in St Louis, St. Louis, MO; [2]Washington University in St. Louis, St. Louis, MO; [3]Washington University School of Medicine in St. Louis, St. Louis, MO; [4]Washington University School of Medicine, St. Louis, MO

4:00 PM - 6:00 PM

Objective: Xylazine, a non-opioid veterinary sedative, is increasingly contaminating nonprescribed fentanyl. We sought to explore outcomes in fentanyl-exposed obstetric patients in an urban labor unit with high prevalence of xylazine in the local fentanyl supply.

Study Design: We performed a retrospective cohort study of all pregnant patients with nonprescribed fentanyl on urine drug screening (UDS) at a Midwestern tertiary care center in 2023. UDS via mass spectrometry is performed after a positive result on universal verbal screening. The primary outcome was preterm birth (PTB). Secondary outcomes included out of hospital birth (OOHB), adult intensive care unit (ICU) admission, neonatal ICU (NICU) admission, and other perinatal metrics. A secondary analysis comparing xylazine positive and negative dyads was performed with X^2 or Mann Whitney U tests as appropriate.

Results: 65 patients were identified. 57 had peripartum care in our facility, and 56 had neonatal data available with 59 neonates after accounting for twins. 62% of pregnant patients had xylazine exposure. Groups were similar aside from higher rates of intravenous drug use in the xylazine group (41.5 vs 16.7%, p = 0.04). 41.7% of xylazine exposed patients experienced PTB, compared to 28.6% of unexposed patients (RR 1.46, 95% CI 0.67-3.18) with a median gestational age of 37 weeks. Unplanned OOHB occurred in 19.4% of xylazine positive dyads and 9.5% of negative dyads, maternal ICU admission in 5.9% and 16.7%, and NICU admission in 76.5% and 70%, though differences were not significant. Xylazine dyads had lower rates of antepartum bleeding (2.4 vs 25%, RR = 0.09, [0.01-0.76]) and higher fentanyl positivity at delivery (100 vs 81%, RR = 1.23, [1.003-1.52]). Xylazine exposed neonates were less likely to be discharged in parental custody (5.6 vs 26.1%, RR 0.21, [0.58-2.3]).

Conclusion: Perinatal fentanyl use is associated with significant obstetric and neonatal morbidity regardless of xylazine exposure. Preliminary data suggests that xylazine may be a marker of severe disease and should be targeted for future study.

Table 1. Background characteristics of patients using non-prescribed fentanyl with and without xylazine exposure in pregnancy

	Positive xylazine N=40	Negative xylazine N=28	P-value
Age, median (IQR)	32 (29-34)	32 (28.5-34.5)	0.98
Completion of high school	7 (77.8%)	2 (100%)	0.46
Public insurance	36 (97.3%)	23 (100%)	0.43
Permanent housing	10 (52.6%)	11 (78.6%)	0.13
Intravenous route of use	**17 (41.5%)**	**4 (16.7%)**	**0.04**
Tobacco Use	31 (100%)	14 (93%)	0.15
Use of other non-opioid substance	40 (100%)	21 (91.3%)	0.05
Prenatal care			
Any office visit	16 (41%)	12 (50%)	0.49
Any triage visit	12 (34.3%)	8 (40.0%)	0.67
Any antepartum admission	18 (50%)	12 (60%)	0.47
Gestational age at presentation to care in weeks, median (IQR)	23 (13.5-33)	20 (12-33)	0.80
Gestational age at delivery, median (IQR)	37 (34-38)	37 (35-38)	0.52

IQR= interquartile range, OUD= opioid use disorder

Table 2. Dyad outcomes in pregnant patients with fentanyl use with and without xylazine exposure

Birthing person	Positive xylazine N=36	Negative xylazine N=21	RR [95% CI]
Antepartum Complication			
ICU admission	1 (5.9%)	2 (16.7%)	0.35 [.035-3.46]
Preterm labor	16 (39%)	7 (29.2%)	1.34 [0.64-2.78]
Fetal growth restriction	3 (7.3%)	3 (12.5%)	0.59 [0.13-2.67]
Vaginal bleeding	**1 (2.4%)**	**6 (25%)**	**0.09 [0.01-0.76]**
Gestational hypertension	4 (9.8%)	5 (20.8%)	0.47 [0.14-1.58]
Delivery Complication			
Preterm delivery	15 (41.7%)	6 (28.6%)	1.46 [0.67-3.18]
Gestational HTN/Preeclampsia	12 (33.3%)	6 (28.6%)	1.17 [0.51-2.65]
Abruption	2 (5.6%)	3 (14.3%)	0.38 [0.07-2.14]
NRFHT requiring OVD or CS	3 (8.3%)	3 (14.3%)	0.58 [0.13-2.63]
Unplanned out of hospital delivery	7 (19.4%)	2 (9.52%)	2.04 [0.47-8.94]
Fentanyl positive at delivery	36 (100%)	17 (81%)	**1.23 [1.003-1.52]**
Neonate	**Positive xylazine N= 36**	**Negative xylazine N=23**	**RR [95% CI]**
NICU admission	26 (76.5%)	14 (70%)	1.09 [0.78-1.54]
Xylazine positive at birth	22 (73.3%)	0	
Small for gestational age	10 (27.8%)	6 (26.1%)	1.06 [0.45-1.53]
APGAR score < 7 at 5 minutes	3 (10%)	2 (10%)	1 [0.18-5.46]
Length of stay > 5 days	34 (94.4%)	23 (100%)	0.94 [0.87-1.02]
NOWS requiring medication management	14 (40%)	8 (34.8%)	1.15 [0.58-2.3]
Parental custody at discharge	**2 (5.6%)**	**6 (26.1%)**	**0.21 [0.05-0.97]**

CS= cesarean section, HTN= hypertension, ICU= intensive care unit, NICU=neonatal intensive care unit, NOWS= neonatal opioid withdrawal syndrome, NRFHT= non-reassuring fetal heart tracing; OVD=operative vaginal delivery

988 | Safety of Cervical Cerclage Between 24 and 27 Weeks: Analysis from the IC-CLEAR Cohort Study

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4:00 PM - 6:00 PM

Objective: Cervical cerclage before 24 weeks gestation prolongs pregnancy in patients at risk for preterm birth. Its benefits after 24 weeks are unclear due to limited safety data. We sought to describe maternal and perinatal outcomes with cerclage placement at 24-27 weeks.

Study Design: This is a secondary analysis from the International Collaborative for Cerclage Longitudinal Evaluation and

Research (IC-CLEAR), a cohort study of women with singleton pregnancies and cerclage placement. Participants were enrolled at 6 institutions in the U.S. and 2 in Colombia from June 2016 to June 2020. For this study, the primary exposure was cerclage placement between 24 0/7 and 27 5/7 weeks; the comparator group was cerclage between 20 0/7 and 23 6/7 weeks. Maternal and neonatal outcomes were evaluated using a test of medians and chi-squared test.

Results: 35 out of 839 pregnancies underwent cerclage placement between 24 0/7 and 27 5/7 weeks; 88% (n = 31) were from the centers in Colombia and 12% (4) in the U.S. Cerclage was performed at a median gestational age of 25.4 weeks (IQR 24.8-26.3) and the median latency from placement to delivery was 10.7 weeks (IQR 7.4-11.35). Premature rupture of membranes occurred in 18% (n = 6), and clinical chorioamnionitis in 3% (n = 1). Three patients required ICU admission, two due to preeclampsia with severe features. NICU admission was required for 10 neonates (32%), with two cases of sepsis and two neonatal deaths. When comparing maternal and perinatal safety outcomes in those with cerclage at 24-27 weeks to those with cerclage at 20-24 weeks (n = 328), there was a higher rate of maternal ICU admission, not associated with cerclage use; no significant differences were observed in maternal or neonatal infectious morbidity, or in other neonatal morbidity or mortality (Table 1).

Conclusion: Cervical cerclage performed between 24 and 27 weeks is not associated with a significant increase in maternal morbidity or adverse neonatal outcomes. Randomized controlled studies to evaluate the effectiveness and safety of cerclage in patients at 24 or more weeks of gestation are needed.

Maternal and Neonatal Outcomes	Cerclage time (N=363)		
	< 24(n=328) (%)	>=24(n=35) (%)	P Value
Gestational age at delivery • Median (IQR)*	n=300 37.1	n=31 36.3	p=0.175
Premature rupture membranes (PPROM) < 34w	234/296 (79)	28/34 (82)	P= 0.652
Clinical Chorioamnionitis	28/290 (10)	1/31 (3)	P= 0.235
Intrauterine Fetal Demise	69/289 (2)	1/34 (3)	P=0.743
Maternal Mortality	0/303	0/30	
Maternal ICU admission**	7/291 (2)	3/31 (10)	P= 0.026
Maternal sepsis	3/289 (1)	1/31 (3)	P= 0.297
Neonatal intensive care unit (NICU) admission	91/273 (33)	10/31 (32)	P=0.904
Length of NICU stay (days) • Media (SD) • Median (IQR)* • Range (LI: LS)	n=116 28.9(38.5) 11.5(0 : 41.25) 0: 185	n=8 23.5(34.8) 8(4: 26.5) 0: 104	P= 0.930
Neonatal death	14/65 (5)	2/30 (7)	P= 0.751
Intraventricular Hemorrhage (IVH) grade 3,4	6/253 (2)	0 /30 (0)	P= 0.394
Retinopathy of prematurity	24/252 (10)	0 /30 (0)	P= 0.077
Necrotizing Enterocolitis (NEC)	4/250 (2)	0 /30 (0)	P= 0.485
Respiratory distress syndrome	51/253 (20)	7/30 (23)	P= 0.684
Bronchopulmonary dysplasia	8/253 (3)	1/30 (3)	P= 0.96
Neonatal culture proven sepsis	9/629 (1)	2/29 (7)	P= 0.062

*IQR: Interquartile range
**ICU Admissions in the >24w group not related to cerclage placement.

989 | Sonographic Indicators of Intralesional Haemorrhage in Fetal Lymphatic Malformation: a Retrospective Cohort Study

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4:00 PM - 6:00 PM

Objective: To review the rate of intralesional hemorrhage (IH), sonographic indicators of IH and outcomes in a cohort of fetuses with lymphatic malformations (LMs).

Study Design: We performed a single-center retrospective cohort study of fetal LMs over a 13-year period. IH was defined as ultrasound findings demonstrating reticular echogenicity, fluid-fluid levels or clot without flow on Doppler. Fetal transfusion was considered if the middle cerebral artery peak systolic velocity (MCA-PSV) was elevated >1.5 MoM. Lymphangioma volume ratio (LVR) was calculated using the formula: 0.532 x (tumour width x length x height in cm)/head circumference (cm). Predictive strength of LVR on IH was determined by ROC analysis.

Results: Twenty-six isolated LMs were identified antenatally. Three pregnancies were terminated and 5 were lost to follow-up. Of the remaining, 10 involved the head and neck (H&N) and 8 involved the axilla. H&N LMs were diagnosed at 26.1 weeks gestation (IQR 21.6-28.8 weeks) with an LVR at presentation of 2.24 (IQR 0.68-17.29). Axillary LMs were diagnosed at 28.1 weeks gestation (IQR 23.6-32.3 weeks) with an LVR at presentation of 4.17 (IQR 1.26-7.02). Lesion growth was observed over the course of pregnancy (Fig 1). Five cases of IH were detected at 28.7 weeks gestation (IQR 24.4-35.2) and were found to have significantly larger tumour volume compared to those without bleeding (LVR: 11.09±5.25 vs 5.33±4.11, p = 0.04, table 1). LVR greater than 6.86 had a detection rate of 80% (95%CI 37.6-99.0%) for IH with a specificity of 66.7% (95% CI 39.1-86.2%). Polyhydramnios was present in all cases of IH but only in 2 out of 13 without IH. Of the 5 cases of IH, 2 died in utero, 2 required fetal transfusions and all 3 survivors were treated with sclerotherapy and rapamycin postnatally.

Conclusion: Intralesional hemorrhage is a recognized complication of fetal LMs with polyhydramnios. LVR may serve as a good predictor for IH prompting serial follow-up with MCA-PSV. Surviving fetuses typically require further treatment postnatally.

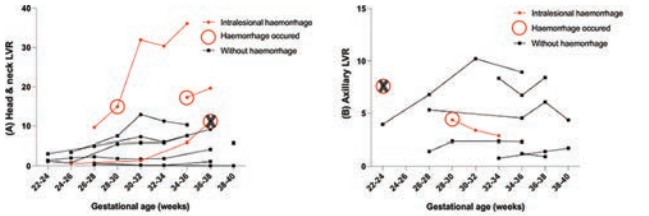

Figure 1. Natural history of tumour growth represented by lymphangioma volume ratio (LVR) in (A) head & neck lymphatic malformations anc (B) axillary lymphatic malformations. X demonstrates intrauterine death.

Table 1. Characteristics of fetal lymphatic malformations with intralesional haemorrhage

Case number	Location	GA at bleeding (weeks)	Tumour volume (cm³)	LVR	Highest MCA-PSV	Hydrops fetalis	Prenatal management	Transfusion hemoglobin Pre	Transfusion hemoglobin Post	IUFD	Delivery	Postnatal hemoglobin	Postnatal management	Neonatal outcomes (90 days)
1	HMN, anterior, midline	27.9	333.39	14.95	73.1 cm/s at 28.7 weeks (1.91MoM)	Yes	IUTx3 (at 27.9, 28.7, 34.0 weeks)	52 g/L	167 g/L	No	CS with EXIT procedure at 34.1 weeks	167 g/L	Rapamycin and sclerotherapy	Alive
2	HMN, anterior, left	36.3	362.56	11.19	70.3 cm/s at 37.3 weeks (1.34 MoM)	No	N/A	N/A	N/A	Yes (at 37.6 weeks)	Vaginal delivery at 38.1 weeks (misoprostol induction)	N/A	N/A	N/A
3	HMN, anterior, right	34.1	541.38	17.29	55.0 cm/s at 34.1 weeks (1.12 MoM)	No	N/A	N/A	N/A	No	CS with EXIT procedure at 37.7 weeks	191 g/L	Rapamycin, sclerotherapy and tracheostomy	Alive
4	Axilla, Left	28.7	178.12	4.38	92 cm/s at 32.4 weeks (2.01 MoM)	No	IUTx3 (at 28.7, 29.6, 32.4 weeks)	46 g/L	123 g/L	No	Vaginal delivery at 33.7 weeks due to preterm labour	183 g/L	Rapamycin and sclerotherapy	Alive
5	Axilla, right	21.1	118.97	5.83	30.7 cm/s at 21.1 weeks (0.75 MoM)	No	N/A	N/A	N/A	Yes (at 22.4 weeks)	CS (twin pregnancy, PPROM and PTB at 33.6 weeks)	N/A	N/A	N/A

990 | Diuretics for Preventing Postpartum Readmission: A Systematic Review and Meta-Analysis

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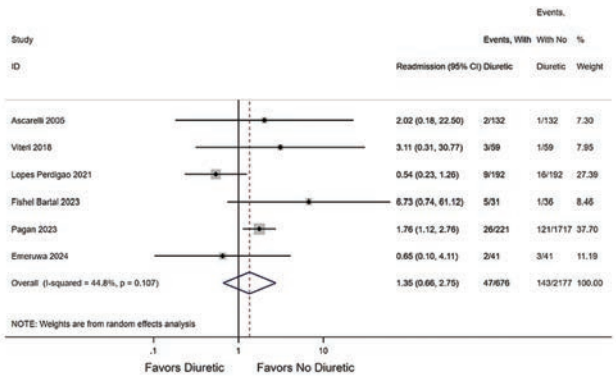
4:00 PM - 6:00 PM

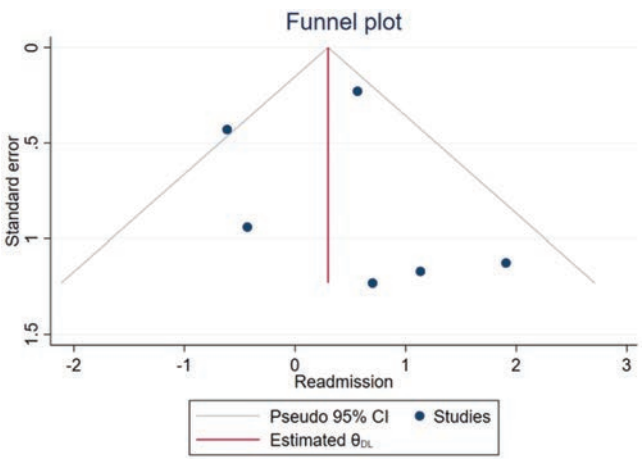
Objective: Hypertensive disease of pregnancy (HDP) is a leading cause of maternal postpartum readmission. While diuretics have been shown to reduce postpartum hypertension in women with HDP, their effectiveness in preventing postpartum readmission remains unclear. We performed a meta-analysis and systematic review to evaluate the impact of diuretic use on postpartum readmission rates in patients with HDP.

Study Design: We conducted a comprehensive search on PubMed, MEDLINE, Web of Science, PROSPERO, Cochrane Library, and ClinicalTrials.gov using a combination of key terms. Studies were included if they were published after 1995 and comprised clinical trials or observational cohorts. Eligible studies compared diuretic treatment to non-diuretic-based or no treatment in the postpartum period for patients with HDP. The primary outcome measured was readmission rates.

Results: Six studies, encompassing a total of 2,893 patients, were included. Five studies utilized loop diuretics (furosemide [4] and torsemide [1]), and one utilized a thiazide. The pooled odds ratio (OR) for readmission with any diuretic use was 1.35 (95% CI: 0.66 to 2.75). Visual inspection of the funnel plot revealed some asymmetry, suggesting that smaller studies showing positive results (i.e., those indicating a beneficial effect of diuretics on reducing readmission rates) might be missing. This asymmetry indicates potential publication bias. The variability among the studies was moderate (I^2 = 44.8%, P = 0.107). Metaregression analysis highlighted that the type of diuretic used had a significant impact on the results. Specifically, secondary analyses focusing only on studies that used loop diuretics (furosemide and torsemide) consistently showed a trend towards increased readmission rates.

Conclusion: Diuretic use in postpartum patients with HDP is not associated with decreases in readmission. Potential publication bias and the significant impact of diuretic type, particularly loop diuretics, on readmission rates highlight the need for targeted, large-scale prospective studies to accurately assess their role in managing postpartum hypertension.





991 | Poor Periconceptional Diet and Sleep Quality are Associated with Hypertensive Disorders of Pregnancy

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4:00 PM - 6:00 PM

Objective: Hypertensive disorders of pregnancy (HDP) remain a leading problem in the US and risk factor for future adverse cardiovascular health. While recommendations to support long-term cardiovascular health exist for adults, specific lifestyle and wellness guidelines intended to improve pregnancy health are limited. We sought to examine the relationship between periconceptional lifestyle-related factors, including nutrition, sleep, and physical activity and development of HDP.

Study Design: We conducted a secondary analysis of singleton pregnancies to nulliparous individuals in the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-be (nuMoM2b) prospective cohort. We studied 7,942 participants without chronic

hypertension or pregestational diabetes. We assessed periconceptional dietary quality using the Alternative Healthy Eating Index-2010 (AHEI-2010) score, sleep quality based on duration and snoring, and physical activity based on duration and adequacy as reported at study visit 1 (6 to 13 weeks' gestation). Multivariable logistic regression estimated odds ratios for HDP adjusted for markers of socioeconomic status, depression, perceived social support, maternal age, tobacco use, and medical comorbidities.

Results: Individuals who developed HDP were more likely to be older, non-Hispanic Black, unmarried, and use tobacco, with higher BMI compared to those who did not (Table 1). In adjusted models, AHEI-2010 score in the lowest quartile was associated with 1.3 times (95% confidence interval 1.04-1.58) higher odds of HDP compared to the highest quartile (Table 2). Early pregnancy snoring was associated with 1.4 times (95% confidence interval 1.18-1.63) higher odds of HDP (Table 2).

Conclusion: Poor diet quality and early pregnancy snoring were associated with HDP in nulliparas without preexisting hypertension or diabetes. Findings support developing low-cost lifestyle interventions targeting diet and snoring to reduce HDP risk, emphasizing the importance of preconception and early pregnancy care to improve maternal and infant health.

Table 1. Maternal and Pregnancy Characteristics

	No HDP (N=6098)			HDP (N=1844)			P-Value
	N	Mean ±SD	Range	N	Mean ±SD	Range	
Maternal age (years) at Visit 1	6098	26.9 ± 5.6	13-45	1844	27.2 ± 5.8	14-44	0.236
Pre-pregnancy BMI	6098	24.7 ± 5.5	14.2-60.1	1844	27.1 ± 6.7	14.6-58.2	<0.001
	N	Median (IQR)	Range	N	Median (IQR)	Range	
Gestational age at delivery	6098	39.0 (38-40)	20-43	1844	39.0 (38-40)	24-42	<0.001
		No. (%)			No. (%)		
Age ≥ 35 years at Visit 1		523 (8.6)			204 (11.1)		0.001
Pre-pregnancy BMI categories							<0.001
Underweight		293 (4.8)			50 (2.7)		
Normal weight		3668 (60.2)			842 (45.7)		
Overweight		1278 (21.0)			443 (24.0)		
Class I obesity		500 (8.2)			263 (14.3)		
Class II obesity		217 (3.6)			140 (7.6)		
Class III obesity		142 (2.3)			106 (5.7)		
Gestational weight gain							<0.001
Inadequate		1174 (19.3)			206 (11.2)		
Adequate		1707 (28.0)			340 (18.4)		
Excessive		3217 (52.8)			1298 (70.4)		
Race/Ethnicity							<0.001
Non-Hispanic White		3805 (62.4)			1145 (62.1)		
Non-Hispanic Black		661 (10.8)			320 (17.4)		
Hispanic/Latina		1074 (17.6)			221 (12.0)		
Asian		263 (4.3)			59 (3.2)		
Other		295 (4.8)			99 (5.4)		
Insurance Type							0.053
Commercial		4166 (68.7)			1234 (67.4)		
Government supported		1654 (27.3)			540 (29.5)		
Self/other		240 (4.0)			56 (3.1)		
Federal Poverty Category							0.850
>200% of federal poverty level		3561 (70.6)			1059 (70.9)		
100-200% of federal poverty level		717 (14.2)			204 (13.7)		
< 100% of federal poverty level		763 (15.1)			230 (15.4)		
Marital status							0.009
Married		3796 (62.2)			1085 (58.8)		
Single/Divorced/Widowed		2301 (37.7)			757 (41.1)		
Maternal Education Status							0.389
Less than HS degree		465 (7.6)			149 (8.1)		
HS degree or equivalent		671 (11.0)			224 (12.1)		
Some college		1782 (28.9)			547 (29.7)		
Completed college		1750 (28.7)			496 (26.9)		
Degree work beyond college		1782 (28.9)			547 (29.7)		
Tobacco prior to pregnancy		1011 (16.6)			373 (20.2)		<0.001
Maternal medical comorbidity		2404 (39.4)			787 (42.7)		0.016
Preterm Birth < 37 weeks		781 (12.8)			405 (22.0)		<0.001

Table 2. Outcomes

	No HDP (N=6098)			HDP (N=1844)			Unadjusted Analysis HDP vs. no HDP	Adjusted* Analysis HDP vs. no HDP
	N	Mean ±SD	Range	N	Mean ±SD	Range	OR (95% CI)	aOR (95% CI)
AHEI-2010 total score	5184	55.6 ± 12.5	22.4-96.9	1577	54.2 ± 12.2	24.8-91.3	0.99 (0.98-1.00)	0.99 (0.99-1.00)
AHEI-2010 Quartiles		No. (%)			No. (%)		OR (95% CI)	aOR (95% CI)
Quartile 4		1342 (25.9)			348 (22.1)		[reference]	[reference]
Quartile 1		1246 (24.0)			445 (28.2)		1.37 (1.17-1.62)	1.28 (1.04-1.58)
Quartile 2		1291 (24.9)			399 (25.3)		1.19 (1.01-1.40)	1.17 (0.97-1.41)
Quartile 3		1305 (25.2)			385 (24.4)		1.14 (0.97-1.34)	1.13 (0.95-1.35)
	N	Mean ±SD	Range	N	Mean ±SD	Range	OR (95% CI)	aOR (95% CI)
Hours of sleep per night	4883	8.1 ± 1.8	3-14	1491	8.2 ± 3.3	5-12	1.02 (0.99-1.05)	1.03 (1.00-1.06)
Duration of sleep categories		No. (%)			No. (%)		OR (95% CI)	aOR (95% CI)
Average sleep		3623 (74.2)			1065 (71.4)		[reference]	[reference]
Short sleep		271 (5.5)			101 (6.8)		1.27 (0.99-1.60)	1.07 (0.79-1.44)
Long sleep		989 (20.3)			325 (21.8)		1.12 (0.97-1.29)	1.17 (0.99-1.39)
Early pregnancy snoring		1093 (28.3)			466 (39.6)		1.67 (1.45-1.91)	1.39 (1.18-1.63)
	N	Mean ±SD	Range	N	Mean ±SD	Range	OR (95% CI)	aOR (95% CI)
Total PA (minutes) per week	6098	164.7 ± 299.5	0-8385	1844	166.2 ± 289.2	0-5520	1.00 (0.99-1.00)	1.00 (1.00-1.00)
PA per week adequacy		No. (%)			No. (%)		OR (95% CI)	aOR (95% CI)
Adequate		2146 (35.2)			636 (34.5)		[reference]	[reference]
Inadequate		3952 (64.8)			1208 (65.5)		1.03 (0.92-1.15)	0.88 (0.77-1.00)

*Adjusted for: maternal age, maternal pre-pregnancy BMI, insurance type, poverty level, marital status, tobacco use, maternal major medical comorbidity, Edinburgh Postnatal Depression Scale score and Multidimensional Scale of Perceived Social Support score

992 | Is the Timing of Gestational Diabetes Screening Associated with Adverse Perinatal Outcomes?

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4:00 PM - 6:00 PM

Objective: Though there is a universal recommendation to screen for gestational diabetes (GDM) from 24-28 weeks, the impact of the timing of screening within this 5-week interval has yet to be studied. The study objective was to determine whether the gestational age of 2-step GDM screening among those diagnosed with GDM is associated with adverse outcomes

Study Design: A retrospective cohort study of singleton, non-anomalous pregnancies at one institution from 2019-2022 and diagnosed with GDM via the 2-step test. The early cohort included patients screened from 24-26.6 and the late cohort included those screened from 27-28.6. The primary outcome was a composite of perinatal morbidity: macrosomia, shoulder dystocia, hypertensive disorders of pregnancy, cesarean delivery for presumed macrosomia, neonatal intensive care unit (NICU) admission, among other adverse neonatal outcomes. Additional secondary maternal and neonatal outcomes were collected. Bivariate analyses, univariate and multivariate regressions were performed

Results: Of 433 patients included, 213 (49.2%) screened early and 220 (50.8%) screened late. More patients self-identified as Asian in the early group ($p = 0.0002$) and a larger proportion of patients had 1st trimester GDM screening ($p = 0.001$) in the late group (Table 1). In univariate and multivariate analyses, there were no significant differences in the composite outcome between the groups (late vs early screening: aOR 0.82, 95% CI 0.54-1.26, $p = 0.36$). A significantly higher incidence of macrosomia (7 vs 2.7%, $p = 0.04$) and trend toward increased NICU admission (8.9 vs 4.5%, $p = 0.07$) was seen in the early group (Table 2)

Conclusion: Among patients diagnosed with GDM using the 2-step test, there was no difference in odds of composite perinatal

morbidity among patients screened at the earlier or later end of the 24-28 week screening interval, though there were differences in race and prevalence of early glucose screening between the groups. Additional research is needed to further elucidate these findings and understand the implications of the timing of GDM screening on maternal and neonatal outcomes

Table 1: Patient Demographic and Clinical Characteristics

Characteristic	ALL (n=433)	EARLY (24.0-26.6) (n=213)	LATE (27-28.6) (n=220)	P value§
Age at delivery – mean (SD)	34.1 (4.7)	34.3 (4.8)	33.9 (4.7)	0.32
AMA – no. (%)	208 (48.0)	103 (48.4)	105 (47.7)	0.90
BMI at screening* – median (IQR)	28.1 (24.9, 32.6)	27.8 (24.6, 32.7)	28.6 (24.9, 32.4)	0.26
BMI* ≥ 30 Kg/m² – no. (%)	158 (37.4)	73 (35.3)	85 (39.4)	0.39
BMI* ≥ 35 Kg/m² – no. (%)	65 (15.4)	32 (15.5)	33 (15.3)	0.96
BMI* ≥ 40 Kg/m² – no. (%)	25 (5.9)	10 (4.8)	15 (6.9)	0.36
CHTN – no. (%)	15 (3.5)	7 (3.3)	8 (3.6)	0.84
GDM in prior pregnancy – no. (%)	38 (8.8)	17 (8.0)	21 (9.5)	0.57
Race* – no. (%)				0.0002
Asian	98 (23.0)	65 (31.0)	33 (15.2)	
Black	57 (13.3)	31 (14.8)	26 (12.0)	
Caucasian	173 (40.5)	67 (31.9)	106 (48.8)	
Other	99 (23.2)	47 (22.4)	52 (24.0)	
Ethnicity* – no. (%)				0.76
Hispanic	101 (24.2)	51 (24.9)	50 (23.6)	
Non-Hispanic	316 (75.8)	154 (75.1)	162 (76.4)	
Insurance – no. (%)				0.08
Medicaid	102 (23.6)	58 (27.2)	44 (20.0)	
Private	330 (76.2)	154 (72.3)	176 (80.0)	
Self-Pay	1 (0.2)	1 (0.5)	0 (0.0)	
Multiparous – no. (%)	200 (46.2)	104 (48.8)	96 (43.6)	0.28
GA at first prenatal visit* – median (IQR)	9.0 (7.7, 10.7)	9.0 (7.9, 10.8)	9.1 (7.6, 10.7)	0.96
GCT – median (IQR)	161.0 (147.0, 180.0)	159.0 (147.0, 177.0)	164.0 (147.0, 182.5)	0.26
Early GCT – no. (%)	68 (15.7)	21 (9.9)	47 (21.4)	0.001

* 1-4% of the data were missing.
§ The Chi-square or Fisher's exact test was used for categorical variables and the t-test or Mann-Whitney test was used for continuous variables.

Table 2: Maternal, Delivery and Perinatal Outcomes

Characteristic	ALL (n=433)	EARLY (24.0-26.6) (n=213)	LATE (27-28.6) (n=220)	P value§
Composite adverse perinatal outcome – no. (%)	274 (63.4)	143 (67.1)	131 (59.8)	0.11
Macrosomia (BW >4000 g)	21 (4.8)	15 (7.0)	6 (2.7)	0.04
CS for macrosomia/LGA	11 (2.5)	6 (2.8)	5 (2.3)	0.72
Gestational Hypertension†	35 (8.1)	20 (9.4)	15 (6.8)	0.33
Preeclampsia with Severe Features	28 (6.5)	13 (6.1)	15 (6.8)	0.76
Shoulder Dystocia	5 (1.2)	4 (1.9)	1 (0.5)	0.21
Neonatal Hypoglycemia	195 (45.2)	100 (47.2)	95 (43.4)	0.43
Neonatal Hyperbilirubinemia Requiring Phototherapy	54 (12.5)	28 (13.1)	26 (11.8)	0.68
Humerus or Clavicular Fracture	0 (0.0)	0 (0.0)	0 (0.0)	--
Neonatal Respiratory Distress	15 (3.5)	10 (4.7)	5 (2.3)	0.17
Neonatal Need for Mechanical Ventilation	13 (3.0)	8 (3.8)	5 (2.3)	0.37
Neonatal ICU Admission	29 (6.7)	19 (8.9)	10 (4.5)	0.07
APGAR at 5min < 7 – no. (%)	0 (0.0)	0 (0.0)	0 (0.0)	--
Arterial pH < 7* – no. (%)	0 (0.0)	0 (0.0)	0 (0.0)	--
Arterial base excess < -12* – no. (%)	1 (0.2)	0 (0.0)	1 (0.5)	1.00
OASIS – no. (%)	10 (2.3)	6 (2.8)	4 (1.8)	0.54

** 6% of the data were missing.
§ The Chi-square or Fisher's exact test was used for categorical variables and the t-test or Mann-Whitney test was used for continuous variables.
† Includes preeclampsia without severe features

993 | Is Time Between Screening and Diagnosis of Gestational Diabetes Associated with Adverse Outcomes?

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Objective: To determine whether the interval between gestational diabetes (GDM) screening glucose challenge test (GCT) and diagnostic glucose tolerance test (GTT) is associated with adverse perinatal outcomes

Study Design: A retrospective cohort study of singleton, non-anomalous pregnancies at one institution from 2019-2022 and diagnosed with GDM via the 2-step test. The primary outcome was a composite of perinatal morbidity: macrosomia, shoulder dystocia, hypertensive disorders of pregnancy, cesarean delivery for presumed macrosomia, neonatal intensive care unit (NICU) admission, among other adverse neonatal outcomes. The comparison groups included patients with an interval between GCT and GTT of less than 10 days or greater than or equal to 10 days. Bivariate analyses, univariable and multivariable regressions were performed

Results: Of 389 patients included, 258 (66.3%) had an interval of less than 10 days between GCT and GTT and 131 (33.7%) had an interval of greater than or equal to 10 days. Patients in the ^{3}10 days group were more likely to be obese at time of GCT (30 vs 43.7%, p = 0.009) and more likely to be of Black race (9.4 vs 19.2%, p = 0.001) and have public insurance (16.3 vs 35.1%, p< 0.0001) (Table 1). There was a trend toward increased need for medication initiation in the ^{3}10 day group (32.9 vs 42%, p = 0.08) and a significantly later gestational age at initiation of medication (31.0 vs 32.9 weeks, p = 0.003) (Table 2). In the univariate and multivariate analyses there was no significant differences in the composite outcome between the groups (< 10 vs ^{3}10 days: aOR 1.03, 95% CI 0.64-1.67, p = 0.9)

Conclusion: While patients who had GTT ^{3}10 days after GCT were more likely to be Black, obese at time of GCT, have public insurance and initiated antihyperglycemic medication on average 2 weeks later than patients who had GTT within 10 days of GCT, no difference was seen in odds of adverse perinatal outcomes.

Table 1: Patient Demographic and Clinical Characteristics

Characteristic	ALL (n=389)	< 10 days between GCT and GTT (n=258)	>= 10 days between GCT and GTT (n=131)	P value§
Age at delivery – mean (SD)	34.2 (4.7)	34.2 (4.7)	34.2 (4.8)	0.92
AMA – no. (%)	188 (48.3)	122 (47.3)	66 (50.4)	0.56
BMI at screening* – median (IQR)	27.8 (24.6, 32.1)	27.0 (24.0, 31.2)	28.8 (26.5, 34.0)	0.0002
BMI* ≥ 30 Kg/m² – no. (%)	131 (34.6)	76 (30.0)	55 (43.7)	0.009
CHTN – no. (%)	10 (2.6)	6 (2.3)	4 (3.1)	0.74
GDM in prior pregnancy – no. (%)	28 (7.2)	15 (5.8)	13 (9.9)	0.14
Race* – no. (%)				0.001
Asian	92 (24.0)	69 (27.2)	23 (17.7)	
Black	49 (12.8)	24 (9.4)	25 (19.2)	
Caucasian	157 (40.9)	113 (44.5)	44 (33.8)	
Other	86 (22.4)	48 (18.9)	38 (29.2)	
Ethnicity* – no. (%)				0.14
Hispanic	86 (22.9)	51 (20.6)	35 (27.3)	
Non-Hispanic	289 (77.1)	196 (79.4)	93 (72.7)	
Insurance – no. (%)				<0.0001
Medicaid	88 (22.6)	42 (16.3)	46 (35.1)	
Private	300 (77.1)	215 (83.3)	85 (64.9)	
Self-Pay	1 (0.3)	1 (0.4)	0 (0.0)	
Multiparous – no. (%)	175 (45.0)	100 (38.8)	75 (57.3)	0.0005
GA at first prenatal visit* – median (IQR)	9.0 (7.7, 10.7)	9.0 (7.7, 10.6)	9.3 (7.9, 11.0)	0.45
GA at GCT – median (IQR)	27.0 (25.7, 28.0)	27.1 (25.9, 28.1)	26.7 (25.4, 27.9)	0.049
GCT value – median (IQR)	158.0 (145.0, 174.0)	158.0 (145.0, 172.0)	159.0 (145.0, 177.0)	0.60
Early GCT – no. (%)	60 (15.4)	41 (15.9)	19 (14.5)	0.72

* 1-4% of the data were missing.
§ The Chi-square or Fisher's exact test was used for categorical variables and the t-test or Mann-Whitney test was used for continuous variables.

Table 2: Maternal, Delivery and Perinatal Outcomes

Characteristic	ALL (n=389)	< 10 days between GCT and GTT (n=258)	>= 10 days between GCT and GTT (n=131)	P value§
Composite adverse perinatal outcome – no. (%)	240 (61.9)	155 (60.3)	85 (64.9)	0.38
Macrosomia (BW >4000 g)	20 (5.1)	14 (5.4)	6 (4.6)	0.72
CS for macrosomia/LGA	10 (2.6)	6 (2.3)	4 (3.1)	0.74
Gestational Hypertension†	27 (6.9)	17 (6.6)	10 (7.6)	0.70
Preeclampsia with Severe Features	20 (5.1)	14 (5.4)	6 (4.6)	0.72
Shoulder Dystocia	5 (1.3)	2 (0.8)	3 (2.3)	0.34
Neonatal Hypoglycemia	175 (45.2)	116 (45.3)	59 (45.0)	0.96
Neonatal Hyperbilirubinemia Requiring Phototherapy	43 (11.1)	29 (11.2)	14 (10.7)	0.87
Humerus or Clavicular Fracture	0 (0.0)	0 (0.0)	0 (0.0)	--
Neonatal Respiratory Distress	11 (2.8)	7 (2.7)	4 (3.1)	1.00
Neonatal Need for Mechanical Ventilation	10 (2.6)	6 (2.3)	4 (3.1)	0.74
Neonatal ICU Admission	24 (6.2)	12 (4.7)	12 (9.2)	0.08
APGAR at 5min < 7 – no. (%)	0 (0.0)	0 (0.0)	0 (0.0)	--
Arterial pH < 7* – no. (%)	0 (0.0)	0 (0.0)	0 (0.0)	--
Arterial base excess < -12* – no. (%)	1 (0.3)	1 (0.4)	0 (0.0)	1.00
OASIS – no. (%)	10 (2.6)	7 (2.7)	3 (2.3)	1.00
Need for medication for GDM – no. (%)	140 (36.0)	85 (32.9)	55 (42.0)	0.08
Gestational age at medication initiation – median (IQR)	32.0 (30.3, 33.7)	31.0 (30.0, 33.1)	32.9 (30.7, 34.3)	0.003
GA at GTT** – median (IQR)	28.3 (27.0, 29.3)	27.9 (26.6, 28.9)	29.4 (27.9, 30.3)	<0.0001

** 6% of the data were missing.
§ The Chi-square or Fisher's exact test was used for categorical variables and the t-test or Mann-Whitney test was used for continuous variables.
† Includes preeclampsia without severe features

994 | Prevalence and Screening Methods for Asymptomatic Bacteriuria in Pregnancy in Low Resource Settings

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Objective: Screening for asymptomatic bacteriuria (AB) has been recommended to reduce the risk of pregnancy complications. The evidence for this practice is outdated and of low quality, and global implementation is inconsistent. We conducted a prospective study in a rural Bangladeshi population to ascertain the prevalence of AB, assess the utility of point of care screening methods, determine antimicrobial sensitivity patterns, and report the prevalence of low birth weight (LBW) in pregnancies with AB.

Study Design: We obtained urine samples from 600 asymptomatic pregnant women (1150 samples) being enrolled in a prospective registry of women in antenatal care. Samples were cultured on blood and MacConkey agar plates. AB was defined as presence of a single organism ≥105 CFU/mL. Antimicrobial sensitivity testing was performed. Samples were inoculated on urine dipslides and analyzed for nitrite and leukocyte esterase (LE) using urine dipsticks (positive dipstick = presence of both nitrite and LE). The performance of dipslide and dipstick were calculated using culture as the reference.

Results: A positive culture was found in 37/1150 samples (3.2%); the overall prevalence of AB during pregnancy was 5.2% (31/600 subjects positive on at least one sample). E. coli was most common (65% of total) followed by Enterococcus and Enterobacter. 90% of all isolates were sensitive to nitrofurantoin, including 100% of E. coli (Table). When compared to culture, the sensitivity of dipslide and dipstick for AB were 65% and 14%. 26% of pregnancies with AB resulted in a LBW newborn vs 21% of pregnancies with negative culture (p = 0.56).

Conclusion: AB was present in 1 in 20 pregnant subjects in this cohort. The sensitivity of dipstick and dipslide were poor, indicating lack of suitability to serve as a primary method of screening for AB in this population. Future trials assessing the impact of screening and treating AB in pregnancy on the incidence of adverse outcomes in low resource settings must address logistics and cost of widespread implementation of urine culture capacity given the low sensitivity of point of care screening tests.

Table – Oral Antibiotic Sensitivity Pattern

Agent	Susceptible (%)	Intermediate (%)	Resistance (%)
Ampicillin / Amoxicillin	27.03	2.70	70.27
Cefixime	45.16	9.68	45.16
Nitrofurantoin	91.67		8.33
Cotrimoxazole	84.38		15.63
Azythromycin		28.13	71.88
Erythromycin	14.29	14.29	71.43

995 | Impact of an Addiction in Pregnancy Program on Breastfeeding in Patients with Substance Use Disorder

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Objective: Breastfeeding (BF) plays a crucial role in promoting maternal and neonatal health. However, BF disparities exist among patients with substance use disorder (SUD). We evaluated the association between participation in a comprehensive addiction in pregnancy program (CAPP) and BF in patients with SUD.

Study Design: Retrospective cohort of pregnant patients with SUD who delivered between 4/2028—8/2022 at a tertiary care center in the southeast US. Exclusion criteria were: HIV, fetal demise, or infant adoption. CAPP provided multi-disciplinary group-based prenatal care to pregnant patients with SUD; patients were CAPP eligible if < 32 weeks, used ≥1 illegal substance, and scored ≥4 on the National Institute on Drug Abuse—Modified Assist Tool. The primary outcome was BF rate at discharge from the delivery-associated hospitalization in those who participated in CAPP compared to patients with SUD who were CAPP eligible but did not enroll (non-CAPP). Secondary outcomes included rate of BF at 6 weeks postpartum, BF intention, rate of neonatal opioid withdrawal syndrome (NOWS), highest modified Finnegan score, and neonatal length of stay (LOS). Outcomes were compared between groups.

Results: A total of 421 patients were included: 147 CAPP, 274 non-CAPP. Of the patients who participated in CAPP, 69.4% BF their infant at discharge compared to 42.9% of non-CAPP patients (p< 0.001, OR 2.89 (95% CI 1.85, 4.52)). Of CAPP patients who BF, 44.8% exclusively BF compared to 14.5% non-CAPP (OR 4.63, 95% CI 2.84, 7.55); and 24.6% of CAPP patients provided both breastmilk and formula compared to 28.4% non-CAPP (OR 0.80, 95% CI 0.50–1.30). At the postpartum visit, 32.1% of CAPP patients and 39.5% of non-CAPP patients were still BF, with no significant difference between cohorts. There was no difference in NOWS, highest Finnegan score, or NICU LOS between groups (Table).

Conclusion: Participation in a comprehensive addiction in pregnancy program is positively associated with BF at discharge from the delivery-associated hospitalization. Additional postpartum interventions are warranted to support BF after hospital discharge.

Table: The Effect of a Comprehensive Addiction in Pregnancy Program (CAPP) on Breastfeeding Rates Among Patients with Substance Use Disorder

	CAPP N=147	Non-CAPP N=274	p-value	OR (95% CI)
Primary Outcome				
Breastfeeding at discharge from the delivery-associated hospitalization	93 (69.4%)	115 (42.9%)	**<0.001**	**2.89 (1.85,4.52)**
Secondary Outcomes				
Feeding intent at delivery hospitalization				
Breast	62 (48.4%)	96 (39.2%)	0.147	1.39 (0.89, 2.15)
Formula	33 (25.8%)	76 (31.0%)	0.254	0.76 (0.46, 1.23)
Both	33 (25.8%)	73 (29.8%)	0.642	0.89 (0.55,1.45)
Feeding at discharge from delivery hospitalization				
Breast	60 (44.8%)	39 (14.5%)	**<0.001**	**4.63 (2.84, 7.55)**
Formula	41 (30.6%)	153 (57.1%)	**<0.001**	**0.35 (0.22, 0.54)**
Both	33 (24.6%)	76 (28.4%)	0.375	0.80 (0.50,1.30)
Feeding at postpartum visit				
Breast	17 (21.8%)	12 (13.9%)	0.19	1.72 (0.76, 3.90)
Formula	53 (67.9%)	52 (60.5%)	0.322	1.39 (0.73, 2.65)
Both	8 (10.3%)	22 (25.6%)	0.014	0.33 (0.14, 0.80)
NOWS	50 (37.3%)	88 (32.8%)	0.382	1.22 (0.78,1.89)
Highest modified Finnegan Score	9.5 ± 4.9	10.6 ± 3.9	0.077	-1.10 (-2.32, 0.12)
NICU admission	70 (94.6%)	180 (84.1%)	0.029	3.31 (1.13, 9.70)
NICU LOS	7.5 ± 16.5	9.5 ± 32.8	0.626	-1.58 (-7.92, 4.77)

Abbreviations: CAPP - Comprehensive Addiction in Pregnancy Program; NOWS - Neonatal Opioid Withdrawal Syndrome; NICU - Neonatal Intensive Care Unit

996 | Association of Fetal Heart Rate Tracing with Neonatal Adverse Outcomes at 32.0 to 36.6 weeks

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Objective: The objective was to determine if features of fetal heart rate tracings (FHRT) were associated with an increased rate of neonatal adverse outcomes among preterm deliveries at 32.0–36.6 weeks.

Study Design: A retrospective review of all available FHRT among non-anomalous singletons attempting labor at 32.0 to 36.6 weeks. The study was conducted at a Level IV maternal center during a consecutive 15-month period. Obstetricians reviewing FHRT were blinded to the maternal characteristics, gestational age, and peripartum outcomes. Features of FHRT were dichotomized by time spent during the last hour before delivery (<50% vs. ≥50%). The primary outcome was the rate of composite neonatal adverse outcomes (CNAO). Chi-square test was used to compare groups, and likelihood ratios (LR) were calculated for FHRT features that differed significantly for those with and without CNAO. A priori, LR greater than 10 was considered a useful diagnostic test (Jeschker R et al. JAMA 1994).

Results: Of 5,160 patients, 672 (13%) met the inclusion criteria. CNAO occurred in 57 (8.5%) newborns. Maternal characteristics (age, nulliparity, race/ethnicity, tobacco use, and hypertensive disorders) were similar between groups (Table 1). Compared to those without, minimal variability was significantly more likely to occur with CNAO (11.2% vs. 24.6% p< 0.01). Two features of FHRT occurred significantly less often with CNAO: moderate variability (85.4% vs. 66.7%, p < 0.01) and presence of accelerations (66.8% vs. 50.9% p < 0.02). The LR of the three features which differed significantly among those with and without CANO ranged from 1 to 2. Notably, there was no significant difference between CNAO with any of the following: prolonged decelerations, combination of decelerations, and recurrent decelerations (Table 2).

Conclusion: Though certain features of fetal heart rate tracings differed significantly in those with and without composite neonatal adverse outcomes at 32.0 to 36.6 weeks, the likelihood ratios of 1 to 2 suggest these characteristics are poor predictors of adverse neonatal outcomes in this cohort.

Table 1. Maternal Characteristics of Preterm Deliveries at 32.0 to 36.6 Weeks

	Without CNAO[1] N= 615		With CNAO[1] N=57		P
	N	%	N	%	
Maternal age (years)					0.12
< 20	38	6.2	1	1.8	
20 - 35	461	75	40	72	
35 or more	116	18.9	16	28.1	
Nulliparous	200	32.5	20	35.1	0.69
Race / ethnicity—self reported					0.59
Black / African-American	108	17.6	9	15.8	
Hispanic / Latina	238	38.7	23	40.4	
White	181	29.4	18	31.6	
Asian	24	3.9	4	7	
Others	64	10.4	3	5.3	
Body mass index ≥ 30 kg / m^2	400	65	39	69.6	0.49
Private Insurance	213	34.6	23	40.4	0.39
Tobacco use during pregnancy	28	4.6	6	10.5	0.05
Hypertensive disorder of pregnancy*	317	51.5	17	29.8	0.11
Diabetes mellitus^	127	20.7	17	29.8	0.11

Data presented as N (%)
[1]CANO, composite adverse neonatal outcomes, which included any of the following: Apgar < 7 at 5 min, mechanical ventilation > 6 hours, bronchopulmonary dysplasia, intraventricular hemorrhage, necrotizing enterocolitis, seizures, sepsis, brachial plexus palsy, hypoxic ischemic encephalopathy or neonatal death
*Includes chronic hypertension, pregnancy induced hypertension without or with severe features
^Includes gestation or pre-gestational diabetes

Table 2. Individual Features of Fetal Heart Rate Tracings with Neonatal Outcomes

	Without CNAO[1] N=615		With CNAO[1] N=57			Likelihood ratio (+)	Post-test Probability[4]
	N	%	N	%	p-value		
Tachycardia	9	1.5	0	0	0.36		
Variability							
Absent	2	0.3	0	0	0.67		
Minimal	69	11.2	14	24.6	**<0.01**	2 (1 – 4)	17 (11 – 25)
Moderate	525	85.4	38	66.7	**<0.01**	1 (0.7 – 1)	7 (6 – 8)
Marked	1	0.2	0	0	0.76		
Acceleration Present	411	66.8	29	50.9	**0.02**	1 (0.6 – 1)	7 (5 – 8)
Prolonged	1	0.2	0	0	0.76		
Early Decelerations[2]							
Minimal	11	1.8	0	0	0.31		
Moderate	7	1.1	0	0	0.42		
Severe	4	0.7	0	0	0.54		
Late Decelerations[2]							
Minimal	44	7.2	4	7	0.97		
Moderate	21	3.4	1	1.8	0.50		
Severe	6	1	2	3.5	0.09		
Variable Decelerations[3]							
Minimal	107	17.4	9	15.8	0.76		
Moderate	66	10.7	3	5.3	0.19		
Severe	17	2.8	4	7	0.08		
Prolonged Decelerations							
> 2 min < 6 min	6	1	2	3.5	0.09		
≥ 6 min < 10 min	3	0.5	0	0	0.60		
Combinations of Decelerations							
Variable (+) Late (+)	232	37.7	21	36.8	0.90		
Variable (+) Late (+) Prolonged	243	39.5	21	36.8	0.69		
Recurrent Decelerations	150	24.4	9	15.8	0.14		

[1]CANO, composite adverse neonatal outcomes, which included any of the following: Apgar < 7 at 5 min, mechanical ventilation > 6 hours, bronchopulmonary dysplasia, intraventricular hemorrhage, necrotizing enterocolitis, seizures, sepsis, brachial plexus palsy, hypoxic ischemic encephalopathy or neonatal death
[2]Minimal are below baseline by < 15, moderate are <30, severe are <45 bpm
[3]Minimal are present, but nadir > 80; moderate are 30-60s <80 nadir; marked are 60-120s < 80 bmp nadir
[4]Assumes a pre-test probability of composite adverse neonatal outcomes: 8%

997 | Using Human-Centered Design to Map the Perinatal Ecosystem for Pregnant People with Substance use Disorders

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Objective: Given the profound impacts of substance use disorders (SUDs) in pregnancy on the health and wellbeing of parents and newborns, improving access to perinatal services for this population is a priority. The objective of this study was to use human-centered design methodologies to map the steps through which families affected by parental substance use progress through prenatal and postpartum care, with the goal of identifying opportunities to improve systems of care for substance-exposed families.
Study Design: We used process mapping–a human-centered design methodology–to characterize the steps associated with engaging in perinatal care systems as a parent with a SUD. Clinical and community-based staff working within a safety-net healthcare system participated in mapping workshops in which they responded 39 questions corresponding to the steps taken throughout a patient's journey from prenatal to postpartum care. Using a human-centered design approach to inductive thematic analysis, we identified themes, constructed insight statements, and generated corresponding design opportunities.
Results: Forty-seven stakeholders participated in process mapping. Eight insights emerged which clustered into 3 overarching themes: (1) provider variability in understanding policies and procedures, (2) care coordination challenges between team members, and (3) lack of standardization in engaging with child welfare. These findings generated 13 actionable design opportunities to strengthen perinatal care delivery.
Conclusion: Process mapping is a unique methodology to understand complex service delivery challenges and to improve systems of care for pregnant people with SUDs. In our ecosystem, process mapping revealed that unstandardized policies and care coordination challenges complicated perinatal care for substance-exposed families. Strengthening healthcare systems to better serve the needs of this population is central to improving family outcomes.

998 | Improving Care Coordination for Socially Complex Perinatal Patients: A Human-Centered Design Study

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Objective: Designing novel solutions to address care fragmentation in the perinatal ecosystem requires rigorous evaluation of current workflows and engagement with the diverse network of stakeholders supporting patient care. Human-centered design (HCD) is an established methodology for identifying challenges in clinical workflows, with the goal of producing actionable insights to inform novel interventions. The objectives of this study were to use HCD methodologies to 1) understand the processes of transitioning perinatal care within a safety-net system, and 2) identify opportunities to improve care coordination for socially complex pregnant patients.
Study Design: We conducted semi-structured interviews with patients, clinical providers, and staff at community-based organizations (CBOs) working in a safety-net healthcare system. Interviews were analyzed using an HCD approach to inductive thematic analysis. We also completed an inventory of all questionnaires administered to patients by their perinatal care teams. Items were coded according to inductively generated themes for a descriptive analysis of item overlap.
Results: Fifteen patients, 21 clinical providers and 6 CBO staff participated in interviews. Six insights statements emerged: 1) the perinatal care system is resource rich but coordination is poor, 2) safety-net hospitals rely on CBOs to support patients but lack reliable communication systems with them 3) patient data protections complicate collaborative care planning, 4) poor communication around substance-use policies introduces bias in decision-making, 5) patients expect continuity of care and seeing new providers may engender mistrust. Eighteen perinatal questionnaires containing 833 items were coded into 21 unique themes, with 17 themes (81%) being duplicated between questionnaires.
Conclusion: Using an HCD approach, we identified key challenges in care coordination for socially complex perinatal patients. Interventions strengthening informational continuity between clinical and community-based providers offer promise for improved care delivery in safety-net systems.

1000 | Emergency Cervical Cerclage Versus Expectant Management in Women with Cervical Insufficiency Beyond 24 weeks

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Objective: To determine whether cervical cerclage (CC) reduced the rate of preterm birth (sPTB), prolonged pregnancy (PP) latency and improved perinatal outcomes (PO) in women with cervical insufficiency (CI) $\geq$ 24 weeks compared to expectant management (EM).

Study Design: This was a prospective quasi-experimental study that compared CC vs EM in patients with CI $\geq$ 24 weeks (cervical dilatation $\pm$ exposed fetal membranes). Prospective data of the CC group was compared with historic data of similar characteristics of EM between 2022 to 2024 at an urban hospital in a 3:1 ratio. Both groups received Vaginal Progesterone, Betamethasone, Antibiotics and Indomethacin. Patient in the CC group were discharged home within 24 hours of surgery while EM group remained on admission until delivery. The outcomes were overall sPTB < 37 weeks, early and late sPTB (< 34 and 34 - 37 weeks), PO, NICU admission and duration. Baseline characteristic and PO were stratified and reported by intervention groups using Chi square and Kruskal Wallis. Multivariable and adjusted binomial and multinomial logistic regression models were used to assess rate of PTB between the two study groups. **(Table 2).**

Results: Of the 91 patients recruited, 67 had CC while 24 had EM. Baseline characteristics were similar. Neonates of women with CC were delivered at a later gestational age [38.2 wks vs 29.9 wks, p < 0.00 1], had higher birth weight [3170 g vs 2295 g, p < 0.001], lower NICU admission rate [18 (27.3%) vs 16 (66.7%), p = 0.001] and lower rate of severe neonatal complications [1 (6%) vs 6 (46.2%), p < 0.010] Table 1. Compared to women with EM, those with CC had 95% lower odds of PTB < 37 weeks [aOR; 0.05, (0.0.14 - 0.19), p < 0.001] and 97% lower risk of early PTB < 34 weeks [aRR; 0.03, (0.01 - 0.15), p < 0.001]. There was no difference in late PTB (34 - 37 weeks) between the groups [aRRR; 0.18, (0.25 - 1.25), p = 0.08] **Table 2.**

Conclusion: This study showed that compared to EM, CC in women with CI $\geq$ 24 weeks reduced the risks of sPTB, prolonged pregnancy latency and reduced NICU admission and severe neonatal complications rates.

Table 1: Comparison of Perinatal Outcomes between Emergency Cerclage and Expectant Management Groups ≥ 24 weeks

Perinatal Outcome	Expectant management	Rescue Cerclage	P value
Small for Gestational age	1 (4.35)	5 (7.69)	0.584
Gestational age at delivery, weeks	29.9 (25.6 – 37.3)	38.2 (37 – 39.2)	**< 0.001**
Mode of delivery			0.907
Spontaneous vaginal delivery	14 (58.33)	40 (59.70)	
Cesarean section	10 (41.67)	27 (40.30)	
Birth weight, grams	2295.5 (908.5 - 2905.5)	3170 (2820 – 3561)	**<0.001**
Birth weight categories, grams			**<0.001**
< 1,000	8 (33.33)	0.00	
1,000 – 1,499	3 (12.50)	3 (4.48)	
1,500 – 2,499	2 (8.33)	9 (13.43)	
2,500 – 4,230	11 (45.83)	55 (82.09)	
Fetal sex			0.513
Male	11 (47.83)	26 (40.00)	
Female	12 (52.17)	39 (60.00)	
NICU Admission	16 (66.67)	18 (27.27)	**0.001**
Number of days on NICU admission	48 (8-98)	14 (6-42)	0.080
[a]Composite Neonatal Complications	12 (85.71)	16 (88.89)	0.788
[b]Composite Severe Neonatal Complications	6 (46.15)	1 (5.88)	**0.010**
Number of days on NICU admission	48 (8-98)	14 (6-42)	0.080

Data were reported as frequency (percentage), median (interquartile range)
NICU, Neonatal Intensive Care Unit
[a]Composite Neonatal outcomes include hypoglycemia, hypothermia, neonatal distress and hyperbilirubinemia.
[c]Composite Severe Neonatal Complications include respiratory distress syndrome, bronchopulmonary dysplasia, intraventricular hemorrhage and necrotizing enterocolitis.

Table 2: Risk of sPTB in women with Cervical Insufficiency: Emergency Cervical cerclage versus Expectant Management ≥ 24 weeks.

	Preterm (< 37 weeks) vs Term Delivery (≥ 37 weeks)			Early Preterm (< 34 weeks) vs Term Delivery (≥ 37weeks)			Late Preterm (34 - < 37 weeks) vs Term Delivery (≥37 weeks)		
	OR (95% CI)	aOR (95% CI)		RRR (95% CI)	aRRR (95% CI)		RRR	aRRR (95% CI)	
Expectant management	Reference (1)	Reference (1)	P value	Reference (1)	Reference (1)	P value	Reference (1)	Reference (1)	P value
[a]Emergency Cerclage	**0.10 (0.03 - 0.29)**	**0.05 (0.14 – 0.19)[a]**	**< 0.001**	**0.06 (0.02 – 0.22)**	**0.03 (0.01 – 0.15)**	**< 0.001**	0.26 (0.05 – 1.28)	0.18 (0.25 – 1.25)	0.08

aOR, adjusted odds ratio; CI, confidence interval; aRRR, adjusted relative risk ratio.
[a]Models were adjusted for maternal age, ethnicity, BMI at initial prenatal visit, parity, gestational age at intervention, smoking in pregnancy, alcohol use in pregnancy and illicit drug use in pregnancy.

1001 | Detecting Maternal Mosaicism in Fetal Sex Chromosome Aneuploidy Screening

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4:00 PM - 6:00 PM

Objective: Sex chromosome anomalies (SCA) are a common class of fetal aneuploidy, but cell-free DNA (cfDNA) screening assays have relatively low positive predictive value (PPV) for SCA calls. False positives are caused by factors including statistical error, confined placental mosaicism, and maternal mosaicism. To compare the impact of these factors and improve SCA screening PPV, we developed a new "depth trajectory" method that identifies mosaic maternal aneuploidy by analyzing covariation in read depth and DNA fragment size.

Study Design: We screened 728 prenatal cfDNA samples for fetal SCA with a whole-genome sequencing (WGS) assay and a new targeted sequencing assay. The targeted assay uses *in silico* size selection to measure how chromosome dosage varies with fetal fraction within each sample's sequencing reads. Maternal mosaic loss of X is identified when X chromosome dosage is depressed but increases along with fetal fraction. The cohort included 25 patients screening positive for monosomy X and 36 patients screening positive for other SCAs on the WGS assay. Fetal diagnosis via amniocentesis or postnatal karyotype was obtained for 12 monosomy X screen-positive patients.

Results: 59 of 61 patients screening positive for fetal SCA in the WGS assay were also positive in the targeted assay prior to maternal anomaly calling. PPV of monosomy X calls in the WGS assay was 42% (5/12). One fetal mosaic true positive was not detected and 3 of 7 false positives were identified as maternal anomalies in the targeted assay, improving PPV to 50% (4/8). Remaining false positives had an average 61% degree of mosaicism in the targeted assay, consistent with placental mosaicism.

Conclusion: Depth trajectory analysis successfully identifies maternal X chromosome mosaicism and improves PPV in fetal sex chromosome anomaly screening. We observed high confirmation rates in re-tested samples, suggesting that statistical error is a relatively minor contributor to SCA false positives, which are primarily explained by confined placental mosaicism and maternal mosaicism.

1002 | Incidence of Recurrent Preterm Birth in the US after FDA Withdrawal of 17-OH-Progesterone

Claire H. Packer[1]; Taylor S. Freret[2]; Kaitlyn E. James[3]; Sarah E. Little[2]; Alexander Melamed[3]; Mark A. Clapp[3]
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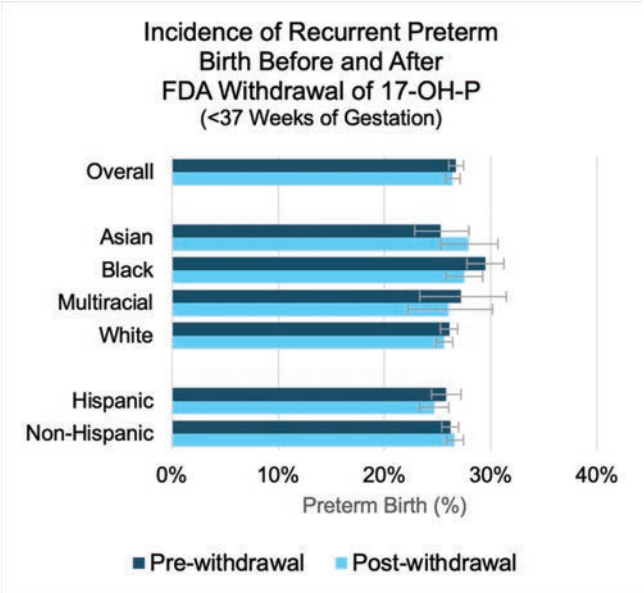
Objective: For >10 years, 17-OH-progesterone (17-OH-P) was prescribed to reduce the risk of recurrent spontaneous preterm birth. In 2023, its FDA approval was withdrawn due to a lack of demonstrated efficacy. The objective of this study was to examine population changes in the incidence of recurrent preterm birth after the FDA withdrawal.

Study Design: We performed a pre-post study using cross-sectional US natality data. Patients with a history of preterm birth and who delivered a singleton, live birth after 20 weeks of gestation were included. FDA withdrawal of approval for 17-OH-P was in April 2023. The pre-period was from 09/2022-03/2023, and the post-period from 09/2023-03/2024; both periods were the same length and comprised the same calendar months. Births from 04/2023-08/2023 were excluded to avoid patients who potentially discontinued 17-OH-P mid-pregnancy. We examined the incidence of recurrent preterm birth < 37 and< 34 weeks of gestation; results were stratified by race and ethnicity and reported for groups with ≥100 individuals in the denominator. Chi-square tests were used for comparison.

Results: There were 16,088 deliveries in the pre-period and 16,534 in the post-period. There were no significant differences in the incidence of preterm birth < 37 weeks (26.7 vs. 26.4%, p = 0.54) or < 34 weeks (6.7 vs 6.7%, p = 1.00) between the pre- and post-periods. When stratified by race, there was no significant increase in preterm births in the post-period among any of the racial and ethnic groups (Figure).

Conclusion: When comparing the periods immediately before and after the FDA withdrawal of its approval for 17-OH-P, there were no apparent national differences in the incidences of recurrent preterm birth overall or among racial and ethnic groups. Future studies using individual patient-level data with more granular details on the etiologies for prior preterm births and accounting for other changes related to recurrent preterm birth management (e.g., vaginal progesterone use) will be important in understanding the population impacts of this major practice change.



1003 | Racial Disparities in Cesarean Deliveries without Trial of Labor: A Population-Based Analysis of Birth Timing

Clarice G. Zhou[1]; Christopher X. Hong[2]; Mariana Masteling[2]; Matthew K. Janssen[3]; Rebecca F. Hamm[4]
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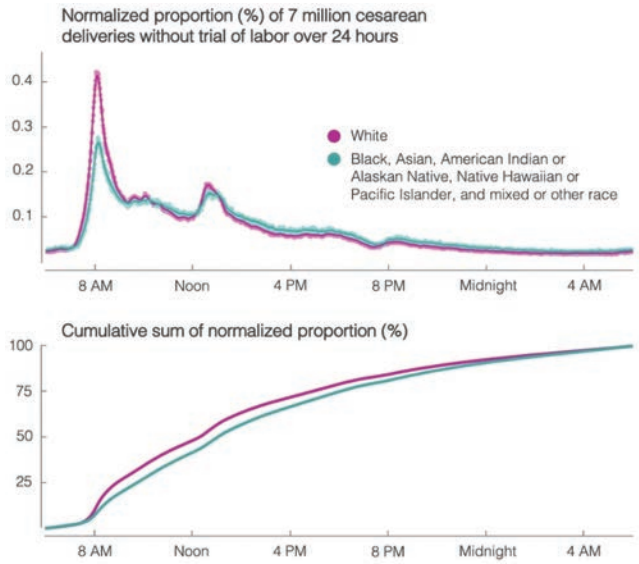
Objective: While racial disparities in obstetrics are multifactorial, differences in resource allocation may contribute to the disparity. Here, we assess racial differences in delivery timing for cesarean deliveries (CD) without a trial of labor (TOL).

Study Design: This retrospective population-based cohort used birth certificate data from the National Vital Statistics System from 2016-2021, which includes birth timing for CD in the US. Since the timing of planned CD may be more susceptible to external systemic influences, this analysis focuses on CD without TOL. We excluded CD with TOL and unknown delivery time. Maternal race was self-identified (White, Black, Asian, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander, or mixed or other race) and categorized as White or Black, Indigenous, and People of Color (BIPOC). The number of CD without TOL at each minute was normalized relative to totals in each racial group to allow for balanced comparison. The cumulative sum in the proportion of CD was calculated starting from 6:00 a.m. Differences in cumulative sum of CD between races were analyzed with the Kolmogorov-Smirnov test.

Results: Among 7,045,802 patients who underwent a CD without TOL, 72% were categorized as White and 26.3% as BIPOC; less than 3% had unknown racial data. For both groups, the highest proportion of CD occurred around 8:00 a.m. followed by a second peak around 12:30 p.m. Differences in the cumulative sum distribution exist between racial groups ($p = 0.01$). The largest difference in the cumulative sum distribution between groups is observed at 10:10 a.m. between White and BIPOC patients; by this

time, CD without TOL occurred for 35% of White patients versus only 28% of BIPOC patients.

Conclusion: This population-based study reveals differences in the timing of CD without TOL between White and BIPOC patients, with White patients more likely to undergo CD earlier in the clinical workday. Future research should assess root causes, and whether disparities in resource allocation contribute to differences in obstetrical outcomes.



1004 | Early Placental Volume as a Biomarker for Maternal Vascular Malperfusion

Claudia J. Tawil[1]; Baris Oguz[2]; Gabriel A. Arenas[2]; Rebecca L. Linn[3]; Jasmine Steele[4]; Ipek Oguz[5]; Nadav Schwartz[1]

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4:00 PM - 6:00 PM

Objective: Early placental volume (PV) is associated with fetal growth outcomes, but manual segmentation makes it clinically infeasible. Novel automated techniques have made 3D placental biometry more clinically practical; yet, it is unclear whether PV can distinguish constitutionally small fetuses from affected by placental insufficiency. Such a distinction is critical for developing targeted interventions and improving pregnancy outcomes. We sought to explore whether early PV, measured by an automated segmentation tool, is associated with placental pathology.

Study Design: In this prospective, longitudinal cohort study, 3DUS volumes of the placenta were obtained at 11-16 weeks (V1) and 18-24 weeks (V2). Automated segmentation tools developed in our lab were utilized to measure PV, which were normalized to gestational age. Placentas were examined by a trained placental pathologist blinded to the PVs. Outcomes included birth weight (BW), birth weight centile (BW%), placental weight (PW), placental weight z-score, and high grade maternal (MVM) or fetal (FVM) vascular malperfusion on the delivered placenta. Given the sample size, analyses were unadjusted.

Results: 72 subjects had a V1PV and available outcomes, 65 of which also had a V2PV. MVM and FVM was identified in 12.3% (n = 8) and 13.9% (n = 9) of placentas, respectively. V1PV (mean: 6.4±1.8 cc/wk) was significantly correlated with BW (mean: 3144.9±548g; p = 0.007) and BW %ile (mean: 42.8±25.6; p = 0.03). V1PV was significantly smaller in cases with MVM (mean: 5.3 vs 6.9cc, p = 0.039). V2PV (mean: 11.3±2.9 cc/wk) was significantly correlated with PW (mean: 463.7±98g; p = 0.02), PW z-score (mean: –0.5±1.3; p = 0.02), and showed a trend towards association with BW (p = 0.06) and MVM (p = 0.06). **Table**

Conclusion: Novel segmentation tools can measure PV in an automated fashion to generate a biomarker of fetal growth outcomes. Our results demonstrate that early PV may be used to identify placental maldevelopment in pregnancy, where early identification can significantly improve patients' counseling and clinical management.

Statistical significance of various factors associated with V1 and V2PV.

	Birth weight	BW %ile	PW	PW z-score	MVM		FVM	
					With	Without	With	Without
V1PV (cc/wk)	r = 0.32 p = 0.007	r = 0.26 p = 0.03	r = 0.15 p = 0.24	r = 0.08 p = 0.54	5.3	6.9 p = 0.039	5.8	6.6 p = 0.20
V2PV (cc/wk)	r = 0.22 p = 0.06	r = 0.18 p = 0.13	r = 0.3 p = 0.02	r = 0.29 p = 0.02	9.5	11.6 p = 0.06	11.7	11.2 p = 0.68
Test type	Pearson's Correlation				T-test			

1005 | FGF2 Interferes with EGF/EGFR Pathway in Trophoblasts

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Objective: Trophoblast migration and invasion are critical to establishment of the healthy placenta, and dysregulation of these processes can result in placental disorders including placenta accreta spectrum (PAS) and preeclampsia (PEC) with high morbidity and mortality. We previously identified fibroblast growth factor-2 (FGF2) as a likely regulator of trophoblast migration. Further, we suggested that FGF2 may interact with epidermal growth factor (EGF) pathway, another signaling pathway that plays a key role in placenta biology. Here we aim to better characterize specific effects of FGF2 on EGF-mediated trophoblast function.

Study Design: Using immortalized human trophoblast cells (Sw.71), we performed transwell migration assay with human serum from healthy pregnant patients with and without a selective FGF2 neutralizing antibody. Next, trophoblasts were treated with either EGF alone or a combination of both EGF and FGF after which flow cytometry for surface expression of EGF receptor (EGFR) was performed. Western blot (WB) was then conducted to evaluate total EGFR expression after treatment with FGF2 and EGF individually and in combination.

Results: Blocking FGF2 in serum collected from healthy pregnant patients resulted in suppressed trophoblast migration. (Figure 1). Trophoblast exposure to EGF resulted in decrease in surface EGFR; however, combination treatment with FGF2 and EGF further decreased surface EGFR compared to treatment with EGF alone (Figure 2A). Similarly, EGF, but not FGF2, solo

treatment resulted in decreased total levels of EGFR protein demonstrated by WB (Figure 2B). Combined treatment with FGF2 and EGF resulted in total EGFR expression most similar to EGF treatment alone.

Conclusion: FGF2 is not only critical to trophoblast migration but may also play a role in regulating the EGF/EGFR pathway in trophoblasts. The decreased surface expression of EGFR after co-treatment with both EGF and FGF2 compared to EGF alone suggests that FGF2 may control cell-surface recycling of EGFR, leaving cells less able to respond to EGF signaling.

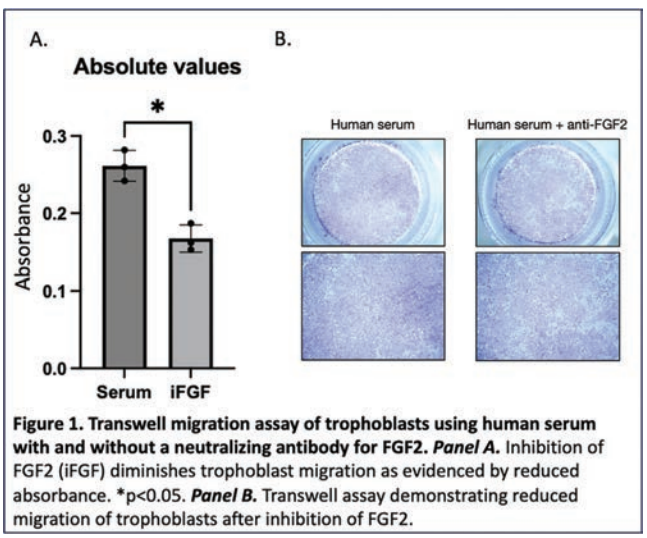

Figure 1. Transwell migration assay of trophoblasts using human serum with and without a neutralizing antibody for FGF2. *Panel A.* Inhibition of FGF2 (iFGF) diminishes trophoblast migration as evidenced by reduced absorbance. *p<0.05. ***Panel B.*** Transwell assay demonstrating reduced migration of trophoblasts after inhibition of FGF2.

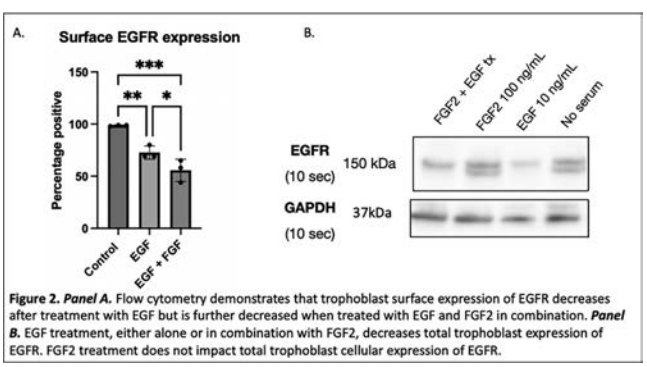

Figure 2. *Panel A.* Flow cytometry demonstrates that trophoblast surface expression of EGFR decreases after treatment with EGF but is further decreased when treated with EGF and FGF2 in combination. ***Panel B.*** EGF treatment, either alone or in combination with FGF2, decreases total trophoblast expression of EGFR. FGF2 treatment does not impact total trophoblast cellular expression of EGFR.

1006 | Equity and Perinatal Urine Drug Toxicology Testing by Hospital Location

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[3]*University of Minnesota, Minneapolis, MN*

4:00 PM - 6:00 PM

Objective: To evaluate racial inequities in perinatal urine toxicology via urine drug screen (UDS) by hospital location.

Study Design: A retrospective cohort study was conducted examining data from pregnancy episodes for all live births occurring at three hospitals (urban vs. suburban vs. rural) within a single health system between January 1, 2019, and March 31, 2019. We assessed racial differences in urine toxicology testing via a UDS, as well as testing results. Data were compared by hospital location.

Results: Among 1368 patients across all hospital locations, 7.3% (n = 99) underwent a UDS before delivery, and 15.2% (n = 208) were tested at the time of delivery. There were significant associations between hospital location and testing rates, with the suburban hospital demonstrating the lowest rate compared to the urban and rural hospitals for testing both before delivery admission (1.9% vs 12.8% vs 14.7%, respectively; $p < 0.001$), and at delivery admission (11.9% vs 19.1% vs 18.4%, respectively; $p = 0.001$). There were no significant differences in the rates of UDS with substances detected between the hospital sites regardless of the timing of testing ($p = 0.305$ and $p = 0.386$). There were significant differences between UDS rates by identified patient race, and Black birthing patients were three times as likely as White birthing patients to undergo toxicology testing before delivery (15.4% vs 5.6%, $p < 0.001$) and twice as likely at delivery (25.8% vs 12.3%, $p < 0.001$).

Conclusion: While rates of perinatal substance use across racial groups are similar, Black birthing patients are more likely to undergo urine toxicology evaluation compared to their White birthing counterparts, and this appears to differ by hospital location. Policies and practices of perinatal urine drug testing warrant critical review to limit racial inequities in toxicology testing and to better support patients with perinatal substance use.

1007 | Practice Attitudes and Behaviors for Peripartum Management of Attention Deficit Hyperactivity Disorder (ADHD)

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[2]*University of Minnesota, Minneapolis, MN;* [3]*Masonic Cancer Center, University of Minesota, University of Minnesota/Minneapolis, MN*

4:00 PM - 6:00 PM

Objective: There is no current standard of care for managing attention deficit hyperactivity disorder (ADHD) in pregnancy. This study explores current practice in peripartum ADHD management among healthcare providers within a single academic health system.

Study Design: Prospective Observational - Over a 6 month period (December of 2023 to June of 2024), a 17-item electronic survey was administered to 198 active women's healthcare professionals within a single academic health system.

Results: A total of 75 respondents completed the survey (37.8% response rate). The average years in practice was 13.4 years, and most respondents (95%) had directly cared for a peripartum patient with ADHD. The majority of respondents (78.7%) were unsure if ADHD medications could be safely used during pregnancy/peripartum period. With regards to medication dose prior to attempting pregnancy, most (60%) recommend decreasing to the lowest effective dose, 14.7% recommend no change in medication and 5.3% recommend stopping ADHD medications prior to conception. During pregnancy, 62.7% advised patients to decrease to the lowest effective dose, 17.3% advised patients to discontinue ADHD medications, and only 12% advised patients to stay on their pre-pregnancy medication dose. For patients continuing ADHD medications during pregnancy, 89.3% of providers recommend

changes in obstetric care, including a detailed anatomic survey (62.7%), fetal growth ultrasound surveillance (57.5%), and/or third trimester antepartum surveillance (8%). In the postpartum period, there were significant variations in recommendations for medication treatment while breast/chest feeding.

Conclusion: There is significant variability among healthcare providers' recommendations in the management of perinatal ADHD. We call for a need to align provider behaviors through the development of evidence-based perinatal ADHD guidelines.

1008 | The Impact of Discrimination on Perceived Control Over Birth

Dana R. Canfield[1]; Marni B. Jacobs[2]; Emmanuel Elijah[3]; Karoline Gutierrez[4]; Minhazur R. Sarker[3]; Rachel L. Wiley[3]; Elizabeth Nicole Teal[3]; Cynthia Gyamfi-Bannerman[3]
[1]UC San Diego Health, San Diego, CA; [2]University of California, San Diego Health, San Diego, CA; [3]University of California, San Diego, San Diego, CA; [4]University of Miami, Miami, FL

4:00 PM - 6:00 PM

Objective: While studies have linked patient factors with perceived control over delivery, known as labor agentry, and discrimination to poor maternal outcomes, the impact of discrimination on labor agentry is unknown. We examined the association between discrimination, measured by the Everyday Discrimination Scale (EDS), and labor agentry, measured by the Labor Agentry Scale (LAS) a 29-item Likert-scale response survey in which a higher score corresponds with greater agentry.

Study Design: This a prospective cohort study in which patients were recruited at 27-34 weeks GA from high-risk obstetric clinics and completed surveys on health and lived experience, including the EDS. Following birth, they completed the LAS. The cohort was divided into two groups: those who reported experiencing discrimination (EDS≥1, n = 28, 47.5%) and those who did not (EDS = 0, n = 31, 52.5%). Plausible confounders were assessed (Table 1), and linear regression was used to estimate differences in LAS score based on reported discrimination, controlling for significant variables. Correlation analysis was also performed with EDS as a continuous measure calculated as frequency of reported discrimination.

Results: 59 patients were included. Patients experiencing discrimination were younger and more frequently preferred a non-English language. Mean unadjusted LAS was 166.8 (SD 32.9) for patients who did not experience discrimination and 161.1 (SD 23.2) for those who did. Age and preferred non-English language were included in the final model of discrimination and LAS. None of the factors in our final model were significantly associated with LAS (Table 2). There was a weak but significant negative correlation between EDS score and labor agentry, suggesting as frequency of discrimination increased, labor agentry decreased (ρ = -0.28, p 0.03).

Conclusion: Patients experiencing discrimination had slightly lower labor agentry when controlling for age and preferred language, with a weak but significant relationship noted between discrimination and agentry. Further studies with larger cohorts are needed to further investigate this relationship.

	Do Not Experience Discrimination (EDS=0) (n=28, 47.5%)	Experience Discrimination (EDS ≥1) (n=31, 52.5%)	p-value
Age (mean (SD))	34.3 (5.5)	31.6 (6.1)	0.09
Race (n (%))			0.74
White	14 (50.0)	12 (38.7)	
Black or African American	1 (3.6)	3 (9.7)	
Asian	2 (7.1)	5 (16.1)	
Other Race or Mixed Race	10 (35.7)	10 (32.3)	
Unknown	1 (3.6)	1 (3.2)	
Patient Ethnicity (n (%))			0.38
Hispanic	13 (46.4)	9 (29.0)	
Non-Hispanic	14 (50.0)	21 (67.7)	
Unknown	1 (3.6)	1 (3.2)	
Household Income			0.41
Less than $20,000	6 (21.4)	6 (19.4)	
$20,000-$49,999	9 (32.1)	7 (22.6)	
$50,000-$99,999	3 (10.7)	1 (3.2)	
$100,000 or more	10 (35.7)	17 (54.8)	
Preferred language other than English (n (%))	10 (35.7)	3 (9.7)	0.03
Reported history of a mental health diagnosis (n (%))	13 (46.4)	18 (58.1)	0.37

Table 1. Demographic variables and OB history variables and Everyday Discrimination score. Continuous variables were compared using a T-Test and categorical variables by Chi Square.

Discrimination	Mean LAS (SD)	p-value	Mean difference (95% CI)[1]	p value
No discrimination (EDS = 0)	166.8 (32.9)	0.44	Ref.	0.30
Experienced discrimination (EDS ≥1)	161.1 (23.2)		-8.7 (-25.5, 8.1)	

[1] Adjusted for maternal age and preferred language other than English

Table 2. Linear regression model of LAS score, experienced discrimination, and preferred language.

1009 | Piperacillin-Tazobactam versus Ceftriaxone as Initial Antibiotic Treatment in 2nd Trimester Pregnancies Complicated by Acute Pyelonephritis

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Objective: Acute pyelonephritis is one of the most common indications for antepartum hospitalization, yet the optimal antibacterial regimen for the treatment of acute pyelonephritis in pregnancy remains undefined. This study sought compare the effectiveness of piperacillin-tazobactam versus ceftriaxone as the initial antibiotic treatment in 2nd trimester pregnancies complicated by acute pyelonephritis.

Study Design: We conducted a multi-center, prospective observational study from 7/2022 to 7/2024 and included all pregnant women diagnosed with acute pyelonephritis in the 2nd trimester receiving initial antibiotic treatment with either piperacillin-tazobactam or ceftriaxone. Choice of regimen was determined by physician preference. Pyelonephritis diagnostic criteria included

presence of fever of 38.0°C, costovertebral angle tenderness, and urinalysis suggestive of urinary tract infection. Primary outcomes included inpatient length of stay (LOS), adult respiratory distress syndrome (ARDS), urosepsis, intensive care unit (ICU) admission and preterm labor. Patients were excluded if they received additional antibiotics before admission, had preexisting renal disease, or had an allergy to either medication.

Results: The study included 404 patients, with 235 receiving piperacillin-tazobactam and 169 receiving ceftriaxone. Baseline demographic factors were not significantly different. The causative uropathogen was not significantly different between treatment groups. Patients receiving piperacillin-tazobactam had lower rates of ICU admissions (5.1% v. 10.7% p = 0.003) and a shorter LOS (2.6 v. 3.1 days, p = 0.041) with a 44% (RR = 0.56, 95% CI 0.31-0.71, p = 0.004) and 17% (RR = 0.83, 95% CI 0.79-0.95, p = 0.001) decreased risk in confounder adjusted models, respectively. Patients receiving ceftriaxone had higher rates of ARDS (2.96% v. 0.85%, p< 0.001) with an 18% increased risk in adjusted models (RR = 1.18, 95%CI 1.10-1.32, p = 0.005).

Conclusion: Piperacillin-tazobactam is a reasonable choice for initial antibiotic treatment for 2nd trimester pregnancies complicated by acute pyelonephritis.

1010 | Adequacy of Chorionic Villus Samples in one- vs. Two-Pass Procedures

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4:00 PM - 6:00 PM

Objective: At our center, when chorionic villus sampling (CVS) is performed, the initial pass sample adequacy is assessed immediately by an on-site cytogenetic lab. If the initial sample is inadequate, a second pass is done. Thus, a two-pass CVS procedure is a surrogate for specimen adequacy. CVS adequacy may be affected by body mass index (BMI), gestational age (GA), procedure route (transvaginal vs transabdominal), and provider experience. This study assesses risk factors for inadequate samples by comparing one-pass and two-pass CVS procedures.

Study Design: Retrospective cohort study of patients who underwent CVS at a single tertiary center in 2019-2023. Data was obtained via medical record review. Cases with an unknown number of placental entries were excluded. Comparisons were made between two groups: adequate villi (one-pass) and initially inadequate villi (two-pass). Factors compared were BMI, GA, genetic abnormality presence, placental location, route, needle size, and provider experience. Chi-square, Fisher's test for categorical data, and Wilcoxon rank sum for continuous data were used for analysis.

Results: Of the 408 CVS procedures that met inclusion criteria, 84% were successful after one pass. Maternal BMI was significantly higher in the two-pass than in the one-pass group (27.9 and 25.4, respectively, $P = 0.02$). There was no difference in GA, placental location, presence of genetic abnormalities, and number of fetuses (Table 1). Fellow years of experience was lower in the two-pass group (median 2.0 years, IQR 1.0-2.0) than the one-pass one (IQR 2.0-3.0). There was no difference across CVS route, needle size, or attending years of experience (Table 2).

Conclusion: Higher maternal BMI and fewer years of fellow experience were associated with a two-pass procedure, indicating sample inadequacy. Route of procedure, placental location, and genetic abnormalities were not associated with requiring a second pass. Rate of complications was low in both groups. This suggests that when on-site cytogenetics is unavailable, two-pass procedures should be considered for high maternal BMI and inexperienced operators.

Table 1. Patient and pregnancy characteristics with one-pass vs two-pass chorionic villous sampling procedure

Variables	Total (N=408)	One-Pass (N=342 (83.8%))	Two-Pass (N=66(19.3%))	*P-Value*
Maternal BMI	25.6 (22.3–29.6)	25.4 (22.2–29.0)	27.9 (23.2–32.2)	***0.021***
Gestational age (weeks)	12.6 (12.0–13.1)	12.6 (12.0–13.1)	12.6 (12.0–13.1)	*0.517*
Placental Location				*0.750*
Anterior	198 (48.5)	165 (48.2)	33 (50.0)	
Posterior	174 (42.6)	144 (42.1)	30 (45.5)	
Fundal	10 (2.5)	9 (2.6)	1 (1.5)	
Previa	1 (0.2)	1 (0.3)		
Too early to assess	10 (2.5)	10 (2.9)		
Missing	15 (3.7)	13 (3.8)	2 (3.0)	
Number of fetuses				*0.418*
Singleton	350 (85.8)	290 (84.8)	60 (90.9)	
Twins	46 (11.3)	41 (12.0)	5 (7.6)	
>2 Multiples	12 (2.9)	11 (3.2)	1 (1.5)	
Presence of fetal genetic abnormality				*0.170*
Yes	223 (54.7)	192 (56.1)	31 (47.0)	
No	185 (45.3)	150 (43.9)	35 (53.0)	

Data presented as n (%) or median (IQR)

Table 2. Procedure and provider characteristics one-pass vs two-pass in chorionic villous sampling procedure

Variables	Total (N=408)	One-Pass (N=342 (83.8%))	Two-Pass (N=66(19.3%))	P-Value
CVS route				*0.136*
Transvaginal	195 (47.8)	169 (49.4)	26 (39.4)	
Transabdominal	213 (52.2)	173 (50.6)	40 (60.6)	
Needle size*				*0.134*
18	134 (62.9)	113 (65.3)	21 (52.5)	
20	74 (34.7)	57 (32.9)	17 (42.5)	
22	1 (0.5)	1 (0.6)		
Lidocaine use*				*1.000*
Yes	112 (52.6)	91 (52.6)	21 (52.5)	
No	98 (46.0)	79 (45.7)	19 (47.5)	
Years of attending experience	4.0 (2.0–10.0)	4.0 (2.0–8.0)	4.5 (2.0–13.0)	*0.304*
Fellow involvement				*0.286*
Yes	206 (50.2)	169 (49.1)	37 (56.1)	
Year of fellow experience	2.0 (2.0–3.0)	2.0 (2.0–3.0)	2.0 (1.0–2.0)	***0.011***
No	199 (48.8)	171 (50.0)	28 (42.4)	
Presence of complications**				*0. 449*
Yes	13 (3.2)	10 (2.9)	3 (4.5)	
No	395 (96.8)	332 (97.1)	63 (95.5)	

Data presented as n (%) or median (IQR)
*Only applicable for transabdominal CVS route
**Includes bleeding, infection, spontaneous abortion, and preterm premature rupture of membranes

1011 | Low Dose Aspirin for Preeclampsia Risk Reduction: Do Patients Actually Take it?

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4:00 PM - 6:00 PM

Objective: ACOG, SMFM, and USPSTF recommend low dose aspirin (LDA) in patients at high risk for preeclampsia (PreE). While there is increasing attention to LDA prescription, little is known about LDA uptake and adherence. This study examines LDA uptake and adherence among patients prescribed.

Study Design: This is a retrospective cohort study of patients who delivered at an academic medical center from 9/2022 to 7/2024 and were prescribed or recommended LDA for PreE risk reduction. LDA prescription/recommendation was ascertained through the electronic health record and chart review by a quality improvement nurse. Patients not prescribed LDA or for whom prescribing data was unavailable were excluded. The primary outcome was rate of LDA uptake. Secondary outcomes included LDA adherence and associations between sociodemographic characteristics and uptake. Chi-square and Student's t-tests were used to compare baseline characteristics and multivariable logistic regression determined strength of association.

Results: Among 1,715 patients prescribed LDA, 1,213 (70%) answered questions about LDA uptake and adherence at delivery admission: 953 (79%) reported taking LDA and 260 (21%) did not. Among those who took LDA, 307 (32%) had adherence data available: 246 (80%) reported taking LDA every day, 43 (14%) missed some doses, and 18 (6%) missed many doses. Patients who took LDA were older and had higher BMI than those who did not ($p > 0.05$, Table 1). Compared to White patients, patients who identified as Black and/or African American had lower odds of LDA uptake in an unadjusted analysis and when adjusting for maternal age and BMI (OR 0.55, 95% CI 0.34–0.87 and aOR 0.54, 95% CI 0.30–0.96, Table 2). There was no association between language or insurance and uptake.

Conclusion: Most patients prescribed LDA for PreE risk reduction took the medication and reported good adherence. However, Black patients indicated lower LDA uptake than White patients. Further studies examining LDA uptake/adherence are needed to understand the root causes of these disparities and identify solutions.

Table 1. Baseline demographics among patients prescribed LDA with uptake data available

	LDA Uptake n = 953 (78.6%)	No LDA Uptake n = 260 (21.4%)	p-value
Baseline Characteristics			
Age, mean ± SD	33.6 ± 5.8	32.4 ± 5.9	**0.003**
Nulliparous, n (%)	455 (47.7)	134 (51.5)	0.28
BMI, mean ± SD	29.7 ± 7.3	28.4 ± 7.1	**0.02**
Ethnicity and/or Race, n (%)			0.24
American Indian or Alaska Native	6 (0.6)	1 (0.4)	
Asian	104 (10.9)	31 (12.0)	
Black and/or African American	78 (8.2)	34 (13.1)	
Hispanic or Latino	294 (30.9)	75 (29.0)	
Native Hawaiian or Pacific Islander	8 (0.8)	1 (0.4)	
White	341 (35.8)	81 (31.3)	
Other/mixed/unknown	122 (12.8)	36 (13.9)	
Language, n (%)			0.86
Spanish	54 (5.7)	17 (6.6)	
English	855 (89.7)	230 (88.8)	
Other	44 (4.6)	12 (4.6)	
Insurance, n (%)			0.23
Private	558 (61.2)	143 (57.0)	
Public	354 (38.8)	108 (43.0)	

Table 2. Multivariable analyses of LDA uptake among participants who were prescribed LDA

	Unadjusted OR (95% CI)	Adjusted Odds Ratio* (95% CI)
Race, n (%)		
American Indian or Alaska Native	1.43 (0.17 – 12.00)	1.07 (0.12 – 9.44)
Asian	0.80 (0.50 – 1.27)	0.75 (0.44 – 1.29)
Black and/or African American	**0.55 (0.34 – 0.87)**	**0.54 (0.30 – 0.96)**
Hispanic or Latino	0.93 (0.66 – 1.32)	0.90 (0.58 – 1.39)
Native Hawaiian or Pacific Islander	1.90 (0.23 – 15.41)	--
White	ref	ref
Other/mixed/unknown	0.81 (0.52 – 1.26)	0.69 (0.42 – 1.15)
Language, n (%)		
Spanish	0.85 (0.49 – 1.50)	0.73 (0.34 – 1.54)
English	ref	ref
Other	0.99 (0.51 – 1.90)	0.97 (0.41 – 2.31)
Insurance, n (%)		
Private	ref	ref
Public	0.84 (0.63 – 1.12)	0.73 (0.51 – 1.03)

*Adjusted for maternal age and BMI

1012 | Induction Versus Expectant Management in Multiparous Low-Risk Women: Single Institution Impact of the ARRIVE Trial

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4:00 PM - 6:00 PM

Objective: The ARRIVE trial found that elective induction of labor (eIOL) at 39 weeks in nulliparous persons compared to expectant management was associated with a lower rate of cesarean delivery (CD). The benefit of eIOL in a multiparous population is less certain. Our goal was to evaluate the performance of low-risk multiparous women undergoing eIOL at 39 weeks.

Study Design: Retrospective cohort study of all multiparous pregnant persons admitted for delivery ≥ 39w0d at a single academic community institution between 3/1/20-3/1/22, when we started offering eIOL. Those with singleton low risk pregnancies, without any clinical indication for delivery prior to 40w5d, were included. Maternal and neonatal outcomes of persons undergoing eIOL between 39w0d-39w4d were compared to women expectantly managed. The primary outcome was rate of CD. Secondary outcomes included select maternal outcomes and composite neonatal outcome (neonatal death and/or serious morbidity).

Results: 1141 multiparous persons with low-risk singleton gestations were identified, with 297 (26%) undergoing eIOL and 844 (74%) expectantly managed. Those undergoing eIOL delivered earlier (39.2 vs 40.0, p< 0.001) and were more likely to be obese (34.4 vs 23.7%, p< 0.001) and have diet controlled gestational diabetes (10.1 vs 6.4%, p = 0.04) (Table). The CD rate was similar between the eIOL and expectant management groups (2.7% vs 2.0%, p = 0.49). Elective IOL was associated with longer maternal but similar newborn lengths of stay compared to expectant management. The composite neonatal outcome occurred in significantly fewer neonates in the eIOL group compared to the expectant management group (4.0% vs 8.3%, p = 0.02), primarily due to decreased need for respiratory support in the eIOL group (1.7% vs. 4.5%, p = 0.03).

Conclusion: In our cohort of low-risk multiparous pregnant persons, eIOL at 39w0d-39w4d did not decrease CD rate but did decrease composite neonatal risk. Like the findings of ARRIVE trial in a nulliparous population, our findings suggest that eIOL at term for multiparous patients is safe and may have benefit.

Table 1:Multiparous Patient Demographics, Perinatal and Neonatal Outcomes

	eIOL (n=297)	Exp. Mgt (n=844)	p-value
Maternal age (years)	30.1 (4.6)	30.6 (4.5)	0.627
Age ≥35	60 (20.2)	177 (21.0)	0.779
Gestational age (wk)	39.2 (0.2)	40.0 (0.70)	<0.001
Pregestational BMI ≥30 kg/m²	97 (34.4)	179 (23.7)	<0.001
GDM (diet controlled)	30 (10.1)	54 (6.4)	0.036
Cesarean delivery	8 (2.7)	17(2.0)	0.492
Hypertensive disorders of pregnancy	39 (13.1)	99 (11.7)	0.924
3rd/4th degree perineal laceration	0 (0)	9 (1.1)	0.122
Postpartum hemorrhage	18 (6.1)	40 (4.7)	0.373
Intra-amniotic infection	8 (2.7)	10 (1.2)	0.073
Hospital length of stay			<0.001
<2d	15 (5.1)	238 (28.2)	
2d	205 (69.0)	513 (60.8)	
3d	69 (23.2)	87 (10.3)	
4d	6 (2.0)	4 (0.5)	
>4d	2 (0.7)	2 (0.2)	
Composite neonatal outcome	6 (2.0)	47 (5.6)	0.012
Neonatal death	0 (0)	1 (0.1)	1.000
Respiratory support	5 (1.7)	38 (4.5)	0.028
Hypoxic-ischemic encephalopathy	0 (0)	1 (0.1)	1.000
Seizure	0 (0)	2 (0.2)	1.000
Infection	0 (0)	4 (0.5)	0.578
Meconium aspiration syndrome	0 (0)	6 (0.7)	0.349
Birth trauma	1 (0.3)	9 (1.1)	0.468
Intracranial/subgaleal hemorrhage	0 (0)	1 (0.1)	1.000
Hypotension requiring vasopressors	2 (0.7)	1 (0.1)	0.168
5-minute Apgar ≤3	0 (0)	1 (0.1)	1.000
Newborn length of stay			0.649
<2d	137 (46.1)	374 (44.3)	
2d	134 (48.1)	423 (50.1)	
3d	9 (3.0)	18 (2.1)	
4d	5 (1.7)	12 (1.4)	
>4d	3 (1.0)	17 (2.0)	
Data presented as n(%) or mean (SD)			

1013 | The Association Between First Trimester Serum Creatinine and Pregnancy Outcomes in Patients with Chronic Hypertension

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4:00 PM - 6:00 PM

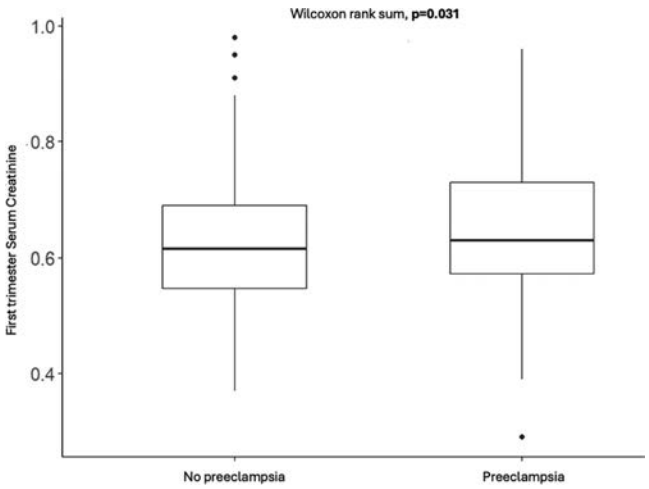
Objective: Pre-existing hypertension (HTN) and renal disease are known risk factors for adverse pregnancy outcomes, including pre-eclampsia (PreE). This study aimed to assess whether an elevated first trimester serum creatinine (sCr) in patients with chronic HTN, in the absence of pre-existing kidney disease, is associated with an increased risk of PreE.

Study Design: This was a retrospective cohort study at a single tertiary center from 1/2018 to 12/2022. Inclusion criteria were patients with HTN with a first trimester sCr result. Exclusion criteria were pre-existing kidney disease, significant proteinuria in the first trimester, acute illness during sCr evaluation, and conditions known to increase the risk for adverse pregnancy outcomes including pregestational diabetes, autoimmune disease, multiple gestation, history of renal surgery, transplantation, donation, and isolated renal agenesis. An elevated sCr was defined as >0.7 mg/dL. The primary outcome was the diagnosis of PreE. Secondary outcomes included assessment of first trimester sCr in patients diagnosed with PreE, gestational age at PreE diagnosis and at delivery, small for gestational age (SGA), and gestational diabetes (GDM). Wilcoxon rank sum tests and Chi-squared tests were used.

Results: 226 patients with normal sCr and 76 with elevated sCr were identified. 82/226 (36%) in the normal sCr group developed PreE, compared to 36/76 (47%) in the elevated sCr group (p = 0.11). First trimester sCr as a continuous variable was associated with an increased incidence of PreE diagnosis (p = 0.03). Gestational age at PreE diagnosis (35.2±3.4 v 35.1±3.6w, p = 0.845), gestational age at delivery (37.3±2.7 v 36.7±3.1w p = 0.045), SGA (27 v 32% p = 0.534), and GDM (15 v 20% p = 0.494) were not different between groups.

Conclusion: In the population studied, a first trimester sCr >0.7 mg/dL was not associated with an increased incidence of PreE, though this was associated with earlier gestational age at delivery. Patients who developed PreE had higher sCr in the first trimester on average than those who did not develop PreE.

Outcome	Normal serum creatinine, n = 226	Elevated serum creatinine, n = 76	p-value
Preeclampsia	82 (36%)	36 (45%)	0.115
Preeclampsia, severe	73 (32%)	34 (45%)	0.068
Gestational age at diagnosis (weeks)	35.2 +/- 3.4	35.1 +/- 3.6	0.845
Gestational age at delivery (weeks)	37.3 +/- 2.7	36.7 +/- 3.1	**0.045**
SGA	61 (27%)	24 (32%)	0.534
GDM	35 (15%)	15 (20%)	0.494
Postpartum Hemorrhage	26 (12%)	4 (18%)	0.179
NICU admission	71 (31%)	32 (42%)	0.119
Demographic			
Age (years)	31 +/- 6	32 +/- 6	
BMI	40 +/- 1-	40 +/- 11	
First trimester sCr (mg/dL)	0.58 +/- 0.08	0.79 +/- 0.07	



1014 | Adverse Perinatal Outcomes Based on Gestational Surrogacy Status in a Large Integrated Healthcare System

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4:00 PM - 6:00 PM

Objective: To examine adverse perinatal outcomes by gestational surrogacy status in a large integrated healthcare system in the United States.

Study Design: We performed a retrospective cohort study among pregnant individuals receiving obstetrical care at Kaiser Permanente (KP) Southern California (01/01/2008–12/31/2023). Unstructured clinical notes abstracted from electronic health records were used to determine surrogate pregnancy status via natural language processing (NLP) validated by manual chart reviews. Births at < 20 weeks gestation were excluded from all analyses. Adjusted risk ratios (aRR) and 95% confidence intervals (CI) derived from robust Poisson regression described the associations.

Results: Among 636,300 pregnancies during the study period, 1,109 (0.17%) were identified as surrogate pregnancies. Compared to those with non-surrogate pregnancy, people with gestational surrogacy were more likely to be older (32.4% versus 19.4%), non-Hispanic white (39.0% versus 23.8%), have privately funded KP membership (19.8% versus 7.6%), and have multiple gestations (15.8% versus 1.6%). They were also less likely to smoke (0.7% versus 2.4%) and consume alcohol (19.0% versus 27.1%) during pregnancy. Gestational surrogacy was associated with significantly increased risk of placenta previa (aRR: 1.74, 95% CI: 1.44-2.10), placental abruption (aRR: 2.25, 95% CI: 1.45-3.50) and preterm birth (aRR: 1.27, 95% CI: 1.13-1.43) while with significantly decreased risk of small for gestational age/intrauterine growth restriction (aRR: 0.80, 95% CI: 0.69-0.93), premature rupture of membranes (aRR: 0.72, 95% CI: 0.53-0.98), gestational diabetes (aRR: 0.84, 95% CI: 0.72-0.98) and chorioamnionitis (aRR: 0.58, 95% CI: 0.40-0.86) (Table).

Conclusion: This study successfully leveraged unstructured data to identify surrogate pregnancies via NLP in a large integrated healthcare system. Placenta previa, placental abruption, and preterm birth were found to be associated with gestational surrogate pregnancy. Identifying these risk factors can provide empirical evidence for predicting and preventing adverse perinatal outcomes.

Table: Association between gestational surrogacy status and adverse pregnancy outcomes

Adverse perinatal outcomes	Gestational surrogacy status: No N=635,191 (%)	Gestational surrogacy status: Yes N=1,109 (%)	[a]Adjusted Risk Ratio (95% Confidence Interval)	[b]P-value
Preeclampsia/Eclampsia	34,146 (5.4)	82 (7.4)	1.15 (0.93, 1.42)	0.1870
Placenta previa	29,092 (4.6)	100 (9.0)	1.74 (1.44, 2.10)	<.0001
Placental abruption	4,244 (0.7)	20 (1.8)	2.25 (1.45, 3.50)	0.0003
SGA / IUGR[c]	76,542 (12.1)	136 (12.4)	0.80 (0.69, 0.93)	0.0043
Macrosomia	53,266 (8.4)	85 (7.7)	0.94 (0.76, 1.15)	0.5208
Congenital anomalies	12,471 (2.0)	22 (2.0)	0.83 (0.55, 1.25)	0.3714
Gestational diabetes	79,301 (12.5)	131 (11.8)	0.84 (0.72, 0.98)	0.0250
Premature rupture of membranes	31,288 (4.9)	39 (3.5)	0.72 (0.53, 0.98)	0.0386
Chorioamnionitis	28,855 (4.5)	25 (2.3)	0.58 (0.40, 0.86)	0.0066
Preterm birth[c]	68,187 (10.8)	227 (20.6)	1.27 (1.13, 1.43)	<.0001
Stillbirth	3,259 (0.5)	11 (1.0)	1.57 (0.87, 2.85)	0.1333

SGA: Small for gestational age; IUGR: Intrauterine growth restriction
[a]Adjustments were made for maternal age, race/ethnicity, smoking during pregnancy, alcohol during pregnancy, pre-pregnancy body mass index, multi-gestation, and insurance type.
[b]P-values were from multivariable models used to estimate adjusted risk ratios.
[c]Applies only to live birth pregnancies.

1016 | How to Efficiently Recruit Participants in a Perinatal Cohort Study; CAN-B Cohort Strategies/Lessons Learned

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4:00 PM - 6:00 PM

Objective: Recruitment processes in perinatal cohort remain challenging, particularly when a specific population such as cannabis consumers is involved. The CAN-B study aims to determine the impact of prenatal cannabis exposure on fetal brain and infant neurodevelopment with longitudinal follow-up of mother/infant from pregnancy until 2y post-natal. Here we share our experience in finding the best recruitment strategy to meet our enrollment objective.

Study Design: From May 2022 to May 2024, at the routine 1st trimester scan at the obstetrical ultrasound unit of Sherbrooke University Hospital Center (CHUS), 4 recruitment strategies were successively tried: 1) study flyer given by care providers (May-September 2022), 2) by phone (October-November 2022), 3) study flyer given by care providers or part time in-person presentation of

the study by research team (December 2022-May 2023) and 4) full time in-person presentation of the study by research team (June 2023 to May 2024). Interest and enrollment rate were compared.
Results: 112 pregnant women were enrolled (71 cannabis users/41 controls). Strategy 4 triggered the highest basic interest to participate in a clinical research compared to the other strategies (87% vs < 64%) and yielded the highest enrollment rate (80%) compared to strategies 1(67%), 2 (40%) and 3 (70%). Ultimately, the last strategy with full time direct personalized approach allowed us to double our monthly enrollment rate of cannabis users. Same strategies performances were observed for the recruitment of controls.
Conclusion: Recruitment of cannabis users in the CAN-B cohort showed that low-cost passive strategies (e.g. flyers) or relying only on care providers appeared to be much less efficient and not cost-effective. Although costly, direct personal contact by research professional integrated into routine care is the best strategy to prioritize for recruiting pregnant women. This experience provides useful information for clinical researchers in designing perinatal cohorts.

1017 | Practice Patterns in the Administration of Late Preterm Antenatal Corticosteroids Among Twin Gestations

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4:00 PM - 6:00 PM
Objective: Predicting preterm delivery is challenging, especially among twin pregnancies. We sought to evaluate the odds of delivering twin pregnancies within 2-7 days of antenatal corticosteroid (ACS) administration in the late preterm period (optimally timed), by delivery indication.
Study Design: This is a retrospective cohort study of twin pregnancies at risk for late preterm delivery (Jan 2013-Dec 2022) performed at a large tertiary care health system. Patients were included if they had non-anomalous twin gestations and received at least one dose of ACS in the late preterm period (34 0/7- 36 6/7 weeks). They were excluded if they received ACS previously or had pre-gestational diabetes. The cohort was stratified into two exposure groups: patients at risk for spontaneous preterm birth (sPTB; preterm labor or preterm pre-labor rupture of membranes) and patients at risk for clinician initiated late PTB (i.e., hypertensive disorders of pregnancy). The primary outcome was optimally timed ACS administration. Secondary outcomes included median time from ACS administration to delivery, delivery at < 2 days and > 7 days, and PTB. Multivariable logistic regression was used to calculate odds ratios (aORs) of the primary and secondary outcomes, adjusted for potential confounders.
Results: Of 166 eligible patients, 30 (18.1%) delivered within 2-7 days. 86 (51.8%) were at risk for sPTB, and 80 (48.2%) were at risk for a clinician initiated late PTB. Group demographics are described in Table 1. Compared to patients at risk for sPTB, those with a clinician initiated late PTB were more likely to have optimally timed administration (4.6% vs 32.5%; aOR 9.2, 95% CI 3.2, 33. 9). Patients at risk for sPTB were more likely to deliver < 2 days (aOR 0.19, 95% CI 0.08, 0.42), with a shorter latency to delivery (7.0 vs 45.7 hours) (Table 2).
Conclusion: In this cohort of twin gestations at risk for late PTB, those at risk for clinician initiated late PTB were more likely to deliver within the optimal time period compared to those at risk for sPTB. Further study is warranted to evaluate factors associated with delivery timing.

Table 1
Demographics and Delivery Indication by Exposure Group

Characteristic	At risk for spontaneous late preterm birth (n=86)	At risk for clinician initiated late preterm birth (n=80)
Maternal Age, years	33 (29 - 36)	33 (30 - 36)
Nulliparity	39 (45.3)	52 (65.0)
Race		
Non-Hispanic White	49 (57.0)	38 (47.5)
Non-Hispanic Black	4 (4.65)	12 (15.0)
Hispanic	10 (11.6)	8 (10.0)
Asian	11 (12.8)	9 (11.3)
Other or Unknown	12 (14.0)	13 (16.3)
BMI, kg/m^2	26.6 (22.5 – 30.3)	25.1 (21.9 – 28.3)
GA at ACS administration, weeks	35.2 (34.4 – 35.9)	35.1 (34.3 – 35.8)
GA at delivery, weeks	35.6 (34.8 – 36.3)	35.7 (34.7-36.4)
Chorionicity		
Dichorionic-diamniotic	67 (77.9)	47 (58.8)
Monochorionic-diamniotic	19 (22.1)	33 (41.2)
Indication for administration		
At risk for spontaneous late preterm birth	86 (51.8)	
Suspected PTL	47 (54.7)	0
PPROM	39 (45.3)	0
At risk for clinician initiated late preterm birth		80 (48.2)
Hypertensive disorder of pregnancy	0	25 (31.2)
Fetal growth restriction	0	36 (45.0)
Oligohydramnios	0	1 (1.3)
Intrahepatic cholestasis of pregnancy	0	7 (8.8)
Category 2 tracing despite resuscitation	0	3 (3.8)
Placental abruption	0	1 (1.3)
History of classical cesarean section	0	5 (6.3)
Monochorionic-diamniotic twin gestation	0	4 (5.0)
Other (umbilical vein varix)	0	1 (1.3)

Data presented as n (%) or median (inter-quartile range).
ACS, antenatal corticosteroid; *BMI*, body mass index; *GA*, gestational age; PTL, preterm labor; PPROM, preterm prelabor rupture of membranes.

Table 2
Administration of Antenatal Corticosteroids and Timing to Twin Delivery, by exposure groups

Characteristic	At risk for spontaneous late preterm birth (n=86)	At risk for clinician initiated late preterm birth (n=80)	Adjusted OR[a] (95% CI)
Primary outcome:			
Delivery 2-7 days after ACS	4 (4.7)	26 (32.5)	9.2 (3.2 – 33.9)
Secondary outcomes:			
Delivery < 2 days after ACS	71 (82.6)	41 (51.3)	0.19 (0.08 – 0.42)
Delivery > 7 days after ACS	11 (12.8)	13 (16.3)	1.50 (0.57 – 3.9)
Median time from ACS to delivery, hours*	7.0 (3.0 – 26.2)	45.7 (14.2 – 108.1)	—
Delivery < 37wk	82 (95.3)	74 (92.5)	0.79 (0.22 – 2.8)

Data presented as n (%) unless otherwise indicated
OR: odds ratio; *ACS*, antenatal corticosteroids
[a]*Adjusted for age, parity, gestational age at ACS administration, and gestational diabetes mellitus.*

1018 | Risk for Adverse Perinatal Outcomes following Induction of Labor in Patients with Class III Obesity

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4:00 PM - 6:00 PM

Objective: Maternal obesity is a known risk factor for adverse maternal and perinatal outcomes. This study evaluates risk for these pregnancy complications among patients with class 3 obesity undergoing induction of labor (IOL).

Study Design: This is a retrospective cohort study of nulliparous, singleton deliveries with BMI $\geq$ 40 following induction of labor $\geq$ 20 weeks at a multi-hospital academic health system from 1/1/2022-6/30/2024. The primary outcome was unplanned cesarean and secondary outcomes included severe maternal morbidity (SMM) without transfusion, postpartum hemorrhage, postpartum infection, postpartum length of stay $\geq$ 5 days, maternal readmission, and NICU admission. Maternal clinical characteristics and outcomes were extracted from the medical record and compared in univariable analyses. The association between class 3 obesity and primary and secondary outcomes was evaluated using a logistic regression model based on significance from univariable analyses.

Results: 6,533 nulliparous patients undergoing IOL were included, 3.4% of whom had class 3 obesity. Numerous comorbidities and outcomes were different based on class 3 obesity status, including significantly higher rates of pregestational and gestational diabetes and chronic and gestational hypertension, but not severe preeclampsia (Table 1). Unadjusted incidence of NICU admission was twofold higher for patients with class 3 obesity (16.8 v. 8.4%, $p < 0.01$). Adjusted analysis demonstrated significantly increased odds of cesarean in nulliparous patients undergoing IOL with class 3 obesity compared to those without (aOR 1.97, 95% CI 1.51–2.56, $p < 0.01$), but for none of the secondary outcomes other than hemorrhage, which had significantly lower odds in class 3 obesity (Table 2).

Conclusion: Nulliparous patients with class 3 obesity undergoing IOL have significantly higher risk of cesarean than those with lower BMI, but not for other adverse outcomes. Further study of predictors of successful vaginal delivery for patients with class 3 obesity is important.

Table 1. Demographics, Clinical Characteristics, and Obstetric Outcomes by Class 3 Obesity Status among Nulliparous Patients with Singleton Pregnancies undergoing Induction of Labor

	No Class 3 Obesity *N = 6,313*	Class 3 Obesity *N = 220*	P-value
Maternal age (median, IQR)	29 (25, 32)	29.5 (26, 33)	0.02
Pregravid BMI (median, IQR)	26.3 (23.0, 31.2)	43.1 (41.5, 45.2)	< 0.01
Delivery BMI (median, IQR)	32.4 (28.7, 37.3)	46.5 (44.1, 49.9)	< 0.01
Black race (N, %)	949 (15.0%)	44 (20.0%)	0.04
Hispanic ethnicity (N, %)	429 (6.8%)	17 (7.7%)	0.59
Insurance type (N, %)			
Medicaid/Medicare	1,551 (24.6%)	45 (20.5%)	
Commercial	4,674 (74.0%)	173 (78.6%)	0.30
Self-pay	88 (1.4%)	2 (0.9%)	
History of bariatric surgery (N, %)	39 (0.6%)	13 (5.9%)	< 0.01
Chronic hypertension (N, %)	727 (11.5%)	89 (40.5%)	< 0.01
Gestational hypertension/mild preeclampsia (N, %)	931 (14.7%)	74 (33.6%)	< 0.01
Severe preeclampsia (N, %)	2,310 (36.6%)	87 (39.5%)	0.37
Pre-gestational diabetes (N, %)	122 (1.9%)	14 (6.4%)	< 0.01
Gestational diabetes (N, %)	730 (11.6%)	71 (32.3%)	< 0.01
Modified OB-CMI* (median, IQR)	0 (0, 1)	0 (0, 1)	0.06
IUFD (N, %)	49 (0.8%)	1 (0.5%)	0.59
Cervical ripening at induction (N, %)	4,402 (69.7%)	177 (80.5%)	< 0.01
Gestational age at delivery [completed weeks] (median, IQR)	39 (38, 40)	38 (37, 39)	< 0.01
Preterm birth < 34 weeks (N, %)	193 (3.1%)	12 (5.5%)	0.05
Late preterm birth [34-37 weeks] (N, %)	379 (6.0%)	29 (13.2%)	< 0.01
Cesarean delivery	1,675 (26.6%)	103 (46.8%)	< 0.01
Emergent cesarean (N, %)	130 (7.8%)	9 (9.0%)	0.68
Quantitative blood loss [mL] (median, IQR)	200 (100, 400)	250 (115, 500)	0.01
Severe maternal morbidity** [without transfusion] (N, %)	191 (3.0%)	12 (5.5%)	0.04
Maternal ICU admission (N, %)	18 (0.3%)	0 (0%)	0.43
Extended postpartum length of stay $\geq$ 5 days] (N, %)	73 (1.2%)	4 (1.8%)	0.37
Birthweight [g] (median, IQR)	3250.0 (2910.1, 3559.8)	3172.5 (2844.0, 3518.5)	0.16
Macrosomia > 4000g (N, %)	335 (5.3%)	8 (3.6%)	0.27
NICU admission (N, %)	528 (8.4%)	37 (16.8%)	< 0.01
Maternal readmission [42 days] (N, %)	133 (2.1%)	7 (3.2%)	0.28

*Excluding BMI, hypertensive disorders, and diabetes, which are reported separately.
**CDC definition: https://www.cdc.gov/maternal-infant-health/php/severe-maternal-morbidity/icd.html

Table 2. Adjusted Odds of Primary and Secondary Outcomes in Patients with Class 3 Obesity Undergoing Induction of Labor

	Adjusted OR*	95% Confidence Interval	P Value
Cesarean delivery	1.97	1.51 – 2.56	< 0.01
Severe maternal morbidity without transfusion	1.22	0.67 – 2.22	0.52
Postpartum hemorrhage♦	0.47	0.30 – 0.74	< 0.01
Postpartum infection◇	1.81	0.70 – 4.72	0.22
Postpartum length of stay ≥ 5 days	0.83	0.34 – 2.02	0.68
Maternal readmission within 42 days	1.07	0.50 – 2.27	0.86
NICU admission	1.37	0.95 – 1.98	0.09

*Model adjusted for maternal race as a proxy for structural racism, chronic hypertension, gestational hypertension, severe preeclampsia, gestational and pre-gestational diabetes, modified OBCMI excluding BMI/hypertensive disorders/diabetes, gestational age, and need for cervical ripening
♦Defined as quantitative blood loss > 1000 mL.
◇Defined based on ICD-10 codes for postpartum infection and endometritis.

1019 | Mediastinal Shift Angle and its Association with Perinatal Mortality and Lung Volumes in CDH Fetuses

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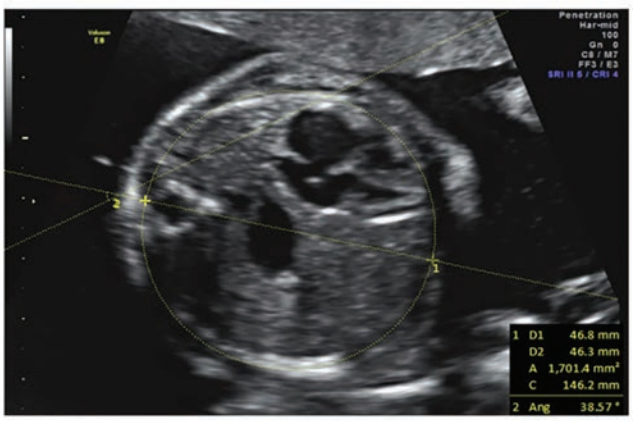
4:00 PM - 6:00 PM

Objective: The mediastinal shift angle (MSA) has been proposed as a potentially useful marker for the identification of CDH fetuses at risk of perinatal death. We aimed to evaluate the predictive performance of MSA for perinatal mortality in fetuses with isolated left CDH, particularly among those considered as mild and moderate with an O/E LHR (observed/expected lung-to-head ratio) >25%, and its correlation with other metrics of CDH severity.

Study Design: MSA was measured in a cross-sectional image of the fetal thorax in 84 fetuses with left CDH. MSA was obtained from two lines starting from a common point in the skin at the midline of the back of the spine, the first line dividing the thorax into two halves, and a second line directed to the lateral border of the right atrium (Fig 1). The MSA becomes wider as the right atrium is displaced towards the right side of the thorax. Additionally, the O/E LHR and MRI assessment of O/E total fetal lung volume (TFLV), and percentage of liver herniation (%LH) were evaluated. ROC analysis, prediction, and association with perinatal mortality and correlations with the mentioned predictors were evaluated

Results: Perinatal mortality was 31.3% (26/83). The areas under the ROC curve for perinatal mortality for MSA and O/E LHR were 0.694 and 0.753, respectively ($p = 0.2$). MSA best cut-off value was 35° with 77% sensitivity, and 38% 1-specificity; OR 6.68 (95% CI 2.2-21.3; $p < 0.001$), adjusted aOR 8.9 (95% CI 1.2-59.7; $p = 0.02$). Among fetuses with O/E LHR > 25% ($n = 60$) mortality was 21% ($n = 13$), MSA $\geq$ 35° showed an AUROC = 0.691 with 75% sensitivity and 36% 1-specificity, aOR 5.29 (1.47-19.01; $p = 0.01$). There was

a significant correlation between MSA and O/E LHR (-0.48, p < 0.001), O/E TFLV (-0.36, p = 0.005), and %LH (0.43, p = 0.001).
Conclusion: The MSA angle is a technically simple and feasible metric to evaluate severity and risks for perinatal mortality in left-sided CDH cases. An MSA ≥ 35° can identify 77% of cases at increased risk of perinatal mortality. The prediction performance is similar among fetuses with moderate or mild CDH



1020 | Risk of Spontaneous PTB < 34 weeks Among Women with Mid-Trimester Cervical Length >25 mm

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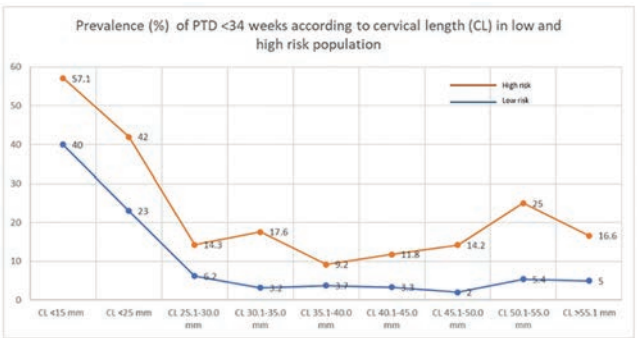
4:00 PM - 6:00 PM
Objective: There is a general assumption that the longer the cervix the lower the rate of spontaneous preterm birth (SPTB). This study aimed to test this hypothesis in low-risk and high-risk pregnant women with normal cervical length.
Study Design: Transvaginal cervical length (TVCL) was measured in 3,376 singleton pregnancies with no fetal anomalies at 17-24 weeks of gestation. Patients were grouped as low (LR) and high risk (HR) based on history of SPTB. TVCL measurements were analyzed as < 15 mm and < 25 mm, and then in groups of 5 mm from 25- 55 mm. SPTB was considered as ≤ 34 weeks of gestation not due to maternal or fetal indication such as placenta accreta, preeclampsia, or fetal growth restriction. Differences in the prevalence of SPTB among the CL groups and between LR and HR patients were evaluated.
Results: 2,863 (84.9%) patients were considered LR, and 513 (15.1%) HR. Short cervix (≤ 25 mm) was found in 3.0% of women (n = 103; LR n = 82 (2.8%); HR n = 21 (4.1%)). Prevalence of SPTB was 6.6% (n = 189; LR 4.0% n = 115, HR 14.4% n = 74; p< 0.001). Figure 1 shows the prevalence of SPTB ≤ 34 weeks according to the TVCL groups in LR and HR patients. The prevalence of SPTB was significantly higher in HR patients at any TVCL group than for LR patients. Among LR women, the risk of SPTB did not significantly change when TVCL was ≥ 30 mm, yet LR patients with TVCL between 25.1 and 30.0 mm had a higher risk of SPTB ≤ 34 weeks as compared to those with TVCL > 30.1 mm (p = 0.02). In HR patients the prevalence of SPTB did not significantly change when TVLC was >25 mm.
Conclusion: In our population, the risk of SPTB ≤ 34 weeks does not substantively increase once TVCL ≥ 30 mm for LR women and once > 25 mm in HR women. HR women had almost 3 times higher rate of SPTB than LR patients at any TVCL cut-off.



1021 | Are Standard Video Sweeps During Fetal Ultrasound Examination more Effective for Cardiac Screening?

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4:00 PM - 6:00 PM
Objective: To compare workflow properties of standardized ultrasound video clips performed as sweeps from the four-chamber [4C] view to the three-vessel-trachea [3VT] view, to the still images and videos acquired during the routine fetal cardiac screening (FCS).
Study Design: An observational study was conducted at the John Radcliffe Hospital, Oxford. Singleton fetuses with normal cardiac anatomy at the routine 18^{+0} to 23^{+0} weeks anomaly scan were included. The available stored grey-scale images, videos and sweeps were extracted from scans performed by seven sonographers. We evaluated the number of records collected per fetus, time spent for data acquisition and the computer memory needed for storing these, comparing FCS and standardized sweeps. For the former, the order of view acquisition and the prevalence of cardiac workflow interrupted by extra-cardiac planes was also assessed.
Results: A total of 100 studies were included. FCS included solely still images in 17% of cases, but in 83% videos were used to complete cardiac assessment, mostly cine-4C alone or 4C and left ventricular outflow tract (LVOT) views. The mean number of images or videos in the FCS group were 10 ± 3, compared to 2 ± 1 in standardized sweeps. In 47% of cases, FCS data-acquisition was interrupted by extra-cardiac records, with a median amount of time spent in heart examination of 285 seconds (interquartile range (IQR) 94-726), compared to 4 seconds (IQR 3-8) needed to perform sweeps. Median memory required to store FCS data and sweeps were 167 MB (IQR 60-257) and 123 MB (IQR 76-165), respectively.
Conclusion: Standardized cardiac sweeps represented a more effective way to acquire and store data compared to the FCS; less time was spent on image acquisition, which was not interrupted by extra-cardiac views, and lower storage memory was required. Further studies are needed to assess the two methods, especially in the presence of fetal congenital heart defects.

1022 | Optimizing Timing of Intravenous Iron Therapy for Improved Outcomes in Pregnant Women with Iron-Deficiency Anemia

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4:00 PM - 6:00 PM

Objective: To evaluate the efficacy and timing of intravenous (IV) iron therapy in improving hemoglobin (Hgb) levels and maternal and neonatal outcomes in pregnant women with iron-deficiency anemia (IDA).

Study Design: A retrospective cohort study was conducted on pregnant women with IDA who received outpatient IV iron therapy from January 2017- June 2024. Patients were divided into those who received their last IV iron dose >10 days (N = 331) or < 10 days (N = 82) before delivery. Primary outcomes included changes in Hgb levels, maternal composite outcomes (including postpartum hemorrhage and blood transfusion), and neonatal outcomes (such as NICU admission and low birth weight).

Results: Demographics and characteristics did not differ between groups. The type of IV iron used was primarily iron sucrose (>86.31%). The >10 days group showed a greater increase in Hgb levels post-infusion, with a median increase of 2.5 g/dL compared to 1.8 g/dL in the < 10 days group (p< 0.001). The maternal composite outcome rate was significantly lower in the >10 days group (7.14% vs. 14.63%, p = 0.03). Neonatal outcomes, including NICU admissions (7.46% vs. 8.54%, p = 0.7) and low birth weight (3.97% vs. 1.61%, p = 0.4), did not differ between the groups.

Conclusion: IV iron therapy improves hemoglobin levels in antenatal IDA. Administering the last dose of IV iron more than 10 days before delivery is associated with better maternal outcomes, suggesting that earlier treatment may reduce the risk of adverse pregnancy outcomes. Further studies are needed to refine treatment protocols and timing of administration to maximize benefits.

Table 1: Maternal and neonatal outcomes in women receiving last IV iron transfusion >10 days vs <10 days from delivery

Outcome	>10 days from delivery	<10 days from delivery	p-value
Hypertensive disorder	12 (3.57%)	4 (4.88%)	0.489
Preterm birth	9 (2.68%)	3 (3.66%)	0.705
Antepartum hemorrhage	3 (0.89%)	2 (2.44%)	0.274
Maternal Composite*	24 (7.14%)	12 (14.63%)	0.030
Hyperbilirubinemia	22 (6.5%)	2 (2.44%)	0.178
Intubation	6 (1.80%)	2 (2.44%)	0.303
NICU Admission	25 (7.46%)	7 (8.54%)	0.743
Birthweight (g)	3280 [1750-4375]	3297.5 [2190-4450]	0.852

*Postpartum hemorrhage, shock index > 1 at time of delivery, blood transfusion, ICU admission, or readmission within 6 weeks postpartum

1023 | Ureaplasma Colonization in Preterm Premature Rupture of Membranes: Implications for Latency Period and Neonatal Outcomes

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4:00 PM - 6:00 PM

Objective: Ascending microbial invasion is thought to be responsible for many cases of preterm premature rupture of membranes (PPROM). Ureaplasma colonization has been observed in up to 65% of cases and may result in poorer neonatal outcomes. We aimed to assess the prevalence of vaginal colonization with Ureaplasma species in pregnancies complicated by PPROM and determine its correlation with the latency period and pregnancy outcomes.

Study Design: Demographics, pregnancy complications, treatment regimens, and outcomes were analyzed from 165 patients with PPROM and vaginal Ureaplasma testing from 2017-2024 at a tertiary care center. Chi-square, t-test, Wilcoxon rank sum tests, and logistic regression were used to assess Ureaplasma colonization effects.

Results: Ureaplasma was detected in 57.6% of PPROM patients. Baseline characteristics with significant variations between groups were adjusted for, including advanced maternal age, in vitro fertilization, history of cesarean section, cerclage, and mycoplasma positivity. There was no significant difference in latency periods between Ureaplasma-positive and negative groups (6 [2-12] vs. 5 [2-16] days, p = 0.9).

After adjusting for significant differences in characteristics, Ureaplasma colonization was associated with reduced odds of intubation (aOR 0.32, 95% CI 0.15–0.71) and surfactant use (aOR 0.34, 95% CI 0.14–0.79), but did not significantly affect the composite neonatal morbidity (aOR 0.82, 95% CI 0.32–2.10; Table 1). Incidence of preterm birth at < 34 weeks and < 28 weeks (Table 1) and maternal outcomes (Table 2) did not differ between groups after adjusting for characteristics differences.

Conclusion: Ureaplasma colonization was common in PPROM patients, however its presence did not significantly affect the latency period. It was associated with specific neonatal outcomes, such as a decreased requirement for neonatal respiratory support. This association suggests the need for further research into the effects of Ureaplasma in pregnancy and the interaction with microbial therapy.

Table 1: Neonatal outcomes comparing Ureaplasma-positive to Ureaplasma-negative PPROM patients

Outcome	OR	95% CI	*aOR	95% CI
Respiratory support	0.66	0.33-1.29	0.63	0.32-1.25
Intubation	0.39	0.19-0.82	0.32	0.15-0.71
Hypoglycemia	1.10	0.52-2.34	0.96	0.45-2.02
Required surfactant	0.30	0.13-0.68	0.34	0.14-0.79
Phototherapy	0.59	0.27-1.26	0.57	0.26-1.21
Respiratory Distress Syndrome (RDS)	0.72	0.36-1.44	0.67	0.33-1.35
Composite^	0.49	0.08-2.17	0.76	0.18-3.24
Preterm birth < 34 weeks	0.79	0.32-1.86	0.85	0.36-1.98
Preterm birth < 28 weeks	0.64	0.31-1.35	0.89	0.40-1.98

*Adjusted for AMA, IVF, history of cesarean section, cerclage, and mycoplasma positivity
^Composite – Sepsis, meningitis, hypoglycemia, surfactant requirement, meconium aspiration, NEC, asphyxia, seizure, IVH, periventricular leukomalacia, phototherapy, demise, bronchopulmonary dysplasia, RDS, other

Table 2: Maternal outcomes comparing Ureaplasma positive to Ureaplasma negative PPROM patients

Outcome	OR	95% CI	*aOR	95% CI
Cesarean section	0.49	0.25-0.97	0.63	0.31-1.29
Postpartum hemorrhage (PPH)	2.26	0.39-23.45	3.25	0.54-19.51
Retained products of conception (POC)	1.22	0.23-8.14	2.03	0.41-10.23
Endometritis	0.72	0.05-10.19	0.95	0.11-8.03
Sepsis	2.99	0.29-149.31	2.95	0.31-27.97
ICU admission	1.09	0.21-13.41	1.19	0.17-8.37
Wound infection	0.72	0.05-10.19	0.49	0.05-4.93
Composite^	1.67	0.66-4.49	2.4	0.91-6.32

*Adjusted for AMA, IVF, history of cesarean section, cerclage, mycoplasma positivity
^Composite – PPH, transfusion, retained POC, endometritis, sepsis, ICU admission, wound infection, hospital readmission <6 week postpartum, thromboembolism, maternal death

1024 | Comparing Inferior Vena Cava Collapsibility in Postpartum Patients with and without Severe Preeclampsia

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4:00 PM - 6:00 PM

Objective: The aim of this study was to determine if there is a difference in the inferior vena cava collapsibility index (IVCCI) between postpartum patients with severe preeclampsia versus those without preeclampsia.

Study Design: This was a prospective cohort study conducted in an urban university teaching hospital from May 2024 to June 2024. Patients had singleton or twin gestations and were evaluated within 48 hours of delivery. Cases had severe features of preeclampsia and controls did not have preeclampsia. Patients who previously received furosemide, were hemodynamically unstable, or who had a postpartum hemorrhage were excluded. Inferior vena cava (IVC) diameter was measured at inspiration (IVCmin) and expiration (IVCmax) using transabdominal ultrasound with a curvilinear 1.5-5 Hz probe. The IVCCI was calculated ((IVCmax-IVCmin)/IVCmax). The primary outcome was the IVCCI in each group.

Results: Amongst cases, the median IVCCI was 0.27 (interquartile range = 0.14 to 0.37) while controls had a mean IVCCI of 0.28 (interquartile range = 0.19 to 0.37). There was no significant difference in the collapsibility index between those with severe preeclampsia and those without preeclampsia.

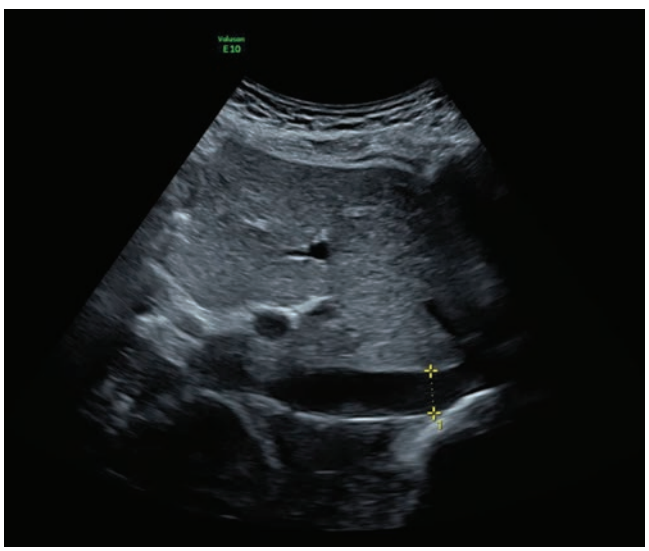
Conclusion: The IVCCI is an objective measure of intravascular volume. It was not shown to have a statistically significant difference between those with and without preeclampsia with severe features. A larger study cohort could establish a better understanding of IVC behavior in these two populations, and thus may provide a useful tool to guide fluid management and diuresis of postpartum patients with severe preeclampsia.

Comparison by Preeclampsia with Severe Features

IQR: Inter-quartile range

Characteristic	All[1]	No PreE, N = 10[1]	PreE SF, N = 12[1]	p-value[2]
Age (yrs)				0.019
Median (IQR)	26.5 (23.0, 31.0)	23.0 (21.3, 23.0)	30.0 (26.8, 32.3)	
Race				0.5
Black	21/22 (95%)	9/10 (90%)	12/12 (100%)	
Hispanic	1/22 (4.5%)	1/10 (10%)	0/12 (0%)	
BMI				0.2
Median (IQR)	35 (29, 43)	32 (28, 35)	36 (32, 44)	
(Missing)	1	1	0	
VD or CS				0.4
CS	12/22 (55%)	4/10 (40%)	8/12 (67%)	
VD	10/22 (45%)	6/10 (60%)	4/12 (33%)	
Gest Age				0.11
Median (IQR)	38.30 (36.63, 39.20)	38.85 (37.58, 39.95)	37.10 (36.40, 39.10)	
IVCCI				0.8
Median (IQR)	0.27 (0.16, 0.37)	0.28 (0.20, 0.36)	0.27 (0.15, 0.37)	

[1]n/N (%)
[2]Wilcoxon rank sum test; Fisher's exact test; Wilcoxon rank sum exact test



1027 | Should Fetuses with Growth Restriction at Term Undergo Trial of Labor?

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4:00 PM - 6:00 PM

Objective: To determine if trial of labor in term pregnancies with fetal growth restriction (FGR) impacts neonatal morbidity compared to planned Cesarean delivery.

Study Design: This is a single-site retrospective cohort study evaluating neonatal outcomes of singleton pregnancies with term FGR from 10/2019 to 02/2024 who underwent trial of labor (TOL) compared to planned Cesarean delivery (CD). Patients with fetal aneuploidy, major structural anomalies, or requiring emergent delivery prior to TOL were excluded. Patients were identified using a query within the obstetric ultrasound imaging program. FGR was defined as estimated fetal weight (EFW) or abdominal circumference (AC) < 10% for gestational age (GA). Maternal demographics, obstetric, and neonatal outcomes were obtained

by chart review. Variables were compared via Chi-square and Fisher's exact test, with significance of $p < 0.05$. Univariate logistic regression was used for the binary composite endpoint. The primary outcome was composite neonatal morbidity.

Results: There were 217 patients included for analysis; 178 (82.0%) underwent TOL and 39 (18.0%) planned CD. Of the TOL group, 140 (78.7%) had a vaginal delivery (VD) and 38 (21.3%) underwent CD. The TOL group was younger and had lower pre-pregnancy BMI. Baseline characteristics were otherwise similar (Table 1). There was no difference in composite neonatal morbidity between groups. Subgroup analyses also did not demonstrate a difference in composite neonatal morbidity based on planned mode of delivery (Table 2). Delivery complication rates were similar between groups.

Conclusion: In pregnancies with term FGR, there was no difference in composite neonatal morbidity in those undergoing TOL versus planned CD. Subgroup analyses for severe FGR, FGR based on AC < 10%, oligohydramnios, and abnormal fetal Dopplers showed no difference in composite neonatal morbidity. Of those with term FGR undergoing TOL, 78.7% had a VD without significantly increased neonatal morbidity or delivery complications. These findings support a trial of labor for patients with FGR at term.

Table 1. Demographics and clinical characteristics

	Planned CD n=39	TOL n=178	P value
Maternal age (yrs)	33.0 ± 5.0	30.6 ± 5.8	**0.017**
Advanced maternal age	13 (33.3%)	50 (28.1%)	0.647
Race			0.853
White	16 (48.5%)	61 (40.4%)	
Black	6 (18.2%)	32 (21.2%)	
Asian	8 (24.2%)	40 (26.5%)	
Other	3 (9.1%)	18 (11.9%)	
Hispanic or Latino ethnicity	10 (26.3%)	37 (22.2%)	0.736
Insurance type			0.802
Commercial insurance	20 (51.3%)	98 (55.1%)	
Public insurance	19 (48.7%)	80 (44.9%)	
Pre-pregnancy BMI	27.1 ± 7.9	24.8 ± 4.8	**0.016**
Total weight gain (lbs)	18.4 ± 14.3	21.9 ± 11.4	0.098
Nulliparity	17 (43.6%)	110 (61.8%)	0.056
IVF pregnancy	3 (7.9%)	7 (3.9%)	0.529
Maternal medical comorbidities[a]	7 (17.9%)	28 (15.7%)	0.920
History of bariatric surgery	1 (2.6%)	5 (2.8%)	1.00
Tobacco use in pregnancy	1 (2.6%)	2 (1.1%)	1.00
Low-dose aspirin during pregnancy	5 (12.8%)	30 (16.9%)	0.704

Data expressed as n (%) or mean ± SD
Abbreviations- CD: Cesarean delivery, TOL: Trial of labor, IVF: In vitro fertilization, BMI: Body mass index
[a]Maternal medical comorbidities: type 1/type 2 diabetes mellitus (DM), gestational DM, chronic hypertension, autoimmune disease

Table 2. Neonatal morbidity and outcomes for pregnancies complicated by term fetal growth restriction (FGR)

	Planned CD n=39	TOL n=178	P value
Composite neonatal morbidity	9 (23.1%)	31 (17.4%)	0.41
NICU admission	9	23	
Respiratory distress	5	13	
Hypoglycemia[a]	2	8	
Fetal acidemia[b]	0	2	
5-minute APGAR score <7	0	0	
Neonatal demise	0	0	
Subgroup analyses:			
Isolated AC <10% (n=59)	1 (8.3%)	6 (12.8%)	1.00
EFW 3-9% (n=134)	6 (27.3%)	18 (16.1%)	0.23
EFW <3% (n=24)	2 (40.0%)	7 (36.8%)	1.00
TOL with VD (n=140)		20 (14.3%)	
TOL with CD (n=38)		11 (29.0%)	
Oligohydramnios (AFI <5 cm) (n=21)	2 (40.0%)	4 (25.0%)	0.60
Abnormal fetal Dopplers (n=28)	3 (37.5%)	4 (20.0%)	0.37
Secondary outcomes			
Delivery complication[c,d]	2 (5.1%)	20 (11.2%)	0.38
Unplanned CD		38 (21.3%)	

Data expressed as n (%)
Abbreviations- CD: Cesarean delivery, TOL: Trial of labor, VD: Vaginal delivery, AFI: Amniotic fluid index, AC: Abdominal circumference, EFW: Estimated fetal weight, NICU: Neonatal intensive care unit
[a]Hypoglycemia: Capillary blood glucose <30 mg/dl within 24-hours after delivery, <45 mg/dl thereafter
[b]Fetal acidemia: umbilical artery pH <7.1
[c]Delivery complication: Postpartum hemorrhage, shoulder dystocia, operative VD, episiotomy, obstetric anal sphincter injury, intraoperative complication/injury, hysterectomy, intraamniotic infection, endometritis, surgical site infection, retained placenta, ICU admission, maternal death
[d]Nine of 20 patients (45%) with delivery complications underwent operative VD

1028 | The Association between PSV MCA and Perinatal Outcomes in Pregnancies Complicated by Small-for-Gestational-Age/Fetal-Growth-Restricted Fetuses

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4:00 PM - 6:00 PM

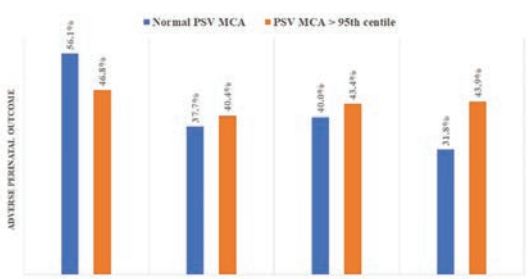
Objective: This study aimed to determine the relationship between middle cerebral artery (MCA) peak systolic velocity (PSV) and perinatal morbidity and mortality in SGA and FGR fetuses.

Study Design: A retrospective cohort study from a tertiary hospital including all singleton pregnancies without fetal genetic/structural anomalies and EFW and/or AC < 10th centile for gestational age (2017-2022). Only cases in which the umbilical artery (UA) and MCA were concurrently sampled within 14 days of birth were considered. The study compared cases with abnormal MCA PSV (> 95th centile for gestational age) to pregnancies with normal MCA PSV. The primary outcome was a composite adverse perinatal outcomes defined as either antenatal fetal death, cesarean birth due to fetal distress, 5-minute Apgar < 7, arterial cord < 7.1, prolonged NICU admission (>7 days), need for intubation, sepsis, necrotizing enterocolitis, and neonatal death. Multi variable logistic regressions were conducted, adjusting for relevant covariates.

Results: The study included 983 patients, among whom 98 (10%) had abnormal MCA PSV and 885 (90%) had a normal PSV MCA. Maternal sociodemographic characteristics were similar between the group. Cases with abnormal MCA PSV presented worse Doppler studies. Cases with abnormal MCA PSV delivered earlier than those with normal MCA PSV (33.9±4.5 vs. 36.1±3.3 wks; p< 0.001); nevertheless, the composite adverse perinatal outcomes did not differ between those with abnormal and normal PSV MCA (56.1% vs. 46.8%, p = 0.09). Subgroup analysis limited to cases with ultrasound assessment ≥ 32 weeks (n = 796); or those with normal MCA PI (≥ 5th centile; n = 708); or with normal CPR (≥ 5th centile; n = 621) presented similar composite adverse outcomes irrespective of MCA PSV status (Figure). Multivariate logistic regression controlling for MCA PI and UA PI failed to show a significant association between abnormal MCA PSV to the composite adverse outcome aOR 1.07; 95% CI 0.68-1.67.

Conclusion: In pregnancies complicated with SGA or FGR, abnormal MCA PSV, as a sole parameter, is not associated with adverse fetal/neonatal outcomes.

Figure 1 – The rate of adverse perinatal outcomes stratified by MCA PSV status in the entire cohort (p=0.09), those in which the most recent ultrasound was completed at or beyond 32 weeks (p=0.786), and those with normal MCA PI (p=0.744), and those with normal CPR PI (>5th centile) in the most recent ultrasound (p=0.283).



1029 | Unraveling Risk-Factors for Intrapartum Cesarean Section in Pregnancies with Fetal-Growth-Restriction Undergoing Labor Induction at Term

Misgav Rottenstreich[1]; Bryon DeFrance[2]; Jon F. Barrett[2]; Eran Ashwal[2]
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4:00 PM - 6:00 PM

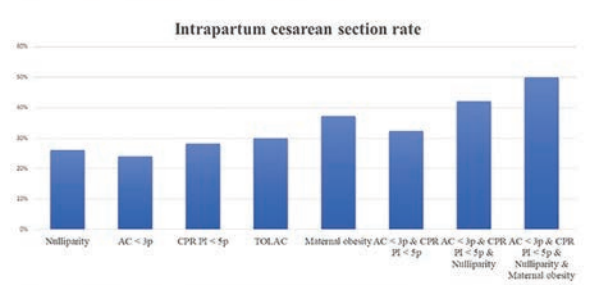
Objective: This study aimed to identify risk factors for intrapartum cesarean section in pregnancies complicated by fetal growth restriction undergoing labor induction at term.

Study Design: This case-control study included singleton pregnancies undergoing labor induction at term (≥37 weeks). All cases had estimated fetal weight (EFW) and/or abdominal circumference (AC) below the 10th centile for gestational age on the last sonographic assessment within 14 days of delivery. Pregnancies with known fetal genetic/structural abnormalities, previous ≥2 cesarean sections, or non-vertex presentation were excluded from the study. Perinatal and fetoplacental characteristics were compared between cases with successful vaginal delivery and those requiring intrapartum cesarean section (CS). Multivariable logistic regressions were conducted to identify independent variables associated with the need for intrapartum CS.

Results: A total of 405 eligible patients participated in the study, with 323 (79.8%) experiencing vaginal delivery, while 82 (20.2%) required intrapartum CS. Those undergoing CS exhibited higher rates of nulliparity and obesity. Gestational age at the most recent ultrasound assessment, mean EFW, and pulsatility index (PI) values of the umbilical artery and middle cerebral artery (MCA) were comparable between the groups. However, cases that underwent CS had a higher rate of fetal AC below the 3rd centile and abnormal cerebroplacental ratio PI. The gestational age at delivery did not differ significantly between the two groups. In the multivariate analysis (Table 2), maternal obesity, nulliparity, previous single CS, AC< 3rd centile, and abnormal cerebroplacental PI were identified as significant and independent predictors of intrapartu m CS. The predictive model demonstrated an area under the curve (AUC) of 0.714 (95% CI: 0.651-0.778); p< 0.001, indicating good discriminative ability.

Conclusion: Understanding maternal and fetoplacental characteristics can offer valuable insights into the success of vaginal delivery in pregnancies complicated by fetal growth impairment undergoing labor induction at term.

The rate of intrapartum cesarean section among pregnancies complicated by fetal growth restriction undergoing labor induction at term, stratified by the clinical status.



AC – abdominal circumference; CPR – cerebroplacental ratio; PI – pulsatility index; TOLAC – trial of labor after cesarean section

Predictors associated with intrapartum cesarean section among pregnancies complicated by fetal growth restriction undergoing labor induction at term – a multivariate analysis.

	Crude odds ratio (95% CI)	Adjusted odds ratio (95% CI)
Obesity (BMI ≥30 Kg/m²)	3.06 (1.77-5.28)	2.84 (1.60-5.03)
Nulliparity	2.40 (1.41-4.06)	2.99 (1.64-5.46)
Previous single cesarean section	1.74 (0.65-4.68)	3.19 (1.03-9.88)
Abdominal circumference < 3rd centile	1.69 (1.02-2.79)	1.94 (1.14-3.30)
Cerebroplacental ratio PI < 5th centile	1.96 (1.19-3.23)	1.81 (1.06-3.06)

BMI – body mass index; PI – pulsatility index

1030 | Prevalence of Cardiovascular-Kidney-Metabolic Syndrome in Reproductive-aged Women in the United States: NHANES 2011-2020

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4:00 PM - 6:00 PM

Objective: The AHA recently defined and staged cardiovascular kidney-metabolic (CKM) syndrome to highlight the multisystem consequences of poor CKM health, harmonize guidelines and provide opportunities for actionable preventive interventions before overt CVD. In the US, the components that comprise CKM (e.g., obesity, diabetes, hypertension) are potent risk factors for poor maternal and neonatal outcomes with a disproportionate burden among racial/ethnic minorities. However, population-level data on CKM syndrome in reproductive-aged women is scarce and is a critical next step in evaluating the association between CKM stages and overall pregnancy outcomes.

Study Design: We analyzed 2,347 non-pregnant, reproductive-aged women (≥ 20-49 years) from the National Health and Nutrition Examination Survey (NHANES) who had data on all CKM risk factors. We incorporated sampling weights into our analyses to account for the complex NHANES survey design. We reported prevalence estimates and standard errors of CKM syndrome stages (defined in Table) in the overall population, by race/ethnicity and across the study period (2011-2020).

Results: The mean age was 34.6 ± 7.7 yrs., with 57% non-Hispanic (NH) White, 19% Hispanic, 13% NH Black, 6% NH Asian, and 4% self-reported other races. Within the study period, 74.7% of participants had CKM syndrome [Stage 1: 37.3%, Stage 2: 35.7%, Stage 3: 0.3% and Stage 4: 1.97%], with notable variations over time. **(Table A & Figure A).** As noted in **Table B/Figure B**, NH Black women had the lowest prevalence of stage 0 CKM (13.2%) and the highest prevalence of stages ≥ 2 CKM (45.6%), followed by other races (40.8%) and Hispanic women (39.4%). Asian women had the lowest prevalence of stages ≥ 2 CKM (27.8%).

Conclusion: More than three-quarters of reproductive-aged women in the U.S. have at least stage 1 CKM with notable racial/ethnic disparities. Focusing health efforts on the prevention of these modifiable risk factors can undoubtedly improve health outcomes within this population. Studies evaluating the implications of these findings for overall pregnancy outcomes are urgently warranted.

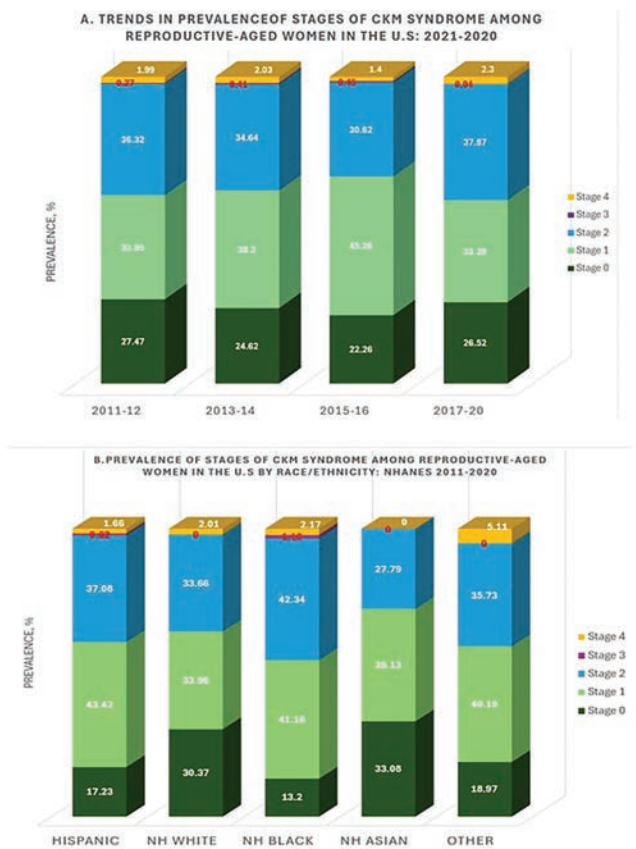
A. Trends in the Prevalence of Stages of CKM Syndrome among Reproductive Aged Women in the United States: NHANES 2011-20

CKM Syndrome Stage	Overall (2011-2020)	2011-2012	2013-2014	2015 - 2016	2017-2020
			Prevalence (95% CI)		
Stage 0	25.33 (22.82 -28.02)	27.47 (22.04 -33.67)	24.62 (20.51 – 29.25)	22.26 (16.78 – 28.91)	26.52 (22.26 – 31.27)
Stage 1	37.28 (34.74 – 39.90)	33.95 (29.91 – 38.23)	38.30 (33.94 – 42.85)	45.26 (39.27 – 51.40)	33.29 (28.44 – 38.53)
Stage 2	35.73 (32.68 – 37.72)	36.32 (32.30 – 40.54)	34.64 (30.05 – 39.54)	30.62 (26.86 – 34.66)	37.85 (32.26 – 43.78)
Stage 3	0.27 (0.15 – 0.48)	0.27 (0.07 – 1.11)	0.41 (0.13 – 1.31)	0.45 (0.21 – 0.98)	0.04 (0.01 – 0.30)
Stage 4	1.97 (1.45 – 2.66)	1.99 (0.86 – 4.57)	2.03 (1.26 – 3.25)	1.40 (0.75 – 2.59)	2.30 (1.42 – 3.70)

B. Prevalence of Stages of CKM Syndrome among Reproductive-aged Women in the United States by Race/Ethnicity: NHANES 2011-20

CKM Syndrome Stage	Overall Prevalence	Hispanic	Non- Hispanic White	Non -Hispanic Black	Non-Hispanic Asian	Other Races, including multi-racial
Weighted sample, n	n=2,347	n=443	n=1,348	n=305	n=151	n=100
			Prevalence (95% CI)			
Stage 0	25.33 (22.82 -28.02)	17.23 (14.26-20.66)	30.37 (26.54 – 34.50)	13.20 (10.49 – 16.48)	33.08 (27.61 – 39.05)	18.97 (11.66 – 29.34)
Stage 1	37.28 (34.74 – 39.90)	43.42 (39.16 – 47.78)	33.96 (30.16 – 47.78)	41.16 (36.52 – 45.96)	39.13 (33.25– 45.33)	40.19 (27.48 – 54.36)
Stage 2	35.73 (32.68 – 37.72)	37.08 (32.84 – 41.52)	33.66 (29.91 – 37.63)	42.34 (38.24 – 46.54)	27.79 (22.63 – 33.62)	35.73 (25.59 – 47.32)
Stage 3	0.27 (0.15 – 0.48)	0.62 (0.27 – 1.42)	0.00	1.13 (0.50 – 2.55)	0.00	0.00
Stage 4	1.97 (1.45 – 2.66)	1.66 (0.84 – 3.27)	2.01 (1.25 – 3.22)	2.17 (1.24 –3.77)	0.00	5.11 (2.11 – 11.87)

All prevalence values are weighted percentages. NHANES, National Health and Nutrition Examination Survey
BMI, body mass index; CKM, Cardiovascular- Kidney- Metabolic; CKD, chronic kidney disease; eGFR, estimated Glomerular Filtration Rate
Stage 0: BMI <25kg/m², or <23kg/m² if Asian ancestry, No hypertension/ hypertriglyceridemia/ metabolic syndrome/ prediabetes/diabetes/ CKD
Stage 1: Dysfunctional Adiposity/ Prediabetes [BMI ≥25kg/m², or ≥23kg/m² if Asian ancestry, waist circumference ≥88cm or ≥80cm if Asian ancestry ± prediabetes]
Stage 2: Hypertriglyceridemia/hypertension/Metabolic syndrome/ Diabetes mellitus/ CKD
Stage 3: High-risk CKD (eGFR <30) or very high-risk CKD per Kidney Disease Improving Global Outcomes (KDIGO) classification.
Stage 4: Clinical cardiovascular disease (stroke, heart failure, coronary heart disease).



1031 | Incidence And Risk Factors For Postpartum Hypertension In LMICs: A Large Prospective Multi-Country Cohort Study

M. Bridget Spelke[1]; Gillian Henderson[2]; Erin M. Oakley[3]; Victor Akelo[4]; Kwaku Poku Asante[5]; Irene Azindow[5]; Sasha Baumann[6]; Santosh Benjamin[7]; Anne G. Cherian[8]; Bethany L. Freeman[9]; Zahra Hoodbhoy[10]; Arun Singh Jadaun[11]; Margaret P. Kasaro[12]; Amna Khan[10]; Neeraj Sharma[11]; Jasmine Sugirtha[7]; Rupa Talukdar[11]; Charlotte Tawiah[5]; Joyce Akinyi Were[4]; Zacchaeus Abaja Were[4]; Blair Wylie[13]; Nida Yazdani[10]; Emily Smith[14]

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4:00 PM - 6:00 PM

Objective: To identify the incidence and risk factors associated with elevated blood pressure at 6 weeks postpartum among women in Ghana, Kenya, India, Pakistan, and Zambia. Study Design: We report findings from the Pregnancy Risk, Infant Surveillance, and Measurement Alliance (PRISMA) prospective multi-country pregnancy cohort in Kenya, Ghana, Zambia, Pakistan, and India. Hypertension (HTN) is defined as blood pressure (BP) greater than 140/90. We excluded participants with known chronic hypertension or elevated BP prior to 20 gestational weeks. We used descriptive statistics to report the incidence of postpartum hypertension overall and by region. We performed multivariable Poisson regression with robust variance to describe the relationship between risk factors and postpartum hypertension with relative risks and 95% confidence intervals. Results: A total of 3858/4358 (89%) participants had at least 1 BP measured at the 6-week postpartum visit and were included in the analysis. The incidence of high BP postpartum differed by region, with 2.7% of participants in South Asia and 7.3% in Africa meeting criteria. Overall, 50/251 (19.9%) participants with hypertensive diseases of pregnancy had persistent elevated BP at 6 weeks postpartum, compared to 4% new onset high BP at 6 weeks postpartum among those who did not have any hypertensive disorders of pregnancy. Factors associated with high BP postpartum included maternal age (aRR 1.10, 95% CI 1.08, 1.13), early pregnancy BMI ≥ 30 (aRR 2.24, 95% CI 1.58, 3.18), and a diagnosis of gestational hypertension or preeclampsia during the current pregnancy (aRR 4.20, 95% CI 2.9, 5.9; aRR 4.49 95% CI 2.85, 7.07, respectively). Participants with HIV infection were less likely to have elevated blood pressure (aRR 0.46 95% CI 0.25, 0.83). Conclusion: This study demonstrates a high incidence of elevated blood pressure postpartum with notable differences by region. These findings underscore the need for robust follow-up at and beyond 6 weeks after delivery and linkages to primary care for women with persistent hypertension.

1032 | Shoulder Dystocia Resolution Utilizing < vs. > 3 Maneuvers and Associated Adverse Outcomes

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[1]University of Rome La Sapienza, Rome, Lazio; [2]Christiana Care Health System, Newark, DE; [3]Sapienza Università di Roma (ROMA), Rome, Lazio; [4]McGovern Medical School at UTHealth, Houston, TX; [5]Delaware Center of Maternal-Fetal Medicine at Christiana Care, Delaware, DE

4:00 PM - 6:00 PM

Objective: Our objective was to examine the association between the use of < 3 versus ≥ 3 maneuvers to resolve SD and adverse outcomes.

Study Design: This was a secondary analysis of the Assessment of Perinatal EXcellence (APEX) study, a observational cohort of over 115,000 deliveries within 25 U.S. hospitals. We included women with singleton, vertex, non-anomalous gestations at ≥ 34 weeks who had SD, relieved with at least 1 maneuver. We excluded SD if no maneuvers were documented. We stratified the groups according to the number of maneuvers used to resolve the shoulder dystocia. The primary outcome was a neonatal composite outcome encompassing Apgar < 5 at 5', fetal fractures, intracranial hemorrhage, brachial plexus injury, facial nerve palsy, hypotension and neonatal death. Statistical analysis included Chi-square, Kruskal-Wallis, logistic and Poisson regressions with robust error variance for adjusted Incidence Rate Ratios, adjusting for BMI and maternal age.

Results: The overall rate of SD in APEX was 1.9% (2,138/118,422). Of 2,138 SD, 96% met the inclusion criteria for analysis. Three or more maneuvers were utilized in 19% (391/2,062) of SD. The composite outcome was higher with ≥ 3 maneuver (14.6%) vs < than 3 (5.7%; Fig 1). After adjustement the aIRR was 2.28 (95%CI 1.62, 3.20). Additionally, Apgar < 5 at 5' (aIRR 4.10 95% CI 1.18-14.25), fetal fractures (aIRR 2.58 95% CI 1,66-4.00), intracranial hemorrhage (aIRR 4.28 95%CI 1.06-17.19), brachial plexus injury (aIRR 2.58 95%CI 1.45-4.60) were significantly more likely when ≥ 3 vs < 3 maneuvers were used. No statistically significant differences were noted for rates of facial nerve palsy, hypotension requiring treatment and neonatal death and postpartum hemorrhage (Table 1).

Conclusion: Shoulder dystocia relieved by 3 or more maneuvers, compared to fewer, was associated with a 2.5-fold increased risk of composite neonatal adverse outcomes, albeit not postpartum hemorrhage.

Fig 1. Numbers of Maneuverers to Resolve Shoulder Dystocia and Composite Neonatal Adverse Outcomes

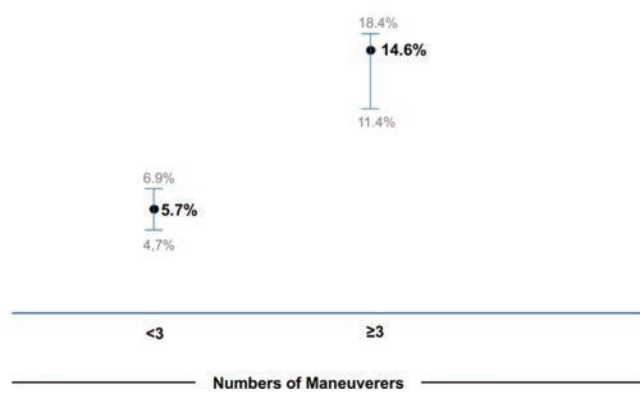

Table 1. Number of maneuvers used to relieve shoulder dystocia and outcomes

	< 3 Maneuvers (N = 1,671)	≥ 3 Maneuvers (N = 391)	Univariate Analysis IRR (95%CI); P	aIRR[1] (95% CI); P
Neonatal composite outcome	96/1,671 (5.7)	57/391 (14.6)	**2.53 (1.82, 3.52); <0.0001**	**2.28 (1.62, 3.20); <0.0001**
Apgar <5 at 5 minutes	5/1,671(0.3)	6/391(1.5)	**5.13 (1.57, 16.80); 0.007**	**4.10 (1.18, 14.25); 0.02**
Fetal fractures[2]	53/1,671 (3.2)	32/391(8.2)	**2.58 (1.66, 4.00); <0.0001**	**2.58 (1.66, 4.00); <0.0001**
Intracranial hemorrhage	5/1,671 (0.3)	4/391 (1.0)	3.41 (0.92, 12.73); 0.067	**4.28; (1.06, 17.19);0.04**
Brachial plexus Injury	31/1,671 (1.9)	20/391 (5.1)	**2.75 (1.57, 4.83); <0.0001**	**2.58; (1.45, 4.60); 0.001**
Facial nerve palsy	2/1,671 (0.1)	1/391 (0.3)	2.13 (0.19, 23.56); 0.53	1.83 (0.16, 20.31); 0.62
Hypotension treated	11/1,671 (0.7)	4/391 (1.0)	1.55(0.49, 4.87); 0.45	1.52 (0.48, 4.80); 0.47
Neonatal death	0/1,671 (0)	0/391 (0)	-	-
Postpartum hemorrhage[3]	104/1671 (6.2)	18/391 (4.6)	0.74; (0.44, 1.21); 0.24	0.72 (0.43, 1.21); 0.22

Data presented as N (%)
IRR: incidence rate ratios from modified Poisson regression
[1]aIRR, incidence rate ratios from modified Poisson regression adjusted for maternal age, and body mass index—the only 2 maternal characteristics which differed significantly between the groups.
CI, confidence intervals
[2]Fetal fractures include: clavicular, skull, depressed skull or skeletal factures
[3]Defined as blood loss ≥ 1,000 mL
Bolded, if significantly different

1033 | Variation in Fetal Heart Rate Tracing and Adverse Outcomes among Pregnancies Complicated by Hypertensive Disorder

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4:00 PM - 6:00 PM

Objective: To compare the fetal heart rate tracing (FHRT) and adverse outcomes among hypertensive and non-hypertensive women who delivered at term (≥ 37 wks).

Study Design: The inclusion criteria of the retrospective study were consecutive individuals with non-anomalous singletons who delivered at ≥ 37 wks over 15 months. The groups were stratified by the presence or absence of hypertensive disorder of pregnancy (HDP), defined as gestational and chronic hypertension. Using the ACOG guidelines, clinicians—blinded to maternal characteristics, BP status, and outcomes—interpreted the FHRT for the last 60 mins of labor. Composite neonatal and maternal adverse outcomes (CNAO, CMAO) were compared between the groups. Chi-square test was used to compare groups. Odds Ratios (OR) and adjusted OR were calculated using a multivariate binomial logistic regression model with permuted omnibus tests to identify confounding factors.

Results: Of the 5,160 deliveries during the study period, 3,166 (61%) met the inclusion criteria and among them 1,062 (33%) had HDP. Pregnancies complicated by HDP were significantly more likely to have minimal variability (p< 0.01). Decelerations occurred at similar rate. The rate of category I, II and III tracings were similar (Table 1). Cesarean delivery was comparable among the two groups after adjustment. CNAO of newborns of individuals with HDP (2.5%) was significantly higher than newborn of normotensive individuals (1.0%; aOR 2.32 95%CI 1.21–4.49). CMAO was significantly higher in the HDP (9.9%) than normotensive group (6.8%; aOR 1.56 95% CI 1.17–2.07); Table 2). Apgar score < 7 at 5 min and neonatal seizure were the only components of the CNAO that differed significantly.

Conclusion: Minimal variability was the only fetal heart rate characteristic which differed significantly among hypertensive

vs. normotensive individuals. Neonatal and maternal adverse outcomes were significantly higher in the hypertensive group. Intervention trials mitigating the increased likelihood of adverse outcomes among term individuals with hypertensive disorder are warranted.

Table 1: Fetal Heart Trace features present for at least 50% of time in the last 60 minutes.

	Normotensive (N=2,104)	Hypertensive (N=1,062)	p value
Fetal Tachycardia	75 (3.6%)	28 (2.6%)	0.16
Presence of Accelerations	1336 (63.5%)	675(63.6%)	0.97
Prolonged Accelerations	4(0.2%)	1(0.1%)	0.52
Early Decelerations	81 (3.8%)	53 (5.0%)	0.13
Late Decelerations	306 (14.5%)	150 (14.1)	0.75
Variable Decelerations	842 (40.0%)	434 (40.9%)	0.65
Prolonged Decelerations	54 (2.6%)	28 (2.6%)	0.90
Heart Rate Variability			
Absent	7 (0.3%)	0(0.0%)	0.06
Minimal	**240 (11.4%)**	**158 (14.9%)**	**0.005**
Moderate	1793 (85.2%)	877(82.6%)	0.05
Marked	12(0.6%)	5 (0.5%)	0.72
Combinations of decelerations			
Variable + Late decelerations	1007 (47.9%)	512 (48.2%)	0.85
Var + Late + Prolonged decelerations	1088 (51.7%)	561 (52.8%)	0.55
Decelerations > 50% of contractions	654(31.1%)	342(32.2%)	0.52
ACOG Classification*			
Category I	632 (30.0%)	316 (29.8%)	0.87
Category II	1444 (68.6%)	736(69.3%)	0.70
Category III	7 (0.3%)	1 (0.1%)	0.21

Data presented as N (%)
Bolded if significantly different
*ACOG, American College of Obstetricians and Gynecologists (based on Practice Bulletins # 106 and # 116)

Table 2: Perinatal Outcomes

	Normotensive (N=2,104)	Hypertensive (N=1,062)	OR (95% CI)	aOR* (95%CI)
Cesarean delivery [1]	**539 (25.6%)**	**334 (31.5%)**	**1.31 (1.13 – 1.57)**	0.97 (0.80 – 1.19)
Repeat	174 (8.3%)	69 (6.5%)		
Malpresentation	57.0 (2.7%)	19.0 (1.8%)		
Arrest	**155 (7.4%)**	**153 (14.4%)**	**2.08 (1.63 – 2.64)**	1.27 (0.96 – 1.71)
Non-reassuring FHRT	185 (8.8%)	106(10.0%)		
Others	43.0 (2.0%)	29.0 (2.7%)		
Umbilical arterial pH <7.00	8/1110 (0.7%)	6/585(1.0%)		
Neonatal Composite	**22 (1.0%)**	**27 (2.5%)**	**2.55 (1.43 - 4.53)**	**2.32 (1.21 – 4.49)**
Apgar score <7 at 5'	**10 (0.5%)**	**17 (1.6%)**		
Mechanical Ventilation	6(0.3%)	8 (0.8%)		
Neonatal seizure	**0 (0.0%)**	**3 (0.3%)**		
Bronchopulmonary dysplasia	0 (0%)	0 (0%)		
Intraventricular hemorrhage	0 (0%)	1 (0.1%)		
Necrotizing enterocolitis	1 (0%)	0 (0%)		
Neonatal sepsis	5 (0.2%)	2 (0.2%)		
Birth injury	3 (0.1%)	4 (0.4%)		
Hypoxic ischemic injury	2 (0.1%)	2 (0.2%)		
Neonatal death	1 (0%)	0 (0%)		
Maternal Composite	**144 (6.8%)**	**105 (9.9%)**	**1.56 (1.19 - 2.06)**	**1.56 (1.17 – 2.07)**
Estimated blood loss ≥ 1000 mL[3]	100/2101 (4.8%)	67/1061(6.3%)		
Blood Transfusion	55 (2.6%)	38 (3.6%)		
Endometritis	19 (0.9%)	10 (0.9%)		
Surgical Site Infection	3 (0.1%)	5 (0.5%)		
Deep venous thrombus	0 (0%)	1 (0.1%)		
Intensive care unit	5 (0.2%)	6 (0.6%)		

Bolded if significantly different ($p<0.05$)
FHRT: fetal heart rate tracing.
* OR adjustment evaluated for: Nulliparous, Gestational age, BMI >30, Diabetes, Induction of labor, magnesium sulfate use, insurance, race, cervical ripening with cervidil, cook balloon, amniotomy, Maternal viral infection (HIV/Hepatitis). Multiple permutations of omnibus tests using binomial logistic regression were used to identify those with statistically significant contribution.
For Neonatal Composite: No co-variables were found to have significant model effect. Adjustment for all candidate variables is presented.
For Maternal Composite: Nulliparity, race, gestational age at delivery, and diabetes were significant co-variates ($P < 0.05$), and adjustment for these is presented.
For Cesarean Delivery rate: Nulliparous, Gestational age at delivery, diabetes, BMI > 30, amnioinfusion, magnesium sulfate use, induction of labor, cervidil, cook ballon, amniotomy, and tobacco use, had significant model effect as co-variates ($P < 0.05$) and adjustment for these is presented. After adjustment cesarean delivery rate was not significantly different due to hypertensive disorder.

1034 | Impact of Timing of Hysteroscopy for Retained Products of Conception on Subsequent Pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: Retained products of conception (RPOC) occur in ~3% of deliveries and can have significant adverse effects on women's health. Hysteroscopy removes RPOC but has its own possible side effects. On the other hand, delayed treatment may damage the endometrium. Prolonged RPOC can lead to infection and inflammation, potentially affects future pregnancy outcomes. We studied outcomes for women with suspected RPOC, comparing hysteroscopy performed within 8 weeks versus more than 8 weeks postpartum.

Study Design: Our 2010-2023 retrospective dataset included information on women who had suspected RPOC and who underwent hysteroscopy at a tertiary medical health center. Women with a documented subsequent live birth following hysteroscopy were categorized based on timing: Group 1 (hysteroscopy within 8 weeks) and Group 2 (hysteroscopy beyond 8 weeks). We compared maternal characteristics, hysteroscopic findings, subsequent delivery details and neonatal outcomes between the two groups. The primary outcome was gestational age at delivery for the subsequent pregnancy. Secondary outcomes included various maternal and neonatal complications.

Results: Both groups had similar baseline characteristics. There were no significant differences in most aspects of the first delivery course, including mode of delivery. Indications for hysteroscopy were similar between groups, with retained placental tissue being the most common finding.

Regarding subsequent pregnancies following hysteroscopy, time to conception, gestational age at delivery, pregnancy complications including hypertensive disease, and most delivery outcomes were all similar between the two groups. Neonatal outcomes were also comparable.

Conclusion: The timing of hysteroscopy for RPOC following delivery - whether within 8 weeks or more than 8 weeks postpartum - appears to have minimal impact on subsequent pregnancy outcomes. Therefore, a wait-and-see approach might be recommended at least for two months after delivery. However, further investigation with a larger sample size is needed to confirm these findings.

Table 1. First delivery characteristics

Characteristics	Hysteroscopy≥8 weeks N=45	Hysteroscopy<8 weeks N=26	P-value
Age, years, mean ± SD	30.8±4.3	28.8±4.2	0.056
BMI, kg/m², mean ± SD	28.08±4.4	28.38±5.3	0.81
Parity, median (range)	1 [1-11]	1 [1-4]	0.31
Previous CD, n (%)	7 (15.6)	1 (4)	0.24
Singleton, n (%)	42 (93)	24 (92)	1.00
Diabetes, n (%)	3 (7)	2 (8)	0.37
Hypertension, n (%)	4 (9)	1 (4)	0.65
Induction of labor, n (%)			0.58
Oxytocin	3 (7)	10 (39)	
CRB/ PGE2	22 (49)	19 (61)	
Delivery mode, n (%)			0.58
Spontaneous	29 (64)	20 (77)	
Vacuum	5 (11)	3 (11.5)	
CD	11 (24)	3 (11.5)	
Gestational age at delivery, mean±SD	38.8±2.3	39.4±2.04	0.32
PPH, n (%)	4 (9)	2 (8)	1.00
Blood transfusion, n (%)	1 (2)	2 (8)	0.55
Chorioamnionitis, n (%)	3 (7)	0	0.29
HYSTEROSCOPY			
Time from delivery, days, mean±SD	87.5±32.8	47.6±5.4	**<0.001**
Indication, n (%)	N=44		0.22
Bleeding	11 (25)	10 (38)	
ultrasound	38 (87)	20 (77)	
Uterine perforation	1 (2)	2 (8)	0.16
Confirmed RPOC, n (%)	33 (73)	25 (96)	**P=0.024**

n, number; SD, standard deviation; BMI, body mass index; CD, cesarean delivery; CRB, catheter ripening balloon; PGE2, prostaglandin E2; P < 0.05 is considered significant

Table 2: Post hysteroscopy delivery

Characteristics	Hysteroscopy≥8 weeks N=45	Hysteroscopy<8 weeks N=26	p-value
PREGNANCY CHARACTERISTICS			
Time to conception,months,mean±SD	17.9±10.3	17.3±10.1	0.79
Singleton, n (%)	44 (98)	27 (92)	0.55
Diabetes, n (%)	5 (11)	1 (4)	0.39
Hypertension, n (%)	1 (2)	0 (0)	1.00
DELIVERY			
Gestational age at delivery, mean±SD	39.2±1.5	38.5±1.7	0.091
Induction of labor, n (%)			0.36
Oxytocin	9 (20)	8 (31)	
CRB/ PGE2	2 (4)	0	
Mode of delivery, n (%)			0.75
Spontaneous	34 (76)	20 (77)	
Vacuum	1 (2)	0 (0)	
Cesarean	10 (22)	6 (23)	
PPH, n (%)	8 (17.8)	4 (15.4)	1.00
Blood transfusion, n (%)	3 (6.7)	1 (3.8)	1.00
Hospitalization length > 5 days	6 (13%)	2 (7%)	0.70
NEONATAL OUTCOMES			
5-minute Apgar < 7	0	1	1
Umbilical artery pH < 7.1	1	0	1
NICU, n (%)	4 (8.9)	3 (11.5)	0.70
n, number; SD, standard deviation; PPH, postpartum hemorrhage; NICU, Neonatal intensive care unit; CD, cesarean delivery; P < 0.05 is considered significant.			

1035 | Vaginal Compared with Oral Misoprostol Induction for Individuals with Morbid Obesity

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4:00 PM - 6:00 PM

Objective: To characterize labor progress in term individuals with morbid obesity undergoing induction using vaginal compared with oral misoprostol

Study Design: We conducted a secondary analysis of a cluster randomized controlled trial comparing oral or vaginal misoprostol regimens for term labor induction among individuals with intact membranes and cervical dilation ≤ 2cm. Pregnant persons with BMI ≥ 40kg/m2 at delivery were included. Weekly randomization was assigned to either oral (100 μg every 4 hours for up to two doses) or vaginal (25 μg every 3 hours for up to five doses) misoprostol, followed by a standardized oxytocin protocol. We recorded cervical exams at misoprostol administrations, oxytocin initiation, and prior to delivery. We compared labor progress and duration, need for oxytocin, and delivery and neonatal outcomes using generalized estimating equations to account for clustering. Outcomes were stratified by parity. Labor curves were constructed using a mixed effects repeated measures model.

Results: Of 491 patients, 264(53.8%) received vaginal and 227(46.2%) oral misoprostol. There were no significant demographic differences. Route of administration was not associated with a difference in time (hours) to delivery (22.9±0.74 vaginal vs 22.3±0.78 oral). Among 165(66.2%) vaginal and 137(62.8%) oral misoprostol recipients who reached the second stage of labor, length of first stage did not differ (20.6±0.81h vs 20.5±0.89h). Need for oxytocin was lower with vaginal misoprostol (188(71.2%) vs 194(85.5%). There were no significant differences in vaginal delivery or other maternal and neonatal outcomes including umbilical cord pH < 7.0 and neonatal intubation. Associations between route of misoprostol and outcomes were similar after stratification by parity. Rate of cervical dilation did not differ by route of administration.

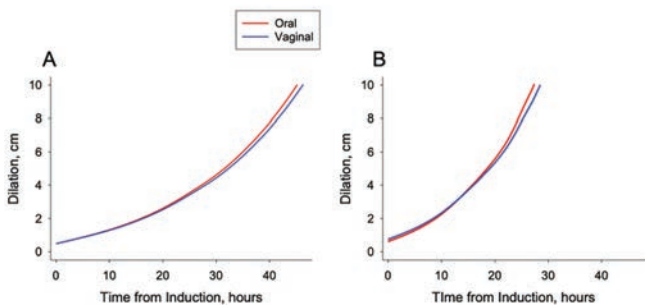
Conclusion: In patients with morbid obesity undergoing term induction, route of misoprostol does not impact time to delivery or vaginal delivery rates.

Table 1: Characteristics of induction in patients with BMI ≥ 40 kg/m² undergoing induction with vaginal vs oral misoprostol

Outcome	Vaginal misoprostol, n = 264	Oral misoprostol, n = 227	Mean difference or OR (95% CI)
Time to delivery, hours	22.9 ± 0.74	22.3 ± 0.78	0.57 (-1.54, 2.69)
Need for oxytocin	188 (71.2)	194 (85.5)	0.42 (0.27, 0.66)
Number who reached complete cervical dilation	165 (66.2)	137 (62.8)	1.09 (0.76, 1.58)
Length of first stage, hours*	20.6 ± 0.81	20.5 ± 0.89	0.05 (-2.31, 2.40)
Vaginal delivery	183 (69.3)	153 (67.4)	1.09 (0.75, 1.60)

Data shown as n (%) or mean ± SD as appropriate. Effect size shown as mean difference for continuous and OR (odds ratio) for categorical outcomes. *Measured for those who reached complete cervical dilation.

Figure 1: Rate of cervical dilation did not differ among patients with BMI ≥ 40 kg/m2 undergoing term induction with oral vs vaginal misoprostol and standardized oxytocin protocol, stratified by parity. A) nulliparous, B) multiparous.



1036 | Characterizing Vaginal Misoprostol Induction in Individuals with Morbid Obesity

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4:00 PM - 6:00 PM

Objective: To compare labor progression in individuals with body mass index < 40 vs ≥ 40 kg/m2 undergoing induction at term

Study Design: This was a secondary analysis of the vaginal misoprostol arm of a cluster randomized controlled trial comparing vaginal to oral misoprostol induction. This analysis included patients ≥ 37 weeks, with cervical dilation ≤ 2 cm who underwent induction using a standardized protocol. Vaginal misoprostol was given in 25 μg doses every three hours for up to five doses, followed by a standardized high-dose oxytocin protocol. We compared characteristics of labor progression among individuals with BMI < 40 and ≥ 40kg/m2 including labor duration, number of misoprostol doses, and obstetric and neonatal outcomes. Data was analyzed using generalized estimating equations to account for clustering. Effect sizes were presented as odds ratios and mean differences in duration with 95% confidence intervals.

Results: From May 2021 to September 2022, 1322 patients received vaginal misoprostol, among whom 1058(80.0%) had BMI < 40 kg/m2 and 264(20.0%) had BMI ≥ 40kg/m2. Baseline differences between the two groups are shown in Table 1. Cervical dilation at the start of induction was lower in patients with BMI ≥ 40, and these individuals required more doses of misoprostol during induction (Table 2). Inductions in this group had longer durations of oxytocin use (13.8 ± 9.2 vs 11.1 ± 8.0 h), length of first stage of labor (20.6 ± 11.1 vs 18.0 ± 9.4 h), and time to delivery (22.9 ± 12.1 vs 19.0 ± 10.3), with lower rates of vaginal delivery (69.3 vs 80.2%). Patients with morbid obesity were more likely to have excess blood loss (22.3 vs 15.5%) and develop wound infection (1.5 vs 0.4%).

Conclusion: Following term labor induction with vaginal misoprostol, morbid obesity is associated with longer labor duration, lower vaginal delivery frequency, and increased obstetric morbidity. Whether alternative labor induction protocols in morbidly obese patients improve these outcomes requires additional study.

Table 1: Baseline characteristics among term pregnant individuals undergoing induction with vaginal misoprostol stratified by BMI

	BMI <40kg/m² n = 1058	BMI ≥40kg/m² n = 264	p-value
Age (y)	26.5 ± 6.6	27.3 ± 6.2	0.07
Race			< 0.001
Black, non-Hispanic	152 (14.4)	60 (22.7)	
Hispanic	831 (78.5)	186 (70.5)	
White, non-Hispanic	47 (4.4)	17 (6.4)	
None of the above	28 (2.6)	1 (0.4)	
Nulliparous	578 (54.6)	129 (48.9)	0.09
Gestational diabetes	96 (9.1)	36 (13.6)	0.01
Pregestational diabetes	32 (3.0)	16 (6.1)	0.11
Initial cervical dilation			< 0.01
0	322 (30.4)	106 (40.2)	
1	427 (40.4)	100 (37.9)	
2	309 (29.2)	58 (22.0)	

Data shown as n (%) or mean ± SD as appropriate.

Table 2: Vaginal misoprostol induction characteristics among individuals with BMI < 40 or ≥ 40 kg/m²

	BMI < 40 kg/m², n = 1058	BMI ≥ 40 kg/m², n = 264	Mean difference or OR (95% CI)
Vaginal delivery	849 (80.2)	183 (69.3)	1.80 (1.33, 2.43)
Time to delivery (h)	19.0 ± 10.3	22.9 ± 12.1	3.94 (2.30, 5.58)
1st stage duration (h)*	18.0 ± 9.4	20.6 ± 11.1	2.53 (0.70, 4.36)
2nd stage duration (h)	0.8 ± 1.5	0.8 ± 2.0	0.02 (-0.31, 0.36)
Oxytocin duration (h)	11.1 ± 8.0	13.8 ± 9.2	2.72 (1.24, 4.21)
Number of misoprostol doses			
1	388 (36.7)	63 (23.9)	1.0 (reference)
2	348 (32.9)	80 (30.3)	1.42 (0.99, 2.03)
3	173 (16.4)	53 (20.1)	1.89 (1.26, 2.83)
4	117 (11.1)	56 (21.2)	2.95 (1.95, 4.46)
5	32 (3.0)	12 (4.5)	2.31 (1.13, 4.72)
Cesarean indication			
Labor dystocia	67 (6.3)	26 (9.8)	0.62 (0.39, 0.99)
FHRT abnormality	105 (9.9)	42 (15.9)	0.58 (0.40, 0.86)
Excess blood loss	164 (15.5)	59 (22.3)	0.64 (0.46, 0.89)
Wound infection	4 (0.4)	4 (1.5)	0.25 (0.06, 0.99)

Data shown as n (%) or mean ± SD as appropriate. FHRT, fetal heart rate tracing. Effect size shown as mean difference for continuous and OR (odds ratio) for categorical outcomes. *Measured for those who reached complete cervical dilation.

1037 | Recurrent Pregnancy Loss as an Independent Risk Factor for Celiac Disease of The Offspring

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4:00 PM - 6:00 PM

Objective: Celiac disease is a common immune-mediated inflammatory disease that mainly develops in genetically predisposed individuals. However, it is still unclear what predisposes some to develop the disease but not others. Women with a history of recurrent pregnancy losses (RPL) may harbor a genetic disposition for inflammatory responses causing pregnancy losses and this genetic trait may pass to their offspring. We sought to investigate whether offspring of women with RPL are at an increased risk to develop celiac disease.

Study Design: A population-based cohort study was conducted to evaluate the risk to develop celiac disease in offspring (up to the age of 18 years) born to mothers with and without a history of RPL. Only singleton deliveries were included. Data for the diagnosis of celiac disease of the offspring was extracted from community-based clinics and/or hospitalization records. Kaplan-Meier survival curve was used to compare the incidence of celiac disease between the study groups. A cox regression model was used to control for confounders.

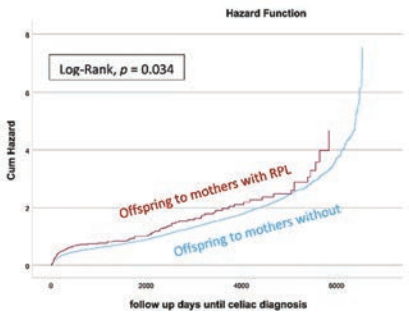
Results: During the 30 years (1991-2021) study period, 356,356 singleton deliveries occurred; 14,235 deliveries (4%) were in women with a history of RPL. Children in this group had higher rates of celiac disease as compared to children born to mothers without a history of RPL (**Figure**). The Kaplan-Meier survival curve illustrated higher incidence of celiac disease in offspring with maternal history of RPL (**Figure**). Using a Cox regression model, adjusting for maternal celiac disease, maternal age and gestational age at birth, maternal history of RPL was independently associated with celiac disease of the offspring (adjusted HR = 1.22, 95% CI 1.1-1.5; P = 0.04).

Conclusion: Maternal history of RPL is an independent risk factor for celiac disease in the offspring.

The association between RPL and celiac disease of the offspring: Univariate analysis, Kaplan-Meier survival curve and results from a Cox regression model

	History of RPL	No RPL	Odds Ratio	95%CI	Adjusted* HR	95%CI	*p* value
Celiac disease	107 (0.8%)	1,854 (0.5%)	1.39	1.1 – 1.7	1.22	1.1 – 1.5	0.04

* Adjusted for maternal celiac disease, maternal age and gestational age



1038 | Maternal Vaginal Colonization with Group-B Streptococcus During Labor and Long-Term Cardiovascular Morbidity of the Offspring

Gil Gutvirtz[1]; Tamar Wainstock[2]; Eyal Sheiner[2]
[1]Soroka University Medical Center, Metar, HaDarom; [2]Department of Obstetrics and Gynecology, Soroka University Medical Center, Ben-Gurion University of the Negev, Beer-Sheva, Israel., Beer Sheva, HaDarom

4:00 PM - 6:00 PM

Objective: Group B Streptococcus (GBS) is a Gram-positive bacteria that commonly colonizes the gastrointestinal and genital tracts of pregnant women. Vertical transmission to the neonate may occur during labor. While early onset GBS infection usually manifests with sepsis, pneumonia or meningitis, cardiac complications such as endocarditis, myocarditis and pericarditis have also been reported. This study was aimed to investigate whether an association exists between maternal vaginal GBS and offspring long-term cardiovascular morbidity

Study Design: A retrospective population-based cohort analysis of singleton vaginal deliveries between the years 2002-2021 at a tertiary medical center was performed. Long-term cardiovascular morbidity of children who were exposed to maternal positive GBS was compared with children to mothers with negative or unknown GBS status. Data for long-term cardiovascular morbidity of the offspring was extracted from community-based clinics and hospitalization records. A Kaplan-Meier survival curve was constructed to compare long-term cumulative cardiovascular morbidity, and a Cox regression model was used to adjust for possible confounders

Results: The analysis included 146,103 singleton vaginal deliveries that occurred during the study period. Of them, 2,225 (1.5%) mothers were identified with positive GBS status. The cumulative incidence of long-term cardiovascular morbidity was comparable between maternal GBS exposed offspring and those with negative or unknown maternal GBS status (**Figure**). The Cox regression model, adjusting for various confounders including gestational and maternal age, hypertensive disorders, diabetes mellitus and ethnicity, found that maternal vaginal GBS colonization was not associated with long-term cardiovascular morbidity of the offspring (adjusted HR = 0.88; 95% CI 0.55-1.42, P = 0.608, **Table**)

Conclusion: Maternal vaginal colonization with GBS during vaginal delivery is not associated with long-term cardiovascular morbidity of the offspring

Figure. Kaplan-Meier survival curve demonstrating the cumulative incidence of cardiovascular morbidity among study groups

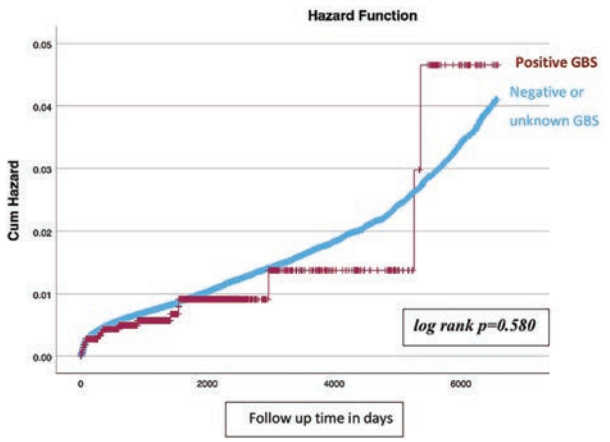


Table. Cox regression model for the association between maternal vaginal colonization of GBS and offspring long-term cardiovascular morbidity

	aHR	95%CI	p value
Positive GBS status	0.88	0.55 - 1.42	0.608
Maternal age (years)	0.99	0.98 - 0.99	0.033
Gestational age (weeks)	0.93	0.91 - 0.95	<0.001
Hypertensive disorders	1.13	0.92 - 1.38	0.230
Gestational Diabetes Mellitus	0.96	0.77 - 1.20	0.748
Ethnicity	1.03	0.94 - 1.12	0.477

1039 | Pulse Pressure does not Predict Response to Treatment of Severe Hypertension in Preeclampsia

Gillian Piltch[1]; Rachel P. Gerber[2]; Chisom Chigozie-Nwosu[3]; Burton Rochelson[2]; Matthew J. Blitz[2]; Evelina Grayver[2]; Alejandro D. Alvarez[2]; David Krantz[2]; Caroline Pessel[2]
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4:00 PM - 6:00 PM

Objective: To evaluate pulse pressure as a predictor of response to treatment of severe hypertension in preeclampsia.

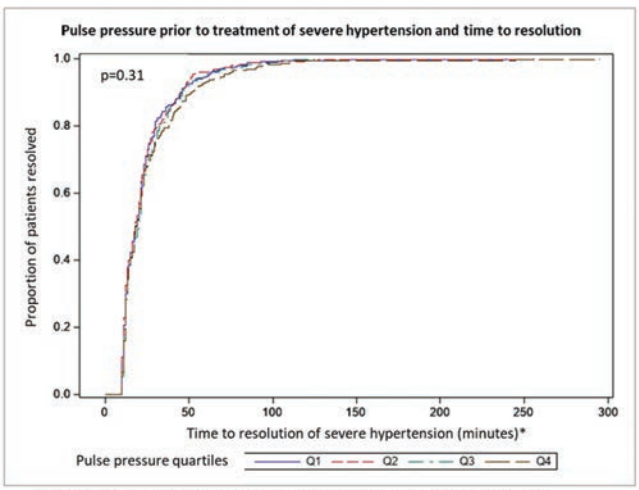
Study Design: Multicenter retrospective cohort study of pregnant or postpartum people who received treatment with immediate release nifedipine or intravenous labetalol or hydralazine for severe hypertension due to preeclampsia with severe features from 2017-2022. Primary outcomes were time to resolution of severe hypertension and resolution of severe hypertension within 30 minutes. Secondary outcomes were number of fast-acting antihypertensive doses and of distinct ACOG-defined medication algorithms needed for resolution of severe hypertension. Log-rank tests, likelihood ratio tests, and t-tests were performed with $p < 0.05$ considered statistically significant.

Results: 1191 people met inclusion criteria. Range in pulse pressure of the severe blood pressure immediately prior to

fast-acting antihypertensive administration was 24-132 mmHg and in time to resolution of severe hypertension was 10-295 minutes. There was no relationship between pulse pressure of the severe blood pressure immediately prior to treatment (Figure 1) or change in pulse pressure between the two severe blood pressures prompting treatment (Figure 2) and time to resolution of severe hypertension. Pulse pressure was not predictive of resolution of severe hypertension within 30 minutes ($p = 0.10$). Subgroup analysis stratified by first fast-acting antihypertensive administered demonstrated no relationship between pulse pressure and resolution within 30 minutes among those who received immediate release nifedipine ($p = 0.23$) or intravenous labetalol ($p = 0.48$) or hydralazine ($p = 0.45$). There was no association between pulse pressure and number of doses of fast-acting antihypertensives ($p = 0.74$) needed for resolution. There was a wider range in pulse pressures that included narrower pulse pressures among people who required one medication compared to those who needed more than one ($p< 0.01$) for resolution.

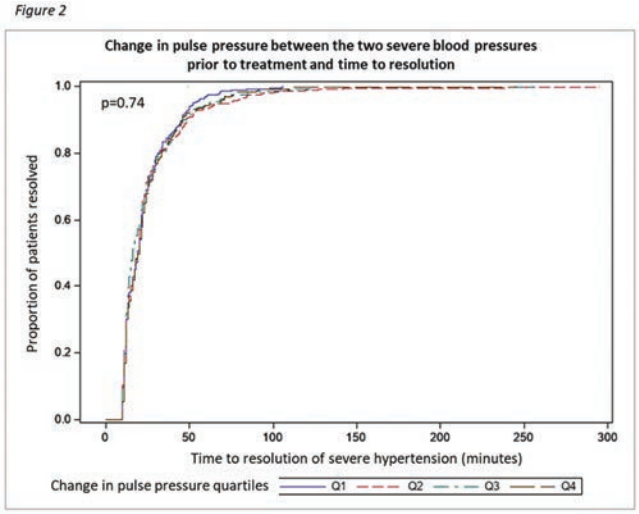
Conclusion: Pulse pressure was not predictive of time to resolution of severe hypertension in preeclampsia with severe features.

Figure 1



*Time from administration of first fast-acting antihypertensive to first non-severe blood pressure

Figure 2



1040 | Safety and Efficacy of Maternal COVID-19 Vaccination During Pregnancy: Umbrella Review & Meta-Analyses

Giulia Bonanni[1]; Nikan Zargarzadeh[2]; Mohammad Haddadi[3]; Ali Javinani[2]; James Versalovic[4]; Kjersti M. Aagaard[5]; Stefania Papatheodorou[6]; Alireza A. Shamshirsaz[7]

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4:00 PM - 6:00 PM

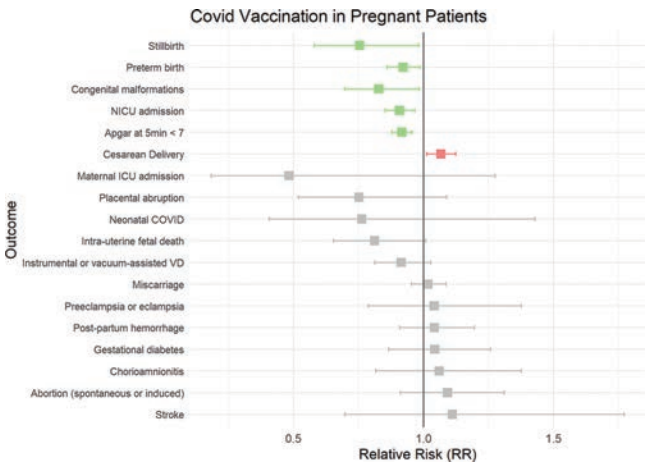
Objective: The safety & efficacy of vaccination against COVID-19 during pregnancy is crucial for not only current maternal and fetal health, but public health policy and management with future pandemics. To date, many meta-analyses on the safety and efficacy of COVID-19 vaccine were published with conflicting results; we aimed to correct this crucial knowledge gap with the current study.

Study Design: We conducted a systematic search of PubMed, Scopus, Web of Science, and Embase from 01/01/2021 to 09/13/2023. We included 23 meta-analyses inclusive of over 200 studies and 1,300,000 gravidae with or without documented evidence of COVID-19 vaccination. Meta-analyses were performed using R to aggregate effect sizes, utilizing random-effects models. Heterogeneity was evaluated using the I^2 statistic, and publication bias was assessed with Egger's test. PROSPERO registration: CRD42024519174.

Results: COVID vaccination during pregnancy reduced maternal COVID-19 infection rates (Risk Ratio [RR] 0.41, 95% CI 0.30-0.57), stillbirth (RR 0.75, 95% CI 0.58-0.98), PTB ≤37 wks (RR 0.92, 95% CI 0.86-0.99), congenital malformations (RR 0.83, 95% CI 0.70-0.98), SGA neonates (RR 0.94, 95% CI 0.91-0.98), and NICU admission (RR 0.91, 95% CI 0.85-0.97). No significant risk differences were observed among other outcomes, with the exception of a marginal increased risk of Cesarean delivery (RR 1.07, 95% CI 1.01-1.12; Table 1, Figure 1).

Conclusion: With the conduct of an umbrella review of comprehensive meta-analyses and including over 1.3M patients, we demonstrate significant benefit towards vaccination at no increased risk. The quantifiable benefits may aid shared

decision-making and public health communications in this and future pandemics.



Outcome	Pooled RR	Lower CI	Upper CI	I^2	Lower CI I^2	Upper CI I^2	Number of Studies	*P* for Egger test
Stillbirth	0.75	0.58	0.98	59.75	37.1	82.41	19	0.94
PTB ≤37 wks	0.92	0.86	0.99	66.9	51.31	82.49	36	0.99
Congenital malformations	0.83	0.70	0.98	12.73	0	33.38	11	0.47
NICU admission	0.91	0.85	0.97	77.05	59.87	94.24	24	0.37
Apgar at 5 min <7	0.92	0.88	0.96	0.04	0	0.85	27	0.27
SGA neonate	0.94	0.91	0.98	22.36	6.34	38.38	27	0.62
Maternal COVID-19 infection	0.41	0.30	0.57	98.66	93.35	100	19	0.06

RR, Risk Ratio; CI, Confidence Interval; PTB, Preterm Birth; NICU, Neonatal Intensive Care Unit; SGA, Small for Gestational Age

1041 | Prenatal Aortic Coarctation Sign Screening Using Automatic AI-Assisted Vessel Diameter Measurement

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[1]Sonio, Paris, Ile-de-France; [2]Cabinet Vendôme, Lille, Nord-Pas-de-Calais; [3]Hôpital Necker Enfants Malades, Paris, Ile-de-France; [4]University and Necker-Enfants Malades Hospital, Paris, Ile-de-France

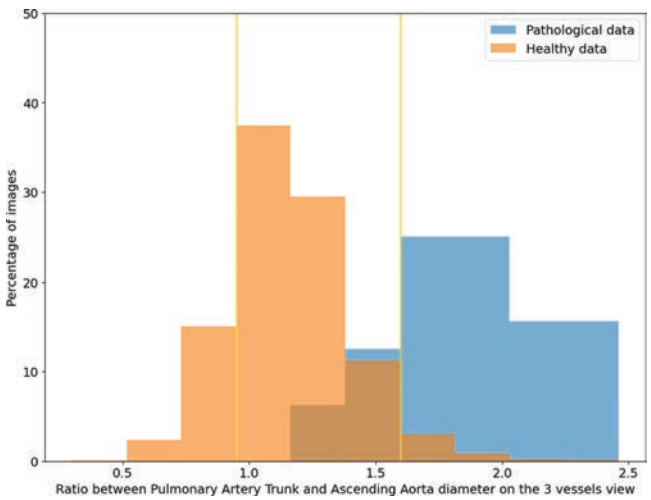
4:00 PM - 6:00 PM

Objective: Aortic coarctation (AoC) is a congenital heart defect characterized by hypoplasia of the aortic arch visible on the 3-vessel view (3VV). This study aims to (i) develop a pipeline using artificial intelligence (AI) for automatic vessel diameter measurement, (ii) assess whether vessel diameter is a reliable predictor of AoC prenatally.

Study Design: An AI software (under development, not yet FDA approved) trained on thousands of annotated images from US and European sites is used for the automatic detection and segmentation of the pulmonary artery (PA) and aorta (Ao) on 2D 3VV images. Post-processing algorithms are applied to achieve automatic and standardized diameter measurements. The model's performance is assessed on a test set of images on which the models were not trained, consisting of 2548 non-pathological images and 32 images from studies where AoC was diagnosed prenatally by a multidisciplinary team (Hôpital Necker, Paris).

Results: The models demonstrated high accuracy in vessel diameter measurement. The sign used for AoC screening is the diameter ratio of the PA to that of the Ao. With a ratio greater than 1.6, an AoC should be suspected. This ratio is calculated over the entire test set for the two populations, and a shift is observed (Figure 1). For healthy data, the mean ratio is 1.2±0.3 mm, while for the pathological data, the mean ratio is 1.8±0.3 mm. Our method achieves a sensitivity of 71.9% and a specificity of 87.8% for AoC sign screening.

Conclusion: This study validates AI's potential for automatic AoC sign screening. It offers a fast and reliable alternative to manual measurement methods. However, the AP/Ao ratio alone has limitations for screening CoA prenatally. Other indicators should be investigated. This study used cases detected prenatally, introducing a bias. Future work will look at cases that were diagnosed postnatally.



1042 | Direct Dispensation of Prenatal Supplements with Iron Among Pregnant People: a Cost-Effectiveness Analysis

Helen Samuel[1]; Megha Arora[2]; Ashley E. Benson[2]; Aaron B. Caughey[2]

[1]Oregon Health and Science University, Springfield, VA; [2]Oregon Health & Science University, Portland, OR

4:00 PM - 6:00 PM

Objective: Postpartum transfusion is a leading cause of severe maternal morbidity in the United States, with pregnant individuals with iron deficiency and/or iron deficiency anemia (IDA) at increased risk. Despite early detection and treatment recommendations to reduce prenatal iron deficiency and IDA, effective strategies to overcome barriers to medication and supplement access are less clear, and iron supplement adherence remains suboptimal during pregnancy. This study compares the cost effectiveness of directly providing versus recommending prenatal iron.

Study Design: A decision-analytic model was constructed in TreeAge to compare directly dispensing prenatal iron supplements versus the standard protocol of recommending prenatal iron supplements in a theoretical cohort of 1,514,784 pregnant

individuals enrolled in Medicare annually. Probabilities, utilities, and costs were derived from the literature. Outcomes included costs, quality-adjusted life years (QALY), preterm deliveries, neurodevelopmental disabilities, maternal postpartum anemia, and postpartum transfusion for acute blood loss. We defined our cost-effective threshold as 100,000 USD per QALY.

Results: Directly dispensing prenatal iron supplements resulted in 62,600 fewer preterm deliveries, 52 fewer cases of neurodevelopmental disability, 75,683 fewer cases of maternal postpartum anemia, and 54,010 fewer postpartum blood transfusions (Table 1) within our theoretical cohort. This intervention resulted in an estimated 187,475 additional QALYs and cost savings of $62,187,202,377 annually. Given the increase in QALYs and cost savings, directly dispensing prenatal iron was a dominant strategy.

Conclusion: In this study, directly dispensing prenatal iron supplements to Medicaid-enrolled pregnant individuals was a cost-effective strategy associated with reduced rates of adverse perinatal outcomes. These findings support the implementation of iron supplement provision at point of care prenatally to improve adherence, maternal and child health outcomes, and reduce healthcare expenditures.

Table 1. Outcomes associated with directly dispensing versus recommending prenatal iron in a theoretical cohort of 1,514,784 Medicaid-enrolled pregnant individuals.

	Directly Dispensed Prenatal Iron	Recommending Prenatal Iron	Differences
Preterm delivery	92,401	155,001	-62,600
Neurodevelopmental disability	353	405	-52
Maternal Postpartum Anemia	545,347	621,030	-75,683
Acute Blood Loss Transfusions at Postpartum	773,062	827,072	-54,010
Cost (USD)	$28,386,003,406	$905,732,057,844	-$62,187,202,377
Effectiveness (QALYs)	84,833,163	84,645,688	187,475

1043 | Increased Risk of Major Fetal Anomalies in Cases of Severe Placenta Accreta Spectrum

Helena C. Bartels[1]; Jennifer M Walsh[2]; Donal O'Brien[2]; Jennifer Donnelly[3]; Stephen Carroll[2]; Heather Hughes[2]; Barbara Cathcart[2]; Rhona Mahony[2]; Paul Downey[2]; Fionnuala M. M. McAuliffe[4]; Siobhan Corcoran[2]

[1]University College Dublin, University College Dublin, Dublin; [2]National Maternity Hospital, Dublin, Dublin; [3]Rotunda Hospital, Dublin, Dublin; [4]UCD Perinatal Research Centre, University College Dublin, Dublin 2, Dublin

4:00 PM - 6:00 PM

Objective: To evaluate the incidence of congenital fetal anomaly in pregnancies with placenta accreta spectrum (PAS).

Study Design: This is a prospective cohort study of PAS cases from January 2018–July 2024. Consecutive patients with clinically and histopathologically confirmed PAS were included. Ultrasound assessments were performed by fetal-medicine specialists in a tertiary referral centre for PAS.

Results: 73 participants with a mean age of 36.0±3.6 met inclusion criteria. In seven cases (9.5%), a major fetal congenital anomaly in a euploid fetus was diagnosed, compared to a background rate of 3%. The anomalies diagnosed were as follows: two major cardiac anomalies (hypoplastic left heart, right heart), two tracheoesophageal fistula, one severe ventriculomegaly, one giant omphalocele with hydrops, and one congenital diaphragmatic hernia. No case was associated with an underlying genetic diagnosis. In each case, clinical PAS findings were on the severe end of spectrum, with low implantation in early pregnancy which evolved to intraoperative topography consistent with type 2L (low lateral parametrial involvement) and 3 (low anterior cervical).

Conclusion: Severe PAS may be associated with a higher rate of fetal congenital anomaly, which in our cohort were major single structural anomalies without genetic associations. PAS cases associated with congenital fetal anomalies were lateral and cervical defects on the severe end of the spectrum. These structural defects suggest fetal insult in early pregnancy from 5-9 weeks gestation. It is possible early implantation within a previous uterine scar results in vascular disruption of embryonic development and the subsequent development of structural fetal anomaly. These cases present significant clinical challenges and warrant specialist multi-disciplinary care to include neonatology and paediatric surgery to ensure safe delivery timing to optimise maternal health and fetal outcomes. PAS cases should have a detailed fetal medicine assessment in view of the higher incidence of fetal anomalies.

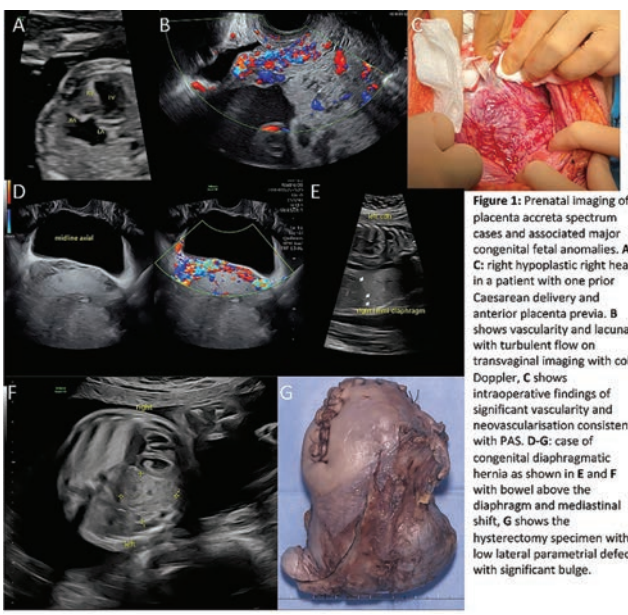


Figure 1: Prenatal imaging of placenta accreta spectrum cases and associated major congenital fetal anomalies. **A-C:** right hypoplastic right heart in a patient with one prior Caesarean delivery and anterior placenta previa. **B** shows vascularity and lacunae with turbulent flow on transvaginal imaging with color Doppler, **C** shows intraoperative findings of significant vascularity and neovascularisation consistent with PAS. **D-G:** case of congenital diaphragmatic hernia as shown in **E** and **F** with bowel above the diaphragm and mediastinal shift, **G** shows the hysterectomy specimen with a low lateral parametrial defect with significant bulge.

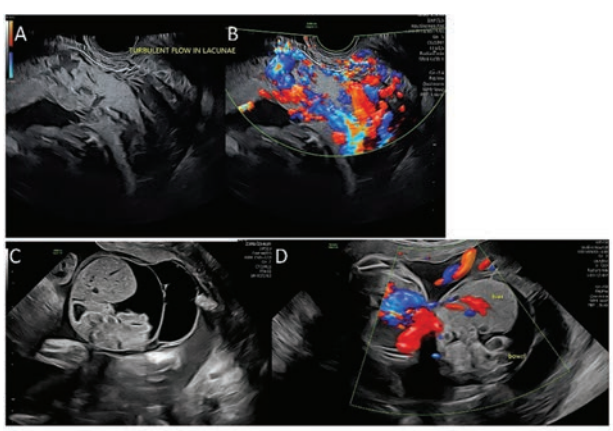


Figure 2: Prenatal imaging of placenta accreta spectrum cases and associated major congenital fetal anomalies. **A/B** anterior placenta previa a patient with one prior Caesarean delivery, with transvaginal imaging showing multiple lacunae with turbulent flow and no discernible myometrium with color Doppler in **B**, associated with a fetus with giant omphalocele and hydrops as seen in **C** and **D**.

1044 | Assessing the Impact of Early Pregnancy Air Travel on First Trimester Miscarriage Rates

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[1]Meir Medical Center, Meir Medical Center, HaMerkaz; [2]ICHILOV, Tel Aviv, HaMerkaz; [3]Jerusalem University, Jerusalem, Yerushalayim; [4]Department of Obstetrics and Gynecology Meir Medical Center, Kfar Saba, HaMerkaz; [5]Meir Hospital, Meir Hospital, HaMerkaz; [6]Department of Obstetrics and Gynecology Meir Medical Center, Kfar Saba, Yerushalayim; [7]Meir Medical Center, Kfar Saba, HaMerkaz

4:00 PM - 6:00 PM

Objective: Our study aimed to investigate the potential association between air travel and spontaneous abortions in the general population, addressing the limited and conflicting data currently available on this subject.

Study Design: We conducted an observational retrospective study using a large dataset comprising 469,976 live births and 76,556 spontaneous abortions from 2010 to 2019. We compared singleton pregnancies that resulted in live births with those that ended in spontaneous abortion in the first trimester, focusing on air travel during the first trimester (4w0d - 13w6d) as the independent variable. The primary outcome was spontaneous abortion. A logistic regression model was used to analyze the association between the outcome and the exposure. Adjusted odds ratios (aOR) and 95% confidence intervals (CI) were reported.

Results: In this study, 427,727 live births (97.2%) and 12,263 (2.8%) spontaneous abortions were recorded. Women who experienced spontaneous abortions exhibited a higher incidence of air travel, with 0.11% having traveled compared to only 0.04% among those who delivered live births (P< 0.001). After adjusting for confounding factors (as detailed in Table 1), the odds ratio for spontaneous abortion was 5.20 (95% CI 4.38-6.33) for those who traveled by air during early pregnancy.

Conclusion: Our study suggests that air travel during early pregnancy is associated with a higher risk of spontaneous abortion.

Table 1. Characteristics of study populations (N = 439,990)

This table presents the demographic and clinical characteristics of the study population, comparing deliveries and spontaneous abortions.

	Deliveries	Spontaneous Abortions	P-value
	N= 427,727 (97.2%)	N= 12,263 (2.8%)	
Maternal age, mean (SD)			
<25	60,169 (14.1%)	1511 (12.3%)	<0.001
25-29	112,960 (26.4%)	3025 (24.7%)	<0.001
30-35	135,499 (31.7%)	3,913 (31.9%)	0.596
>35	119,099 (27.8%)	3,814 (31.1%)	<0.001
BMI, mean (SD)			
<20	41,910 (9.8%)	1,561 (12.7%)	<0.001
20-25	125,715 (29.4%)	4,743 (38.7%)	<0.001
26-30	75,783 (17.7%)	2,744 (22.4%)	<0.001
>30	40,564 (9.5%)	1,259 (10.3%)	0.004
Smoking, n (%)	20,196 (4.7%)	928 (7.6%)	<0.001
Socioeconomic state (SES), mean (SD)	5.9 (2.1)	6.2 (2.0)	<0.001
Chronic hypertension, n (%)	2,660 (0.6)	89 (0.7)	0.167
Pregestational diabetes type 1, n (%)	474 (0.1%)	16 (0.1%)	0.613
Pregestational diabetes type 2, n (%)	854 (0.2%)	37 (0.3%)	0.014
Fertility treatments (IVF), n (%)	24,072 (5.6%)	637 (5.2)	0.042
End of pregnancy week (SD)	40.3 (1.9)	10.3 (2.8)	<0.001
Previous abortion	38,844 (9.1%)	1578 (12.9%)	<0.001
Number of flights, n (%)	17,109 (0.04%)	1294 (0.11%)	<0.001

Continuous variables are presented as mean ± SD and categorical variables as n (%).

*SES levels range between 1 (lowest) to 10 (highest)

Table 2: Multivariable logistic regression analysis: Factors associated with spontaneous abortion.

Variable	Adjusted Odds Ratio (aOR)	95% Confidence Interval	P-value
Air travel during pregnancy	5.20	4.38-6.33	0.008
Past spontaneous abortion	1.36	1.29-1.44	<0.001
Age < 25	1.02	0.96-1.09	0.427
Age 25-29	0.99	0.94-1.04	0.802
Age 30-35	Reference		
Age > 35	1.10	1.05-1.15	<0.001
Religiosity	1.06	1.00-1.12	0.045
BMI < 20	1.68	1.58-1.78	<0.001
BMI 20-25	Reference		
BMI 25-29	1.71	1.64-1.78	<0.001
BMI >30	1.45	1.36-1.55	<0.001
Smoking	1.47	1.37-1.58	<0.001
Socioeconomic state (SES)*	1.07	1.06-1.08	<0.001
Pregestational diabetes type 2	1.40	0.8-2.45	0.224
Fertility treatments (IVF)	0.75	0.69-0.82	<0.001

Factors were included in the multivariable regression model were independent variables found significantly different between groups in the univariate analysis or considered to potentially impact spontaneous abortion. Results are reported as adjusted odds ratios and 95% confidence intervals.

*SES levels range between 1 (lowest) to 10 (highest)

1045 | Utilizing the PEN-FAST Scoring Tool in Pregnant Patients for Syphilis Management Complicated by Penicillin Allergy

Hope Brandon[1]; Noelle Leung[2]
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4:00 PM - 6:00 PM

Objective: Assess the PEN-FAST scoring tool in conjunction with direct oral challenge to expedite appropriate syphilis treatment in pregnant patients reporting a penicillin allergy without increasing incidence of penicillin-related adverse reactions.

Study Design: This was a single center, retrospective, case cohort study of pregnant patients with confirmed Syphilis requiring treatment and a reported penicillin allergy between August 2022 through August 2023.

Results: There were six patients included in analysis. Three patients had a PEN-FAST score of zero, two of whom had direct de-labeling of the penicillin allergy while one patient had an oral challenge followed by allergy de-labeling. Three patients had a PEN-FAST score of three. One of these patients had a successful oral challenge with subsequent penicillin allergy de-labeling, one patient received an IV test dose followed by a continuous penicillin infusion and subsequent penicillin allergy de-labeling, and one patient required admission to the intensive care unit for desensitization. All patients were successfully treated for syphilis with penicillin without adverse drug reactions, with only one requiring desensitization. Overall, four out of six patients had their penicillin allergy successfully de-labeled as one patient had a true allergy and one declined de-label. Patients with a documented penicillin allergy had a significant delay in time to treatment compared to patients without a documented penicillin allergy presenting with syphilis during the same time period.

Conclusion: Overall, the PEN-FAST assessment was an efficient and safe tool for stratifying risk of penicillin allergies within this cohort of patients. The clinical impact of this assessment includes decreased utilization of healthcare resources and improved time to treatment for pregnant patients with syphilis. The PEN-FAST

scoring tool in combination with direct oral challenge when needed, resulted in the safe, effective, and timely treatment of six pregnant patients with syphilis.

1046 | Disposition Index as a Predictor of Diabetes Development in Women with Gestational Diabetes

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4:00 PM - 6:00 PM

Objective: Gestational diabetes mellitus (GDM) increases the risk of developing type 2 diabetes mellitus (DM) postpartum. The disposition index (DI), reflecting pancreatic beta-cell function in response to insulin resistance, is a potent predictor of diabetes development outside pregnancy. This study aimed to evaluate the utility of early postnatal DI in predicting DM development within three years postpartum in women with GDM.

Study Design: This prospective cohort study included singleton pregnant Japanese women diagnosed with GDM during pregnancy. An oral glucose tolerance test (OGTT) was conducted at 6 to 9 weeks postpartum and repeated every 6 to 12 months. The primary outcome was the development of DM within three years postpartum. Using early postpartum OGTT results, we calculated the Matsuda index (MI) and AUCins/AUCglu (area under the curve of insulin/glucose) over 120 minutes as indices of insulin sensitivity and secretion, respectively, and DI (MI x AUCins/AUCglu). We examined the association between DI and DM development, adjusting for potential confounders including age, family history of DM, insulin treatment during pregnancy, obesity, and breastfeeding.

Results: Among 363 women with GDM (mean age 34 ± 5 years, prepregnancy BMI 23.7 ± 5.0), 14 developed DM (3.9%). DI was significantly lower in the DM group compared to the non-DM group (1.17 ± 0.30 vs. 1.83 ± 0.65, $p < 0.01$). A low DI was significantly associated with DM development (**Figure**). Women with a DI less than 1.58, derived from the receiver operating characteristic curve, had significantly higher odds of developing DM (crude odds ratio 20.6, adjusted odds ratio 12.5; 95% confidence intervals 4.0-376.3 and 2.3-234.6, respectively). Neither MI nor AUCins/AUCglu was significantly associated with DM development.

Conclusion: In Japanese women with GDM, early postnatal DI is a significant predictor of DM development within three years postpartum. Women who developed DM already had impaired beta-cell response to insulin resistance during the early postpartum period.

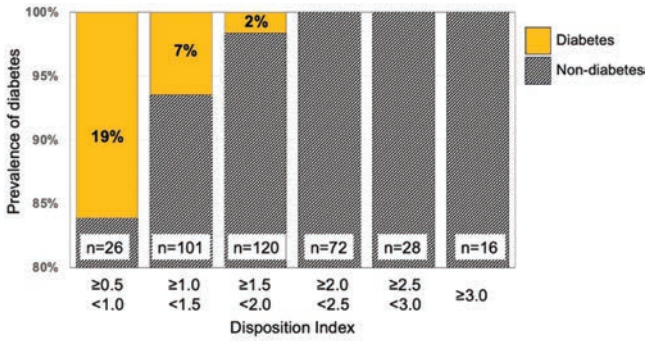


Figure. Association between the disposition index at the 1st postpartum OGTT and the prevalence of diabetes during three years after delivery

1047 | Association between Psychopharmacotherapy and Excessive Gestational Weight Gain

Insaf Kouba[1]; Frank I. Jackson[2]; Nathan A. Keller[2]; Luis A. Bracero[2]; Matthew J. Blitz[2]
[1]Northwell, St. Petersburg, FL; [2]Northwell, New Hyde Park, NY

4:00 PM - 6:00 PM

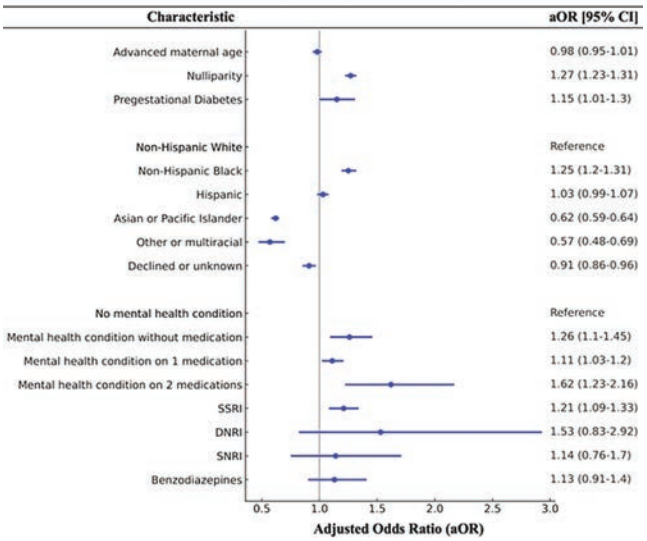
Objective: To determine the relationship between use of medications to treat mood disorders (psychopharmacotherapy, PPT) and excessive gestational weight gain (EGWG).

Study Design: This retrospective cohort study included all pregnant patients who delivered live, term, singleton newborns at seven hospitals within a large health system in New York from 2019-2023. Patients with missing GWG data were excluded. The primary exposure was prenatal exposure to PPT (yes/no), which included selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), dopamine-norepinephrine reuptake inhibitors (DNRIs), benzodiazepines, and others. The primary outcome was EGWG (yes/no), defined as weight gain exceeding the upper limit recommended by the Institute of Medicine based on pre-pregnancy BMI. Multiple logistic regression was performed to evaluate the association between PPT and EGWG, adjusting for covariate factors.

Results: A total of 87,385 pregnancies were included for analysis and EGWG occurred in 49.50% (n = 43,261). Patients with mental health conditions had EGWG more often than patients without such conditions (49.3% vs. 54.3%, respectively; aOR 1.26, 95% CI 1.10-1.45). Among the individual PPT categories, only SSRI monotherapy was associated with increased odds of EGWG (aOR 1.21, 95% CI 1.09-1.33) compared to patients without a mental health disorder. Patients taking two medications had higher odds of EGWG (aOR 1.62, 95% CI 1.23-2.16) than those taking one medication (aOR 1.11, 95% CI 1.03-1.20). Regression results are shown in Figure.

Conclusion: Pregnant patients with mental health disorders are at higher risk for EGWG, especially those treated with SSRIs and those receiving multiple PPT medications. Our findings suggest that the type of PPT affects GWG, underscoring the need for tailored management strategies to mitigate excessive weight gain in these patients

Figure 1: Multivariable logistic regression evaluating the relationship between psychopharmacotherapy and EGWG



1048 | Patient-reported Outcomes of Iron-Deficiency Anemia Treatment in Pregnancy: a Mixed Methods Analysis

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4:00 PM - 6:00 PM

Objective: Iron deficiency anemia (IDA) in pregnancy is common, yet patient-reported outcomes on IDA treatment are limited. Our objective is to determine whether intravenous iron, compared with oral iron, improves patient-reported outcomes in the treatment of iron-deficiency anemia (IDA) in pregnancy.

Study Design: We conducted a randomized controlled trial of pregnant patients with laboratory-confirmed IDA comparing IV ferumoxytol to oral ferrous sulfate. We assessed patient-reported outcomes with a modified short-form validated survey and free text feedback using a mixed methods approach. We compared the changes in survey domain scores (scale of 0-100) in general health, physical functioning, role limitations due to physical health, and energy/fatigue from study initiation to 4 weeks between treatment groups. We analyzed free-text responses with inductive thematic analysis and compared qualitative themes with quantitative results. Adverse side effects were monitored by survey and a Data Safety Monitoring Board.

Results: Among the 61/80 (76% of the total study) participants who responded to the 4-week survey, participants in the IV ferumoxytol group noted improvements in energy/fatigue, with a median increase of 10 points over 4 weeks compared to no change in the oral ferrous sulfate group (p = 0.018) (Table 1). There were no changes in general health, physical functioning, or role limitations due to physical health at 4 weeks post-treatment in either study group. Thematic analysis of free text responses revealed that patients generally favored IV iron (preferred IV treatment despite randomization, more energy and effectiveness, and fewer side effects) and desired anemia management (follow-up of their hemoglobin levels) (Table 2). Analysis of quantitative and qualitative data reinforced patient preference for IV iron. There were no serious adverse events during the study period.

Conclusion: IV iron significantly improved patient-reported outcomes in quality of life, specifically more energy and less fatigue, compared to oral ferrous sulfate.

Table 1: Median Survey Domain Changes

Median survey domain changes from pre-treatment to 4 weeks post-treatment

Domain[1]	N	Oral iron, N = 34[2]	IV iron (ferumoxytol), N = 29[2]	p-value[3]
Energy/fatigue	60	0 (-10, 10)	10 (0, 30)	0.018
General health	61	0 (-13, 0)	0 (-13, 0)	0.56
Physical functioning	60	-10 (-20, 0)	0 (-20, 10)	0.21
Role limitations due to physical health	58	0 (0, 25)	0 (0, 50)	0.99
Energy/fatigue	60	0 (-10, 10)	10 (0, 30)	0.018

[1]*Possible range -100 to 100. Zero indicates no change and positive number indicates an improvement in the domain.*
[2]*Median* (Q1, Q3)
[3]Wilcoxon rank sum test

Table 2. Overarching Themes of Experience with Treatment of Iron Deficiency Anemia In Pregnancy

Themes	Experience with IV Ferumoxytol	Experience of Oral Ferrous Sulfate
Preferred treatment despite randomization	"I preferred infusion because I did not have to worry about taking oral medication." "One-time thing I had to do."	"The [oral iron] treatment worked, although I would have preferred an infusion...instead of remembering to take pills." "I prefer [oral iron] because I am afraid of intravenous meds."
Energy	"Following the infusion, my mom observed a noticeable transformation... I appeared revitalized with a healthy flush to my cheeks."	"I did not feel results when taking oral iron as prescribed. I was usually weak and little to no energy."
Perceived effectiveness of treatment	"I felt like the treatment had faster results and lasted longer."	"I am happy my iron rose to sufficient levels by delivery, but it did take my body time to adjust..."
Patient reported side effects	"[IV iron] didn't cause constipation which is already so hard when pregnant to keep the bowel movements regular."	"The oral iron has been particularly bad because it seems to make me nausea [nauseated] and makes my heart burn worse."
Patient desire for anemia management	"My hemoglobin increased by a lot with the IV and I appreciated that. Postpartum hemoglobin was good too."	"I'm very satisfied since they were testing my blood count every four weeks to see if taking oral iron makes a big difference."

1049 | Relationship Between Patient Trust and Adverse Perinatal Outcomes Among Black and White Pregnant Patients

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[1]University of Tennessee Graduate School of Medicine, Department of OB/GYN, Knoxville, TN; [2]LSU Health Science Center, Baton rouge, LA; [3]Woman's Hospital, Baton Rouge, LA; [4]LSU Health Science Center, New Orleans, LA; [5]University of Tennessee Health Science Center, College of Medicine, Knoxville, TN; [6]University of Tennessee Graduate School of Medicine, Department of OB/Gyn, Knoxville, TN; [7]UAMS, UAMS/Little Rock, AR

4:00 PM - 6:00 PM

Objective: To evaluate trust in physicians among different self-reported patient races and evaluate if trust was a contributing factor to adverse perinatal outcomes by evaluating the interplay of trust, patient race and a severe maternal morbidity composite.

Study Design: The 10-item Wake Forest Physician Trust Scale (WFPTS) was administered to pregnant individuals from July 2021- January 2022 (score 10-50; higher scores indicating higher trust) in an academic, primarily Medicaid-funded, OB/GYN practice in Baton Rouge, Louisiana. The survey also included demographic information including self-reported race, household income, and education. Pregnancy and delivery data were abstracted from medical records and coded into a binary adverse perinatal outcome. The composite outcome included any of the following events: transfusion, hospital readmission, intensive care unit admission, non-live birth, PPROM, and pre-term birth.

Categorical variables were compared using Fisher exact tests and continuous variables using Wilcoxon rank sum tests. Logistic and Quasi-Poisson regressions were used to adjust for confounding effects.

Results: Average WFPTS score was 40.1±4.7, indicating moderate-high trust. There was no difference in trust scores between Black patients compared to all other races (40.5±4.5 vs 39.4±4.9, p = 0.116), which held after confounding adjustment for income, age, and education. The adverse perinatal outcome composite occurred in 19% (n = 37) of the study cohort. There were no significant associations between the composite adverse outcome and patient race (aOR 1.65, 95% CI 0.64-4.28, p = 0.301) or trust score (aOR 1.03, 95% CI 0.95-1.12, p = 0.451).

Conclusion: This study showed high levels of trust in physicians across all racial groups. Neither trust score nor race was related to adverse perinatal outcomes in our cohort.

Figure 1. Total Trust Score by Patient Race, P-value = 0.116

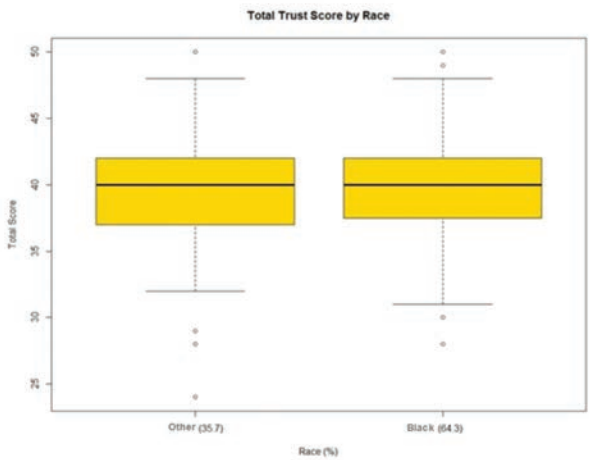
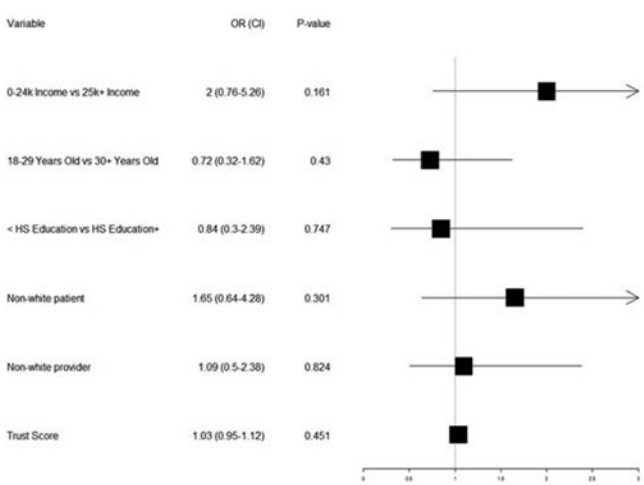


Figure 2: Logistic Regression for Adverse Perinatal Composite Outcome



1050 | Obesity Remains Associated with Cesarean Delivery Despite Combined Cervical Ripening

Jacqueline J. Thompson[1]; Lisa D. Levine[2]; Celeste Durnwald[1]; Rebecca F. Hamm[2]

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4:00 PM - 6:00 PM

Objective: Prior studies demonstrate that patients with obesity have increased risk of cesarean delivery (CD) and longer inductions of labor (IOL), however few studies have evaluated this in the context of combination cervical ripening methods.

Study Design: This is a secondary analysis of prospective cohort study of term, singletons with intact membranes and unfavorable cervix undergoing standardized IOL at 2 sites from 2018-2022. This analysis included only IOLs who utilized combined cervical ripening (Foley + either misoprostol or oxytocin concomitantly). Patients were stratified by BMI (< 35 vs. ≥35kg/m2). Primary outcomes included CD and labor length. Poisson regression with robust error variance was used to calculate adjusted relative risks (aRR) for CD. Time-to-event regression analyses for labor length, censored for CD, was modeled with a Cox proportional hazard model. Secondary outcomes included time Foley in, time utilizing misoprostol if applicable, dilation at and time to amniotomy, and maximum dose of oxytocin.

Results: 4,263 patients were included (BMI< 35 = 2,819, ≥35 = 1,444). BMI groups differed by hospital site, race, insurance, parity, diagnosis of diabetes and hypertension, modified Bishop score, maternal age, gestational age, and IOL indication. Even when controlling for differences between groups, patients with BMI ≥35 had a 64% higher risk of CD than those with BMI< 35 (24.0% v. 15.3%; aRR1.64[1.41-1.90]. BMI ≥35 was not associated with differences in length of labor (HR 1.11[0.96-1.29]). While patients with obesity had a similar time utilizing Foley and misoprostol, they had longer time to and were less dilated at amniotomy. Higher maximum oxytocin doses were also utilized in those with BMI > = 35.

Conclusion: Even in the setting of combined cervical ripening methods, patients with BMI ≥35 are at increased risk of CD, although there is no difference in labor length. As our data is indicative of lower success of ripening with BMI > = 35, innovative solutions for IOL are needed to improve CD rate for patients with obesity.

Table 1: Demographic and clinical characteristics by patient BMI

		BMI < 35 (n= 2819) n (%)	BMI ≥35 (n=1444) n (%)	p-value
Site	*#1*	1746 (61.9)	989 (68.5)	<0.001
	#2	1073 (38.1)	455 (31/5)	
Standardized IOL protocol	*Pre-Implementation*	1434 (50.9)	729 (50.5)	0.81
	Post-Implementation	1385(49.1)	715 (49.5)	
Maternal age		31.2 [25.6, 34.7]	29.8 [25.4, 33.9]	
Race	*Black/African-American*	1139 (40.4)	938 (65)	<0.001
	White	1188 (42.2)	351 (24.3)	
	Asian	260 (9.2)	38 (2.6)	
	Latinx, Not Otherwise Specified	108 (3.8)	71 (4.9)	
	Other	124 (4.5)	46 (3.1)	
Ethnicity	*Hispanic*	185 (6.6)	110 (7.6)	0.2
	Not Hispanic	2634 (93.4)	1334 (92.4)	
Maternal BMI at last prenatal visit		29.2 [26.6, 31.8]	39.8 [37, 43.7]	<0.001
Gestational age		39.5 [38.8, 40.3]	39.3 [38.5, 40.1]	<0.001
Nulliparity		1738 (61.7)	754 (52.2)	<0.001
Modified Bishop score a		3[2, 3]	2 [2, 3]	<0.001
Pre-gestational diabetes		212 (7.5)	202 (14)	<0.001
Chronic hypertension		155 (5.5)	242 (16.8)	<0.001
IOL indication	*Maternal indications (a)*	824 (29.2)	711 (49.2)	<0.001
	Fetal indications (b)	582 (20.6)	241 (16.7)	
	Elective/post-term	973 (34.5)	338 (23.4)	
	Other (c)	440 (15.6)	154 (10.7)	

Age, BMI, gestational age, modified bishop score reported as median[IQR]
(a) Examples include: chronic hypertension, gestational hypertension, preeclampsia, diabetes, renal disease, history of venous thromboembolism, cardiac disease or other chronic medical condition where induction was recommended
(b) Examples include: Oligohydramnios, intrauterine growth restriction, abnormality on fetal testing
(c) Examples of "other" include: history of an intrauterine fetal demise, vaginal bleeding at term, cholestasis

Table 2: Labor Outcomes Stratified by BMI for Patients Undergoing Induction of Labor with Combined Cervical Ripening

	BMI < 35 (n= 2819) n (%)	BMI ≥35 (n=1444) n (%)	p-value	Adjusted Outcome (95% CI)
CD Rate	430 (15.3)	346 (24)	0.001	aRR 1.64 (1.41-1.90)*
Time to delivery (minutes)	865 [602, 1273]	976 [656, 1387.5]	0.001	aHR 1.11 [0.96-1.29]**
Time foley in (minutes)	270 [202, 411]	275 [200, 412.5]	0.91	aHR 1.43 [1.24-1.66]
Time first to last misoprostol (minutes)	230 [200, 328]	229 [200, 316.5]	0.96	aHR 1.91 [1.44-2.53]
Cervical dilation at amniotomy (cm)	4 [4,5]	4 [3.5, 5]	0.015	
Time to amniotomy (minutes)	439 [284, 646]	469.5 [296, 699]	<0.001	aHR 1.26 [1.08-1.47]
Max dose oxytocin	8 [4,14]	10 [6,18]	<0.001	

Minutes, cm, max oxytocin dose reported as median[IQR]
* aRR: controlling for gestational age, modified bishop score, race, insurance status, parity, diabetes.
**aHR: controlling for gestational age, race

1051 | Maximum Oxytocin Dose in Labor Induction and Associated Pregnancy Outcomes in Nulliparous Individuals

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[1]The Ohio State University, Columbus, OH; [2]The Ohio State University, Wexner Medical Center, Columbus, OH

4:00 PM - 6:00 PM

Objective: Oxytocin is often used for induction of labor (IOL) with a lack of evidence-based guidelines on its maximum dose. In some institutions, 20 milliunits/minute (mU/min) is used as a maximum dose due to concerns about adverse outcomes at higher rates. We sought to evaluate the relationship between the maximum dose of oxytocin with maternal and neonatal outcomes in low-risk nulliparous individuals.

Study Design: This secondary analysis of the MFMU ARRIVE trial included nulliparous individuals who underwent IOL. The primary exposure was maximum oxytocin dose categorized as ≤ 20 or > 20 mU/min. Logistic regression was used to adjust for gestational age, body mass index, induction without medical indication, Bishop score on admission, and hypertensive disorders of pregnancy.

Results: Of the 3,565 participants included in this secondary analysis, 2,673 (75%) were exposed to a maximum dose of oxytocin of ≤ 20 mU/min and 892 (25%) were exposed to a maximum dose of > 20 mU/min. Those who were exposed to > 20 mU/min of oxytocin had a greater median BMI (p< 0.001) and a lower Bishop score on admission (p< 0.001) (Table 1). Duration from initiation of oxytocin to delivery was longer in the higher-dose group compared to the lower-dose group (median[IQR] ≤ 20 mU/min: 12.1[8.2-17] vs. > 20 mU/min: 21.2 [15.9-257] hours; p< 0.001). Individuals exposed to < 20 mU/min of oxytocin had higher rates of cesarean delivery (adjusted odds ratio [aOR] 1.23, 85%CI 1.01-1.48), cesarean deliver for labor dystocia (aOR 1.63, 95%CI 1.28-2.07), and postpartum hemorrhage (aOR 1.51, 95%CI 1.09-2.09) (Table 2). There was no difference in rates of cesarean delivery for non-reassuring fetal status (aOR 0.80, 95%CI 0.62-1.03), NICU admissions (aOR 1.03 95%CI 0.82-1.30), or neonatal adverse outcomes (aOR 0.97, 95%CI 0.68-1.39).

Conclusion: This analysis showed no difference in rates of cesarean delivery for non-reassuring fetal status or adverse neonatal outcomes at oxytocin rates > 20 mU/min, suggesting that 20 mU/min should not be used as a maximum dose during IOL of nulliparous individuals.

Table 1. Characteristics of the study population

	Maximum oxytocin dose ≤20 mU/minute N=2,673	Maximum oxytocin dose >20 mU/minute N=892	P
Gestational age (weeks)	39.4 (39.1-39.9)	39.4 (39.3-39.9)	0.76
Advanced maternal age	195 (7.3)	57 (6.4)	0.36
Race/ethnicity			<0.001
White	1,247 (46.7)	329 (36.9)	
Black	538 (20.1)	277 (31.1)	
Hispanic	648 (24.2)	195 (21.9)	
Asian	75 (2.8)	23 (2.6)	
Other/not reported	165 (6.2)	68 (7.6)	
BMI (kg/m^2)	31.0 (27.7-35.2)	32.1 (28.0-37.0)	<0.001
Indication for induction			0.01
Elective	1,754 (65.6)	586 (65.7)	
Maternal condition	171 (6.4)	86 (9.6)	
Fetal condition	195 (7.3)	68 (7.6)	
PROM	158 (5.9)	43 (4.8)	
Postdates	367 (13.7)	101 (11.3)	
Other	28 (1.1)	8 (0.9)	
Bishop score on admission	5 (3-6)	4 (3-5)	<0.001
Hypertensive disorders of pregnancy	358 (13.4)	155 (17.4)	0.003
Hours from oxytocin to delivery	12.1 (8.2-17)	21.2 (15.9-27)	<0.001
With vaginal delivery	11.5 (8-16)	19.3 (14.4-24.5)	<0.001

Data represented as median (interquartile range) or n (%). BMI: body mass index; PROM: premature rupture of membranes.

Table 2. Maternal and neonatal outcomes by maximum oxytocin dosage.

	Maximum oxytocin dose ≤20 mU/minute N=2,673	Maximum oxytocin dose >20 mU/minute N=892	aOR (95%CI)
Cesarean delivery	589 (22.0)	258 (28.9)	1.23 (1.01-1.48)
Cesarean (dystocia)	259 (9.7)	144 (16.1)	1.63 (1.28-2.07)
Cesarean (non-reassuring fetal status)	322 (12.1)	105 (11.8)	0.80 (0.62-1.03)
Postpartum hemorrhage	123 (4.6)	65 (7.3)	1.51 (1.09-2.09)
Chorioamnionitis	370 (13.8)	137 (15.4)	1.03 (0.82-1.29)
Neonatal composite	134 (5.0)	47 (5.3)	0.97 (0.68-1.39)
NICU admission	333 (12.5)	127 (14.2)	1.03 (0.82-1.30)

Data represented as n (%) and adjusted odds ratio (95%CI). Outcomes were adjusted for by gestational age, body mass index, elective induction, Bishop score on admission, and hypertensive disorders of pregnancy. Neonatal composite consists of any perinatal death, need for respiratory support within 72 hours of life, 5-minute APGAR score of ≤3, hypoxic-ischemic encephalopathy, seizure, confirmed sepsis or pneumonia, meconium aspiration syndrome, birth trauma, intracranial or subgaleal hemorrhage, or hypotension requiring vasopressors. NICU: neonatal intensive care unit.

1052 | Assessment of Disparities in Cerclage Placement Among Individuals with a History of Preterm Birth

Jamie Green; Sarah H. Abelman; Frank I. Jackson; Nathan A. Keller; Julie Chen; Luis A. Bracero; Matthew J. Blitz
Northwell, New Hyde Park, NY

4:00 PM - 6:00 PM

Objective: To evaluate the association between rates of cerclage placement and race and ethnicity group, primary language, and insurance type among patients with a history of preterm birth.

Study Design: This was a retrospective cohort study within a large healthcare system in New York. Patients with were included who had screening cervical length measurements between 16 weeks 0 days and 23 weeks 6 days of gestation and a history of preterm birth due to any indication. Multivariate logistic regression was used to compare rates of cerclage placement by race and ethnicity group, English as primary language, Medicaid insurance, and the presence of a very short cervix < 10mm. All statistical analyses were performed in R 4.3.1.

Results: A total of 3,988 pregnancies in patients with a history of preterm birth were included. A cerclage was placed during 1228 (30.8%) of these pregnancies, and not in the remaining

2760 (69.2%). There were no significant differences in the rates of cerclage placement based on race and ethnicity groups, primary language, or insurance type. Very short cervical length (< 10mm) was associated with a significantly higher rate of cerclage placement (aOR 4.04, 95% CI 2.97-5.51).

Conclusion: Systemic disparities in rates of cerclage placement among patients with a history of preterm birth on the basis of race and ethnicity group, primary language, and insurance type were not identified in this cohort. Patients with a history of preterm birth and a cervical length < 10mm have increased odds of receiving a cerclage.

Chart 1- Incidence of Cerclage Placement by Race/Ethnicity, Language, Insurance and Presence of Cervix <10mm

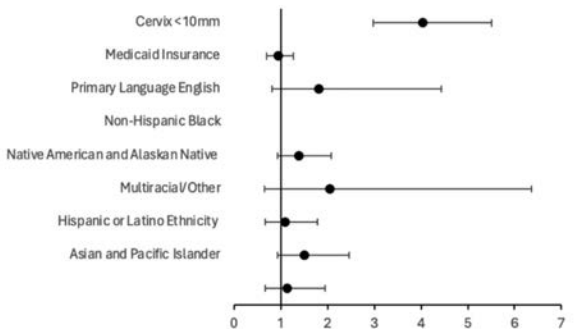

Table 1- Incidence of cerclage placement by race and ethnicity groups, language, insurance and cervical length <10mm

	Cerclage Placed	Total	% Cerclage Placed	OR	95% CI
Race/Ethnicity					
Asian and Pacific Islander	34	111	30.63%	1.14	(0.66-1.94)
Hispanic or Latino	56	163	34.36%	1.51	(0.93-2.46)
Multiracial/Other	40	141	28.37%	1.09	(0.66-1.79)
Native American and Alaskan Native	7	15	46.67%	2.05	(0.65-6.36)
Non-Hispanic Black	116	347	33.43%	1.39	(0.93-2.08)
Primary Language English	298	959	31.07%	1.82	(0.82-4.34)
Medicaid Insurance	124	398	31.16%	0.94	(0.7-1.27)
Cervix <10mm	133	242	54.96%	4.04	(2.97-5.51)

1053 | Migrating while Pregnant: A Qualitative Study of Immigration and Obstetric Health

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4:00 PM - 6:00 PM

Objective: The recent influx of migrants to select regions of the United States (US) has reshaped the demographic landscape and need for social and health services. We aimed to understand the experiences of pregnant people during immigration and in the domestic migration system.

Study Design: This qualitative study applied inductive methods to explore the perspectives of pregnant and postpartum migrants in Chicago, Illinois, a sanctuary city and frequent destination for migrants transported from Texas. To design interviews, we engaged with patients, advocates, physicians, nurses, and social workers through community-based participatory methods. Participants were recruited from a public hospital prenatal clinic and completed validated demographic surveys and semi-structured interviews in Spanish or English. We applied iterative coding of transcripts to develop a codebook, evaluate interrater reliability (Cohen's kappa >0.85), and analyze themes.

Results: Of 12 participants (ages 19-39), 11 identified as Latine and one as Black. Six were in the third trimester, 5 in the second and 1 postpartum. Half had attended or completed university prior to migration. Most were publicly insured (7/12) and the remainder were uninsured (5/12). Participants migrated from Venezuela, Colombia, and Sierra Leone. Interviews revealed that pregnant people face a number of health-harming migration-related circumstances, including: (1) unique obstetric health challenges during migration; (2) significant food insecurity; (3) hazardous conditions in shelters; (4) family separation; (5) limited access to income during pregnancy (largely due to the physically demanding nature of work in the informal sector); and (6) limited access to legal support (Table). When pregnant migrants faced hardship, scarce options were available to improve their circumstances and health.

Conclusion: Pregnant individuals migrating to the US face unique challenges that may negatively influence obstetric health. The current system for migrant support struggles to provide basic obstetric necessities, such as adequate safety, nutrition, or sanitation measures.

Table. Refugee experiences in pregnancy: Themes and representative quotations

Unique obstetric health challenges during migration
"I was pregnant, so, we couldn't run, so, the Immigration official came and said: "Stop now, stop, stop." Because everyone was running away, because the normal thing was to run away, but in our condition, we could not run, because they were going to trap us anyway, and I could also fall. So we stopped and I felt like they were furious about the fact that they could not catch [the other migrants]. They took it out on us. Then, they unloaded on us, beat my husband, pushed us, and knocked my children onto the ground." "It affected me physically because I had an infection, urine infection, and vaginal infection. I had very low hemoglobin...After all that we walked; I had very swollen feet. Contractions even started before."
Significant food insecurity
"I'm currently living in a [refugee] shelter, they give breakfast, lunch, dinner there...it is actually very little amount for my pregnancy. And there are times when I do feel dizzy and I know it is from the poor diet, but we have no income [to buy more food] because we are just beginning our legal immigration process." "I experienced stress while living in the shelter because of concerns about food. During my pregnancy, I lost a significant amount of weight. I am underweight; I did not eat well… That's because the shelter only gave us cookies and juice. There was food available outside, but let's say it was pretty costly."
Hazardous conditions in shelters
"The truth is that I am very concerned about the overcrowding [in the refugee shelter]... there are so many people. There are people who cough, there are people who have a rash on their skin, like rubeola...So that's dangerous too...You have to share the area and if someone coughs...It is difficult to protect my children or protect myself like this, in terms of health." "Well, it affected me during pregnancy because I think around 300 or 400 women were using the bathrooms. I got a lot of infections because I was pregnant."
Family separation
"It was not very good, because they had [my spouse] at one shelter and me at another one. And more than anything, we would live in a friend's car, sleep there, and everything."
Limited access to income during pregnancy
"At the beginning, I had to work in family houses…Because my belly had already grown more, I didn't have the same strength or the same as someone would say…In other words, I no longer performed at the job like in the beginning when I had a tiny belly." "I want to work but don't feel well at some jobs. I used to work making tortillas, but the machine, the assembly line—well, the smell made me dizzy. I fainted once, so I stopped working there. I'm interested in finding a cleaning job, even if it's a modest job, but opportunities in this area are limited."
Limited access to legal support
"I have an appointment for June next year. They haven't told me anything; I don't know. I think I have to wait for the appointment to find out how my process is going…I haven't spoken to a lawyer before; they only gave me my parole and scheduled a date for next year."

1054 | Postpartum Hospital use in the 90 days after Delivery

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Northwestern University Feinberg School of Medicine, Chicago, IL

4:00 PM - 6:00 PM

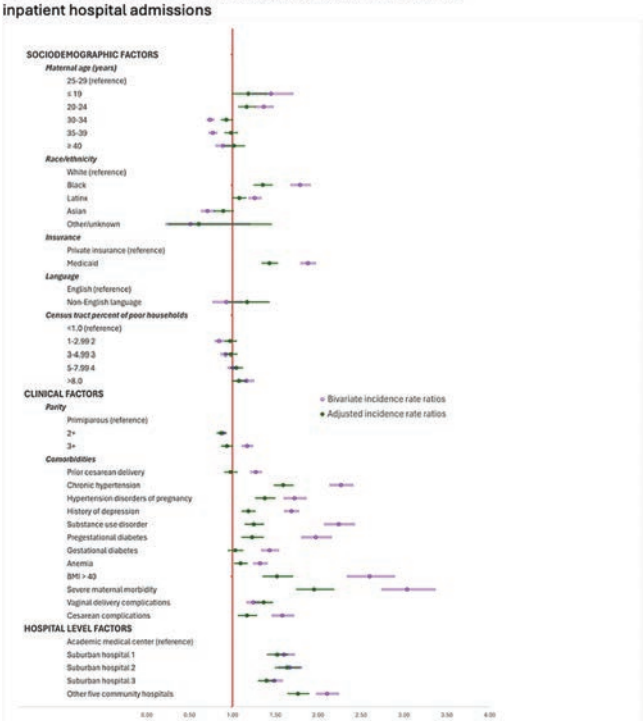
Objective: We aimed to perform a health system-wide analysis of sociodemographic, clinical, and hospital-level factors associated with 90-day postpartum emergency department (ED) visits and inpatient hospital admissions.

Study Design: This cross-sectional study of all 90-day postpartum hospital ED visits and inpatient admissions ("90-day readmission") in a nine-hospital Midwest health system included all births from 1/2018-6/2023. We applied a multilevel eco-social framework to examine associations between factors in three domains and 90-day readmission. Exposure variables included sociodemographic (age, race/ethnicity, insurance, language, census zip code percent poor households), clinical (body mass index [BMI], severe maternal morbidity during delivery admission [SMM], and other comorbidities), and hospital-level factors. We applied bivariate and adjusted Poisson regression analyses.

Results: Of 104,076 deliveries, 6,879 (6.6%) were followed by 90-day readmission. In bivariate analysis, chronic hypertension, substance use disorder, BMI ≥40, and SMM demonstrated the strongest association with 90-day readmission (Figure). After adjusting for all factors under investigation, of sociodemographic factors, Medicaid insurance (adjusted incidence rate ratio [aIRR] 1.43; 95% confidence interval [CI] 1.34-1.45) and Black race (aIRR 1.35; CI 1.25-1.46) were associated with the greatest 90-day readmission risk. SMM remained most strongly associated with 90-day readmission of any factor (aIRR 1.95; 95% CI 1.75-2.18). Chronic hypertension (aIRR 1.59; CI 1.49-1.70) and BMI ≥40 (aIRR 1.52; CI 1.36-1.70) both had elevated 90-day readmission risk. Primiparity and all other medical comorbidities had relatively weaker associations (Figure). At the hospital level, delivery at a suburban or community hospital was associated with greater 90-day readmission risk than delivery at the academic medical center.

Conclusion: In this health system-wide analysis, 90-day readmission is driven by a combination of sociodemographic, clinical, and hospital-level factors, underscoring the need for a comprehensive mitigation strategy.

Figure. Association of clinical, sociodemographic and hospital level factors with 90-day postpartum emergency department visits and inpatient hospital admissions



1055 | Frequency and Type of Chromosome Abnormalities in Stillbirths: Insights from More Than 4000 Cases

Vivienne Souter[1]; Katrina Merrion[1]; Madeleine Armer-Cabral[1]; Katherine Howard[1]; Melda Balcioglu[1]; Kathryn J. Gray[2]; Peter Benn[3]
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4:00 PM - 6:00 PM

Objective: Approximately 1 in 166 pregnancies in the US result in stillbirth (fetal demise ≥20 weeks' gestation) and only a minority have a postmortem examination or genetic evaluation. Our objective was to evaluate chromosomal abnormalities detected by single nucleotide polymorphism (SNP)-based chromosomal microarray (CMA) in products of conception (POC) from a large cohort of stillbirths.

Study Design: Retrospective review of 4,990 fresh POC specimens from singleton pregnancies at ≥ 20 weeks' gestation evaluated 2010-2022. Known pregnancy terminations and livebirths were excluded (278 cases). Illumina CytoSNP-12b SNP-based CMA was used to detect maternal cell contamination (MCC), aneuploidy, triploidy, copy number variants (CNVs), uniparental disomy (UPD), mosaicism, and parental origin of abnormalities.

Results: Of 4,712 samples, 244 (5.2%) had MCC and 37 (0.8%) had an inconclusive result leaving 4,431 samples for analysis. Of these, 517 (11.7%) were abnormal (Table). Median maternal age was 30 and 31 years for normal and abnormal cases, respectively, and median gestational age was 25 and 24 weeks. The percentage of abnormal results increased with maternal age ($p < 0.001$) but not gestational age ($p = 0.34$). Triploidy was not observed after 31 weeks' gestation. Common autosomal trisomies (T21, T18, T13) were present in 3.9%; monosomy X, 2.6%; CNVs with one or more

regions involved, 3.2%; triploidy, 1.0%; and single chromosome UPD, 0.2% (Table).

Conclusion: Here we report a large dataset of CMA analyses in stillbirth. CMA was successfully performed in approximately 95% of cases (MCC explained most of those without a result). More than 1 in 10 cases had an abnormal finding with a spectrum of abnormalities intermediate between those seen in livebirths and those present in early gestation miscarriages. Many of the findings had implications for future **r**eproductive risk. CMA was useful across all maternal ages and all gestational ages at the time of stillbirth.

Table. Abnormalities detected by CMA in 4,431 stillbirths

Abnormality	Non-mosaic (N)	Mosaic (N)	With additional abnormality (N)	Total (N)	Total (% of all cases)
Common autosomal trisomy					
Trisomy 21	97	1	1	99	2.23%
Trisomy 18	41	2	0	43	0.97%
Trisomy 13	24	1	1	26	0.59%
Other autosomal trisomy	27	8	0	35	0.79%
Diandric triploidy (molar)	11	0	1	12	0.27%
Digynic triploidy	30	0	0	30	0.68%
Triploidy (parental origin unknown)	3	0	0	3	0.07%
Monosomy X	113	1	0	114	2.57%
Other sex chromosome abnormality	3	2	0	5	0.11%
CNV	109	7	7	123	2.78%
Possible unbalanced translocation	11	0	0	11	0.25%
Single chromosome UPD	9	0	0	9	0.20%
Multiple abnormalities	7	0	0	7	0.16%
All abnormal results	**485**	**22**	**10**	**517**	**11.67%**

Total sample sizes = 4,431 stillbirths. CNV = copy number variant; UPD = uniparental disomy

1056 | Perinatal Outcomes in Patients with Diagnosed and Undiagnosed Depression

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4:00 PM - 6:00 PM

Objective: Each year in the US, 20% of pregnant people suffer from perinatal mental health conditions; up to 75% never receive treatment. The adverse impact of undiagnosed depression is likely underestimated. We aimed to examine the association between diagnosed and undiagnosed depression and birth outcomes.

Study Design: This is a secondary analysis of the CRADLE randomized clinical trial which compared birth outcomes in group vs. individual prenatal care. Patients were included if they completed the Center for Epidemiological Studies-Depression (CES-D) tool and birth outcome data were available. A CES-D score ≥23 was considered positive, and the clinical team was blinded to results. Clinically diagnosed depression (CD) was identified via chart review. Providers used patient history or the Edinburgh Postnatal Depression tool if CD was suspected; universal screening was not being utilized at the time. Patients were classified based on CD during pregnancy and CES-D scores: 1) no depression (no CD and negative CES-D; CON); 2) depression (CD with any CES-D score; DIAG); 3) undiagnosed depression (no CD but positive CES-D; CESD+). The primary outcome was preterm birth (< 37 weeks). Secondary outcomes were low birthweight (< 2,500g), NICU admission, and APGAR < 7 at 1 and 5 minutes. Multivariable logistic regression was performed with CON as the reference and adjustments for race, maternal age, nulliparity, and pregnancy intention.

Results: 1765 patients were included: 1380 (78%) in the CON group, 202 (12%) in DIAG, and 184 (10%) in CESD+. CESD+ patients were more likely to be younger, Black, nulliparous, and have an unintended pregnancy (Table 1). CESD+ patients had increased odds of preterm birth (OR 2.50, 95% CI 1.53-4.10) compared to CON. CESD+ patients had increased odds of all secondary outcomes compared to CON while DIAG had increased odds of low birthweight and NICU admission (Table 2).

Conclusion: Diagnosed and undiagnosed depression is associated with adverse birth outcomes. Increased screening efforts using validated instruments during pregnancy are warranted and may help improve racial equity.

Table 1: Comparison of baseline characteristics between groups.

	CON	DIAG	CESD+	p-value
Demographics, % (n)	78.2 (1380)	11.4 (202)	10.4 (183)	
Race				<.0001
Black	41.3 (570)	28.7 (58)	45.9 (84)	
Hispanic	22.9 (316)	8.9 (18)	13.1 (24)	
White	33.1 (457)	58.9 (119)	38.3 (70)	
Other	2.7 (37)	3.5 (7)	2.7 (5)	
Maternal age, years, mean (SD)	25.1 (5.4)	25.0 (5.0)	23.5 (4.5)	0.0005
Education, high school graduate	75.4 (1001)	73.1 (141)	73.1 (128)	0.66
Medicaid eligible	96.4 (1304)	95.9 (189)	95.2 (157)	0.72
Employment, full or part time	55.5 (733)	51.1 (95)	47.3 (79)	0.09
Marital status, married	23.4 (313)	24.9 (44)	20.8 (30)	0.69
Nulliparous	44.1 (609)	39.1 (79)	57.4 (105)	0.0007
Unintended pregnancy	66.4 (894)	68.8 (132)	76.6 (134)	0.02

Table 2: Comparison of birth outcomes with CON as reference.

	CON	DIAG	CESD+	DIAG v. CON aOR (95% CI)†	CESD+ v. CON aOR (95% CI)†
Outcome, % (n)	78.2 (1380)	11.4 (202)	10.4 (183)		
Preterm birth, <37 weeks	6.5 (89)	8.5 (17)	14.0 (24)	1.32 (0.75. 2.32)	**2.50 (1.53, 4.10)**
Low birthweight, <2500g	5.6 (75)	10.7 (21)	13.3 (21)	**1.85 (1.06, 3.22)**	**2.50 (1.48, 4.23)**
NICU admission	7.7 (104)	13.6 (27)	13.0 (21)	**1.89 (1.18, 3.03)**	**1.74 (1.03, 2.92)**
APGAR, 1 minute, <7	8.0 (111)	7.9 (16)	18.6 (34)	1.01 (0.62, 1.93)	**2.51 (1.61, 3.93)**
APGAR, 5 minutes, <7	4.0 (55)	4.5 (9)	14.8 (27)	1.28 (0.61, 2.67)	**3.89 (2.33, 6.49)**

†Adjustments for race, maternal age, nulliparity, and pregnancy intention.

1057 | Healthy Placental or Umbilical Cord Stem Cell Extracellular Vesicles Restore Preeclamptic Cells to Normal Function

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4:00 PM - 6:00 PM

Objective: Preeclampsia (PE) contributes to pregnancy-related morbidity and mortality, with inflammation a critical factor in PE pathophysiology. Healthy placenta mesenchymal stem cells (P-MSC) mitigate inflammation. Our group reported on PE P-MSC dysfunction, characterized by decreased anti-inflammatory licensing, cell cycle dysregulation, and reduced immune suppressive cytokine production. Aspirin (ASA) treatment remedied these via epigenetic reprogramming. This study hypothesized extracellular vesicles (EV) from healthy P-MSCs or umbilical cord (UC) blood could reset PE P-MSCs to a healthy phenotype, improving cell cycle dysregulation and anti-inflammatory capacity.

Study Design: P- and UC-MSCs were isolated from healthy and PE pregnancies at delivery. EVs from healthy MSCs were isolated by differential ultracentrifugation and quantified. PE P-MSCs were exposed to EVs or treated with 1mM ASA for 48h. P-MSCs were added as third-party cells in mixed lymphocyte reaction (MLR) to assess anti-inflammatory capacity. Treated P-MSCs were analyzed for the epigene regulator TDG and cell cycle linked CDK4, p21, and p53 proteins.
Results: EV- and ASA-treated PE P-MSC suppressed MLR to levels of healthy P-MSCs. While ASA increased p21, p53, and TDG, and decreased CDK4, EV treatment decreased their expression. Of note, p53 and TDG remained elevated as compared to healthy P-MSCs while p21 was decreased.
Conclusion: PE P-MSC can be restored towards healthy anti-inflammatory function. The healthy EVs reduced PE-MSC cell cycle with evidence of changes in DNA methylation regulation. These findings are consistent with MSCs exhibiting tissue maintenance during insult. In total, healthy P-MSC EVs may restore the function of PE P-MSCs, as well as other insults during pregnancy. These findings suggest off-the-shelf availability of EVs to treat PE. Combined with prior data on ASA restoring MSC function, this study furthers our understanding of possible methods to reduce PE via anti-inflammatory modality.

1058 | Development and Validation of Ensemble Model for Fetal Birthweight Prediction in Third-Trimester Pregnant Women

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4:00 PM - 6:00 PM
Objective: On the basis of clinical big data, we aim to develop a machine learning (ML) model for accurate prediction of birth weight in the third trimester of pregnancy, which can help reduce adverse maternal and fetal outcomes.
Study Design: From 1 January 2018 to 31 December 2019, a retrospective cohort study involving 16655 singleton live births without congenital anomalies (> 28 weeks of gestation) was conducted in a tertiary first-class hospital in Shanghai. The initial set of data was divided into a train set for algorithm development and a test set on which the algorithm was divided in a ratio of 4:1. We extracted maternal and neonatal delivery outcomes, as well as parental demographics, obstetric clinical data, and sonographic fetal biometry, from electronic medical records. Five basic machine learning algorithms, including Ridge, SVM, Random Forest, XGBoost, and Multi-Layer Perceptron, were used to develop the prediction model, which was then averaged into an ensemble learning model. The models were compared using accuracy, mean squared error, root mean squared error, and mean absolute error.
Results: Train and test sets contained a total of 13324 and 3331 cases, respectively. From a total of 59 variables, we selected 17 variables that were readily available for the "few feature model" which achieve high predictive power with an accuracy of 81.84% and significantly exceeds ultrasound formula methods. In addition, our model maintained superior performance for low birth weight and macrosomic fetal populations.
Conclusion: Our research investigated an innovative artificial intelligence model for predicting fetal birthweight and maximizing healthcare resource utilization. In the era of big data, our model improves maternal and fetal outcomes and promotes precision medicine.

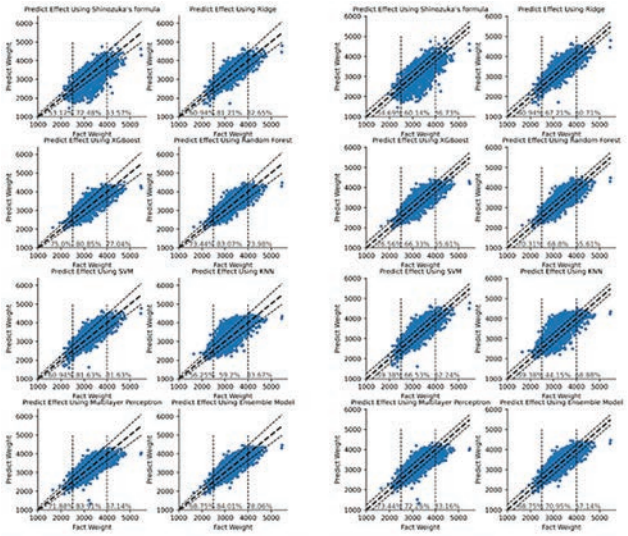
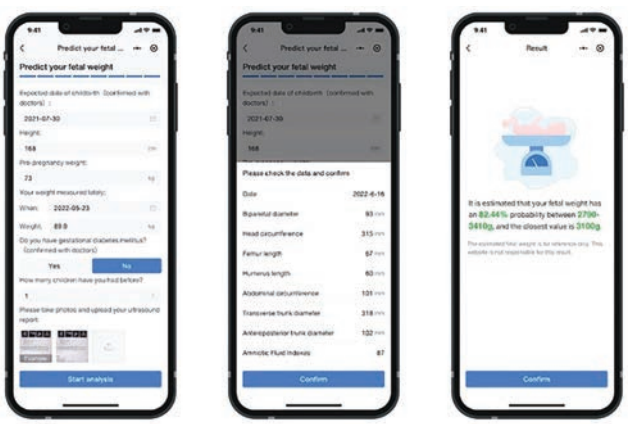


Fig. Prediction scatter diagram based on 31 features (RE ≤10% and AE < 250g)



1059 | Increased BMI Associated with Decreased Breastfeeding Initiation in Million Veteran Program Participants

Joanna Lankester[1]; Rodrigo Guarischi-Sousa[2]; Austin T. Hilliard[2]; Labiba Shere[2]; Marya Husary[2]; Susan Crowe[3]; Philip S. Tsao[2]; David H. Rehkopf[3]; Themistocles L. Assimes[2]
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4:00 PM - 6:00 PM
Objective: Breastfeeding has been associated with maternal and infant health benefits but has been inversely associated with body mass index (BMI) prepartum. Breastfeeding and BMI are both linked to socioeconomic factors. The objective of this study was

to disentangle the underlying biological association between BMI and breastfeeding initiation using a genetic predictor of BMI.
Study Design: Data from parous female participants with available breastfeeding information from the Million Veteran Program cohort was included (n = 20,375). BMI at enrollment and earliest BMI available were extracted, and polygenic scores (PGS) for BMI were calculated. We modeled breastfeeding for one month or more as a function of BMI at enrollment; earliest BMI where available pre-pregnancy; and PGS for BMI. We conducted Mendelian randomization for breastfeeding initiation using PGS as an instrumental variable.
Results: A higher BMI predicted a lower likelihood of breastfeeding for one month or more in all analyses. A +5 kg/m^2 BMI pre-pregnancy was associated with a 24% reduced odds of breastfeeding, and a +5 kg/m^2 genetically predicted BMI was associated with a 17% reduced odds of breastfeeding.
Conclusion: BMI predicts a lower likelihood of breastfeeding for one month or longer. The impact of breastfeeding on later BMI is an important future direction of research. Given the high success of breastfeeding initiation regardless of BMI in supportive environments as well as potential health benefits, patients with elevated BMI may benefit from additional postpartum breastfeeding support.

Observational analysis predicting breastfeeding initiation as a function of earliest prepartum body mass index (BMI). Odds ratio (OR) and 95% confidence interval for analyses: (a) by quartile (Q1 - lowest value, Q4 - highest value; Q1 is reference with OR=1) and (b) continuous (OR per +5 kg/m^2).

Covariates	Q2	Q3	Q4	Continuous
None (univariate)	0.91 (0.52,1.58)	0.63 (0.34,1.17)	0.37 (0.16,0.84)	0.72 (0.56,0.92)
age at earliest BMI measurement + race/ethnicity + education level + income level + smoking status	0.87 (0.48,1.55)	0.74 (0.38,1.43)	0.37 (0.15,0.94)	0.76 (0.58,0.99)
age at earliest BMI measurement + race/ethnicity + education level + income level + smoking status + married/partnered status + number of births	0.87 (0.48,1.58)	0.87 (0.44,1.72)	0.34 (0.13,0.87)	0.76 (0.58,1.00)

Mendelian randomization predicting breastfeeding initiation as a function of genetically predicted body mass index increase of +5 kg/m^2. P value, odds ratio (OR), and 95% confidence interval (CI) shown.

Ancestry group	p value	OR (CI)
EUR	0.002	0.83 (0.74, 0.93)
AFR	0.11	0.69 (0.44, 1.09)
AMR	0.026	0.62 (0.41, 0.95)

1060 | Concordance of Maternal GBS DNA-PCR Rectovaginal test at 36 weeks and Maternal/Neonatal Testing at Delivery

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4:00 PM - 6:00 PM
Objective: GBS is an important cause of neonatal infectious morbidity. Universal GBS screening via rectovaginal test in the late third trimester, with intrapartum antibiotic prophylaxis if GBS positive, decreases the risk of neonatal GBS infection. The effectiveness of this strategy depends on the predictive nature of this result, and GBS point-of-care (POC) testing at the time of delivery admission has been proposed as a possible strategy to further decrease neonatal risk. The goal of this study was to determine discordance between a negative GBS test at 36 weeks and at the time of delivery using GBS DNA-PCR.
Study Design: Prospective pilot study of pregnant persons with a negative GBS DNA-PCR rectovaginal test on routine screen at 36 weeks intending to deliver vaginally at the study institution from 3/2023-4/2024. On admission for delivery, repeat maternal rectovaginal GBS DNA-PCR was performed; immediately after delivery, GBS DNA-PCR testing was performed on the placenta and neonatal ear. Results were not disclosed to the clinical team and intrapartum/neonatal care was otherwise routine. Primary outcome was GBS positive rate. Planned sample size was 60. Study supported by an institutional grant.
Results: 39 patients were enrolled; 9 did not complete the study (tests not performed as planned, subject withdrew or delivered elsewhere) for 30 completed subjects. Recruitment was terminated early due to slow enrollment. Most subjects were White (80.0%), non-Hispanic (86.7%), and multiparous (60.0%), Table. Mean gestational age at delivery was 40.3±0.68 wks and 93.3% delivered vaginally. Of the 90 GBS DNA-PCR study tests performed, 2/90 (2.2%) were positive in 2 different patients–1 maternal rectovaginal and 1 neonatal ear–for a GBS positive rate of any result in 2/30 (6.7%) patients. There were no cases of neonatal GBS sepsis.
Conclusion: Maternal and neonatal GBS DNA-PCR testing results done at 36 weeks and at the time of delivery are highly concordant. Our findings suggest that the addition of GBS POC testing at the time of delivery admission is likely low yield and would add additional cost.

Table. Characteristics and outcomes of GBS concordance study population	
Baseline Characteristics	
Age at delivery, years	30.6 ± 4.4
White	24 (80.0%)
Non-Hispanic	26 (86.7%)
Multiparous	18 (60%)
Private insurance	24 (80.0%)
Pre-pregnancy BMI, kg/m2	25.95 ± 5.36
Smoking	0 (0%)
Gestational diabetes	5 (16.7%)
Hypertensive disorders of pregnancy	6 (20%)
Prior preterm birth	2 (6.7%)
Prior cesarean delivery	0 (0%)
Maternal and Neonatal Outcomes	
Gestational age at delivery, weeks	40.3 ± 0.68
Induction	19 (63.3%)
Elective	9/19 (47.4%)
Post-term	3/19 (15.8%)
Premature rupture of membranes	2/19 (10.5%)
Fetal growth restriction	1/19 (5.3%)
Other medical conditions	4/19 (21.1%)
Vaginal delivery	28 (93.3%)
Maternal Intrapartum/Delivery complications	
Premature rupture of membranes	4 (13.3%)
Chorioamnionitis	2 (6.7%)
Endometritis	0 (0%)
Postpartum hemorrhage	2 (6.7%)
Antibiotics in labor	2 (6.7%)
Birthweight, grams	3385.0 ± 398.3
Male gender	16 (53.3%)
Neonatal complications	
NICU admission	1 (3.3%)
Neonatal hypoglycemia	4 (13.3%)
Meconium aspiration	1 (3.3%)
GBS sepsis	0 (0%)
Data are in mean (SD) or n (%) as indicated. BMI, body mass index.	

1061 | How does Needing an Interpreter Affect Outcomes among Primarily Non-English Speaking Patients?

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4:00 PM - 6:00 PM

Objective: The need for interpreter services has been linked to poor health outcomes but remains understudied in the obstetric population. We sought to compare outcomes among patients whose primary language was not English between those who used an interpreter and those who did not.

Study Design: We performed a retrospective cohort study of all patients delivering at an urban tertiary care center between 2021-2023 who self-reported their primary language as anything other than English. Patients were dichotomized between those who used an interpreter versus those who did not; all patients with non-English as a primary language are offered interpreter services. Our primary outcomes were mode of delivery, gestational age at delivery, and low birth weight (LBW, < 2500g); secondary outcomes included postpartum hemorrhage (PPH), shoulder dystocia, APGAR at 5 minutes, and perineal lacerations. Mann-Whitney U, chi-square, fisher exact, and multivariable logistic regression were performed appropriately.

Results: 767 patients reported a primary language other than English; 396 (51.6%) did not use an interpreter and 371 (48.4%) did. There were lower rates of Hispanic ethnicity (28% vs 43%, p< 0.001) and gestational hypertension (11% vs 16%, p = 0.010), and higher rates of pre-existing diabetes (4.3% vs 1.3%, p = 0.035) among patients who used interpreters, as well as differences in self-reported race between groups (Table 1). There were no differences in age, parity, BMI, or rates of chronic hypertension. Gestational age at delivery and LBW did not differ between cohorts (Table 2); most patients delivered at term with birthweights >2500g. However, there were increased odds of cesarean (aOR 1.08, 95% CI 1.02-1.14) and PPH (aOR 1.61, 95% 1.43-1.82) in the cohort who used an interpreter.

Conclusion: For delivering patients whose primary language was not English, needing an institutional interpreter was associated with a higher risk of cesarean delivery and PPH. These results suggest that language barriers in the labor unit are an important target to improve outcomes, especially for those who require an interpreter.

Table 1. Background demographics of delivering patients with non-English as primary language

	No interpreter used N= 396	Used interpreter N= 371	p-value
Age	28 (8)	28 (10)	0.299
Race			*0.011*
American Indian or Alaska Native	*10 (2.5)*	*5 (1.3)*	
Black or African American	*42 (10.6)*	*22 (5.9)*	
White	*244 (61.2)*	*246 (66.3)*	
Asian	*42 (10.6)*	*35 (9.4)*	
Other Pacific Islander	*15 (3.8)*	*11 (3.0)*	
Unable to Answer	*15 (3.8)*	*32 (8.6)*	
Declined	*20 (5.1)*	*18 (4.9)*	
Unknown	*0*	*0*	
Other	*8 (2.0)*	*2 (0.5)*	
Ethnicity			
Hispanic	*171 (43.2)*	*104 (28.0)*	*<0.001*
Multiparity	289 (73.0)	280 (75.5)	0.498
BMI			0.774
<18	1 (0.3)	0	
18-25	43 (10.9)	37 (10.0)	
25-30	103 (26.0)	91 (24.5)	
30	165 (41.7)	167 (45.0)	
Unknown BMI	84 (21.2)	75 (20.5)	
Chronic hypertension	10 (2.5)	7 (1.9)	0.723
Gestational hypertension	*62 (15.7)*	*42 (11.3)*	*0.010*
Diabetes			*0.035*
Pre-existing	*5 (1.3)*	*16 (4.3)*	
Gestational	*38 (9.6)*	*33 (8.9)*	

BMI: body mass index
Statistically significant values italicized

Table 2. Obstetric outcomes of delivering patients with non-English as primary language

	No interpreter used N= 396	Used interpreter N= 371	p-value	aOR (95%CI)*
Gestational age at delivery			0.175	1.04 (0.99-1.09)
Less than 28 weeks	5 (1.3)	2 (0.5)		
28-37 weeks	31 (7.8)	17 (4.6)		
Greater than 37 weeks	358 (90.4)	351 (94.6)		
Missing	2 (0.5)	1 (0.3)		
Birth Weight <2500g	26 (6.6)	19 (5.1)	0.486	0.99 (0.96-1.02)
Mode of delivery				
Cesarean	*57 (14.4)*	*82 (22.1)*	*0.007*	*1.08 (1.02-1.14)*
Postpartum hemorrhage	*8 (2.0)*	*18 (4.9)*	*<0.001*	1.61 (1.43-1.82)
Shoulder dystocia	10 (2.5)	11 (3.0)	0.880	1.00 (0.98-1.03)
APGAR at 5 minutes				
Less than 7	14 (3.5)	10 (2.7)	0.645	0.99 (0.97-1.02)
Laceration			0.717	0.95 (0.83-1.09)
None	223 (56.3)	222 (59.8)		
1st degree	67 (16.9)	53 (14.3)		
2nd degree	91 (23.0)	84 (22.6)		
3rd degree	14 (3.5)	10 (2.7)		
4th degree	1 (0.3)	2 (0.5)		

BMI: body mass index
Statistically significant values italicized
*adjusted for gestational hypertension, diabetes

1062 | Routine Genetic Carrier Screening Practices During Prenatal Care and Perceptions Regarding Expanded Carrier Screening

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4:00 PM - 6:00 PM

Objective: The American College of Obstetricians and Gynecologists (ACOG) and the American College of Medical Genetics

(ACMG) disagree on prenatal genetic carrier screening (GCS) guidelines. ACOG recommends routine screening for 2 genes plus risk based screening, while ACMG recommends screening for genes with a ≥1/200 carrier frequency. We sought to understand current GCS practices, and perceptions of expanded genetic carrier screening (EGCS).

Study Design: An electronic survey was distributed to obstetrical providers, including Ob/Gyns, midwives, and medical students. For statistical analysis, logistic regression was used.

Results: 210 responses were recorded from 37 states. The majority of responses were from providers in Michigan (20%, n = 42), in an urban setting (49.5%, n = 104), and practicing as Ob/Gyn physicians (81.9%, n = 172) or Maternal Fetal Medicine physicians (14.8%, n = 31). For a low risk prenatal patient, providers reported screening for a wide range of genes (1-445 genes, Fig. 1). Most reported screening for 14 genes (n = 49, 23.3%), followed by 4 genes (n = 33, 15.7%). A minority of providers deviate from this practice, with some (4.6%) basing the gene number on patient preferences, while others (5.7%) routinely screen for >100 genes; furthermore, 12.9% of providers were unsure of the number screened (Fig. 1). Overall, 62.4% (n = 131) of respondents support expanding ACOG recommendations for routine GCS for low risk PNC. Increased provider comfort level for counseling patients on GCS results was significantly associated with increased support for EGCS (p = 0.02) (Fig. 2). Perceived barriers to integrating EGCS include concerns about patient cost, a lack of appropriate pre and post-test counseling, and clinic logistics.

Conclusion: There is significant heterogeneity in current GCS practices among obstetrical providers. The majority of respondents support an updated ACOG practice guideline for EGCS. Given the rapidly changing landscape of genetic technology and reproductive choice, increased provider education is paramount to overcome potential barriers to implementing EGCS and achieving equitable PNC.

Figure 1: Number of Genes Routinely Screened in a Low Risk Patient During Prenatal Care

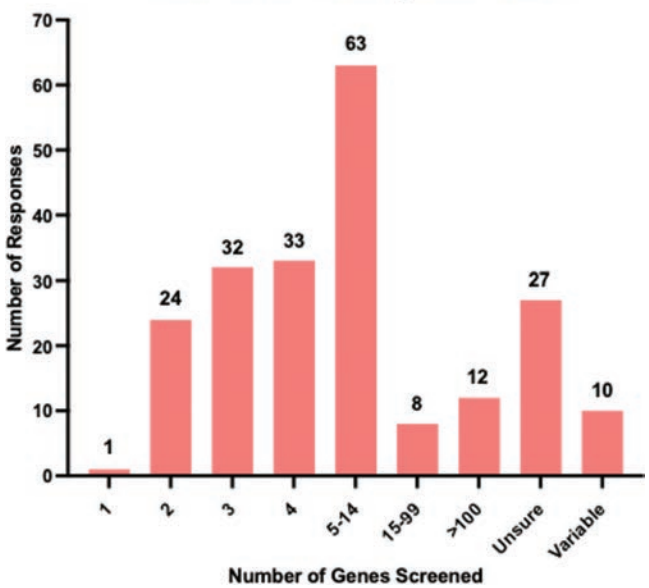
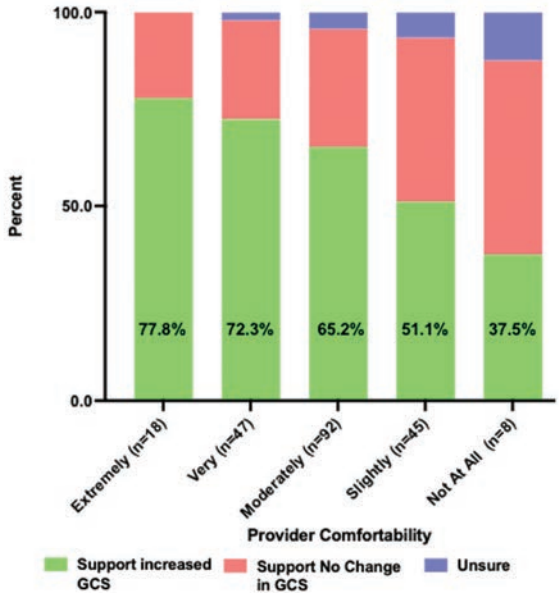


Figure 2: Relationship between provider comfort level with counseling patients about GCS results and support for updated ACOG recommendations



1063 | Risk Of Severe Maternal Morbidity and Mortality Among Pregnant Patients with Chronic Kidney Disease

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4:00 PM - 6:00 PM

Objective: Chronic kidney disease (CKD) is a significant cause of adverse obstetric outcomes, yet few studies assess the risk of severe maternal morbidity (SMM) among those with CKD. We evaluated the prevalence and association of CKD with SMM.

Study Design: This was a population-based, retrospective cohort study of U.S. delivery hospitalizations from 2010-2020 utilizing the National Inpatient Sample database. Patients were identified as having a delivery hospitalization, CKD, and SMM using International Classification Diagnoses codes (9th and 10th edition). The primary outcome of SMM was defined by the Centers for Disease Control and Prevention criteria. Multivariate logistic regression analyses were used to estimate adjusted relative risks (aRR) and 95% confidence intervals (CI). Subgroup analyses were performed by CKD subtype, stage, race and ethnicity, and individual SMM indicators.

Results: Among 38,374,326 parturients, 77,210 (0.2%) had CKD. CKD was associated with an increased risk of SMM (aRR 7.2, 95% CI 6.7-7.6) and maternal death (aRR 4.6, 95% CI 3.2-6.4). Increased risk of SMM was associated with all CKD subtypes, stages, and a history of renal transplant. Those with CKD were at the highest risk for acute renal failure (aRR 24.4, 95% CI 22.2-26.8) and sepsis (aRR 9.3, 95% CI 7.9-11.0) (Table 1). Black individuals had a higher adjusted population attributable fraction between SMM and CKD (3.8%, 95% CI 3.5-4.1). Maternal death was significantly associated with diabetic nephropathy, renovascular, and obstructive or unspecified CKD (aRR 7.3-14.1), as well as CKD

stages 3-5 (aRR 15.5-32.6). The risk of SMM and maternal death was similar in those with a history of renal transplant and those with stage 1 CKD (Figure 1). The number needed to treat with renal transplant to prevent one SMM event or maternal death in those with stages 3-5 CKD was 2.6 (95% CI 2.4-2.9) and 45.0 (95% CI 31.0-82.0), respectively.

Conclusion: CKD in pregnancy was significantly associated with SMM, mortality, and other adverse perinatal outcomes, warranting close surveillance and multidisciplinary management throughout pregnancy.

Table 1. Incidence of Severe Maternal Morbidity at Delivery Hospitalization in Individuals with Chronic Kidney Disease in the United States, 2010–2020 (n=38,374,325)

SMM Indicators	CKD (n=77,210)	No CKD (n=38,297,116)	Relative Risk (95% CI)
Composite SMM	10,728 (13.9)	272,481 (0.7)	7.2 (6.7-7.6)
Transfusion SMM	12,873 (16.7)	659,511 (1.7)	4.5 (4.3-4.8)
Maternal death	342 (0.44)	2,734 (0.007)	4.6 (3.2-6.4)
Cardiovascular SMM per 10,000 delivery hospitalizations			
Acute myocardial infarction	175 (22.72)	1,354 (0.35)	2.3 (1.5-3.5)
Aneurysm*	30 (3.94)	1,108 (0.29)	1.1 (0.5-2.6)
Cardiac arrest/ventricular fibrillation	249 (32.23)	3,262 (0.85)	2.2 (1.6-3.3)
Conversion of cardiac rhythm	259 (33.53)	2,974 (0.78)	2.7 (1.8-4.0)
Heart failure/arrest during surgery*	74 (9.63)	2,294 (0.60)	2.5 (1.3-4.7)
Puerperal cerebrovascular disorders	382 (49.48)	12,398 (3.24)	2.1 (1.6-2.8)
Renal SMM per 10,000 delivery hospitalizations			
Acute renal failure	7,135 (924.1)	34,235 (8.94)	24.4 (22.2-26.8)
Respiratory SMM per 10,000 delivery hospitalizations			
Acute respiratory distress syndrome	2,290 (296.6)	31,650 (8.26)	4.3 (3.7-5.0)
Pulmonary edema / Acute heart failure	2,941 (380.87)	23,871 (6.23)	3.9 (3.4-4.6)
Pre-eclampsia Related SMM per 10,000 delivery hospitalizations			
Eclampsia	214 (27.67)	27,771 (7.25)	1.5 (1.1-2.0)
Infectious SMM per 10,000 delivery hospitalizations			
Sepsis	1,508 (195.33)	23,159 (6.05)	9.3 (7.9-11.0)
Shock	1,893 (245.22)	20,774 (5.42)	6.3 (5.4-7.4)
Hemorrhagic SMM per 10,000 delivery hospitalizations			
Disseminated intravascular coagulation	1,311 (169.79)	97,655 (25.50)	2.7 (2.4-3.1)
Blood transfusion	5,006 (648.41)	446,117 (116.49)	2.2 (2.1-2.4)
Thromboembolic SMM per 10,000 delivery hospitalizations			
Sickle cell disease with crisis*	65 (8.36)	4,225 (1.10)	1.8 (1.0-3.2)
Amniotic fluid embolism*	46 (5.90)	1,579 (0.41)	3.3 (1.6-6.9)
Air and thrombotic embolism	265 (34.31)	8,917 (2.33)	2.9 (2.1-4.0)
Morbidity-Associated Procedures per 10,000 delivery hospitalizations			
Severe anesthesia complications*	34 (4.39)	3,876 (1.01)	1.5 (0.7-3.2)
Hysterectomy	792 (102.60)	41,014 (10.71)	3.7 (3.0-4.4)
Temporary tracheostomy	125 (16.24)	533 (0.14)	7.5 (4.0-14.1)
Ventilation	1,017 (131.74)	18,102 (4.73)	2.7 (2.2-3.4)

Data are displayed in the table as n (%) or relative risk (95% confidence interval)
CKD: chronic kidney disease; SMM: severe maternal morbidity; transfusion SMM: severe maternal morbidity including transfusion codes
Model adjusted for advanced maternal age, race, government insurance, class III obesity (BMI > 40), social determinants of health, tobacco use, anemia, chronic hypertension, severe preeclampsia, chronic cardiac disease, pregestational diabetes, and mode of delivery.
*Model adjusted for mode of delivery, preeclampsia, and cardiac disease only due to rarity of events

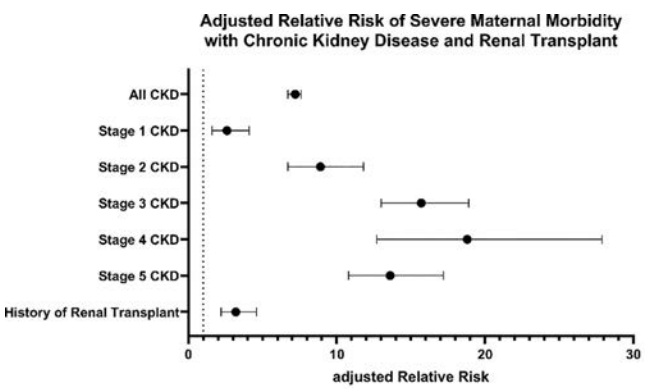

Figure 1. Adjusted Relative Risk of Severe Maternal Morbidity (SMM) by Chronic Kidney Disease (CKD) Stage and History of Renal Transplant in the United States, 2010-2020. Referent group is those without CKD diagnosis (dotted line). Error bars present 95% confidence intervals. SMM events include those defined by the Center for Disease Control and Prevention (acute myocardial infarction, aneurysm, cardiac arrest or ventricular fibrillation, conversion of cardiac rhythm, heart failure or arrest during surgery, puerperal cerebrovascular disorders, pulmonary edema or acute heart failure, acute renal failure, adult respiratory distress syndrome, temporary tracheostomy, ventilation, severe anesthesia complications, eclampsia, sepsis, shock, disseminated intravascular coagulation, air and thrombotic embolism, sickle cell disease with crisis, amniotic fluid embolism, and hysterectomy) but excludes transfusion.

1064 | Effect of Intraoperative Sublingual Nitroglycerin on Active Segment Uterine Incision Rate in Preterm Cesarean Delivery

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4:00 PM - 6:00 PM

Objective: Active segment uterine incisions, including classical, T-shaped and high transverse incisions are often performed during preterm cesarean deliveries (CD). These uterine incisions increase the risk of maternal morbidity with longer operative time, increased blood loss, and rate of uterine dehiscence in future pregnancies compared to lower segment uterine incisions. Patients with uterine incisions in the active segment are also not candidates for future trials of labor. Nitroglycerin is known to cause uterine relaxation and has been used in cases of uterine inversion and Bandl's rings. Our primary aim was to determine if intraoperative sublingual nitroglycerin is associated with decreased active segment uterine incision rate in patients undergoing CD prior to 30 weeks of gestation. Secondary outcomes included maternal blood loss, umbilical artery pH, and five minute APGAR scores.

Study Design: In this case control study, patients with singleton pregnancy between 22 weeks 0 days and 29 weeks 6 days of gestation undergoing CD at two community-based hospitals were compared between the years of 2017 and 2023. Maternal and neonatal variables were collected and analyzed using equality of means, Mann-Whitney U tests as appropriate.

Results: Patients who received nitroglycerin (n = 26) were compared with patients at the same week of gestation who did not receive nitroglycerin (n = 26) during cesarean delivery. The rate of active segment uterine incision was lower in the group that received nitroglycerin intraoperatively (26.9%) compared to the group that did not (61.5% p = 0.012). Quantitative blood loss (QBL) was significantly decreased in patients who received nitroglycerin with a mean QBL of 583mL compared to 794mL in patients who did not (p = 0.002). Neonatal outcomes including umbilical artery pH and APGAR scores were not found to be significantly different between the two groups.

Conclusion: Intraoperative nitroglycerin administration was associated with a lower rate of active segment uterine incision in patients undergoing CD and decreased maternal blood loss. Neonatal outcomes were similar between groups.

1065 | Factors Associated with Exclusive Formula Feeding in Individuals with History of Diabetes in Pregnancy

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4:00 PM - 6:00 PM

Objective: Infants of those with diabetes are less likely to be breastfed despite unique benefits in this population. Knowledge of factors associated with exclusive formula feeding (EFF) would enable identification of patients at high-risk of lactation difficulties. Our objective was to investigate factors associated with EFF in those with pregestational diabetes (PGDM) or gestational diabetes (GDM).

Study Design: The United States Vital Statistics Birth Certificate data was utilized in this retrospective cohort study. Singleton pregnancies with PGDM or GDM from 2016-2022 were included. Pregnancies with missing infant feeding and diabetes data were excluded. We evaluated EFF risk at hospital discharge across multiple maternal and neonatal characteristics and morbidity within both groups. Composite maternal morbidity included admission to ICU, blood transfusion, clinical chorioamnionitis/fever, uterine rupture, unplanned hysterectomy, and perineal laceration. Composite neonatal morbidity included admission to NICU, APGAR score < 5 at 5 min, assisted ventilation > 6 hours and neonatal seizure.

Results: Of the 1,796,752 births included, 227,948 (12.7%) had PGDM and 1,568,804 (87.3%) had GDM. Demographic factors associated with EFF included racial minorities especially non-Hispanic Black, education less than college level, single marital status, lack of prenatal care, smoking in pregnancy, underweight, overweight and obesity within both groups (Table 1). EFF was more likely after caesarean delivery and operative vaginal delivery compared to vaginal delivery within both groups (Table 2). Composite maternal morbidity, ICU admission and transfusion were associated with increased EFF, while clinical chorioamnionitis/fever was not associated with increased EFF within both groups. EFF was more likely within the setting of composite neonatal morbidity or preterm delivery within both groups (Table 2).

Conclusion: This study demonstrates that several maternal and neonatal risk factors are associated with EFF among those with PGDM or GDM. There is a need for enhanced breastfeeding support in this vulnerable population.

Table 1: Risk of exclusive formula feeding (EFF) by patient demographics

Characteristic	Risk ratio (95% confidence interval) Pregestational Diabetes (n=227,948)	Gestational Diabetes (n=1,568,804)
Maternal age (years)		
>35 years of age	0.93 (0.92 – 0.95)	0.87 (0.87 – 0.88)
Maternal Race/Ethnicity		
Non-Hispanic White	Reference	Reference
Non-Hispanic Black	1.4 (1.4 – 1.4)	1.4 (1.4 – 1.4)
Non-Hispanic AIAN	1.2 (1.1 – 1.2)	1.1 (1.1 – 1.2)
Non-Hispanic Asian	0.62 (0.59 – 0.64)	0.61 (0.60 – 0.62)
Non-Hispanic NHOPI	1.1 (1.01 – 1.2)	1.1 (1.03 – 1.2)
Non-Hispanic more than one race	0.97 (0.92 – 1.02)	0.93 (0.91 – 0.96)
Hispanic	0.83 (0.81 – 0.84)	0.81 (0.80 – 0.82)
Maternal education		
Less than high school	2.6 (2.5 – 2.6)	2.8 (2.8 – 2.9)
High school or GED	2.5 (2.5 – 2.6)	2.8 (2.7 – 2.8)
Some college/associate's degree	1.8 (1.8 – 1.8)	1.9 (1.9 – 1.9)
College or more	Reference	Reference
Marriage Status		
Married	Reference	Reference
Not Married	1.7 (1.7 – 1.8)	1.9 (1.9 – 1.9)
Prenatal Care		
Yes	Reference	Reference
No	1.9 (1.8-2.0)	1.6 (1.5-1.6)
Smoking during pregnancy		
Yes	2.0 (2.0 – 2.0)	2.4 (2.4 – 2.4)
No	Reference	Reference
Pre-pregnancy BMI		
Underweight (<18.5)	1.2 (1.1 – 1.3)	1.3 (1.3 – 1.4)
Normal Weight (18.5-24.9)	Reference	Reference
Overweight (25-29.9)	1.05 (1.02 – 1.1)	1.1 (1.1 – 1.1)
Obesity I (30.0-34.9)	1.2 (1.1 – 1.2)	1.3 (1.3 – 1.3)
Obesity II (35.0-39.9)	1.3 (1.3 – 1.3)	1.5 (1.5 – 1.5)
Extreme obesity III (≥40.0)	1.5 (1.4 – 1.5)	1.8 (1.8 – 1.8)

Data presented as Relative Risk (95% Confidence Interval)

Table 2: Risk of EFF by mode of delivery, and maternal and neonatal morbidity

Characteristic	Risk ratio (95% confidence interval) Pregestational Diabetes (n=227,948)	Gestational Diabetes (n=1,568,804)
Labor and Delivery		
Mode of delivery		
Vaginal delivery	Reference	Reference
Operative Vaginal Delivery	1.1 (1.02 – 1.1)	1.0 (0.99 – 1.03)
Caesarean Delivery	1.2 (1.2 – 1.2)	1.2 (1.2 – 1.2)
Induction of Labor	0.83 (0.82 – 0.84)	0.93 (0.92 – 0.93)
Augmentation of Labor	0.87 (0.85 – 0.89)	0.92 (0.91 – 0.93)
Maternal Morbidity		
Composite maternal postpartum morbidity	1.2 (1.2 – 1.3)	1.04 (1.02 – 1.1)
Admission to ICU	2.0 (1.9 – 2.1)	2.4 (2.3 – 2.5)
Blood transfusion	1.6 (1.5 – 1.7)	1.6 (1.6 – 1.7)
Clinical chorioamnionitis or maternal fever	0.89 (0.84 – 0.96)	0.87 (0.84 – 0.89)
Uterine rupture	1.6 (1.3 – 2.0)	1.9 (1.7 – 2.1)
Unplanned hysterectomy	1.5 (1.3 – 1.8)	2.0 (1.9 – 2.2)
Perineal laceration	0.82 (0.73 – 0.91)	0.79 (0.66 – 0.73)
Gestational Age at Delivery		
Early preterm (< 32w0d)	1.7 (1.6 – 1.7)	1.8 (1.8 – 1.8)
Moderately preterm (32w0d - 33w6d)	1.5 (1.4 – 1.5)	1.6 (1.5 – 1.6)
Late preterm (34w0d - 36w6d)	1.3 (1.3 – 1.3)	1.4 (1.4 – 1.4)
Term (37w0d - 41w6d)	Reference	Reference
Post-term (> 41w6d)	1.1 (1.1 – 1.1)	1.1 (1.1 – 1.1)
Fetal/Neonatal Characteristics		
Composite neonatal morbidity	1.5 (1.5 – 1.5)	1.5 (1.6 – 1.6)
Steroids for fetal lung maturity	1.2 (1.2 – 1.3)	1.4 (1.4 – 1.4)
Admission to NICU	1.4 (1.4 – 1.5)	1.6 (1.6 – 1.6)
Apgar score <5 at 5 min	2.1 (2.0 – 2.2)	2.3 (2.3 – 2.4)
Assisted ventilation >6 h	1.5 (1.4 – 1.5)	1.7 (1.7 – 1.8)
Neonatal seizure	1.9 (1.6 – 2.2)	2.7 (2.5 – 2.9)

Data presented as Relative Risk (95% Confidence Interval)

1066 | First Trimester Combined Screening for Preterm Preeclampsia using the Fetal Medicine Foundation Competing Risks Model

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4:00 PM - 6:00 PM

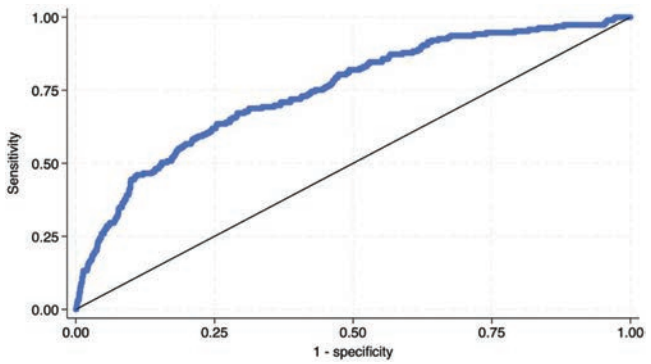
Objective: To assess the performance of first trimester combined screening using the Fetal Medicine Foundation (FMF) model for the prediction of preterm preeclampsia in a U.S. population.

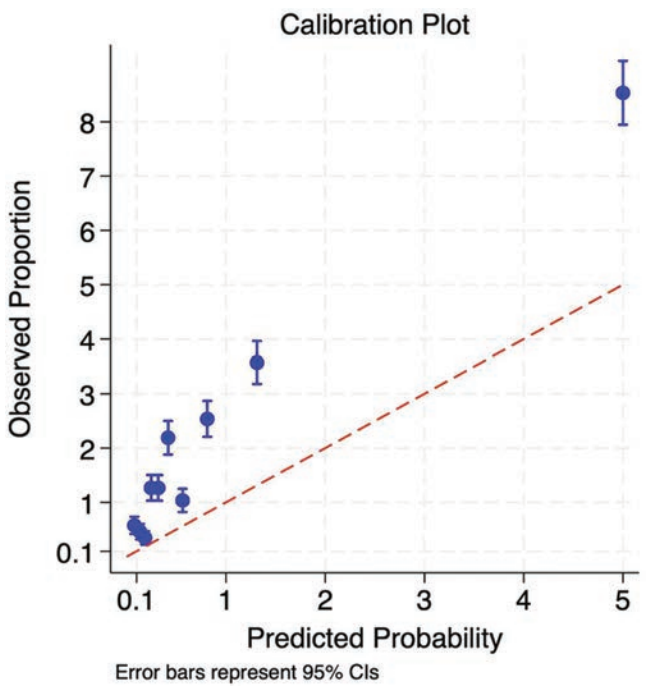
Study Design: This was a secondary analysis of the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-be database. Diagnoses of chromosomal or structural fetal abnormality, miscarriage, or fetal death before 24 weeks of gestation, and those missing information regarding gestational age at delivery or preeclampsia were excluded. Variables in the FMF risk calculation included maternal factors, mean arterial pressure, biochemical markers, and uterine artery pulsatility index. We assessed the model performance using the area under the curve (AUC) of the receiver operating characteristic (ROC) curve using a bootstrap method. The optimal cutoff point was determined using Liu's method and calculated sensitivity, specificity, positive and negative predictive values (PPV, NPV), positive and negative likelihood ratio (LHR), and odds ratio (OR). Goodness of fit was evaluated by calibration plot.

Results: The study analyzed 8,675 nulliparous women, among whom 2.18% had preterm preeclampsia. The ROC curve (Figure 1) revealed an AUC of 0.75, with a 95% confidence interval (CI)

of 0.71 to 0.78 at the optimal cutoff point of 0.7%. Sensitivity of the model was 64.0% (95% CI 56.7–70.9), and specificity was 72.5% (95% CI 71.5–73.4). The PPV was 4.9% (95% CI 4.1–5.9), whereas NPV was 98.9% (95% CI 98.6–99.1). The positive LHR was 2.3 (95% CI 2.1–2.6), and the negative LHR was 0.5 (95% CI 0.4–0.6). OR for predicting preterm preeclampsia was 4.7 (95% CI 3.5–6.3). Overall, the FMF model underestimated the risk of preterm preeclampsia as shown by calibration plot (Figure 2).

Conclusion: The FMF combined screening algorithm demonstrates a moderate ability to predict preterm preeclampsia in a U.S. nulliparous population, indicating a fair discriminative power. Ongoing prospective studies aim to validate this model across diverse populations, potentially leading to more tailored and effective pre-eclampsia prediction.





1067 | Association of CDC Social Vulnerability Index and Adequate Prenatal Care

Julie Robin Dean[1]; Anna P. Staniczenko[1]; Kristin M. Voegtline[2]; Charlene Thomas[2]; Steven Yen[2]; Evan Sholle[2]; Lauren M. Osborne[2]; Heather S. Lipkind[2]; Moeun Son[2]

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4:00 PM - 6:00 PM

Objective: Disparities in prenatal care (PNC) access are a major public health issue. We aimed to evaluate the association between the CDC Social Vulnerability Index (SVI) and receipt of adequate prenatal care.

Study Design: This was a retrospective case control study of patients delivered at 3 hospitals within a New York City health system from 1/1/22 to 5/31/24 who had at least 1 completed PNC visit at < 20 weeks' gestation at an affiliated clinic. Data were extracted from the electronic medical record. Outcomes were based on the distribution of the number of outpatient PNC visit encounters among the cohort: inadequate PNC was defined as ≤8 visits (≤25th percentile) and adequate PNC was defined as >8 visits. The exposure of interest was CDC-defined SVI, which was calculated using a validated technique for geocoding patient addresses: FIPS codes were generated for the census tract and block group of each patient's home address to generate overall SVI and SVI theme scores. SVI scores were converted into categorical variables by quartiles signifying low to high social vulnerability. Other sociodemographic, medical, and obstetric factors were examined. Univariate and multivariate logistic regression models were performed.

Results: Compared to those with adequate PNC, those with inadequate PNC were more often Black, Hispanic, non-married, and < 21 years old. Among the SVI quartiles, high vulnerability SVI had the greatest number of patients with inadequate PNC (40.0%). Compared to those with low SVI, patients with mid-high and high SVI had the lowest odds of adequate PNC (respectively: OR = 0.84, 95% CI 0.73, 0.96; OR = 0.67, 95% CI 0.58, 0.77). Of the SVI themes, socioeconomic status and household composition had the strongest associations with inadequate PNC.

Conclusion: Social vulnerability is associated with adequacy of prenatal care. The CDC's SVI may be a useful tool to identify patients at risk of receiving inadequate prenatal care and linking them to appropriate resources.

Table 1. Frequency and odds of adequate prenatal care by CDC Social Vulnerability Index (SVI)

Characteristic	Number of patients (n, %)		Odds of adequate prenatal care (OR [95% CI])	Adjusted odds of adequate prenatal care* (aOR [95% CI])
	Adequate prenatal care (>8 visits) n=18,243	Inadequate prenatal care (≤8 visits) n=3,004	n=21,132	n=21,132
SVI: Overall^				
Lowest vulnerability	4,606 (25.4)	442 (14.8)	Ref	Ref
Mid-low vulnerability	5,470 (30.2)	614 (20.5)	0.85 [0.75, 0.97]	0.98 [0.85, 1.12]
Mid-high vulnerability	4,051 (22.3)	742 (24.8)	0.52 [0.46, 0.59]	0.84 [0.73, 0.96]
Highest vulnerability	4,011 (22.1)	1,196 (40.0)	0.32 [0.29, 0.36]	0.67 [0.58, 0.77]
Unknown**	105 (0.6)	10 (0.3)	NA	NA
SVI Theme: Socioeconomic Status^				
Lowest vulnerability	7,952 (43.8)	791 (26.4)	Ref	
Mid-low vulnerability	3,911 (21.6)	471 (15.7)	0.83 [0.73, 0.93]	
Mid-high vulnerability	2,988 (16.5)	659 (22.0)	0.45 [0.40, 0.50]	
Highest vulnerability	3,287 (18.1)	1,073 (35.8)	0.30 [0.28, 0.34]	
Unknown**	105 (0.6)	10 (0.3)	NA	
SVI Theme: Household Composition/Disability^				
Lowest vulnerability	9,534 (52.6)	1,117 (37.3)	Ref	
Mid-low vulnerability	3,884 (21.4)	713 (23.8)	0.64 [0.58, 0.71]	
Mid-high vulnerability	2,561 (14.1)	516 (17.2)	0.58 [0.52, 0.65]	
Highest vulnerability	2,159 (11.9)	648 (21.6)	0.39 [0.35, 0.43]	
Unknown**	105 (0.6)	10 (0.3)	NA	
SVI Theme: Minority Status and Language^				
Lowest vulnerability	1,322 (7.3)	356 (11.9)	Ref	
Mid-low vulnerability	5,779 (31.8)	696 (23.2)	2.24 [1.94, 2.57]	
Mid-high vulnerability	6,701 (36.9)	849 (28.3)	2.13 [1.85, 2.44]	
Highest vulnerability	4,346 (24.0)	1,097 (36.6)	1.07 [0.93, 1.22]	
Unknown**	95 (0.5)	6 (0.2)	NA	
SVI Theme: Housing Type and Transportation^				
Lowest vulnerability	1,030 (5.7)	146 (4.9)	Ref	
Mid-low vulnerability	1,308 (7.2)	216 (7.2)	0.86 [0.68, 1.07]	
Mid-high vulnerability	4,473 (24.7)	645 (21.5)	0.98 [0.81, 1.19]	
Highest vulnerability	11,327 (62.5)	1,987 (66.4)	0.81 [0.67, 0.96]	
Unknown**	105 (0.6)	10 (0.3)	NA	

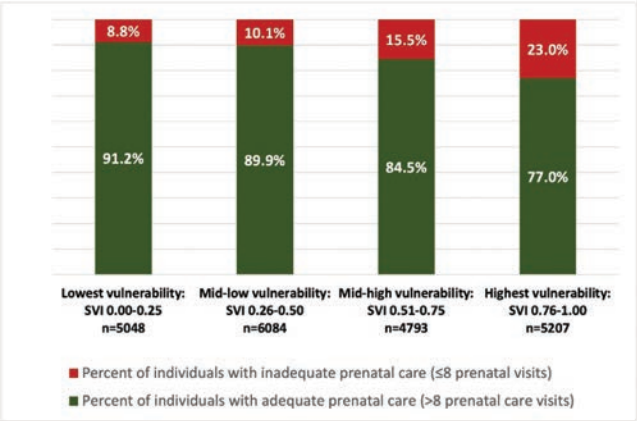
SVI=social vulnerability index, OR=odds ratio, CI=confidence interval, aOR=adjusted odds ratio

^The Centers for Disease Control and Prevention Social Vulnerability Index (SVI) uses 16 U.S. census variables from the 5-year American Community Survey; these variables are grouped into four themes (socioeconomic status, household characteristics, racial and ethnic minority status, housing type and transportation) and then combined into a single measure of overall social vulnerability.

*Adjusted for factors that were significantly associated with adequate prenatal care in univariate analyses: maternal age, marital status, preferred language, employment status, delivery hospital, number of OB providers seen during prenatal care, antepartum admission, GA at first visit, multifetal gestation, BMI>30, in vitro fertilization pregnancy, pregestational diabetes, and gestational diabetes. Race, ethnicity, insurance status, and SVI themes, although associated with adequate prenatal care, were not included in multivariate model due to high collinearity.

**Those with unknown SVI were excluded from univariate and multivariate analyses.

Figure 1. Distribution of prenatal care adequacy based on CDC Social Vulnerability Index (SVI)



1068 | Maternal Serum Leptin Level in Early-and mid-Gestation as a Possible Marker of Fetal Adiposity

Junko Tamai[1]; Satoru Ikenoue[1]; Keisuke Akita[1]; Naotsugu Ishikawa[1]; Yasuhiko Ogata[1]; Kaoru Kajikawa[1]; Yuka Fukuma[1]; Yuya Tanaka[1]; Toshimitsu Otani[2]; Yoshifumi Kasuga[1]; Mamoru Tanaka[1]

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4:00 PM - 6:00 PM

Objective: Newborns exhibit substantial variation in fat mass accretion, which extend into infancy and metabolic dysregulation in later life. Leptin is one of the adipokines related with lipid metabolism, which affects birth weight and infant adiposity. However, the association between maternal serum leptin and fetal fat deposition remains unclear. This study aimed to investigate the association of maternal serum leptin in early- and mid-gestation with fetal adiposity across gestation.

Study Design: A prospective cohort study was conducted in 95 singleton uncomplicated pregnancies. Maternal blood sample was obtained at 10 and 24 weeks' gestation. Serum leptin level was log transformed to be normally distributed. Fetal ultrasonography was performed at 24, 30 and 36 weeks' gestation. Estimated fetal adiposity (EFA) was calculated as the average of standardized z scores of arm percentage fat area, thigh percentage fat area and anterior abdominal wall thickness as previously reported. The association between maternal serum leptin and EFA was examined using Pearson product moment correlation. Multiple linear regression was conducted to quantify the association between maternal serum leptin and EFA with adjustment for potential confounding factors including maternal age, parity, pre-pregnancy body mass index, gestational weight gain, and infant sex.

Results: Maternal serum leptin was 20.0 ± 11.9 (mean ± S.D.) and 22.8 ± 14.6 ng/ml at 10 and 24 weeks, respectively. Maternal leptin levels were not associated with EFA at 24 and 30 weeks. Maternal leptin at 10 weeks ($r = 0.298$, $p = 0.005$) and 24 weeks ($r = 0.361$, $p < 0.001$) were associated with EFA at 36 weeks. After controlling for the covariates, leptin at 10 weeks (standardized $B = 0.317$, $p = 0.028$) and 24 weeks (standardized $B = 0.413$, $p = 0.004$) significantly correlated with EFA at 36 weeks.

Conclusion: Maternal serum leptin level in early- and mid-gestation is associated with fetal fat deposition in late gestation. Maternal serum leptin could be a marker for identifying increased adiposity during intrauterine life.

1069 | Association of Cord Blood Cytokine Levels with Fetal Adiposity Across Gestation

Junko Tamai[1]; Satoru Ikenoue[1]; Keisuke Akita[1]; Naotsugu Ishikawa[1]; Yasuhiko Ogata[1]; Kaoru Kajikawa[1]; Yuka Fukuma[1]; Yuya Tanaka[1]; Toshimitsu Otani[2]; Yoshifumi Kasuga[1]; Mamoru Tanaka[1]

[1]Keio University School of Medicine, Shinjuku-ku, Tokyo; [2]Keio University School of Medicine, Nakano-ku, Tokyo

4:00 PM - 6:00 PM

Objective: Recent clinical and experimental evidence have shown that the origins of obesity (i.e., increased adiposity) can be, in part, traced back to intrauterine life. However, the determinants of fetal fat deposition have yet to be elucidated. This study aimed to investigate the association between cord blood cytokines related with lipid metabolism (leptin, adiponectin, insulin-like growth factor-1 [IGF-1]) and fetal adiposity across gestation.

Study Design: A prospective study was conducted in a cohort of 91 singleton pregnancies. Fetal 3D ultrasonography was performed at 24, 30, and 36 weeks' gestation. Estimated fetal adiposity (EFA) was calculated by integrating measurements of cross-sectional arm and thigh percentage fat area and anterior abdominal wall thickness as previously reported. Serum cytokine levels and C-peptide immunoreactivity (CPR) of the umbilical cord (as a proxy for fetal insulin resistance) were evaluated in the cord blood sample obtained at delivery. The associations between cord blood cytokine levels and EFA at 24, 30 and 36 weeks were determined by multiple linear regression adjusted for potential covariates including maternal age, parity, pre-pregnancy BMI, gestational weight gain, fetal sex, and gestational age at assessments.

Results: Serum leptin, adiponectin and IGF-1 of the umbilical cord was 8.5 ± 6.4 ng/ml (mean ± S.D.), 23.0 ± 6.7 μg/ml and 52.1 ± 19.0 ng/ml, respectively. After adjusting for the covariates, leptin was not associated with EFA at 24 and 30 weeks, but significantly correlated with EFA at 36 weeks (standardized $B = 0.299$, $p = 0.008$). Leptin was also positively correlated with CPR in the umbilical cord ($p = 0.024$). Cord adiponectin and IGF-1 were not associated with EFA across gestation.

Conclusion: Cord blood leptin level was associated with fetal adiposity in late gestation. Considering the effect of leptin on fetal insulin resistance and lipid metabolism, increased leptin level potentially be one of the serum biomarkers of increased fetal adiposity, which leads to infant obesity and metabolic dysfunction in later life.

1070 | Non-Mother Birthing Identities and Risk of Hospitalization for Psychiatric Diagnoses Before and After Delivery Hospitalizations

Justin S. Brandt[1]; Rebecca J. Baer[2]; Scott P. Oltman[2]; Diana S. Abbas[3]; Marra Ackerman[1]; Allison Deutch[1]; Dana R. Gossett[1]; Laura L. Jelliffe-Pawlowski[1]

[1]NYU Langone Health, New York, NY; [2]University of California San Francisco School of Medicine, San Francisco, CA; [3]NYU Grossman School of Medicine, New York, NY

4:00 PM - 6:00 PM

Objective: To understand the impact of pregnancy on depression and other psychiatric illnesses for transgender and gender diverse people, we evaluated the risk of hospitalization for psychiatric diagnoses among non-mother birthing people in the year before and after delivery hospitalizations.

Study Design: We performed a cross-sectional study of singleton live births in California (2019-2021). Birth certificates were linked to hospital discharge records for birthing people for the year before and after delivery hospitalizations. Birthing parent identity was based on birth certificates, in which birthing people self-identify as mother, father, or parent. The primary outcome was hospital admission with psychiatric diagnoses, as determined by ICD-10 codes. Risk of hospitalization with psychiatric diagnoses was calculated for non-mother versus mother birthing people in the year before or after delivery hospitalization using Poisson regression models.

Results: There were 1,298,307 singleton live births in California from 2019-2021, including 1,065,714 hospital records linked with birthing person identities. 898 (0.08%) people had non-mother birthing identities (n = 515 fathers, n = 383 parents), of whom 143 (15.9%) had psychiatric diagnoses compared to 127,545 (12.0%) birthing mothers. In the year prior to delivery hospitalization, 41 (4.6%) non-mother birthing people were hospitalized with psychiatric diagnoses compared to 30 (3.3%) non-mother birthing people in the year postpartum. Compared to mother birthing people, non-mother birthing people were at increased risk for these hospitalizations in the year before (RR 1.22, 95% CI 0.90, 1.66) and after (RR 1.52, 95% CI 1.06, 2.17) delivery hospitalizations. Characterization of medical engagement is described in the Table.

Conclusion: In this study, non-mother birthing people were at increased risk for hospitalization with psychiatric diagnoses in the year after delivery hospitalizations, but the absolute number of postpartum hospitalizations with psychiatric diagnoses was lower. Further study is needed to understand the impact of pregnancy on this risk.

Table
Relationship between hospital admissions with psychiatric diagnoses in the year *before* and *after* delivery hospitalizations, by birthing parent identity

	Mother	Non-Mother[a]	RR (95% CI)
All births	1,064,816	898	
Year before delivery			
No admission	96.3	95.4	*Reference*
Any admission	3.7	4.6	1.22 (0.90, 1.66)
Admission without psychiatric health diagnosis[b]	3.2	3.6	1.12 (0.79, 1.58)
Admission with psychiatric diagnosis	0.5	[c]	1.98 (1.03, 3.81)
Admission with substance use diagnosis	0.3	[c]	[d]
Year after delivery			
No admission	97.8	96.7	*Reference*
Any admission	2.2	3.3	1.52 (1.06, 2.17)
Admission without psychiatric health diagnosis	1.8	2.5	1.40 (0.92, 2.12)
Admission with psychiatric health diagnosis	0.2	[c]	[d]
Admission with substance use diagnosis	0.4	[c]	2.05 (1.02, 4.10)

Data listed as percentages. RR: relative risk; CI: confidence interval.
[a]Non-mother birthing identities include 'father' and 'parent' identities as self-identified on California birth certificates.
[b]Mental health diagnoses derived from ICD-10 codes for suicidal behavior, major depression, postpartum depression, anxiety, bipolar disorder, schizophrenia, substance use disorder, and other mental health diagnosis.
[c]Not displayed when n<11.
[d]Not calculated when n<5.

1071 | Non-Mother Birthing People and the Risk of Ischemic Placental Disease, Severe Morbidity, and Preterm Birth

Justin S. Brandt[1]; Rebecca J. Baer[2]; Scott P. Oltman[2]; Diana S. Abbas[3]; Marra Ackerman[1]; Allison Deutch[1]; Dana R. Gossett[1]; Laura L. Jelliffe-Pawlowski[1]
[1]NYU Langone Health, New York, NY; [2]University of California San Francisco School of Medicine, San Francisco, CA; [3]NYU Grossman School of Medicine, New York, NY

4:00 PM - 6:00 PM

Objective: To evaluate the risk of ischemic placental disease (IPD), severe morbidity (SM), and preterm delivery (PTD) among individuals who identify as non-mother birthing people, presumably transgender men and gender diverse people assigned female sex at birth.

Study Design: We performed a cross-sectional study of singleton live births in California (2019-2021). Birth certificates were linked to hospital discharge and neonatal records. Birthing parent identity was based on birth certificates, in which birthing people self-identify as mother, father, or parent. The primary outcomes were IPD (hypertensive disorders of pregnancy, placental abruption, and small for gestational age birth), composite SM based on the CDC definition, and PTD < 37 weeks gestation. Outcomes were determined by ICD-10 codes. The risk of outcomes was calculated for non-mother versus mother birthing people using Poisson regression models.

Results: There were 1,298,307 singleton live births in California from 2019-2021, including 1,065,714 linked hospital and neonatal records with birthing person identities. 898 (0.08%) people had non-mother birthing identities, of whom 9.2% were age >40 years, 24.9% had BMI >30 kg/m^2, 13.1% had pregestational diabetes, and 2.2% had chronic hypertension. Compared to mother birthing people, non-mother birthing people had similar rates of adequate prenatal care as defined by Kotelchuck (71.9% vs. 70.1%), but higher rates of cesarean delivery (30.9% vs. 24.9%) and pregnancies conceived with assisted reproduction (17.3% vs. 1.7%). The risk of IPD was similar between the groups, but the risks of SM (RR 1.69, 95% CI 1.20, 2.38) and preterm birth (RR 1.30, 95% CI 1.07, 1.58) were increased among non-mother birthing people. The risks are further described in the Table.

Conclusion: In this study of singleton live births in California, non-mother birthing people had similar rates of adequate prenatal care, but were at increased risk for SM and PTD, though not at increased risk for IPD, compared to mother birthing people. These disparate risks may reflect the impact of minority stress and warrant further evaluation.

Table
Risk of ischemic placental disease, severe morbidity, and preterm birth, by birthing person identity

	Mother	Non-Mother[a]	RR (95% CI)
	n (%)	n (%)	
All births	1,064,816	898	
Ischemic placental disease			
No	838,135 (78.7)	701 (78.1)	*Reference*
Yes	226,681 (21.3)	197 (21.9)	1.03 (0.90, 1.19)
Hypertensive disorder of pregnancy	139,403 (13.1)	126 (14.0)	1.07 (0.90, 1.27)
Chronic hypertension	18,725 (1.8)	20 (2.2)	1.27 (0.82, 1.97)
Gestational hypertension	47,144 (4.4)	36 (4.0)	0.92 (0.66, 1.27)
Preeclampsia/eclampsia	62,737 (5.9)	61 (6.8)	1.15 (0.89, 1.48)
Placental abruption	10,409 (1.0)	[c]	0.92 (0.46, 1.84)
Small for gestational age birth	97,853 (9.2)	83 (9.2)	1.01 (0.82, 1.26)
Severe morbidity[b]			
No	1,041,690 (97.8)	865 (96.3)	*Reference*
Yes	23,126 (2.2)	33 (3.7)	1.69 (1.20, 2.38)
Severe morbidity (without transfusions)	13,486 (1.3)	13 (1.5)	1.16 (0.67, 2.00)
Gestational age at delivery			
≥37 weeks	*971,246 (91.2)*	*796 (88.6)*	*Reference*
<37 weeks	92,999 (8.7)	102 (11.4)	1.30 (1.07, 1.58)
34-36 weeks	71,044 (6.7)	74 (8.2)	1.25 (0.99, 1.57)
32-33 weeks	8,955 (0.8)	11 (1.2)	1.49 (0.83, 2.70)
<32 weeks	13,571 (1.3)	17 (1.9)	1.52 (0.94, 2.44)

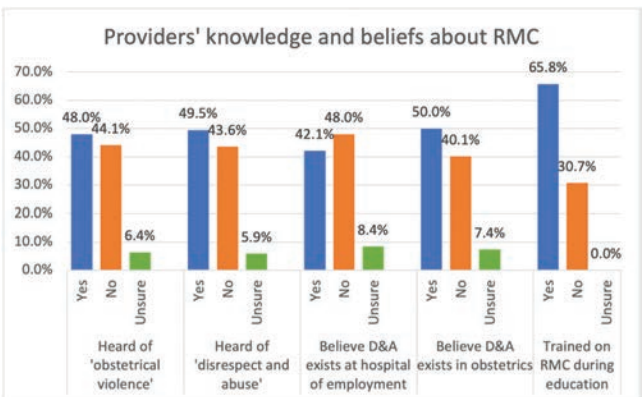
RR: relative risk; CI: confidence interval.
[a]Non-mother birthing identities include father and parent identities as self-identified on California birth certificates.
[b]Severe morbidity based on the CDC definition using birth certificate indications and ICD-10 codes.
[c]Not displayed when n<11.

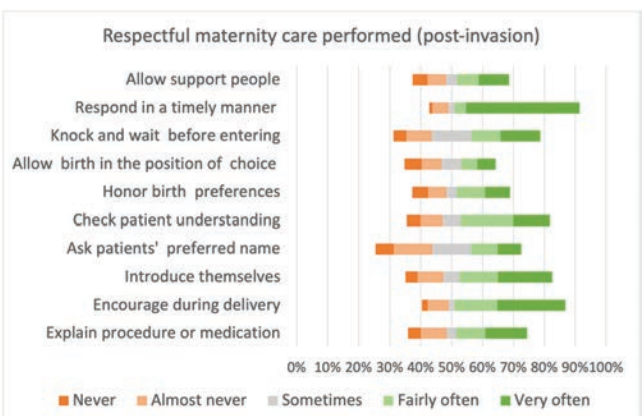
1072 | Respectful Maternity Care in Ukraine During a Time of War

Volodymyr V. Artyomenko[1]; Annekathryn Goodman[2]; Igor Shpak[3]; Mary Greenwald[4]; Marcella Regina Cardoso[4]; Katherine D. Fachon[4]; Christina M. Duzyj[2]
[1]Odesa National Medical University, Odesa, Odes'ka Oblast'; [2]Massachusetts General Hospital, Boston, MA; [3]Maternity Hospital No 5, Odesa, Odes'ka Oblast'; [4]Strength and Serenity Initiative Against Gender-Based Violence, Massachusetts General Hospital, Boston, MA

4:00 PM - 6:00 PM

Objective: Respectful maternity care (RMC) is a fundamental right of birthing people. Our objectives were: to measure the proportion of obstetric providers at an Odesa Maternity Hospital reporting disrespect and abuse (D&A) during childbirth; to identify challenges to RMC; and to assess perceptions of the impact of war on RMC.
Study Design: This is a cross-sectional study consisting of a quantitative survey distributed to physicians, nurses, midwives, and other personnel at Odesa City Maternity Hospital № 5. The survey included 90 questions assessing prevalence and types of disrespect. Topics covered included: RMC practices performed; disrespectful behaviors witnessed; the impact of war on the provision of RMC; Perceived Stress Scale and Post-Traumatic Stress Scale; perspectives on patient autonomy and decision-making. Results were compared with a survey administered in a Boston maternity unit.
Results: 202 Providers responded: 89 nurses and junior nurses, 28 midwives, 84 physicians, and 1 unknown provider. 49.5% were familiar with the term "disrespect and abuse," compared with 82.6% in Boston; and 50.0% believed D&A exists in the obstetrics field, compared with 84.8% in Boston. The most reported types of disrespect were scolding or blaming (58.4% compared with 63% in Boston), asking private questions in the presence of others (42.1% vs 58.7%) and uncomfortable vaginal examinations (39.6% vs. 65.2%). The most common types of discriminatory care witnessed were discrimination based on social status (38.6% vs. 28.3%) and ability to pay "pocket money" (37.1%).
Conclusion: This study provides insights into the provision of maternity care under conditions of duress, and highlights challenges faced under the strains of conflict. These efforts aim to identify gaps in education and training around RMC in order to enhance maternal healthcare delivery in conflict-affected regions, fostering a more supportive and respectful environment for providers and patients.





1073 | Short-Interval Births Among Adolescents who Received Immediate Postpartum Long-Acting Reversible Contraception

Katherine B. Kaak[1]; Alicia Mastronardi[2]; Jill M. Maples[3]; Kimberly B. Fortner[4]; Lilyan Starkey[1]; William L. Riley[4]; Rebecca Purvis[5]; Megan L. Young[6]; Nikki B. Zite[4]
[1]University of Tennessee at Knoxville, Knoxville, TN; [2]University of Tennessee Graduate School of Medicine, Department of OB/Gyn, Knoxville, TN; [3]University of Tennessee Health Science Center, College of Medicine, Knoxville, TN; [4]University of Tennessee Graduate School of Medicine, Knoxville, TN; [5]University of Tennessee Medical Center Knoxville, Knoxville, TN; [6]University of Tennessee Medical Center, Center for Women and Infants, Knoxville, TN

4:00 PM - 6:00 PM

Objective: Adolescent pregnancy is linked to adverse maternal and neonatal outcomes and is associated with short interval birth, further exacerbating these risks. Contraceptive counseling and access can decrease rates of short-interval birth, especially in this high-risk population. Tennessee faces high rates of both adolescent pregnancies and SIB, with 32.5% of pregnancies following a prior live birth having <18 months of birth spacing (2018-2020 average). In 2018, a statewide quality improvement project introduced immediate postpartum long-acting reversible contraception (IPP LARC) for publicly insured recipients. This study aims to assess SIB rates among adolescents who received IPP LARC.

Study Design: This retrospective study utilized billing data for publicly insured adolescents (≤20 years old) giving birth from January 2018-December 2019. These data were matched by SSN, date of birth, and mother's name with statewide birth certificate records from January 2015-December 2021. SIB was defined as two births ≤24 months apart. Among multiparous patients, SIB prior to and after receiving IPP LARC was assessed.

Results: We identified 267 adolescent deliveries. IPP arm implants were inserted more often than intrauterine devices (IUDs) (65.5% vs 34.5%) (Figure1) in these adolescents. Of the 267, 62.0% (n = 165) were primiparous (Table 1). Among multiparous patients (n = 101), 56.4% (n = 57) had a SIB prior to IPP LARC placement. The median number of previous live births among multiparous was 1.0 (IQR:1,2). Among the multiparous patients with a prior SIB, 90.7% (49) did not have another SIB post LARC. Among the entire cohort, 8.2% (n = 22) of deliveries had a SIB after IPP LARC placement.

Conclusion: Adolescents electing IPP LARC had low subsequent SIB rates. Addressing adolescent pregnancy is a public health priority, and, although secondary prevention, access to desired IPP LARC is a strategy to decrease repeat adolescent pregnancies and short interval births.

Figure 1: Type of Immediate Postpartum LARC Chosen by Adolescents

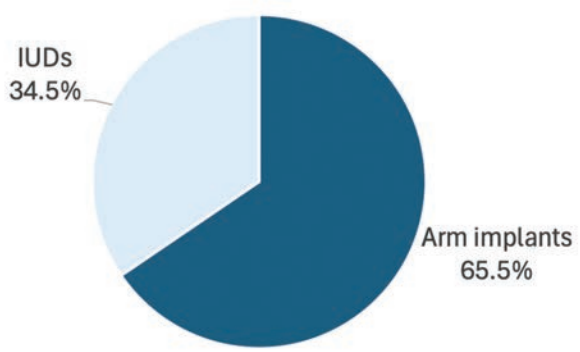


Table 1. Demographics of adolescents receiving IPP LARC

	Number of adolescents (N=267) (%)
Age	
14-16	32 (11.9)
17-18	72 (27.0)
19-20	163 (61.0)
Primiparous	154 (57.7)
Patient Predominant Race Reported	
White	128 (47.9)
Black	93 (34.8)
Other Race	45 (17.3)
Hispanic	47 (17.6)
Previous live birth	102 (38.2)
Short-Interval Birth After IPP LARC Receipt	22 (8.2)
Public Insurance	251 (94.0)
Primary Language Not English	33 (12.4)

1074 | Impact of Socioeconomic Disadvantage on Adolescent Pregnancy

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4:00 PM - 6:00 PM

Objective: Adolescent pregnancy is associated with adverse maternal and neonatal outcomes, less prenatal care, and lower school attendance. In Tennessee, the adolescent birth rate is higher than the national average (23.7/1,000 vs 16.7/1,000). The Area Deprivation Index (ADI), ranging from 1-100, assesses neighborhood-level disadvantages, with higher values indicating greater deprivation. This study explores the relationship between adolescent pregnancy, ADI scores, and pregnancy outcomes.

Study Design: This retrospective cohort study analyzed adolescent patients (age ≤20) delivering at a regional academic medical center from March 2018-June 2023. Data was extracted from

electronic medical records. Each patient's address was used to determine their Area Deprivation Index (ADI) score, categorized into quintiles representing increasing deprivation (1 to 100), with scores of 61 or higher considered high risk. Chi-square tests were used to evaluate associations within the dataset.

Results: Of 22,086 deliveries, 1,281 (5.8%) were to patients ≤20 years of age. The mean ADI score in this adolescent cohort was 73.4 and 78.8% had ADI 61 or greater (Figure 1). No statistically significant differences were found in patients with higher ADI scores in adequacy of prenatal care obtained, low birth weight full-term infants, illicit drug use, or hypertensive disorders. Reported marijuana use was significantly lower (p =.007) in patients with higher ADI scores (Table 1). During this time, 60 adolescents had an additional birth while under the age of 20 and 85.0% of those had a high-risk ADI. Nearly 1 in 4 (23.3%) of the births to adolescent patients were pre-term.

Conclusion: Although nearly 4 of 5 adolescents giving birth at our center were from high-risk zip codes, risk factors and outcomes did not statistically differ based on ADI score. Further research should look more into these at-risk teens, focusing on patients with the highest burden of disadvantages.

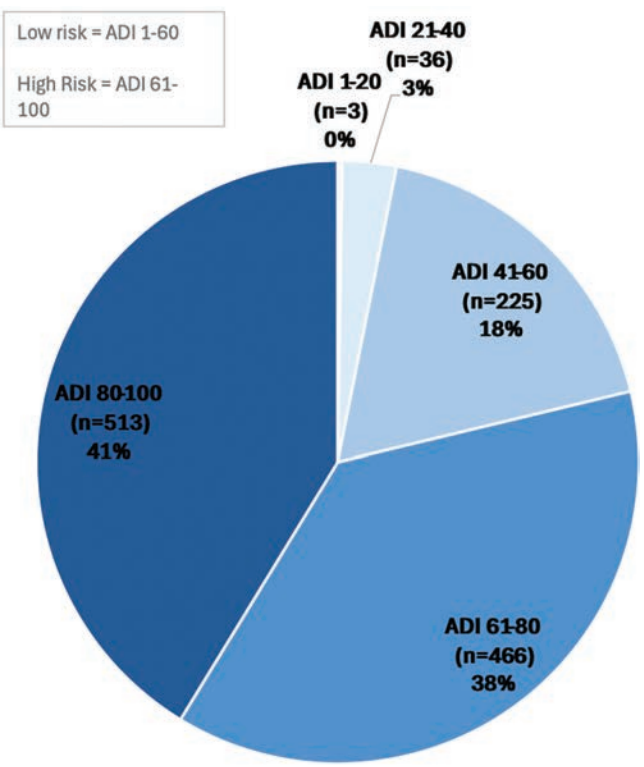

Figure 1: Area Deprivation Index (ADI) Quintiles of Pregnant Adolescents

Table 1: Pregnancy Risks and Outcomes by ADI Score			
	Low Risk = ADI 1-60 (n=264)	High Risk = ADI 61-100 (n=979)	p-value
Late/Limited/No Prental Care**	25 (9.5%)	113 (11.5%)	0.458
Preterm Delivery	47 (17.8%)	169 (17.3%)	0.231
Low Birth Weight Infant	9 (5.0%)	34 (4.7%)	0.900
Gestational Hypertension	28 (10.6%)	101 (10.4%)	0.866
Marijuana Use	66 (25.2%)	173 (17.8%)	*0.007
Tobacco Use	20 (7.7%)	111 (11.6%)	0.077
Chi-squared tests were used to compare groups.			
*P-value of <0.05 was used to signal significance.			
**Late prenatal care defines as starting after 18 weeks gestation. Limited prenatal care defined as fewer visits than recommended based on gestational age. No prenatal care was designated if they had no prental visits prior to their encounter for delivery			

1075 | Remote 3D LiDAR Imaging to Estimate Fundal Height: A Feasibility Study

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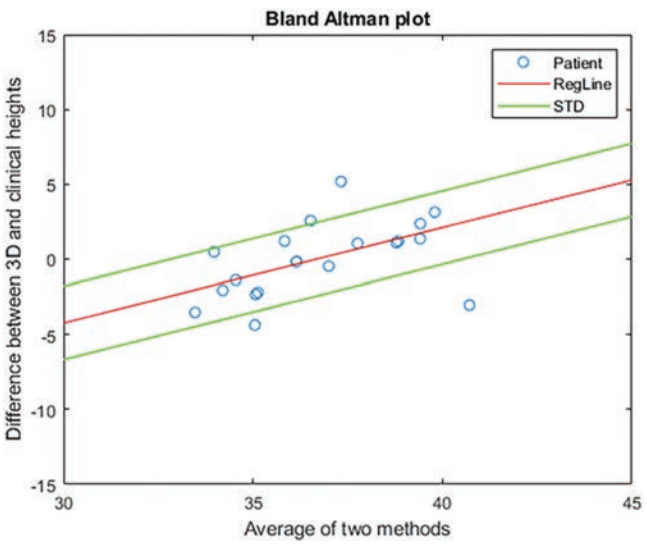
4:00 PM - 6:00 PM

Objective: Prenatal care is increasingly offered virtually to expand access to care. However, estimation of fetal growth is limited during virtual appointments jeopardizing safety and quality of care. The purpose of this feasibility study was to evaluate accuracy of term fundal height estimation using 3D LiDAR (Light Detection and Ranging) technology to create accurate 3D images of the gravid abdomen using an Apple iPad. Development of this technology would allow patients to remotely share a 3D image during a virtual visit to allow for accurate physical exam including fundal height estimate.

Study Design: In this retrospective feasibility study, we compared fundal height measurements calculated remotely from 3D LiDAR images to those measured in-person by research nurses using a measuring tape at term in (N = 20) low risk pregnant patients. The 3D LiDAR image was captured on the same day as the physical measurement by the nurse using an Apple iPad with the Polycam app. Participants with incomplete data or inadequate imaging of the fundus and pubis were excluded. Fundal heights were calculated by first mapping fiducial markers along the midline from pubis to the fundus then summing the distances calculated between the 3D surface markers. Fundal heights measured using the 3D LiDAR images were detrended with linear regression and a Bland-Altman Plot was created to evaluate agreement.

Results: Fundal heights measured via 3D LiDAR imaging ranged from 36.68 to 40.21 cm (mean = 38.53) and by the nurses from 35.50 to 44.00 cm (mean = 38.53). The mean absolute error (MAE) before detrending was 1.97±2.44cm. Post detrending MAE was 1.01±1.57cm with the limits of agreement (95% CI, ±3.09cm).

Conclusion: 3D LiDAR imaging shows promising preliminary results for accurately measuring fundal heights at term and may provide a clinically useful alternative for estimating fetal growth for patients receiving care remotely. Follow-up studies are needed to extend these findings to earlier gestations, explore usability of the app during remote visits, and identify additional obstetric applications of 3D abdominal imaging.



1077 | Impact of Prenatal Care on Perinatal Outcomes in Individuals with Opioid Use

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4:00 PM - 6:00 PM

Objective: Prenatal opioid use is associated with maternal and neonatal morbidity and mortality, yet only half of individuals are connected to treatment due to barriers accessing care. The objective of this study is to assess how the number of prenatal care attendance affects perinatal outcomes in individuals with opioid use.

Study Design: We conducted a retrospective cohort of singleton, non-anomalous births between 23-42 weeks gestation using California linked vital statistics and hospital discharge data (2008-2020). Opioid-related diagnosis was identified using ICD-9/ICD-10 codes. Prenatal visit number grouping (≥5 visits and < 5 visits) was determined based on WHO recommendations for minimum visits to mitigate adverse perinatal outcomes. Chi-squared and multivariable logistic regression were utilized for statistical analyses.

Results: There were 8,799 individuals with opioid use in pregnancy that met inclusion criteria, with the majority attending ≥5 prenatal care visits (80.34%). Attendance at < 5 prenatal care visits was associated with adverse maternal outcomes, including a higher rate of placental abruption (6.2% vs 2.7%; aOR 1.87, 95% CI: 1.42-2.47), preterm premature rupture of membranes (8.0% vs 3.8%; aOR 1.91, 95% CI: 1.50-2.43), preterm delivery < 37 weeks (33.0% vs 14.2%; aOR 2.69, 95% CI: 2.34-3.08), and severe maternal morbidity (6.5% vs 2.8%; aOR 2.31, 95% CI: 1.77-3.02). Neonatal outcomes were also worse in those with fewer prenatal visits, including higher rates of respiratory distress (4.6% vs 2.6%; aOR 1.78, 95% CI: 1.31-2.42), neonatal withdrawal (37.6% vs. 29.4%, aOR 1.42, 95% CI: 1.26-1.61), and NICU admission (58.4% vs 41.9%; aOR 1.76, 95% CI: 1.57-1.99).

Conclusion: We found that lower prenatal care attendance among individuals with an opioid-related diagnosis is associated with worse maternal and neonatal outcomes. Although our study is limited by the ability to control for pharmacotherapy, addressing barriers to prenatal care among those with opioid use may impact maternal and neonatal morbidity and mortality.

Table 1. Maternal outcomes among patients with opioid use during pregnancy by number of prenatal care visits attended

	≥5 visits (n=7,069)	<5 visits (n=1,730)	p	aOR (95% CI)
Hypertensive disorders	779 (11.0%)	223 (12.9%)	0.021	1.24 (1.03-1.48)
Preterm premature rupture of membranes	268 (3.8%)	139 (8.0%)	<0.001	1.91 (1.50-2.43)
Placental abruption	188 (2.7%)	107 (6.2%)	<0.001	1.87 (1.42-2.47)
Preterm delivery				
<37 weeks	1,001 (14.2%)	571 (33.0%)	<0.001	2.69 (2.34-3.08)
<32 weeks	100 (1.4%)	84 (4.9%)	<0.001	2.77 (1.95-3.94)
Cesarean delivery (CD)				
Nulliparous	880 (35.1%)	119 (24.4%)	<0.001	0.53 (0.41-0.69)
Multiparous without prior CD	467 (15.2%)	131 (15.3%)	0.615	0.94 (0.74-1.19)
Multiparous with prior CD	1,372 (92.5%)	318 (87.1%)	0.057	0.66 (0.43-1.01)
Operative vaginal delivery*	370 (8.5%)	108 (9.4%)	0.602	1.07 (0.83-1.39)
Severe maternal morbidity	199 (2.8%)	112 (6.5%)	<0.001	2.31 (1.77-3.02)
Non-transfusion severe maternal morbidity	81(1.2%)	41(2.4%)	0.022	1.67 (1.08-2.60)

Analyses adjusted for race/ethnicity, age, education, body mass index, insurance type, parity, chronic hypertension, pre-existing diabetes, mental health conditions, and polysubstance use (nicotine, alcohol, amphetamines, cocaine)
**Among vaginal deliveries*

Table 2. Neonatal outcomes among patients with opioid use during pregnancy by number of prenatal care visits attended

	≥5 visits (n=7,069)	<5 visits (n=1,730)	p	aOR (95% CI)
Small for gestational age	1,076 (15.2%)	299 (17.3%)	0.580	1.05 (0.89-1.22)
APGAR <7 at 5 minutes	158 (2.3%)	78 (4.6%)	<0.001	1.93 (1.4-2.65)
Respiratory distress syndrome	186 (2.6%)	79 (4.6%)	<0.001	1.78 (1.31-2.42)
Neonatal withdrawal syndrome	2,063 (29.4%)	639 (37.6%)	<0.001	1.42 (1.26-1.61)
Neonatal ICU admission	2,962 (41.9%)	1,010 (58.4%)	<0.001	1.76 (1.57-1.99)
Neonatal death	16 (0.23%)	20 (1.2%)	<0.001	3.77 (1.72-8.25)
Infant death	44 (0.6%)	29 (1.7%)	0.006	2.12 (1.24-3.65)

Analyses adjusted for race/ethnicity, age, education, body mass index, insurance type, parity, chronic hypertension, pre-existing diabetes, mental health conditions, and polysubstance use (nicotine, alcohol, amphetamines, cocaine)

1078 | Impact of Changing Medicaid Coverage for Methadone on Opioid Use Disorder Treatment in Pregnancy

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4:00 PM - 6:00 PM

Objective: Driven by synthetic opioids, overdose is the leading cause of maternal mortality. Pregnancy increases difficulty in accessing treatment. The purpose of this study was to assess how Medicaid coverage for methadone affected treatment for opioid use disorder in pregnancy.

Study Design: This is a cross-sectional study using linked South Carolina claims and birth certificate data (2015 to 2022) of live births with a diagnosis of opioid use disorder (OUD) in pregnancy. We divided our population into 2 cohorts: 1) before and 2) after the state's Medicaid approval for methadone coverage on January 1st 2019. Our primary outcome was receipt of medication for OUD (MOUD) during pregnancy or within the first 60 days postpartum. Using standard bi-variate tests, we compared the pre- and post-policy rates of Methadone of MOUD as well as demographic factors between each group.

Results: In total, 2,633 patients with OUD were included in our study. Of these, 1181 delivered prior to Medicaid approval of methadone and 1,452 were in the post-approval cohort. Following Medicaid approval for methadone, there was a statistically significant increase in the number of methadone prescriptions within the Medicaid population ($p< 0.001$) and a near significant increase of individuals receiving methadone as MOUD (5.1% vs 9.1%, $p = 0.06$). There was a statistically significant increase in those receiving any MOUD post-coverage (34.8% vs 47.2%, $p < 0.001$). Those who did not receive Methadone or any MOUD were more likely to be under the age of 25 (57.2%) and live in a rural county (59.9%).

Conclusion: Our results show that changing Medicaid coverage for methadone increases overall treatment for OUD in pregnancy. However, there continue to be gaps in treatment connections for individuals < 25 years of age and from rural counties. As the opioid epidemic increases, improving access to medication coverage for OUD and focusing efforts on younger, more rural areas may impact OUD treatment in pregnancy, and subsequently, maternal mortality.

Table 1. Prescriptions of MOUD related to Medicaid approval for methadone coverage

Number (N) of prescriptions pre/post methadone approval by Medicaid in South Carolina among those with OUD			
	Pre-Medicaid Methadone Approval (pre 1/1/19) (N=3816)	**Post-Methadone Approval (1/2/19 and beyond) (N=11,338)**	**p-value***
Methadone	1323 (34.5%)	5210 (45.9%)	<0.001
Buprenorphine	3624 (95.0%)	9136 (80.6%)	<0.001
Naltrexone	51 (1.3%)	91(0.8%)	0.0012
Proportion of individuals with OUD receiving MOUD during pregnancy or within 60 days postpartum pre-and post (N=2,633)			
	Pre-Medicaid Methadone Approval (pre 1/1/19) (N=1,181)	**Post-Methadone Approval (1/2/19 and beyond) (N=1,452)**	**p-value***
Methadone	60 (5.1%)	131 (9.0%)	0.06
Buprenorphine	331 (28.0%)	525 (36.2%)	0.19
Naltrexone	22 (1.9%)	30 (7.3%)	0.57
Any MOUD	411 (34.8%)	686 (47.2%)	<0.001

**Chi-squared test*

Table 2. Demographics of those receiving methadone following Medicaid approval of methadone (N=1452)

	Methadone (N=131)	**Any MOUD (N=686)**	**No MOUD (N=876)**	**p-value****
Age < 25	22 (16.8%)	124 (18.1%)	501 (57.2%)	<0.001
Rural County	18 (13.7%)	136 (19.8%)	517 (59.9%)	<0.001
Infant NICU admission	4 (3.1%)	22 (3.2%)	38 (4.3%)	0.17
HTN or DM in pregnancy	19 (14.5%)	128 (18.7%)	173 (19.7%)	0.08
Multiparous	81 (61.8%)	412 (60.0%)	538 (61.4%)	0.43
Cesarean Delivery	38 (29.0%)	183 (26.7%)	244 (27.9%)	0.31

***Kruskal Wallis test*

1079 | Inequities in Breastfeeding Patterns Among Patients with HDP at a Southwestern Safety net Hospital

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4:00 PM - 6:00 PM

Objective: Breastfeeding reduces lifelong cardiovascular (CV) risk, particularly in those with a hypertensive disorder of pregnancy (HDP). American Indian (AI) patients experience inequities in both preeclampsia and chronic CV disease. This study investigated newborn feeding differences among women with HDP in a cohort with a representative AI population.

Study Design: This retrospective cohort study analyzed patients with chronic hypertension or HDP using a quality improvement data set. Cases with uncertain diagnoses underwent direct chart review. The primary outcome was exclusive formula feeding (FF). Demographics included race, ethnicity, insurance type, cesarean delivery (CD), and selected comorbidities. Univariate and multivariable analysis used t-tests, chi-square, and logistic regression as appropriate, with a significance level of $p< 0.05$.

Results: Data were analyzed from 975 patients: 198 non-Hispanic white (NHW), 494 Hispanic (H), 178 AI, and 37 non-Hispanic Black (NHB). FF was higher (44%) and exclusive breastfeeding (EB) lower (16%) among AI patients compared to other groups ($p< 0.001$). Univariate analysis revealed increased odds of FF among patients with CD (OR 2.1 [1.6-2.9]), antihypertensive use (3.5 [2.5-4.8]), transfusion (2.2 [1.4-3.5]), and preterm birth (PTB) (13.7 [9.2-20.4]). AI patients were more likely to have diabetes (2.9 [1.8-4.7]), PTB (3.3 [2.0-5.5]), and require antihypertensives (1.8 [1.1-2.9]). FF rates were high (>60%) in PTB cases across all groups. Multivariable analysis showed 80% increased odds of FF among AI patients compared to NHW, controlling for DM, CD, and HTN medications. Among term deliveries and controlling for the above, AI patients had higher odds of FF (aOR 1.9 [1.2-3.0]) as well as lower odds of EB (aOR 0.35 [0.21-0.59]) compared to NHW.

Conclusion: These findings demonstrate a higher rate of FF among AI patients compared to NHW, indicating a potential contributor of inequities in subsequent CV disease. Future educational and quality improvement measures should seek to optimize rates of breastfeeding in this high-risk population.

1080 | Racial Disparities in Maternal Mortality before, during, and after the COVID-19 Pandemic in the US

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4:00 PM - 6:00 PM

Objective: To evaluate racial disparities in maternal mortality before, during, and after the Coronavirus Disease 2019 (COVID-19) pandemic.

Study Design: We conducted difference-in-differences (DID) analyses using the Centers for Disease Control and Prevention's

WONDER database. Data on the number of births and maternal mortality were aggregated into monthly intervals. We compared changes in maternal mortality during pregnancy and up to 1 year after delivery per 100,000 births between White and Black or African Americans before (Jan 2018–Mar 2020), during (Apr 2020–Mar 2022), and after (Apr 2022–Jun 2024) the COVID-19 pandemic. Predicted incidence of maternal mortality and DID with 95% confidence intervals (95% CI) were calculated using negative binomial regression models with interactions between race and periods.

Results: There were 3,694,282 Black individuals and 17,284,929 White individuals who gave birth during that period, with 2,513 (68 per 100,000) and 4,547 (26 per 100,000) death, respectively (**Figure 1**). Mortality per 100,000 from before COVID-19 to during COVID-19 increased by 29.4 (95% CI: 19.8-39.1) for Black and 11.8 (95% CI: 8.2-15.4) for White individuals, with a DID of 17.6 (95% CI: 7.3-28.0) in favor of White (Table 1). Mortality per 100,000 from before COVID-19 to after COVID-19 increased by 9.5 (95% CI: 3.2-15.9) for Black and 1.6 (95% CI: -0.4-3.7) for White with a DID of 7.9 (95% CI: 1.2-14.6), suggesting that Black-White disparity worsened after COVID-19 pandemic.

Conclusion: The findings highlight that racial disparity in maternal mortality, which disproportionately affects Black individuals, was further exacerbated by the COVID-19 pandemic. The gap in maternal mortality between Black and White individuals increased post-pandemic, underscoring the need for targeted interventions to address systemic inequities in maternal healthcare.

Figure 1. Charts showing monthly changes in maternal mortality among Black and White, Jan 2018 to Jun 2024. Dashed lines represent before (Jan 2018–Mar 2020), during (Apr 2020–Mar 2022), and after (Apr 2022–Jun 2024) the COVID-19 pandemic. Each line represents the predicted incidence of maternal mortality (blue is Black and red is White).

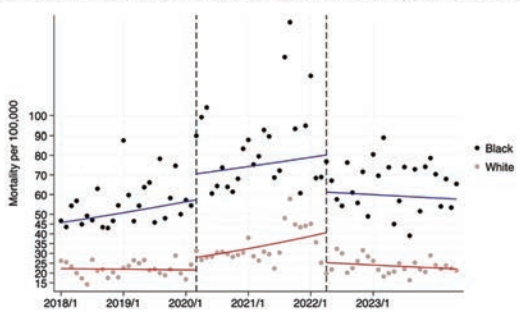

Table 1. Maternal mortality during pregnancy and up to 1 year post-delivery (per 100,000 births).

	Black	White	Difference
Before COVID-19	55.3 (50.9-59.6)	21.9 (20.6-23.3)	33.3 (28.8-37.9)[a]
During COVID-19	84.7 (76.0-93.4)	33.7 (30.4-37.1)	51.0 (41.7-60.2)[a]
After COVID-19	64.8 (60.1-69.5)	23.6 (22.0-25.1)	41.2 (36.3-46.2)[a]
Difference between before COVID-19 and during COVID-19	29.4 (19.8-39.1)	11.8 (8.2-15.4)	17.6 (7.3-28.0)[b]
Difference between before COVID-19 and after COVID-19	9.5 (3.2-15.9)	1.6 (-0.4- 3.7)	7.9 (1.2-14.6)[b]

a Difference between Black and White individuals

b Difference-in-Difference between Black and White individuals

Data is given as count (95% confidence interval).

1081 | An Increased Postpartum Visit Model vs. the Usual Postpartum Visit Model: A Cost-Effectiveness Analysis

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4:00 PM - 6:00 PM

Objective: The postpartum (PP) period is crucial for the health of both mothers and infants, necessitating comprehensive care. Traditional obstetrics care includes a routine postpartum follow-up visit at perhaps 2 to 6 weeks postpartum, but there is growing interest in exploring alternatives. A recent model which utilized Certified Nurse Midwives (CNMs) to provide more frequent PP visits was found to reduce both visits to the Emergency Department as well as hospital readmissions. The current study models the outcomes, costs, and cost-effectiveness of more frequent postpartum care versus a traditional obstetric care approach.

Study Design: A decision-analytic model was created using TreeAgePro software to compare outcomes between using the frequent PP visit model versus the standard approach for postpartum follow-up visits. Our theoretical cohort was 2,356,883, the approximate number of postpartum individuals following low-risk vaginal deliveries annually in the US. Outcomes were emergency department visits, hospital readmissions, costs, and quality-adjusted life years (QALYs). All probabilities were derived from literature. The willingness to pay threshold was $100,000/QALY.

Results: In our cohort, the higher frequency care model was associated with 68,350 fewer emergency department visits (129,629 vs 197,978) and 683 fewer hospital readmissions (1296 vs 1980) (Table 1). There were $1,487,263,566 of increased costs with the higher frequency of visits model and it increased QALYs by 1217 (by 63,878,707 vs 63,877,490). The increased frequency model was not cost-effective with an ICER of $1,222,097/QALY. However, the model becomes cost effective when the costs were varied down to 50% or less of baseline assumed cost of 6 postpartum visits.

Conclusion: The model of more frequent postpartum visits led to fewer ED visits and hospitalizations, but ultimately was not cost-effective. Whether the benefits from this high-frequency visit model would be realized from a virtual visit approach which would reduce costs should be investigated.

Table 1. Outcomes of using the Certified Nurse-Midwife (CNM) Model compared to an Obstetrics (OB) model for postpartum follow-up visits in a cohort of 2,356,883 individuals.

Outcomes	CNM Model	OB Model	Difference*
Emergency department visits	129,629	197,978	68,349
Hospital Readmissions	1296	1980	- 684
Cost (in USD millions)	$2,135,283,478	$648,019,911	$1,487,263,567
QALYs (effectiveness)	63,878,707	63,877,490	1217
Incremental Cost Effectiveness Ratio (ICER)	$1,222,097/QALY		

USD, United States Dollar; QALYs, quality-adjusted life years

1082 | Impact of Patient-Directed Financial Penalties on Appointment Non-Adherence Rates in an Academic Maternal-Fetal Medicine Clinic

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4:00 PM - 6:00 PM

Objective: To examine the impact of patient-directed financial penalties on appointment non-adherence rates within a single

academic institution's maternal-fetal medicine (MFM) outpatient clinic.

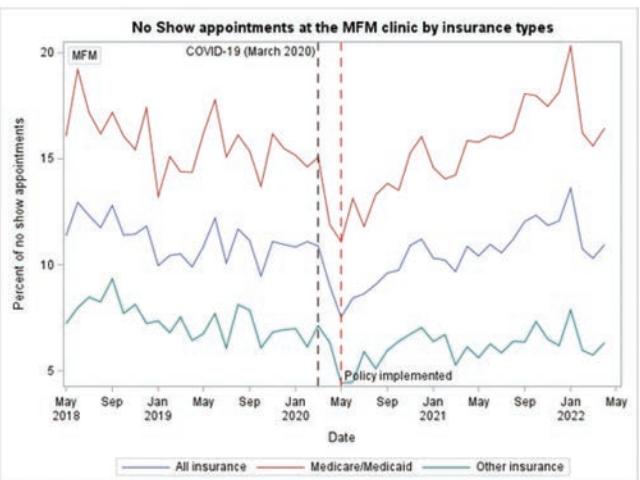
Study Design: This retrospective policy effectiveness study included administrative data from all appointments at Eastern Virginia Medical School's MFM outpatient clinics from May 1, 2018 to April 30, 2022. The institution-wide patient-directed financial penalty for appointment non-adherence was implemented on May 1, 2020. Institutional Review Board approval was waived for this study. An interrupted time series analysis (ITS) stratified by patient insurance type was performed after adjusting the model for the effect of COVID-19.

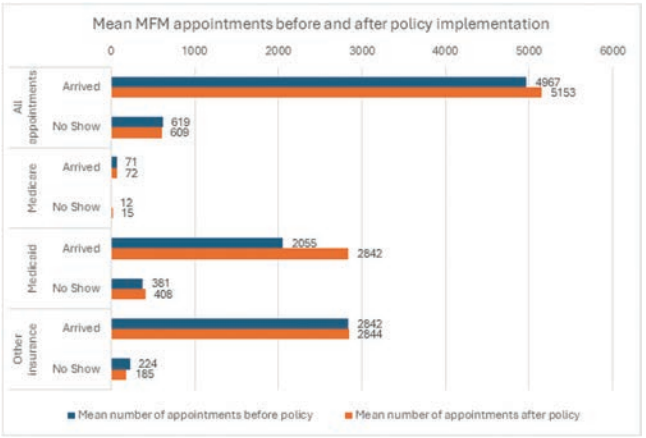
Results: There were 272,335 appointments; 29,452 (10.8%) were not attended. Pre-implementation mean (standard deviation) per month was 5,586 (466) appointments with11.1% (0.99%) non-adherence rate. Post-implementation was 5,762 (429) appointments with 10.6% (1.36%) non-adherence rate. Publically insured patients had a higher non-adherence rate (pre-: 15.60% (1.56%); post-: 15.46% (2.13%)).

Adjusted ITS models observed a statistically significant immediate (1.47% fewer appointments; p = 0.01) and sustained (0.09% additional appointments; p = 0.02) effect on number of non-adherent appointments per month.

Stratified by insurance, non-publically insured patients observed a significant immeidate effect (1.66% fewer appointments; p = 0.02). Publicly insured patients observed a significant sustained effect (0.18% additional appointments; p< 0.01).

Conclusion: A clinically significant reduction in appointment non-adherence was not observed in a single academic center's MFM outpatient clinic after institutional implementation of patient-directed financial penalties for appointment non-adherence. Patient-directed financial penalties for appointment non-adherence may not be an effective strategy for decreasing appointment non-adherence rates. The impact may differ based on patient insurance type.





1084 | Childhood Sexual Abuse Impacts 2nd Trimester Blood Pressure Nadir

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4:00 PM - 6:00 PM

Objective: Childhood trauma (CT) impacts health in adulthood with increased risks of hypertensive disease. Relationships between CT & maternal blood pressure (BP) during pregnancy are less clear. Using the Childhood Trauma Questionnaire (CTQ), we sought to assess relationships between CT & BP in each trimester (TRI) & BP nadir in the 2nd TRI.

Study Design: We performed a prospective longitudinal cohort study investigating associations between trauma & pregnancy outcomes at an urban safety net hospital. Participants who self-identified as Black completed the CTQ, a validated measure of 5 trauma domains in 1st TRI. CT was determined by CTQ total score: ≥35 with CT, < 35 no CT. Systolic (SBP) and diastolic (DBP) pressures were recorded in each TRI. SBP/DBP nadir was calculated (2nd TRI SBP/DBP–1st TRI SBP/DBP) & compared between subjects with & without CT. Continuous variables were compared using Student T-tests or Rank Sum Tests. Categorical variables were compared using Chi-Square tests. Multivariable linear regression was performed controlling for age, race, 1st TRI body mass index, & chronic hypertension.

Results: Of N = 335, 34.3% & 65.6% had no CT & CT exposure respectively (Table 1). There were no differences in 1st, 2nd or 3rd TRI SBP/DBP or 2nd TRI SBP/DBP nadir between groups (Table 2). CT scores were further subtyped into 3 groups: sexual abuse (SA), physical abuse (PA) and emotional abuse (EA). SA scores were associated with lower 1st TRI SBP (β = -0.06, 95% CI -0.14-0.01, p = 0.09). No significant differences in 1st TRI SBP were seen in those with PA or EA. Those with SA had a lower 2nd trimester SBP nadir compared to those without SA (-1.7±10.5 vs -6.3±11.2, p = 0.04).

Conclusion: CT is a concerning problem affecting many reproductive aged individuals. Using the detailed CTQ, our data innovatively demonstrates SA in childhood may mitigate vascular relaxation between 1st & 2nd TRI, a time where vascular relaxation is physiologically necessary. Future studies need to evaluate

mechanisms driving the relationship between CT subtypes & gestational vascular dysregulation.

TABLE 1: DEMOGRAPHIC DATA			
	CT* 34.3% (115)	NO CT* 65.6% (220)	p-value
Age (mean±SD**)	26.9±5.2	27.3±5.6	0.62
Health Insurance			0.42
Yes	80.36% (135)	76.85% (83)	
No	10.7% (18)	9.26% (10)	
Unknown	8.9% (15)	13.9% (15)	
Body Mass Index (mean±SD**)	31.7±9.2	32.6±9.5	0.41
Chronic Hypertension	25.6% (38)	25.8% (22)	0.97
Pre-Gestational Diabetes	7.43% (11)	7 (8.24%)	0.82

*Childhood Trauma
**Standard Deviation

Table 2: Blood Pressure Data

Blood Pressure (Mean ± SD**)	No CT* 65.6% (220)	CT 34.3% (115)	p-value
First trimester Systolic BP***	124±14	121.2±12.13	0.18
Second trimester Systolic BP	120.3±15.4	118.5±11.2	0.38
Third trimester Systolic BP	125 ±14.4	123.7±14.1	0.52
1st Trimester Diastolic BP	71.4±1.4	70.1±1.0	0.41
2nd Trimester Diastolic BP	67.6±1.6	66.7±0.73	0.61
3rd Trimester Diastolic	73.9±11.4	73.3±9.8	0.73
Systolic BP Nadir (mean)	-5.9 ±13.3	-2.6±12.3	0.19
Diastolic BP Nadir (mean)	-4.9 ±11.3	-3.0± 10.8	0.39

*Childhood Trauma
**Standard Deviation
***Blood Pressure

1085 | Neighborhood Deprivation as a Predictor of Congenital Syphilis

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4:00 PM - 6:00 PM

Objective: In the US, congenital syphilis (CS) has increased 464% since 2001, a trend that has been even more pronounced in Louisiana, a place with both high socioeconomic deprivation at the individual and neighborhood levels. Area Deprivation Index (ADI) is a geographic measure of socioeconomic disadvantage that quantifies neighborhood-level limitations to material resources. High ADI is associated with a range of adverse health outcomes. We hypothesize that high ADI is a predictor of CS.

Study Design: We performed a retrospective cohort study of patients between 18-45 years old with at least one prenatal visit and delivery within a single large health system in Louisiana between 2015-2023. Incomplete charts and those without any prenatal syphilis testing were excluded. Patients were stratified as high ADI if their home address census block ranked above the 75th percentile; controls were those below the highest quartile. CS was defined by Centers for Disease Control case criteria. Baseline and pregnancy characteristics were compared using chi square or Wilcoxon Ranked-Sum test where appropriate. Outcomes were compared by regression analysis controlling for individual level socioeconomic deprivation (indicated by public insurance) generating odds ratio and 95% confidence intervals.

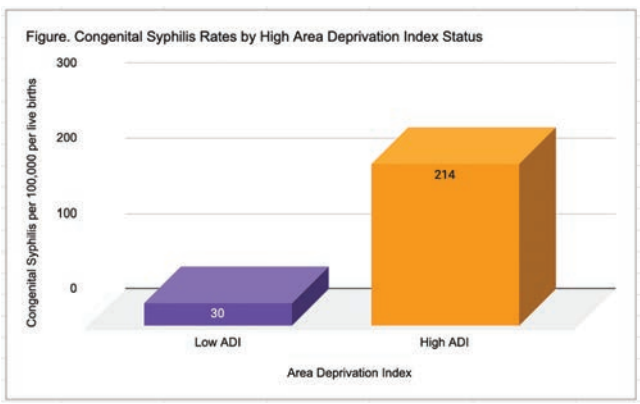
Results: Among 56,654 pregnancies meeting inclusion criteria, 17,335 patients (30.5%) resided in high deprivation neighborhoods. High ADI residence was associated with younger age, Black race & public insurance (Table). Among 49 positive CS cases, 37 (75.5%, Table) occurred among patients in high ADI census blocks, corresponding with a congenital syphilis rate of 214 per 100,000 live births compared to 30 per 100,000 live births among non-high ADI pregnancies (aOR 5.1, 95% CI 2.7–9.8). When analyzed in a continuous fashion, there is a positive correlation between CS and high ADI, with each increasing decile representing an 80% increased risk for CS.

Conclusion: High neighborhood deprivation was highly associated with congenital syphilis even when controlling for individual-level socioeconomic deprivation.

Table. Baseline characteristics of pregnancies by high Area Deprivation Index (ADI) status, defined as >75%

	Non-High ADI		High ADI		
	N or Median	(%) or [IQR]	N or Median	(%) or [IQR]	P
Median maternal age in years [IQR]	29.0	[25.0, 33.0]	26.0	(22.0, 31.0)	<.0001
Black race (%)	13,524	(34.7%)	4,839	(66.6%)	<.0001
Hispanic ethnicity (%)	3,961	(10.2%)	1,527	(8.9%)	<.0001
Public Insurance (%)	14,022	(35.7%)	10,713	(61.8%)	<.0001

IQR, interquartile range



1086 | Displaying 1-year Versus Lifetime Pay-offs In the Perinatal Decision Analyses

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4:00 PM - 6:00 PM

Objective: When the interests of maternal and fetal patients do not align, pregnancy presents a unique challenge to health economic evaluations. The common practice on perinatal topics has been combining all health pay-offs during the lifetime for both mothers and babies in the equation. However, using lifetime evaluation may not truly reflect the complicated decision-making considerations in real-life practice. The objective of this study is to construct a decision tree to compare immediate delivery and expectant management in a hypothetical clinical scenario to compare the preferred decision when 1-year versus lifetime pay-offs are used.

Study Design: This is a decision analysis in a hypothetical clinical situation when choosing immediate delivery or expectant management is an equipoise. Key assumptions are 1) only one maternal complication is included, its probability is 10% when seeking immediate delivery, while increases to 20% if pregnancy is prolonged for a week, and 25% if prolonged for two weeks; 2) neonatal demise, a short-term complication (i.e. respiratory distress syndrome), and a long-term complication (i.e. developmental delay) are considered for neonatal outcomes.

The probabilities of neonatal complications are derived from literature. Quality Adjusted Life Week (QALW) was calculated as a product of utility and duration.

Results: When maternal complication lasts lifetime, preferred strategies between the 1-year or lifetime evaluation differ at or before 31 weeks. At and after 32 weeks, both evaluation methods favor immediate delivery due to maternal benefits (Table 1). However, when maternal complication is presumed as short-term only, preferred strategies between the 1-year and lifetime evaluation differ almost throughout the span of gestational age.

Conclusion: Choosing between immediate delivery versus expectant management is a complicated decision that requires balancing the maternal and neonatal risks and benefits. Our study supports individualized consideration when the risk of maternal complication is high, and the impact is long lasting.

Table 1. Comparison of Quality Adjusted Life Week (QALW) of Mother and Baby in a Hypothetical Clinical Situation When Maternal Complication Is Long-term *

		1 year		Lifetime	
		Delivery	Expectant	Delivery	Expectant
28 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	44	45 (↑1)	3462	3469 (↑7)
29 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	45	46 (↑1)	3469	3511 (↑42)
30 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	46	46	3511	3549 (↑38)
31 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	46	49 (↑3)	3549	3557 (↑8)
32 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	49	49	3557	3557
33 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	49	50 (↑1)	3557	3586 (↑29)
34 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	50	51 (↑1)	3586	3605 (↑19)
35 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	51	51	3605	3610 (↑5)
36 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	51	52 (↑1)	3610	3623 (↑13)
37 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	52	52	3623	3623
38 weeks	Mother	51 (↑1)	50	1529 (↑31)	1498
	Baby	52	52	3623	3628 (↑5)

(↑#) means the QALW is higher by # of weeks in this strategy compared to the other strategy.
The highlight in green indicates this is the preferred strategy when considering both maternal and baby's QALW.
* Model assumptions: 1) pregnancy is presumed to extend by one week if expectantly managed; 2) life expectancy is presumed 30 years for mother after the delivery, and 70 years for baby; 3) only one maternal complication with a utility of 0.8 is considered; 4) the probability of the maternal complication when seeking immediate delivery is presumed at 10%, while in the expectant management arm, it increases to 20% if pregnancy is prolonged for a week, and 25% if pregnancy is prolonged for two weeks; 5) maternal complication lasts lifetime; 6) baby demise, a short-term complication (i.e. respiratory distress syndrome, utility of 0.8), and a long-term complication (i.e. developmental delay, utility of 0.6) are considered for fetal or neonatal outcomes.

Table 2. Comparison of Quality Adjusted Life Week (QALW) of Mother and Baby in a Hypothetical Clinical Situation When Maternal Complication Is Short-term *

		1 year		Lifetime	
		Delivery	Expectant	Delivery	Expectant
28 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	44	45 (↑1)	3462	3469 (↑7)
29 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	45	46 (↑1)	3469	3511 (↑42)
30 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	46	46	3511	3549 (↑38)
31 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	46	49 (↑3)	3549	3557 (↑8)
32 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	49	49	3557	3557
33 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	49	50 (↑1)	3557	3586 (↑29)
34 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	50	51 (↑1)	3586	3605 (↑19)
35 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	51	51	3605	3610 (↑5)
36 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	51	52 (↑1)	3610	3623 (↑13)
37 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	52	52	3623	3623
38 weeks	Mother	51 (↑1)	50	1559 (↑1)	1558
	Baby	52	52	3623	3628 (↑5)

(↑#) means the QALW is higher by # of weeks in this strategy compared to the other strategy.
The highlight in green indicates this is the preferred strategy when considering both maternal and baby's QALW.
* Model assumptions: 1) pregnancy is presumed to extend by one week if expectantly managed; 2) life expectancy is presumed 30 years for mother after the delivery, and 70 years for baby; 3) only one maternal complication with a utility of 0.8 is considered; 4) the probability of the maternal complication when seeking immediate delivery is presumed at 10%, while in the expectant management arm, it increases to 20% if pregnancy is prolonged for a week, and 25% if pregnancy is prolonged for two weeks; 5) duration of maternal complication only lasts 1 year; 6) baby demise, a short-term complication (i.e. respiratory distress syndrome, utility of 0.8), and a long-term complication (i.e. developmental delay, utility of 0.6) are considered for fetal or neonatal outcomes.

1087 | Electrocardiogram Changes Associated with Pregnancy and Pregnancy Trimesters

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4:00 PM - 6:00 PM

Objective: Pregnancy is a physiologic high-volume state. Physiologic electrocardiogram (ECG) changes in pregnancy have been reported but not well characterized. We hypothesize that certain ECG features are more likely to be present in pregnant compared to non-pregnant individuals, reflecting physiologic cardiac volume and compliance changes. The objective of this study is to evaluate ECG changes in normal pregnancies by trimester compared to women who are not pregnant.

Study Design: This is an analysis of a database that includes 22,034 ECGs on 7,298 individual patients from 18-50 years of age who were pregnant at least once between 2011 to 2024 in a single tertiary medical center. Univariate and multiple generalized linear mixed effect models were performed to evaluate associations between four ECG features (QRS interval, QTc interval, PR interval, and heart rate) in pregnancy and by trimester compared to those in women who were not pregnant or within 6 months postpartum.

Results: After excluding patients with pre-existing cardiac morbidity, or affected hypertensive disorders of pregnancy, 5,574 ECGs from 2,988 patients were included: 3,423 of ECGs (61%) were obtained outside of pregnancy or the 6 months postpartum period, 2,151 (39%) of ECGs during pregnancy or postpartum. Shorter QRS duration, QTc interval, PR interval, and higher heart rate were associated the pregnancy or 2 weeks postpartum state (Table 1). The shorter QRS duration, PR interval, and higher heart rate were associated with the second, third trimester, and two weeks postpartum, and these changes resolved within 6 months postpartum (Table 2).

Conclusion: Four ECG features were found to be associate with pregnancy. The association is present particularly in the 2nd and 3rd trimester when cardiovascular changes are most pronounced. Future research includes extracting subtle patterns beyond well characterized ECG features to further investigate associations with normal pregnancy and to evaluate how they can be used to predict pathologic cardiovascular changes associated with pregnancy and postpartum.

Table 1. Adjusted Odds of ECG Features Associated with Pregnancy Compared to State Outside of Pregnancy or Postpartum*

Features	OR (95%CI)
QRS Duration**	0.72 (0.6, 0.85)
QTc Interval**	0.93 (0.87, 0.98)
PR Interval**	0.79 (0.73, 0.85)
Heart Rate**	1.55 (1.42, 1.7)

All Odds ratio (OR) have p-value < 0.001
*Multivariate logistic regression was performed to adjust for other ECG features listed in the table.
** Rescaling was performed via dividing by 10.
95%CI= 95% confidence interval.

Table 2: ECG Features Associated with Trimesters Compared to State Outside of Pregnancy or Postpartum*

	QRS Duration Estimates (95%CI)	QTc Interval Estimates (95%CI)	PR Interval Estimates (95%CI)	Heart Rate Estimates (95%CI)
Trimester 1	-0.05 (-0.16, 0.05)	-0.05 (-0.32, 0.23)	-0.16 (-0.34, 0.03)	0.08 (-0.12, 0.27)
Trimester 2	**-0.14 (-0.23, -0.05)**	**0.27 (0.04, 0.51)**	**-0.33 (-0.49, -0.17)**	**0.43 (0.26, 0.6)**
Trimester 3	**-0.25 (-0.34, -0.17)**	0.05 (-0.16, 0.26)	**-0.73 (-0.88, -0.58)**	**1.18 (1.03, 1.33)**
Within 2 Weeks Postpartum	**-0.18 (-0.32, -0.04)**	**-0.72 (-1.09, -0.35)**	**-0.37 (-0.61, -0.12)**	**0.73 (0.47, 0.99)**
Between 2 Weeks to 6 Months Postpartum	0.16 (0, 0.31)	0.18 (-0.23, 0.58)	-0.03 (-0.29, 0.23)	0.19 (-0.09, 0.47)

*Multiple generalized linear mixed effect models with a random effect for pregnancy identifier were fit to adjust for other ECG features listed in the table
** Rescaling was performed via dividing by 10
Bolded estimates and 95%CI (95% confidence interval) have p-value < 0.05.

1088 | Trends in Uterine Rupture and Perinatal Outcome Among Individuals Undertaking Trial of Labor After Cesarean

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4:00 PM - 6:00 PM

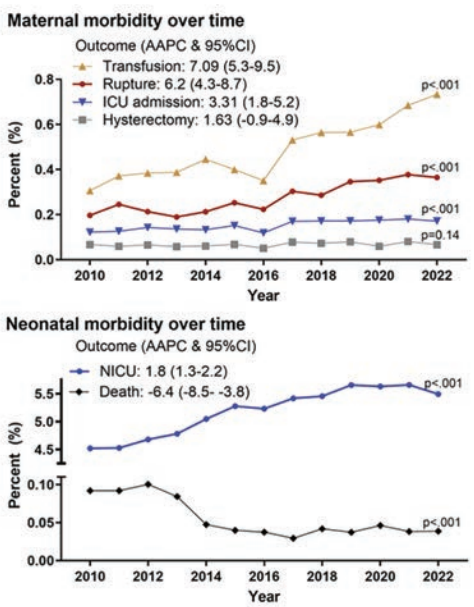
Objective: ACOG endorses trial of labor after cesarean (TOLAC) as a reasonable alternative to repeat cesarean delivery (CD). Concordantly, national rates of TOLAC have increased but the risk of uterine rupture remains a serious complication. We aimed to evaluate U.S. trends in uterine rupture and perinatal outcomes among individuals undertaking TOLAC from 2010 to 2022.

Study Design: This was a population-level retrospective cohort study using natality files in the National Vital Statistics System (NVSS) from 2010-2022. We included individuals with singleton, cephalic, term pregnancies undertaking TOLAC with 1 or 2 prior CD. The primary outcome was uterine rupture. Secondary outcomes included unplanned hysterectomy, blood transfusion, maternal or neonatal ICU admission, and neonatal death. Baseline characteristics were compared among those with and without uterine rupture. Temporal trends in outcomes were characterized using JoinPoint regression with average annual percentage change (AAPC) and 95% CI reported. Log binomial modeling estimated changes in maternal outcomes by 1-year increments adjusting for confounding.

Results: Of 1,016,073 deliveries included, uterine rupture occurred in 2,888 (0.28%). Those with uterine rupture were more likely to be older, have gestational diabetes, and be diagnosed with a hypertensive disorder of pregnancy. Rates of uterine rupture, transfusion, and maternal and neonatal ICU admission increased over time, while rates of hysterectomy were not significantly different over time and rates of neonatal death declined (Figure). In adjusted modeling, each 1-year increment remained significantly associated with higher rates of uterine rupture, transfusion, and admission to ICU but absolute rates remained low (Table).

Conclusion: While national rates of uterine rupture increased over time, uterine rupture continues to be rare. Counseling regarding mode of delivery among those with a prior CD should continue to weigh maternal and neonatal outcomes.

Figure. Trends in uterine rupture and perinatal outcomes among those undertaking trial of labor after cesarean (TOLAC) from 2010 to 2022



Average Annual Percentage Change (AAPC) with 95% confidence interval (CI) from joinpoint analysis. Maternal outcomes with zero joinpoints (i.e., linear), neonatal death estimated with two joinpoints, and NICU admission with one joinpoint. Intensive care unit (ICU), neonatal intensive care unit (NICU)

Table. Unadjusted and adjusted estimate of uterine rupture and perinatal outcomes over time among individuals undertaking trial of labor after cesarean (TOLAC)

	Incidence			AAPC*	
Outcomes	2010-14 (n=301,030)	2015-19 (n=438,407)	2020-22 (n=275,784)	Unadjusted	Adjusted†
Maternal					
Uterine rupture	637 (0.21)	1,244 (0.28)	1,007 (0.37)	6.25 (5.14-7.38)	4.28 (3.13-5.44)
Unplanned hysterectomy	187 (0.06)	308 (0.07)	191 (0.07)	1.58 (-0.54-3.75)	0.14 (-2.08-2.41)
Blood transfusion	1162 (0.39)	2,126 (0.48)	1,859 (0.67)	7.17 (6.31-8.02)	5.99 (5.11-6.90)
ICU admission	400 (0.13)	690 (0.16)	485 (0.18)	3.32 (1.89-4.79)	2.09 (0.58-3.62)
Neonatal					
Neonatal death	244 (0.1)	163 (0.0)	113 (0.0)	–	–
NICU admission	14,250 (4.7)	23,712 (5.4)	15,417 (5.6)	–	–

Data are n (%). Intensive care unit (ICU), neonatal intensive care unit (NICU), confidence interval (CI)
*Average Annual Percent Change (AAPC) estimate from log binomial regression of outcome difference for 1-year difference, estimate transformed as 100*exp(B)-1. Year parameterized linearly for maternal endpoints is a validated assumption per joinpoint analysis; data do not support assumption of linearity for neonatal outcomes and therefore estimates are not provided.
†Adjusted model includes maternal age, delivery weight, tobacco use, interval since last delivery, induction of labor, augmentation of labor, year of delivery.

1089 | Maternal Cytokine Expression in Mice with Gestational Breast Cancer

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4:00 PM - 6:00 PM

Objective: Immunosuppressive cytokines are implicated in both cancer progression and prenatal health outcomes. This study aims to examine cytokine levels in the plasma of tumor-bearing pregnant mice using a murine model of gestational breast cancer.

Study Design: On estrous day 11, nulliparous female BALB/c mice were either injected with 20K 4T1 MCherry tumor cells in PBS (20uL) a model for triple-negative breast cancer, or PBS (20uL) injected into the right 4th mammary duct (5 per group). These nulliparous BALB/c female mice were bred with BALB/c males (N = 10). Mice were euthanized on gestational day 19: pup numbers and fetal weights were recorded and maternal blood was collected. Isolated serum was frozen and analyzed using a cytokine array (Proteome Profiler Mouse Array Kit).

Results: Three of 5 mice injected with tumor cells and 1 of 5 mice injected with PBS were pregnant at time of specimen collection. Mice injected with tumor cells developed small but grossly visible mammary tumors. The mouse injected with PBS had 5 pups weighing ~1.3g/pup, whereas mice injected with tumor cells had 1-6 pups weighing ~1.2g/pup. Cytokine array demonstrated absence of pro-inflammatory cytokines in both serum samples and similar expression of CXCL13 and GM-CSF. However, tumor-injected serum demonstrated decreased IL-10, an anti-inflammatory cytokine implicated in tumorigenesis and pregnancy outcomes (4.27 units control to tumor-injected serum expression), IL-3, and IL-4 (3.95 and 2.09 units control to tumor-injected, respectively), regulators of adaptive immunity.

Conclusion: There does not appear to be a difference in pro-inflammatory cytokine expression in serum of pregnant tumor-affected mice; however, there is decreased anti-inflammatory cytokine expression among individual markers. This was a pilot analysis on a small sample size; we plan to perform cytokine analysis on a larger murine sample size, to validate findings in the pregnant human population, and to examine murine cytokine expression of amniotic fluid and pups in this gestational breast cancer model.

1090 | Prevalence of and Factors Associated with Iron Deficiency at the time of Delivery

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4:00 PM - 6:00 PM

Objective: Iron deficiency (ID) and iron deficiency anemia (IDA), the end-stage manifestation of ID are associated with maternal and fetal morbidity in pregnancy and postpartum. While pregnant individuals are screened for anemia, there is no consensus on the role of routine ID screening. Our study sought to assess the prevalence of ID and IDA at the time of delivery.

Study Design: This pilot, single-site, prospective cohort study recruited patients with singleton pregnancies at ≥ 36 weeks of gestation during routine prenatal care visits. Patients who had received IV iron during the pregnancy were excluded. Participants completed surveys about their use of iron supplementation during pregnancy and had iron studies and hemoglobin measured on admission for delivery. We report the prevalence of ID and IDA by varying definitions: ferritin < 30 ng/mL, transferrin saturation (TSAT) < 20%, or either criterion; anemia was defined as Hgb < 11 g/dL. Patient characteristics and the rates of anemia were compared among those with and without ID by ferritin criteria.

Results: Of 92 patients included, 45 (49%) had ferritin < 30 ng/mL, 52 (57%) had TSAT < 20%, and 60 (65%) had either (Figure 1). 10 patients (11%) had anemia, of which 8 (80%) had ferritin < 30 ng/mL. Patients with ID were more likely to be multiparous (60% vs. 36%, p = 0.04) and have higher BMI at delivery (median (IQR) 32.0 (28.5-34.3) vs. 29.2 (27.3-31.7), p = 0.02; Table 1). 13% of the subjects self-identified as Asian; none had ID. Although the rates of anemia in the 3rd trimester were similar, 19 patients without ID (40%) vs. 5 with ID (11%) reported taking an iron (p = 0.001). On admission, 8 (18%) with ID and 2 (4%) without ID were anemic (p = 0.048).

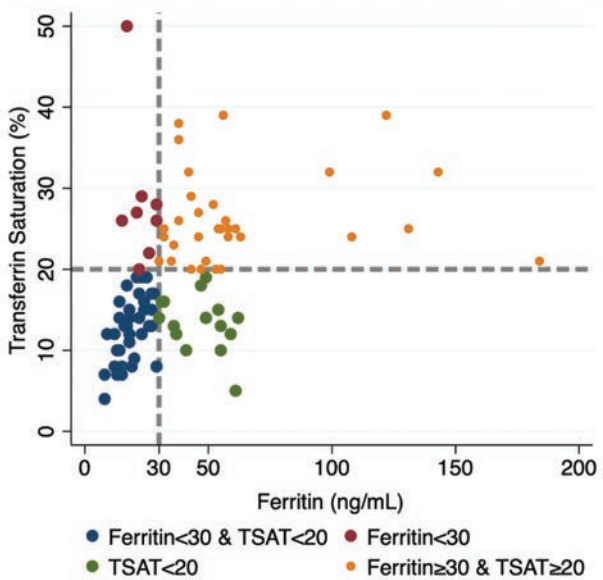
Conclusion: ID was highly prevalent at the time of delivery, exceeding previously published estimates, and associated with anemia. Further research is needed to evaluate the impact of ID at delivery as well as the treatment of ID with and without anemia on perinatal outcomes.

Table 1: Characteristics of patients with and without iron deficiency at delivery

Characteristics	Iron Deficiency N=45	No Iron Deficiency N=47	P-value
Maternal age, years	34.6 (4.9)	33.6 (3.6)	0.28
Self-reported race			
American Indian or Alaska Native	1 (2%)	0	<0.001
Asian	0	12 (26%)	
Black	1 (2%)	3 (6%)	
Other Race	2 (4%)	1 (2%)	
White	41 (91%)	31 (66%)	
Ethnicity			
Hispanic	5 (11%)	4 (9%)	0.48
Not Hispanic	38 (84%)	39 (83%)	
Prefer not to say/Decline	1 (2%)	0	
Unavailable	1 (2%)	4 (9%)	
Nulliparous	18 (40%)	30 (64%)	0.04
GA at delivery, weeks	40.3 (39.4, 40.9)	39.7 (39.1, 40.7)	0.12
BMI at delivery, kg/m²	32.0 (28.5, 34.3)	29.2 (27.3, 31.7)	0.02
Scheduled cesarean delivery	2 (64	10 (21%)	0.03
Iron supplement			
Reported taking iron supplement	5 (11%)	19 (40%)	0.001
Prescribed iron supplement	3 (7%)	5 (11%)	0.71
Anemia			
1st trimester	1 (2%)	0	
3rd trimester	7 (16%)	8/44 (18%)	1.00
At delivery	8 (18%)	2 (2%)	0.048

Data displayed as n (%), mean (SD), or median (IQR).
ID, iron deficiency; GA, gestational age; BMI, body mass index.

Figure 1: Prevalence of ID at delivery using ferritin and TSAT



1091 | Patient-Reported unmet Health-Related Social Needs in Patients with and without Preterm Birth

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4:00 PM - 6:00 PM

Objective: Preterm birth (PTB) is the leading cause of infant mortality and has been linked to social determinants of health (SDOH) such as economic stability, social and community context, and limited healthcare access. There is little evidence on the impact of unmet health-related social needs (HRSNs), the patient-level manifestations of these SDOH, on birth outcomes.

We sought to characterize the impact of patient-reported HRSNs on PTB.

Study Design: Retrospective cohort study of pregnant patients who completed a screen at least once in pregnancy for HRSNs in a regional health-care system from 5/2020 to 3/2024. HRSNs in the domains of education, employment, family care, food, housing, medication affordability, transportation, and household utilities affordability were identified through a validated screening tool. The primary outcome was birth before 37 weeks' gestation. Generalized estimating equations were generated to determine adjusted odds ratios (aOR) for the association between preterm birth and HRSN domains. Models were adjusted for advanced maternal age, nulliparity, hypertensive disorders of pregnancy, pre-existing diabetes mellitus, and pregravid body mass index.

Results: There were 2,055 pregnancies screened for HRSNs that met inclusion criteria, of whom 156 (7.6%) had a PTB. Patients with a PTB were significantly more likely to report food insecurity (14.1% vs 8.2%; aOR 2.09 95% CI 1.22-3.59) and unemployment (19.2% vs 11.2%; aOR 1.74 95%CI 1.07-2.81). The presence of ≥ 2 or ≥ 3 HRSNs was associated with increased odds of PTB: ≥ 2 HRSNs aOR 1.68 (95% CI 1.12-2.52); ≥ 3 HRSNs aOR 1.81 (95% CI 1.11- 2.95). Other HRSNs represented in the cohort were not significantly associated with risk of PTB.

Conclusion: Patient-reported food insecurity and unemployment are independently associated with PTB. Further, HRSNs in 2 or more of any domains have nearly the same impact. Future research is needed to understand the mechanisms of these associations to inform critically needed patient and policy level interventions to reduce PTB.

TABLE 1: Rates of preterm birth by health-related social needs

	Term birth (n=1,899)	Preterm birth (n=156)
Patient Factors		
Maternal age at delivery (mean, SD)	32.6 (5.2)	33.8 (5.4)
Nulliparity	1033 (54.4%)	79 (50.6%)
Hypertensive disorders of pregnancy*	355 (18.7%)	56 (35.9%)
Pre-existing diabetes mellitus	25 (1.3%)	6 (3.8%)
Pregravid BMI (mean, SD)	26.6 (6.6)	27.7 (7.0)
HRSNs		
Transportation	66 (3.5%)	7 (4.5%)
Utilities	105 (5.5%)	10 (6.4%)
*Unemployment**	213 (11.2%)	30 (19.2%)
Family care	54 (2.8%)	3 (1.9%)
*Food insecurity**	156 (8.2%)	22 (14.1%)
Paying for medication	47 (2.5%)	6 (3.8%)
Residential stability	143 (7.5%)	17 (10.9%)
Number of HRSNs		
0	1210 (63.7%)	90 (57.7%)
1+	689 (36.3%)	66 (42.3%)
*2+**	388 (20.4%)	47 (30.1%)
*3+**	219 (11.5%)	28 (17.9%)

*p-value < 0.05

SD, standard deviation; BMI, body mass index; HRSNs, health-related social needs

TABLE 2: Adjusted odds ratio for preterm birth less than 37 weeks gestation based on HRSN burden and individual HRSNs

	Preterm birth (less than 37 weeks gestation)	
	*aOR (95% CI)**	*p-value*
MODEL 1: HRSN Burden		
1+	1.30 (0.89, 1.87)	0.17
2+	**1.68 (1.12, 2.52)**	**0.01**
3+	**1.81 (1.11, 2.95)**	**0.02**
MODEL 2: HRSNs		
Transportation	1.59 (0.70, 3.63)	0.27
Paying utilities	1.41 (0.70, 2.84)	0.34
Unemployment	**1.74 (1.07, 2.81)**	**0.02**
Family care	0.51 (0.12, 2.13)	0.35
Food insecurity	**2.09 (1.22, 3.59)**	**0.008**
Paying for medication	0.78 (0.39, 1.55)	0.48
Residential stability	2.43 (0.99, 5.94)	0.05

* Models adjusted for advanced maternal age, nulliparity, hypertensive disorders of pregnancy, pre-existing diabetes mellitus, and pregravid body mass index.

HRSN, health-related social need; aOR, adjusted odds ratio

1092 | State Partisan Divide and Intimate Partner Violence before and during Pregnancy

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4:00 PM - 6:00 PM

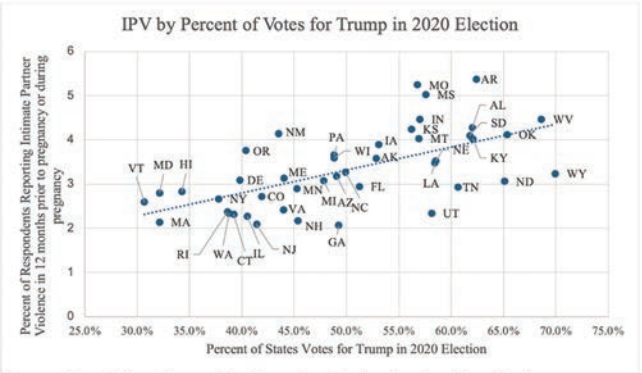
Objective: Pregnancy is a high-risk period for intimate partner violence (IPV), with greater risk for adverse pregnancy outcomes among people who experience IPV. Our objective was to evaluate the association between a state's percent vote for Donald Trump in the 2020 presidential election and statewide IPV rates before and during pregnancy reported by birthing people.

Study Design: Data from 2016-2020 from 44 states using the Pregnancy Risk Assessment Monitoring System (PRAMS) were linked to the state percent vote for Trump in the 2020 election. PRAMS surveys postpartum people two to four months after delivery. The survey asks participants if their current or past husband/partner "push, hit, slap[ped], kick[ed], choke[d], or physically hurt [them] in any way" in the 12 months before pregnancy and/or during pregnancy. Respondents who answered "yes" to either question were defined as reporting IPV. Our main outcome was the mean state-reported prevalence of IPV in the 12 months before or during pregnancy. Multivariable Poisson regression estimated the association between the 2020 state percent vote for Trump and the mean IPV rate reported, controlling for individual-level sociodemographic variables. Sensitivity analysis with 2016 election data was performed.

Results: Among 190,800 respondents representing an estimated population of 9,762,956, 3.1% of respondents reported experiencing IPV before or during pregnancy. There was a significant positive association ($r = 0.62$, $p < 0.001$) between mean state IPV rate and state percent vote for Trump in 2020 (Figure). After adjusting for respondent sociodemographic factors, each 10-point increase in the state percent vote for Trump was associated with a nine percent greater likelihood of reporting IPV before or during pregnancy (aIRR 1.09, 95% CI 1.05, 1.13; Table). Findings were similar for 2016 election data (aIRR 1.08, 95% CI 1.04, 1.13).

Conclusion: Political and cultural environments are potential contributing factors to IPV prevalence before and during pregnancy. The state percent vote for Trump may be a signal of a greater prevalence or toleration of abusive behavior.

FIGURE, Pearson correlation between state percent vote for Trump in the 2020 election[1] and reported IPV in the 12 months before or during pregnancy[2]



[1]Percent of population who voted for Trump from the American Presidency Project
[2]Percent of respondents experiencing intimate partner violence (IPV) in the 12 months before or during pregnancy from Pregnancy Risk Assessment Monitoring System 2016-2020 data. All respondents include n=190,800 (total weighted population *n*=9,762,956) and respondents reporting IPV includes n=7,859 (total weighted population *n*=342,293) with births living in 44 states and the District of Columbia. District of Columbia excluded from analysis. California, Idaho, Nevada, Ohio, South Carolina, and Texas not included in PRAMS dataset.
Pearson correlation 0.62, p<0.000

TABLE, Poisson regression results for reported IPV[1] by respondent sociodemographic characteristics and state percent vote for Trump in the 2020 election

	All respondents, Percent (*n*=190,800)	**Respondents reporting IPV in 12 months before or during pregnancy, Percent (*n*=7,859)**	**Incident Rate Ratio and 95% CI[2]**
Sample percent	100	3.1	
Percent voted for Trump[3]	47.2		1.09 (1.05, 1.13)

[1]Percent of respondents experiencing intimate partner violence (IPV) in the 12 months before or during pregnancy from Pregnancy Risk Assessment Monitoring System 2016-2020 data. All respondents include n=190,800 (total weighted population *n*=9,762,956) and respondents reporting IPV includes n=7,859 (total weighted population *n*=342,293) with births living in 44 states and the District of Columbia. District of Columbia excluded from analysis. California, Idaho, Nevada, Ohio, South Carolina, and Texas not included in PRAMS dataset.
[2]Poisson regression
[3]Percent of population who voted for Trump from the American Presidency Project

1093 | Exposed Fetal Membranes Prior to Physical Examination-Indicated Cervical Cerclage and Time to Delivery

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4:00 PM - 6:00 PM

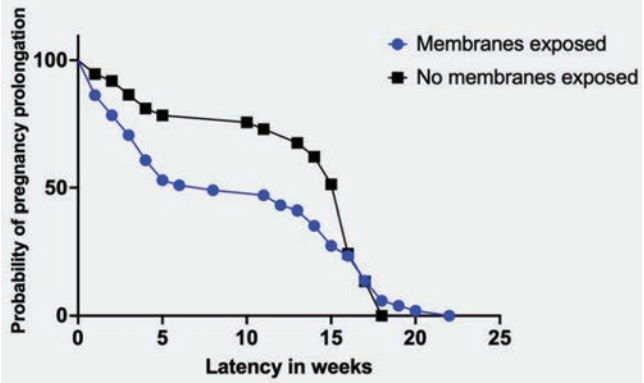
Objective: Physical examination-indicated cerclage (PEIC) is considered in the setting of painless cervical dilation with or without exposed fetal membranes. We hypothesize that exposed fetal membranes is a poor prognostic sign and associated with shortened latency from cerclage to delivery.

Study Design: This is a retrospective cohort study of all singleton pregnancies that underwent PEIC at a Level IV center between January 2015 and March 2024. Patients with no delivery records available for review were excluded. We compared demographic and clinical characteristics, latency from cerclage to delivery, and perinatal outcomes among patients with and without exposed fetal membranes at the time of surgery.

Results: Ninety-three cases of PEIC were analyzed: 56 (60%) had exposed fetal membranes and 37 (40%) did not. There were no significant differences in the distribution of age, race, parity, or medical comorbidities between groups. Latency period was significantly shortened in patients with exposed membranes compared to patients without (median 5 vs 16 weeks, P = 0.008) (Figure 1). Exposed membranes was associated with higher rates of preterm birth at < 24, < 28, < 32, and < 37 weeks gestation respectively (32 vs 11%, P = 0.02; 55 vs 22%, P = 0.001; 57 vs 27%, P = 0.004; and 73 vs 46%, P = 0.01). Exposed membranes was also associated with higher rates of prelabor premature rupture of membranes (PPROM) and intraamniotic infection (IAI) (27 vs 8%, P = 0.008; 12 vs 2%, P = 0.04) (Table 1).

Conclusion: Sixty percent of patients with PEIC had exposed fetal membranes at the time of cerclage placement. Patients with exposed membranes had shortened latency periods and higher rates of preterm delivery < 24, < 28, < 32, and < 37 weeks. These data will inform provider counseling and patient expectations when considering PEIC.

Figure 1



Kaplan-Meier curve representing latency (time interval between cerclage placement and delivery) in weeks when amniotic membranes were visible at time of cerclage placement compared to when membranes were not visualized (p= 0.04).

Table 1.

	Membranes exposed n= 56	**No membranes exposed n= 37**	**P value**
Characteristics:			
GA at cerclage placement	21 (19-22)	22 (20-22)	0.009
Indomethacin use	46 (82.1)	17 (45.9)	<0.001
Antibiotics use	39 (69.6)	19 (51.4)	0.07
Latency (weeks)	5 (2-16)	16 (10-16)	0.008
Latency > 28 days	34 (60.7)	30 (81.8)	0.04
GA at delivery	25 (23-37)	37 (31-38)	0.002
Preterm birth < 24 weeks	18 (32.1)	4 (10.8)	0.02
Preterm birth < 28 weeks	31 (55.4)	8 (21.6)	0.001
Preterm birth < 32 weeks	32 (57.1)	10 (27.0)	0.004
Preterm birth < 37 weeks	41 (73.2)	17 (45.9)	0.01
PPROM	27 (49.1)	8 (21.6)	0.008
IAI	12 (21.8)	2 (5.4)	0.04

Data presented as number (percentage), median (interquartile range).
GA gestational age, *PPROM* prelabor premature rupture of membranes, *latency* time interval from cerclage placement to delivery, *IAI* intraamniotic infection.

1094 | The Accuracy of Crown-Rump Length Measurements: Comparison of 5-7 with 8-10 Gestational Weeks

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4:00 PM - 6:00 PM

Objective: The International Society of Ultrasound in Obstetrics and Gynecology recommends for dating to use ultrasound (US) measurements at 8-13gestational weeks (GW), and to change the dating if the difference from the last menstrual period (LMP) is of 6d or more. We aimed to evaluate the accuracy of the crown-rump length (CRL) at an earlier stage of 5-7GW compared with 8-10GWand to estimate if 5d difference justifies dating correction.

Study Design: A retrospective cohort study was conducted. Data was retrieved from the medical records of women treated in the assisted reproductive technology (ART) clinic between 2016-2023 at Emek Medical Center, Afula, Israel. The LMP was calculated from embryo age and the date of transfer. The study and control groups included women who conceived by ART a singleton pregnancy and performed an US exam at 5+5-7+6 or/and 8-10+6GW, respectively. Transvaginal US was performed using the Voluson E10 BT20 device by experienced technicians at the US unit. Women with severe chronic diseases (e.g. chronic hypertension, pre-gestational diabetes, autoimmune diseases and heart or renal diseases) were excluded. The primary outcome was the accuracy of the CRL values at a range of ±4d according to Hadlock at 5+5(CRL = 2mm)-7+6 compared with 8-10+6(CRL = 42mm)GW. Assuming that 20% of the US CRL measurements at 5+7-7+6GW will differ at least 5d from the calculated GW compared with 10% of the measurements at 8-10+6GW, a sample size of 400 pregnancies was required ($\alpha = 0.05$, power = 80%).

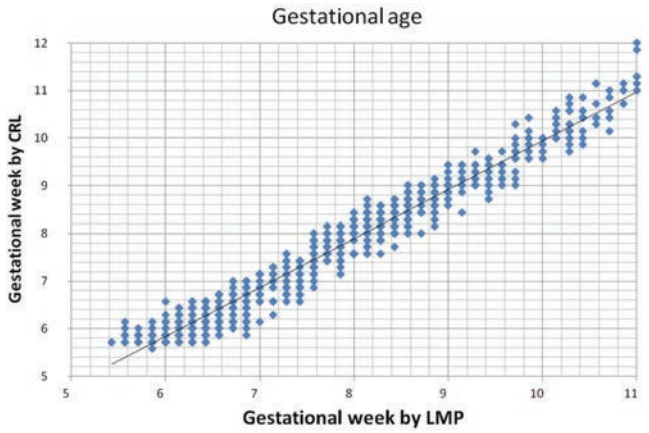
Results: Included in the study 443 women, who performed 1045 US exams (mean 2.4/woman). The study and control groups performed 575 and 470 exams, respectively, and the accuracy of CRL measurements of ±4d within the LMP was 96% and 99%, respectively (P = 0.02). High rate of accuracy of 95-100% was found throughout all GWs (Table and Figure).

Conclusion: Although the control group performed slightly better, the early 5+5-7+6GW group has a high accuracy of CRL measurements and can be used for dating. We recommend dating correction if a 5d difference or more is found using transvaginal US exam during 5+5-10+6GW.

Table: accuracy of CRL measurements by early gestational weeks

GW \ Accuracy	±3 days	±4 days
5+5 – 7+6 (N=575)	506 (88%)	552 (96%)
8+0 – 10+6 (N=470)	445 (95%)	463 (99%)
P value	0.0002	0.02
5+5 – 5+6 (N=42)	42 (100%)	42 (100%)
6+0 – 6+6 (N=351)	307 (87%)	337 (96%)
7+0 – 7+6 (N=182)	157 (86%)	173 (95%)
8+0 – 8+6 (N=328)	317 (97%)	324 (99%)
9+0 – 9+6 (N=83)	75 (90%)	80 (96%)
10+0 – 10+6 (N=59)	53 (90%)	59 (100%)

CRL = crown-rump length, GW = gestational week



1095 | Intellectual Disability as a risk Factor for Adverse Outcomes Among Pregnant People with Diabetes

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4:00 PM - 6:00 PM

Objective: Intellectual and developmental disabilities (IDD) are associated with increased risk of adverse pregnancy outcomes and the proportion of pregnant patients with a IDD diagnosis has increased over time. Diabetes mellitus (DM) requires more intensive antenatal care including frequent glucose monitoring, medication adherence and titration, and frequent visits. It is unclear whether IDD is an independent risk factor for adverse outcomes among pregnancies with DM. The purpose of this analysis was to evaluate whether IDD was associated with adverse outcomes among deliveries complicated by DM.

Study Design: Delivery hospitalizations to patients with pregestational and gestational DM aged 15-54 were analyzed using the 2000-2021 Nationwide Inpatient Sample. The primary exposure of interest was IDD defined using ICD9/ICD10 codes. Temporal trends in proportion of deliveries with IDD and DM were analyzed with joint point regression to determine average annual percent change (AAPC) with 95% confidence intervals. The association between hospital, demographic, and a range of adverse outcomes were analyzed with logistic regression models.

Results: 2389 (0.04%) deliveries of 6,012,324 with DM diagnosis had an associated IDD diagnosis. Deliveries to patients with both DM and IDD increased from 2 per 10,000 in 2000 to 7 per 10,000 in 2021 (AAPC 7.8, 6.4-10.3, p< 0.01). More patients with IDD had pregestational DM (30.2% vs 13.5%). In adjusted analyses, patients with IDD had increased odds of diabetic ketoacidosis (aOR 2.66, 1.06-6.69), preterm birth < 37 weeks (aOR 1.46, 1.10-1.92), cesarean delivery (aOR 1.30, 1.05-1.60), non-transfusion severe maternal morbidity (aOR 2.06, 1.26-3.32), hypertensive disorders of pregnancy (aOR 1.29, 1.03-1.63), and stillbirth (aOR 1.94, 1.07-3.5). Odds of shoulder dystocia did not differ between the groups.

Conclusion: Among deliveries with DM, the proportion of IDD increased over time. IDD is associated with increased risk of adverse outcomes among deliveries with DM. Additional

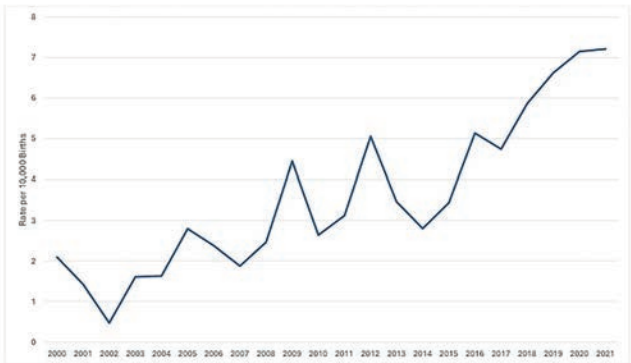
resources and surveillance may be warranted for patients with IDD and DM to optimize outcomes.

Table. Odds of adverse outcomes related to diabetes in pregnancy

	Intellectual and Developmental Disability*				Unadjusted model		Adjusted model	
	Absent		Present					
	N	%	N	%	OR	95% CI	aOR	95% CI
Shoulder dystocia	130,527	4.0%	54	4.7%	1.18	0.64, 2.16	0.95	0.52, 1.74
Diabetic ketoacidosis	6,653	0.3%	25	1.8%	6.19	2.54, 15.11	2.66	**1.06, 6.69**
Gestational age at delivery								
<37 weeks	327,395	15.5%	325	25.3%	1.85	**1.40, 2.44**	1.46	**1.10, 1.92**
<34 weeks	85,230	4.0%	85	6.6%	1.68	**1.03, 2.75**	1.18	0.71, 1.97
<32 weeks	43,200	2.1%	55	4.3%	2.14	**1.17, 3.9**	1.45	0.78, 2.70
Cesarean delivery (exclude prior cesarean)	1,449,712	31.5%	801	42.1%	1.58	**1.29, 1.94**	1.3	**1.05, 1.60**
Operative vaginal delivery (among vaginal deliveries)	237,979	7.3%	117	10.1%	1.44	0.95, 2.19	1.62	**1.44, 1.82**
Severe maternal morbidity (excluding transfusion)	65,681	1.1%	89	3.7%	3.51	**2.20, 5.62**	2.06	**1.28, 3.32**
Transfusion	71,738	1.2%	53	2.2%	1.88	1.03, 3.40	1.21	0.67, 2.19
Hypertensive disorders of pregnancy	914,600	15.2%	613	25.7%	1.93	1.57, 2.38	1.29	**1.03, 1.63**
Postpartum hemorrhage	223,480	3.7%	117	4.9%	1.33	0.89, 2.00	1.19	0.79, 1.80
Placental abruption and/or antepartum hemorrhage	84,922	1.4%	14	0.6%	0.42	0.14, 1.32	0.35	0.11, 1.09
Chorioamnionitis and/or endometritis	186,458	3.1%	106	4.5%	1.46	0.94, 2.26	1.44	0.93, 2.24
Wound infection	217,973	0.8%	62	0.7%	0.44	0.06, 3.11	0.38	0.06, 2.67
Stillbirth	45,547	0.8%	60	2.5%	3.41	1.92, 6.04	1.94	**1.07, 3.50**

*Defined using ICD-9/ICD-10 codes that gave definite indication of intellectual and developmental disability per the Center for Developmental Disabilities Evaluation and Research.

Figure. Among those with GDM/DM, proportion of pregnant patients with IDD over time



1096 | Race and Temporal Temperature Measurement in Intraamniotic Infection

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4:00 PM - 6:00 PM

Objective: Temperature is underestimated in Black versus White inpatients when temporal thermometers are used. There is no data on racial differences in temporal temperature measurements in obstetrical patients in assessment of Intraamniotic infection (IAI). Our aim was to analyze intrapartum temporal temperature readings in self-identified Black versus White patients with IAI. We hypothesized that Black patients would have significantly lower max temperature (Tmax) when measured temporally and this may result in delay of diagnosis or antibiotics, higher stage or grade of chorioamnionitis on pathology or neonatal and maternal morbidity.

Study Design: We conducted a single institution retrospective cohort study of self-identified Black and White patients at term with clinical IAI or histopathological diagnosis of chorioamnionitis from 2021-2022. Primary outcomes were differences in Tmax in Black versus White patients with clinically diagnosed IAI and Tmax differences in Black versus White patients with histopathological chorioamnionitis. All temperatures were measured with temporal thermometers. Secondary outcomes included differences in stage and grade of chorioamnionitis, timing of diagnosis and antibiotics, and neonatal and maternal complications.

Results: 459 patients were identified that met the inclusion and exclusion criteria, 285 (62.1%) Black patients and 174 (37.9%) White patients, with Black patients more likely to be diagnosed with IAI. Black patients were younger, more often multiparous, with higher BMIs and a higher likelihood of hypertensive diseases. There was no difference in primary outcome of Tmax by race. Black patients with a clinical diagnosis of IAI were more likely to undergo cesarean delivery. Infants of White patients with a histopathological diagnosis of chorioamnionitis were more likely to be admitted to the NICU.

Conclusion: Temporal thermometer measurements were not statistically significant by race. However there were disparities in cesarean delivery rates and NICU admissions.

1098 | Risk Factors for Unplanned Cesarean Delivery Among Pregnancies with Preexisting Diabetes

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4:00 PM - 6:00 PM

Objective: Diabetes in pregnancy is associated with an increased risk of cesarean delivery (CD). While CD risk factors among pregnancies with gestational diabetes (GDM) are well defined, such as nulliparity, body mass index, gestational weight gain, and insulin use, it is unclear whether these same risk factors apply to pregnancies with preexisting diabetes. The objective of this study was to identify risk factors for unplanned CD among pregnancies with Type 2 diabetes (T2D) or early GDM.

Study Design: This was a secondary analysis of the Metformin Plus Insulin for Preexisting Diabetes or Gestational Diabetes in Early Pregnancy (MOMPOD) randomized controlled trial. Participants with T2D or early GDM were included if they had a trial of labor. Baseline and pregnancy characteristics were compared between those with a vaginal delivery (VD) and those with an unplanned CD using descriptive and logistic regression analyses, controlling for potential confounders.

Results: Of 405 participants, 144 (36%) had an unplanned CD and 261 (64%) had a VD. There were no differences in diabetes type, metformin use, or neonatal birthweight between groups. Compared to those with a VD, participants with an unplanned CD had greater median gestational weight gain [11.6 pounds (interquartile range (IQR) 6.8-15.4) vs. 10 pounds (IQR 4.4-14.9), $p = 0.019$], enrollment HbA1c $\geq$ 6.5% (69% vs. 56%, $p = 0.0239$), third trimester HbA1c $\geq$ 6.5% (39% vs. 25%, $p = 0.0459$), and median glucose levels in labor [130.0 mg/dL (IQR 112.0-161.5) vs. 121.0 mg/dL (IQR 100.0-144.0), $p = 0.0025$]. There was no difference in median third trimester HbA1c. In multivariate adjusted analysis, only median enrollment HbA1c (mean gestational age 11.2 weeks) was associated with CD [7.3% for CD vs. 6.85% for VD, $p = 0.0107$; aOR 1.21 (95% confidence interval 1.03, 1.42)].

Conclusion: Higher first trimester HbA1c is associated with CD in patients with T2D or early GDM attempting VD. Preconception counseling should focus on improved glycemic control prior to and in early pregnancy as a potential strategy to reduce risk of unplanned CD for pregnant individuals with preexisting diabetes.

Table 1. Baseline, Diabetes, and Pregnancy Characteristics

	Unplanned cesarean deliveries (n=144)	Vaginal deliveries (n=261)	P-value
Maternal age (years) (mean, SD)	31.99 ±6.04	33.00 ±5.65	0.0999
Race (n, %)			0.2639
White	52 (36.11%)	93 (35.63%)	
Black	51 (35.42%)	73 (27.97%)	
Asian	8 (5.56%)	11 (4.21%)	
American Indian or Alaska native	1 (0.69%)	1 (0.38%)	
Multi-race	2 (1.39%)	3 (1.15%)	
Not reported or declined to report	30 (20.83%)	80 (30.65%)	
Hispanic origin (n, %)	68 (47.22%)	154 (59.04%)	0.0226
Married or living with partner (n, %)	89 (61.79%)	191 (73.18%)	0.0177
Primary source of insurance (n, %)			0.2939
Private	28 (19.44%)	50 (19.31%)	
Military	2 (1.39%)	1 (0.39%)	
Medicaid, federal, or state insurance	107 (74.31%)	185 (71.43%)	
None	7 (4.86%)	23 (8.88%)	
Pre-pregnancy BMI (kg/m^2) (median, IQR)	34.50 (30.36-40.85)	33.46 (28.88-39.94)	0.0877
Type of diabetes (n, %)			0.068
Preexisting type 2 diabetes	118 (81.94%)	193 (73.94%)	
Early gestational diabetes	26 (18.06%)	68 (26.06%)	
Preexisting hypertension requiring daily medication (n, %)	41 (28.47%)	45 (17.37%)	0.0092
Preeclampsia (n, %)	60 (41.67%)	76 (29.13%)	0.0105
Cigarette use in pregnancy (n, %)	17 (11.82%)	12 (4.64%)	0.0076
Nulliparity (n, %)	34 (41.46%)	17 (7.12%)	<0.0001
Gestational age at delivery (weeks) (median, IQR)	37.43 (36.50-38.75)	37.71 (36.57-38.71)	0.9328
Induction of labor (n, %)	127 (88.19%)	197 (75.50%)	0.0022
Birthweight (grams) (median, IQR)	3198 (2693-3524)	3216 (2880-3586)	0.4324

IQR: interquartile range; SD: standard deviation

Table 2. Logistic regression analyses

Exposures*	Unplanned CD (n=144)	VD (n=261)	Adjusted p-value	Adjusted OR (95% CI)
HbA1c at enrollment (%) (median, IQR)	7.3 (6.2-9.4)	6.85 (5.9-8.5)	0.0185	1.21 (1.03, 1.42)
HbA1c at enrollment ≥6.5% (n, %)	87 (68.49%)	133 (56.37%)	0.0523	1.96 (0.99, 3.87)
HbA1c in 3rd trimester ≥6.5% (n, %)	26 (39.39%)	29 (25.22%)	0.0612	2.40 (0.96, 6.00)
Gestational weight gain (pounds) (median, IQR)	11.55 (6.81-15.43)	9.95 (4.38-14.88)	0.926	1.00 (0.98, 1.03)
Induction (n, %)	127 (88.19%)	197 (75.50%)	0.1835	1.67 (0.78, 3.57)
Highest glucose level in labor (mg/dL) (median, IQR)	130.0 (112.0-161.5)	121.0 (100.0-144.0)	0.0083	1.01 (1.00, 1.01)

**Logistic regression was performed to test the association between unplanned cesarean delivery and each of the six exposures, with adjustment for nulliparity, Hispanic origin, marital status, preexisting hypertension requiring daily medication, preeclampsia, and cigarette use in pregnancy. Characteristics were considered potential confounders if they were significantly different between CD and VD groups.*
CD: cesarean delivery; IQR: interquartile range; OR: odds ratio; VD: vaginal delivery

1099 | Anal Sphincter Injury After Vacuum-Assisted Delivery- is Avoiding Episiotomy Still Safe?

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4:00 PM - 6:00 PM

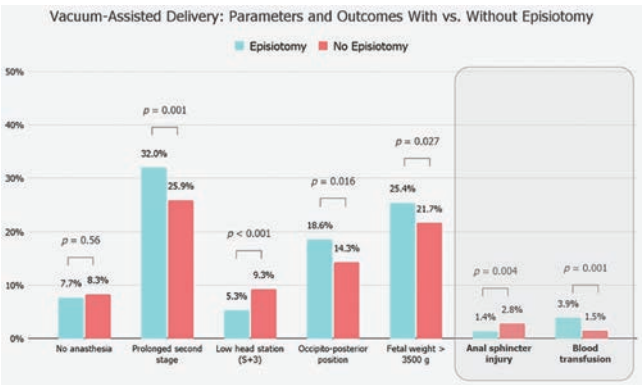
Objective: To assess whether avoiding episiotomy during vacuum-assisted deliveries (VAD) affects the incidence of anal sphincter injury (OASI) in primiparous women.

Study Design: A retrospective cohort study of all primiparous patients who had a VAD at a university-affiliated tertiary center (2011-2022). In our institution, during VAD, a mediolateral episiotomy is performed at the attending physician's discretion. We compared outcomes between VADs with and without episiotomy. Baseline characteristics were evaluated along with various VAD parameters. The primary outcome was OASI, with secondary outcomes including other maternal adverse events.

Results: Out of 157,282 deliveries, 10,400 (6.6%) were VADs, and 7,951 met the inclusion criteria. Among these, 7,201 (90.6%) had episiotomies, and 750 (9.4%) did not. Baseline maternal characteristics were similar between the groups. Those who had episiotomy had a higher rate of prolonged second stage of labor (PSS) (32% vs. 25.9%, p = 0.001), higher rates of occipitoposterior position (OP) (18.6% vs. 14.3%, p = 0.016) and more advanced head station (+3 under ischial spine in 5.3% vs. 9.3%, p< 0.001), as compared to no episiotomy. Newborns weighing >3500 grams were more common in the episiotomy group (25.4% vs. 21.7%, p = 0.027).

Despite these known risk factors for OASI, the incidence of OASI was higher in the no-episiotomy group (2.8% vs. 1.4%, p = 0.004). Multivariable analysis confirmed that episiotomy had a protective effect against OASI [aOR 0.433 (0.258-0.728), p = 0.002]. Prolonged second stage [aOR 1.98 (1.32-2.94), p< 0.001] and higher birthweight [aOR 1.86 (1.09-3.17), p = 0.022] also correlated with a higher risk of OASI. The number needed to treat (NNT) to prevent one OASI with episiotomy was 71, reduced to 42 for PSS, 33 for OP, and 22 for newborns >3500 g. Other maternal adverse outcomes were similar, except for a higher postpartum blood transfusion rate in the episiotomy group (3.9% vs. 1.5%, p = 0.008).

Conclusion: Avoiding routine episiotomy during VAD in primiparous women is associated with a higher OASI rate, particularly in those with PSS, OP, or larger newborns.



1100 | Normotensive vs. Hypertensive HELLP Syndrome: Should We Expect Different Outcomes?

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4:00 PM - 6:00 PM

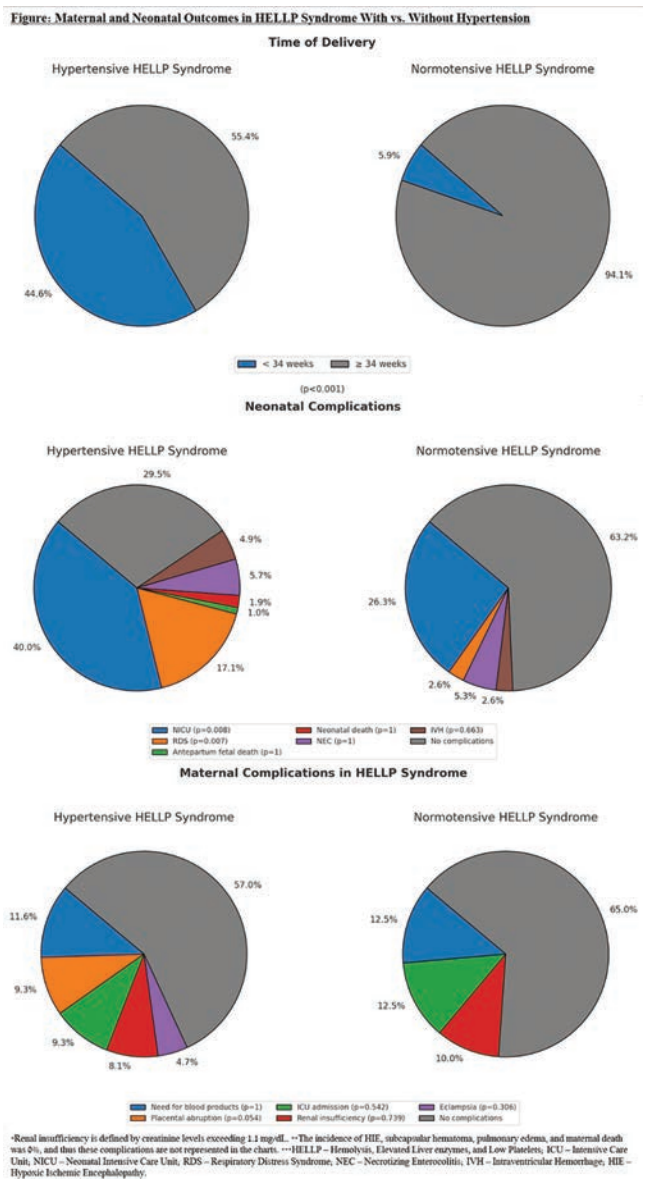
Objective: To compare maternal and neonatal outcomes between women with hemolysis, elevated liver enzymes, and low platelet (HELLP) syndrome with and without associated hypertension, focusing on differences in presentation, disease severity, and associated complications.

Study Design: A retrospective cohort study of singleton deliveries diagnosed with HELLP syndrome at a tertiary university-affiliated hospital (1.2011-3.2023). Cases were categorized into normotensive HELLP and hypertensive HELLP. We collected and compared data on maternal demographics, clinical presentation, laboratory findings, delivery outcomes, and neonatal complications.

Results: Among 157,282 deliveries, 118 met the full criteria for HELLP syndrome: 74 (68.5%) hypertensive and 34 (31.5%) normotensive. Normotensive HELLP cases were diagnosed at a significantly later gestational age (37.5 ± 3.0 vs. 34.5 ± 4.4

weeks, p< 0.001). Only 2 women (5.9%) with normotensive HELLP delivered < 34 weeks, compared to 33 (44.6%) with hypertensive HELLP (p< 0.001) (figure). Proteinuria was less common in normotensive cases (58.8% vs. 87.8%, p< 0.001). Laboratory parameters, including hemoglobin, platelet count, creatinine, liver function tests, and hemolysis parameters, did not differ significantly between the groups. Neonates in the normotensive group had significantly higher mean birth weights (2574.6 ± 746.2 vs. 1947 ± 816.6 grams, p< 0.001), fewer NICU admissions (29.4% vs. 56.8%, p = 0.008), and lower rates of respiratory distress syndrome (2.9% vs. 24.3%, p = 0.007) (figure). Maternal complications related to HELLP syndrome did not differ significantly between normotensive and hypertensive cases (figure).

Conclusion: Normotensive HELLP syndrome appears to be a less severe form of HELLP syndrome, presenting at a later gestational age. Despite differences in neonatal outcomes, maternal adverse outcomes remain comparable to those in hypertensive HELLP syndrome. This suggests that normotensive HELLP should be managed with the same caution as hypertensive HELLP to ensure optimal maternal and neonatal outcomes.



•Renal insufficiency is defined by creatinine levels exceeding 1.1 mg/dL. ••The incidence of HIE, subcapsular hematoma, pulmonary edema, and maternal death was 0%, and thus these complications are not represented in the charts. •••HELLP – Hemolysis, Elevated Liver enzymes, and Low Platelets; ICU – Intensive Care Unit, NICU – Neonatal Intensive Care Unit, RDS – Respiratory Distress Syndrome, NEC – Necrotizing Enterocolitis, IVH – Intraventricular Hemorrhage, HIE – Hypoxic Ischemic Encephalopathy.

1101 | Optimizing Induction: Shortened Balloon Protocols for Better Outcomes

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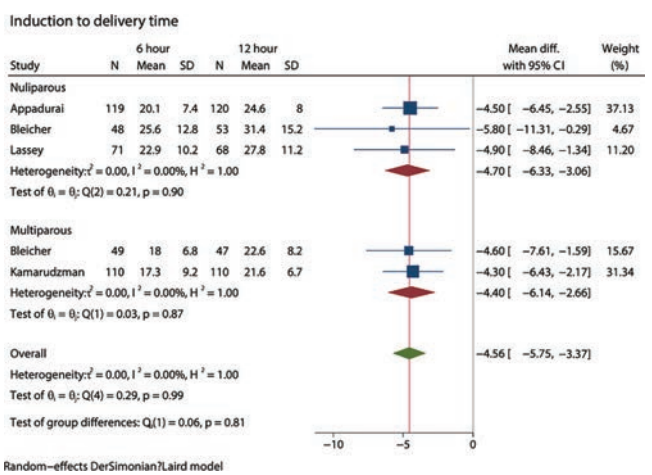
4:00 PM - 6:00 PM

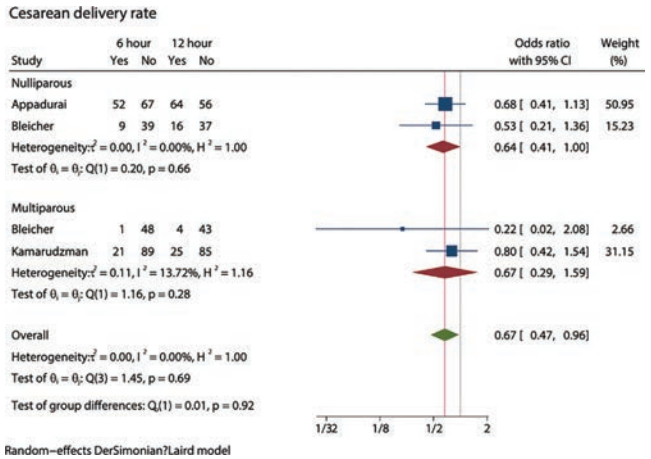
Objective: The optimal timing of mechanical balloon induction remains controversial. This meta-analysis compares the effectiveness of 6-hour versus 12-hour mechanical balloon induction protocols in reducing delivery time in term pregnancies.

Study Design: A comprehensive literature search was conducted using terms related to mechanical balloon induction. Randomized controlled trials (RCTs) comparing 6-hour and 12-hour induction protocols with various types of balloon catheters (single and double balloon) were included. The primary outcome was the interval time to delivery, defined as the time from the start of the induction process to delivery. The secondary outcomes were cesarean delivery rate (CD), operative vaginal delivery rate, time on oxytocin, and delta bishop score. The random-effects model was used to pool the odds ratios (ORs) and the corresponding 95% confidence intervals (CIs).

Results: Four RCTs were included in the meta-analysis, encompassing a total of 972 participants. Overall, patients with a 6-hour balloon induction delivered 4.5 hours sooner compared to those with a 12-hour balloon (mean difference -4.56, CI [-5.75,-3.37], P< 0.001). The risk of cesarean delivery was 1.5 times higher for patients with a 12-hour balloon compared to those with a 6-hour balloon (OR 0.67, 95% CI [0.47, 0.96], P = 0.028). Additionally, the risk of cesarean delivery due to non-reassuring fetal heart tones (NRFHTs) was 1.7 times higher in the 12-hour group (OR 0.59, 95% CI [0.36, 0.96], P = 0.030). No significant differences were found in the rate of operative vaginal delivery, time on oxytocin, change in Bishop score, or starting and post-intervention Bishop scores between the two groups.

Conclusion: A 6-hour mechanical balloon induction protocol significantly reduces the interval to delivery and the risk of cesarean delivery, particularly due to NRFHTs, compared to a 12-hour protocol. These findings support the use of a shorter induction interval for improved maternal and fetal outcomes in term pregnancies.





1102 | Neonatal Outcomes of Gastroschisis Births by mode of Delivery in the United States

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4:00 PM - 6:00 PM

Objective: Although trial of labor (TOL) versus planned caesarean delivery (CD) has been hypothesized to influence clinical outcomes in neonates with gastroschisis, this clinical decision remains controversial. We assessed neonatal outcomes in newborns with gastroschisis based on delivery mode in a contemporary United States cohort.

Study Design: We conducted a retrospective cohort study using population-based data from the US Natality Database on live singleton births complicated by gastroschisis from 2017 to 2022. Data was stratified by TOL versus CD. A sub-group analysis for term versus preterm neonates was performed. Cases with CD after failed TOL were included in the TOL group. Our primary outcome was composite adverse neonatal outcome, including chorioamnionitis, 5-minute Apgar score < 3, assisted ventilation use > 6 hours, surfactant use, neonatal seizures, and neonatal death. Patient characteristics were compared and logistic regression was performed to estimate adjusted odds ratios (aORs) for adverse outcomes accounting for gestational age (GA) at birth and birthweight.

Results: Of 17,104,917 births, 3,543 (0.021%) were complicated by gastroschisis. TOL was attempted in 2,433 (68.7%), while 1,110 (31.3%) reported planned CD. Compared to the planned CD group, those undergoing TOL had lower rates of preterm birth, delivered at later GA, and had higher birthweights (Table 1). TOL was associated with lower odds of composite adverse neonatal outcome (25.5% vs 31.4%, aOR 0.79). TOL was also associated with lower odds of NICU admission (aOR 0.53) and immediate ventilation use (aOR 0.73), and higher odds of chorioamnionitis (OR 2.12) and infant transfer to a higher-level care facility (OR 1.23) (Table 2). Similar results were observed after stratification for term versus preterm neonates.

Conclusion: TOL was associated with lower composite adverse neonatal outcome compared to planned CD among pregnancies complicated by gastroschisis. This study is limited by variables of antenatal morbidity, such as fetal growth restriction and size of gastroschisis.

Table 1. Patient Characteristics

Characteristics	Trial of Labor N=2,433	Planned Cesarean Delivery N=1,110	P-value
Maternal age, years	23.7±4.9	23.7±5.1	0.968
Race			0.013
White	1,362/2,272 (60.0%)	579/1,040 (55.7%)	
Black	230/2,272 (10.1%)	100/1,040 (9.6%)	
Hispanic	629/2,272 (27.7%)	344/1,040 (33.1%)	
Asian	51/2,272 (2.2%)	17/1,040 (1.6%)	
Body mass index, kg/m²	24.7±7.3	24.9±6.4	0.427
Assisted reproductive technology use	5 (0.2%)	0 (0%)	0.776
Smoking	320 (13.2%)	125 (11.3%)	0.115
Private insurance	774 (31.8%)	352 (31.7%)	0.952
Neonatal female sex	1,172 (48.2%)	563 (50.7%)	0.159
Cesarean delivery	444 (18.6%)	1,110	
Gestational age at delivery, weeks	36.2±2.5	35.6±2.4	<0.001
Preterm birth <37 weeks	1,271 (52.2%)	730 (65.8%)	<0.001
Preterm birth <34 weeks	210 (8.6%)	159 (14.3%)	<0.001
Mean birthweight	2473.5±521.7	2353.7±547.3	<0.001

Table 2. Neonatal Outcomes

Outcomes	Trial of Labor N=2,433	Planned Cesarean Delivery N=1,110	OR, 95% CI	aOR, 95% CI*
Neonatal adverse composite**	621 (25.5%)	349 (31.4%)	0.75 (0.64-0.87)	0.79 (0.68-0.93)
Chorioamnionitis	55 (2.3%)	12 (1.1%)	2.12 (1.13-3.97)	--***
5-minute Apgar score < 3	44 (1.8%)	28 (2.5%)	0.71 (0.44-1.15)	0.79 (0.49-1.28)
NICU admission	2,260 (92.9%)	1,054 (95.0%)	0.69 (0.51-0.95)	0.53 (0.99)
Immediate ventilation use	851 (35.0%)	465 (41.9%)	0.75 (0.65-0.86)	0.78 (0.68-0.91)
Assisted ventilation for > 6 h	520 (21.4%)	295 (26.6%)	0.75 (0.64-0.89)	0.78 (0.66-0.93)
Surfactant use	74 (3.0%)	57 (5.1%)	0.58 (0.41-0.82)	0.66 (0.46-0.95)
Seizures	3 (0.12)	2 (0.18)	0.68 (0.11-4.10)	--***
Infant transferred	677 (27.8%)	267 (24.1%)	1.23 (1.03-1.43)	1.23 (1.04-1.45)
Neonatal death at time of report	18 (0.7%)	19 (1.7%)	0.43 (0.22-0.82)	--***

*Adjusted for gestational age at birth and birthweight
**Neonatal adverse composite includes chorioamnionitis, Apgar score <3, assisted ventilation use >6 hours, surfactant use, neonatal seizures, and neonatal death
***No adjustment due to lower event rate

1103 | Antenatal Ultrasound Predictors of Genitourinary Injury in Cesarean Hysterectomy for Placenta Accreta Spectrum

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4:00 PM - 6:00 PM

Objective: Placenta accreta spectrum (PAS) is a complex obstetric condition associated with maternal morbidity. Urologic injuries complicate 20-30% of PAS deliveries during cesarean hysterectomy. This study aimed to evaluate ultrasonographic predictors of genitourinary (GU) injury during Cesarean Hysterectomy for PAS from multiple referral centers.

Study Design: We conducted a multicenter, retrospective analysis of singleton pregnancies with pathology-confirmed PAS (accreta, increta, or percreta). Ultrasonographic variables assessed included placental location, presence of previa or low-lying

placenta, presence of lacunae, loss of retroplacental clear zone, lower segment hypervascularity, bladder and uterine bulge, myometrial thinning, abnormal uterine-bladder interface, and suspected depth of invasion. The primary outcome was the occurrence of any GU injury (ureteral or bladder) during cesarean hysterectomy. Comparisons were made using Fisher's Exact test, and odd ratios were established using logistic regression.

Results: Among 358 patients included in the study, 59 (16%) experienced GU injury during surgery. Patients with GU injury were significantly more likely to have had antenatal suspicion of percreta based on ultrasound findings (OR 2.89, 95% CI: 1.56–5.35) and to have complete placenta previa (OR 3.26, 95% CI: 1.71–6.21), as seen in Table 1. Conversely, posterior placental location was associated with a lower risk of GU injury (OR 0.31, 95% CI: 0.11–0.89). None of the six ultrasonographic markers independently predicted GU injury.

Conclusion: Antenatal suspicion of percreta and complete placenta previa significantly increase the risk of GU injury during Cesarean Hysterectomy for PAS. Conversely, posterior placental location appears to be associated with a lower risk of such injuries. Individual ultrasonographic markers alone do not reliably predict GU injury at the time of cesarean hysterectomy; thus, multimodal imaging may be important for patient counseling and surgical preparation.

Table 1: Ultrasound Predictors and Genitourinary Injury

US Predictor		Odds Ratio	95% Confidence Interval	P-value
Placenta Previa		3.84	1.57 to 11.34	**<0.01**
Lacunae		1.43	0.78 to 2.69	0.25
Turbulent Flow		0.80	0.15 to 2.82	1.0
Loss of Retroplacental Space		1.32	0.67 to 2.47	0.36
Hypervascularity		1.48	0.81 to 2.71	0.20
Bladder Bulge		0.75	0.22 to 2.05	0.65
Uterine Bulge		0.86	0.38 to 1.80	0.73
Myometrial Thinning		0.63	0.27 to 1.35	0.24
Abnormal Bladder Interface		1.44	0.62 to 3.11	0.32
Feeder Vessels		0.72	0.08 to 3.25	1.0
Placental Location		-	-	**<0.01**
	n			-
Anterior	211	0.67	0.39 to 1.18	-
Complete Previa	57	3.26	1.71 to 6.21	-
Posterior	61	0.31	0.11 to 0.89	-
Lateral	8	1.71	0.34 to 8.70	-
Fundal	7		-	-
Antenatal US PAS Prediction	**n**	-	-	**<0.01**
Low risk for PAS	124	0.33	0.16 to 0.68	-
Accreta	144	1.02	0.58 to 1.81	-
Increta	21	1.21	0.39 to 3.72	-
Percreta	69	2.89	1.56 to 5.35	-

Table 1. The table includes p-values, odds ratios, and 95% confidence intervals for each PAS US predictor.
$p < 0.05$ was considered significant
*There were no GU injuries in the Fundal placental group
Abbreviations: PAS – Placenta Accreta Spectrum, US - Ultrasound

1104 | Azithromycin Utilization and Maternal Outcomes in Patients with Intrapartum Cesarean Birth, 2016-2020

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4:00 PM - 6:00 PM

Objective: In 2016, the Cesarean Section Optimal Antibiotic Prophylaxis (C/SOAP) study demonstrated perioperative azithromycin at time of labored cesarean delivery reduced infection by 50% (12% to 6%). We examined national trends in perioperative azithromycin use following C/SOAP. We also evaluated association between azithyromicin use and maternal sepsis and death.

Study Design: This retrospective cohort study used the Premier Healthcare Database to identify births from 2016-2020 in patients aged 12 to 55, at > 24 weeks' gestation, with a singleton pregnancy and intrapartum cesarean or cesarean after rupture of membranes. Those with chorioamnionitis prior to delivery were excluded. The primary outcome was azithromycin use. Secondary outcomes were a composite endpoint of infectious and surgical wound complications, endometritis, necrotizing fasciitis, abscess, septic pelvic thrombophlebitis, sepsis, pyelonephritis, pneumonia, meningitis and death during delivery hospitalization or the following 30 days.

Results: From 2016 to 2020, there were 1,528,602 cesarean deliveries, of which 531,709 met inclusion criteria. Azithromycin recipients were more likely than Azithyromicin non-recipients to have diabetes, hypertension, and tobacco use disorder. Azithromycin use increased from < 1% to nearly 40% from 2016-2020 (Figure). Utilization was highest in hospitals with > 500 beds compared to hospitals with < 100 beds (41.4% vs 4.7% $p < 0.001$). Despite increasing azithromycin use, the composite outcome was higher among patients receiving Azithyromicin, as was endometritis, length of stay, and home health use (Table).

Conclusion: After C/SOAP, the uptake of azithromycin was rapid and faster in larger hospitals. Further implementation should focus on smaller rural hospitals where uptake remains low, which may reflect limited financial resources, or capacity for implementation. Given outcomes assessment was limited to inpatient encounters and this cohort was not randomized, we encourage caution when evaluating associations between azithromycin exposure and outcomes.

Figure 1. Azithromycin utilization trends for intrapartum cesarean birth by hospital size, 2016-2020

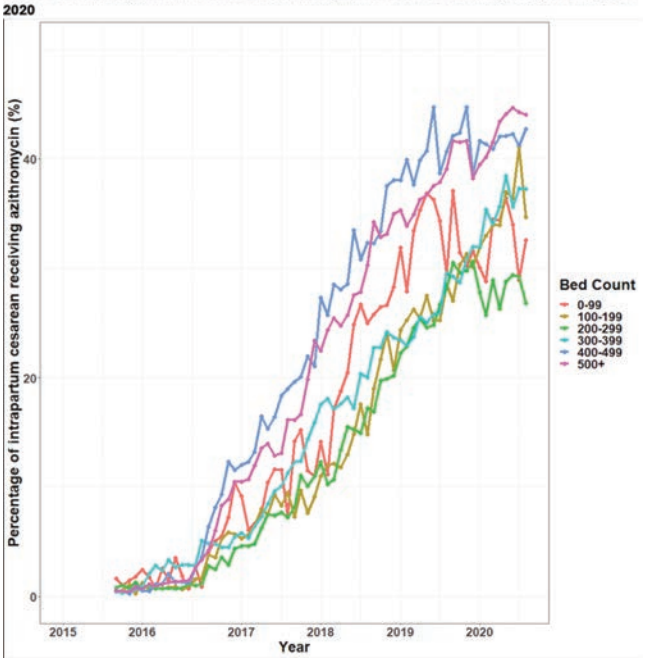

Table : Postoperative outcomes among patients with intrapartum cesarean

	Received Azithromycin Intraoperatively?			
	Overall (N=531,709)	No (N=435,392)	Yes (N=96,317)	p
Infectious complication composite*	8,737 (1.6%)	6,893 (1.6%)	1,844 (1.9%)	<0.001
Surgical Wound Complication	3,237 (0.6%)	2,681 (0.6%)	556 (0.6%)	0.165
Endometritis	5,047 (0.9%)	3,851 (0.9%)	1,196 (1.2%)	<0.001
Necrotizing fasciitis	70 (0.0%)	55 (0.0%)	15 (0.0%)	0.472
Abdominal or pelvic abscess	159 (0.0%)	128 (0.0%)	31 (0.0%)	0.651
Septic pelvic thrombophlebitis	48 (0.0%)	38 (0.0%)	10 (0.0%)	0.625
Maternal sepsis	451 (0.1%)	366 (0.1%)	85 (0.1%)	0.686
Pyelonephritis	65 (0.0%)	59 (0.0%)	6 (0.0%)	0.063
Pneumonia	700 (0.1%)	543 (0.1%)	157 (0.2%)	0.003
Meningitis	0 (0.0%)	0 (0.0%)	0 (0.0%)	N/A
Maternal mortality within 30 days	83 (<0.1%)	72 (<0.1%)	11 (<0.1%)	0.314
Length of Stay (days)	3 [3, 4]	3 [3, 4]	3 [3, 4]	<0.001
Any readmission within 30 days of discharge	11,042 (2.1%)	8,925 (2.0%)	2,117 (2.2%)	0.004
Discharge with home health care	5,817 (1.1%)	4,377 (1.0%)	1,440 (1.5%)	<0.001

*Secondary outcome composite of surgical wound complications that were not present on admission, endometritis, necrotizing fasciitis, abscess, septic pelvic thrombophlebitis, maternal sepsis, pyelonephritis, pneumonia, meningitis

1105 | Trial of Labor After Cesarean in Twin Pregnancies with Two Prior Cesarean Deliveries

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4:00 PM - 6:00 PM

Objective: To investigate short-term maternal and neonatal outcomes in individuals with twin pregnancies and two prior CDs undergoing TOLAC.

Study Design: A cross-sectional study of live birth data was conducted between 2014-2021 in the United States. Individuals with twins and two prior CDs undergoing TOLAC were included. Comparison groups included those with: (1) twins and two prior CDs undergoing elective CD, (2) twins and one prior CD undergoing TOLAC, and (3) singletons and two prior CDs undergoing TOLAC. The primary outcomes were composite measures of maternal and neonatal morbidity. Maternal outcomes included chorioamnionitis, transfusion, hysterectomy, uterine rupture, ICU admission, and vaginal birth after cesarean (VBAC). Neonatal outcomes included 5-min Apgar ≤ 3, assisted ventilation, NICU admission, surfactant or antibiotic use, and seizures.Univariable and multivariable analyses were conducted with P value < 0.05 considered significant after Bonferroni adjustment.

Results: A total of 92,665 pregnant individuals and 106,361 neonates were isolated. VBAC was achieved in 37.8% (239/632) of individuals with twins and two prior CDs attempting TOLAC compared to 61.5% (2,271/3,693) in twins and one prior CD and 58% (45,834/78,969) in singletons and two prior CDs undergoing TOLAC ($P< 0.001$). Both composite maternal and neonatal morbidity were not significantly different between individuals with twin pregnancies and two prior CDs attempting TOLAC and other twin groups. None of the 632 individuals with twins and two prior CDs attempting TOLAC had a uterine rupture. Following adjustments with covariates, the odds of VBAC were more than twice as great in those with twins with one prior CD (aOR: 2.41; 95% CI: 2.01-2.90) and those with singletons with two prior CDs (aOR: 2.23; 95% CI: 1.88-2.65) compared to individuals with twins and two prior CDs.

Conclusion: In twin pregnancies with two prior CDs, although the chance of VBAC was 37.8%, there was no significant difference in adverse maternal or neonatal outcomes.

Table 1. Maternal Outcomes

	Twin Pregnancies					Singleton Pregnancies	
	2 CD + TOLAC (Ref)	2 CD + Elective CD	p value	1 CD + TOLAC	p value	2 CD + TOLAC	p value
	N = 632	N = 9371		N = 3693		N = 78969	
Chorioamnionitis	4 (0.6%)	48 (0.5%)	>0.999[1]	55 (1.5%)	0.761[1]	1089 (1.4%)	0.973[1]
Missing	0	0		0		23	
Transfusion	10 (1.6%)	178 (1.9%)	>0.999[2]	63 (1.7%)	>0.999[2]	550 (0.7%)	0.064[2]
Missing	0	7		0		48	
Uterine Rupture	0 (0.0%)	15 (0.2%)	>0.999[1]	3 (0.1%)	>0.999[1]	288 (0.4%)	>0.999[1]
Missing	0	7		0		48	
Unplanned Hysterectomy	0 (0.0%)	30 (0.3%)	>0.999[1]	5 (0.1%)	>0.999[1]	109 (0.1%)	>0.999[1]
Missing	0	7		0		48	
Admission to ICU	2 (0.3%)	84 (0.9%)	>0.999[1]	6 (0.2%)	>0.999[1]	237 (0.3%)	>0.999[1]
Missing	0	7		0		48	
Composite Maternal Morbidity*	11 (1.7%)	249 (2.7%)	>0.999[2]	69 (1.9%)	>0.999[2]	975 (1.2%)	>0.999[2]
Missing	0	7		0		48	
Successful VBAC	239 (37.8%)	-		2271 (61.5%)	<0.001[2]	45834 (58.0%)	<0.001[2]
Missing	0	-		0		0	

1. Fisher's exact test for count data (adjusted for multiple comparisons)
2. Pearson's Chi-squared test (adjusted for multiple comparisons)

ICU: intensive care unit; VBAC: vaginal birth after cesarean section.

*Composite maternal morbidity included either transfusion, ruptured uterus, unplanned hysterectomy, or admission to ICU.

**P-value underwent Bonferroni adjustment

Table 2. Neonatal Outcomes

	Twin Pregnancies					Singleton Pregnancies	
	2 CD + TOLAC (Ref)	2 CD + Elective CD	P value	1 CD + TOLAC	P value	2 CD + TOLAC	P value
	N=1264	N=18742		N=7386		N=78969	
Five Minute APGAR ≤ 3	34 (2.7%)	221 (1.2%)	0.004	121 (1.7%)	0.393	696 (0.9%)	<0.001
Missing	5	43		68		522	
Birth Weight (grams), mean	2296.3 (658.3)	2392.8 (615.0)	0.001	2368.8 (609.0)	0.045	3261.8 (642.5)	<0.001
Missing	1	13		5		31	
Assisted Ventilation (immediately)	276 (21.8%)	3184 (17.0%)	0.006	1220 (16.5%)	0.004	5080 (6.4%)	<0.001
Missing	0	11		4		80	
Assisted Ventilation (>6 hrs)	132 (10.4%)	1585 (8.5%)	0.479	617 (8.4%)	0.591	1800 (2.3%)	<0.001
Missing	0	11		4		80	
Admission to NICU	572 (45.3%)	7747 (41.4%)	0.240	2956 (40.0%)	0.049	9618 (12.2%)	<0.001
Missing	0	11		4		80	
Surfactant use	49 (3.9%)	566 (3.0%)	>0.999	224 (3.0%)	>0.999	580 (0.7%)	<0.001
Missing	0	11		4		80	
Antibiotic use	143 (11.3%)	1360 (7.3%)	0.001	765 (10.4%)	>0.999	2514 (3.2%)	<0.001
Missing	0	11		4		80	
Seizures	0 (0.0%)	6 (0.0%)		3 (0.0%)		56 (0.1%)	
Missing	0	11		4		80	
Composite Neonatal Morbidity*	614 (48.6%)	8202 (43.8%)	0.066	3158 (42.8%)	0.023	11230 (14.2%)	<0.001
Missing	0	11		4		80	

NICU: neonatal intensive care unit.

*Composite neonatal morbidity included assisted ventilation (immediate or >6hr) or seizures.
**P value underwent Bonferroni adjustment

1106 | Role of Prenatal Care in Modifying the Risk of NAS Among Mothers with OUD

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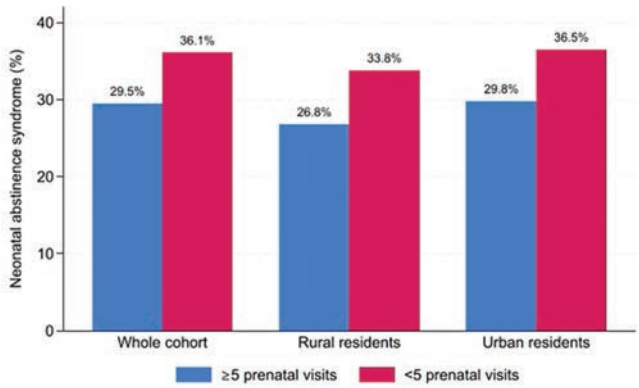
4:00 PM - 6:00 PM

Objective: To examine the risk of neonatal abstinence syndrome (NAS) among mothers with opioid use disorder with low and high engagement with prenatal care.

Study Design: We conducted a retrospective cohort study of births in the state of California from 2008-2020 among individuals with opioid use disorder to compare rates of NAS between those with < 5 prenatal visits and ≥5 prenatal visits. NOWs rates were assessed in the overall cohort then stratified by urban/rural residence. We performed multivariable logistic regression controlling for age, race/ethnicity, education, pre-pregnancy BMI, parity, and insurance status to estimate adjusted odds ratios (aOR) and 95% confidence intervals.

Results: In the cohort of 10,654 individuals with opioid use disorder, 2,147 (20.15%) attended < 5 prenatal visits and 8,507 (79.85%) attended ≥5 prenatal visits. There was lower prenatal care attendance among individuals aged 20-34, those with public insurance, and those with high school education or less. In the overall cohort, the adjusted odds of NAS was significantly higher among individuals with < 5 prenatal visits (aOR = 1.29; 95% CI 1.15-1.44). Similar significant results were found in rural residents; however, the results were not statistically significant in urban residents.

Conclusion: Our study found that among pregnant individuals with opioid use disorder, those with lower prenatal care had a higher risk of NAS in the infant. Close follow up of pregnant individuals with opioid use disorder through prenatal visits may reduce the burden of NAS among neonates.



1107 | What to Expect when you're Expecting: Impact of Physician and Patient factors on Predicted Delivery

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4:00 PM - 6:00 PM

Objective: The cesarean delivery rate continues to rise, and it is critical to understand how physician perceptions of likely mode of delivery influence the delivery outcome. The aim of this study was to perform an early, intrapartum assessment of physician's predictions of their patient's likelihood of vaginal delivery (VD) and to identify which physician and patient factors affect these predictions.

Study Design: We prospectively assessed physician prediction of anticipated mode of delivery for patients presenting to labor and delivery for planned vaginal delivery. At 4 hours, physicians were sent a single-item REDCap survey, "On a scale of 1-10 (where 10 = the highest), what is your patient's likelihood of a vaginal delivery?" and the value was converted to a probability (0-1.0).
We chart abstracted patient demographics and outcomes and obtained physician demographics through publicly available sources. We used linear mixed models to assess differences in predictions by patient and physician characteristics, and performed subgroup analysis for nulliparous, term, singleton vertex (NTSV) patients.

Results: We received 203 physician responses from 46 physicians. Table 1 lists physician and patient demographics. The median prediction was 0.9. Physicians predicted a lower likelihood of VD for patients with obesity and a higher likelihood of VD for multiparas. (Table 2)
The NTSV subgroup was 111 patients delivered by 39 physicians. Physician and patient characteristics were similar to the overall population. The median prediction was 0.8. Physicians predicted a lower likelihood of VD for patients age ≥ 35 and for BMI ≥30 and a higher likelihood of VD for Asian patients. There were no differences in predictions by physician demographics (age, gender, language, practice duration).

Conclusion: Numerous patient factors influence physician's perception of the probability of a VD. Given that we anticipate the physician's early perception impacts the eventual outcome (anchoring bias), future research will focus on the importance of

early recognition to determine strategies to mitigate those without causal association.

Table 1. Descriptive statistics for the cohort of patients and physicians.

	Mean ± SD or n (%)	
	All Patients (n=203)	NTSV Deliveries (n=111)
DEMOGRAPHICS		
Age	33.7 ± 4.5	33.0 ± 4.2
≥35 yrs	89 (43.8%)	38 (34.2%)
Race/ethnicity		
Non-Hispanic White	118 (58.1%)	62 (55.9%)
Hispanic	36 (17.7%)	21 (18.9%)
Non-Hispanic Asian	23 (11.3%)	16 (14.4%)
Non-Hispanic Black	11 (5.4%)	5 (4.5%)
Other	15 (7.4%)	7 (6.3%)
BMI	29.4 ± 5.6	28.9 ± 5.6
≥30	71 (35.0%)	36 (32.4%)
Parity	0.7 ± 0.9	
0	113 (55.7%)	111 (100%)
1	57 (28.1%)	-
≥2	33 (16.2%)	-
Previous Cesareans		
0	131 (64.5%)	78 (70.3%)
1	7 (3.4%)	-
OUTCOMES		
Gestational age (weeks)	39.0 ± 1.2	39.2 ± 1.1
Mode of delivery		
NSVD	162 (79.8%)	82 (73.9%)
VAVD	7 (3.4%)	5 (4.5%)
VBAC	6 (3.0%)	-
LT Cesarean	28 (13.8%)	24 (21.6%)
CLINICIAN CHARACTERISTICS	n=46	n=39
Age ≥40	28 (60.9%)	23 (59%)
Years in Practice <10	18 (39.1%)	16 (41%)
Gender		
Women	27 (58.7%)	24 (61.5%)
Men	19 (41.3%)	15 (38.5%)
Language in addition to English	5 (10.9%)	13 (11.7%)

Table 2. Summary of predicted probability of vaginal delivery and linear mixed-effects model results for the prediction made by clinician adjusting for patient demographics.

	All Deliveries (n=203)		NTSV Deliveries (n=111)	
Overall Predicted Probability (median, IQR)	0.9 (0.7-1.0)	-	0.8 (0.7-1.0)	-
Age		0.225		**0.034**
<35 yrs	ref	ref	ref	ref
≥35 yrs	-0.03 (-0.07, 0.02)	0.226	**-0.07 (-0.13, -0.00)**	**0.037**
Race/ethnicity		0.955		0.174
Non-Hispanic White	ref	ref	ref	ref
Hispanic	-0.01 (-0.07, 0.05)	0.753	+0.02 (-0.06, 0.11)	0.588
Non-Hispanic Black	-0.01 (-0.11, 0.09)	0.847	-0.01 (-0.16, 0.14)	0.883
Non-Hispanic Asian	0.00 (-0.06, 0.07)	0.888	**+0.11 (0.02, 0.20)**	**0.015**
Other	+0.103 (-0.05, 0.11)	0.512	+0.02 (-0.10, 0.14)	0.728
BMI		**0.009**		**0.001**
18.5-24.9	ref	ref	ref	ref
25-29.9	-0.01 (-0.07, 0.04)	0.636	-0.03 (-0.10, 0.05)	0.466
≥30	**-0.08 (-0.15, -0.02)**	**0.009**	**-0.14 (-0.23, -0.06)**	**0.001**
Parity		**<0.001**		
0	ref	ref	-	-
1+	**+0.16 (0.11, 0.20)**	**<0.001**	-	-

1108 | Physician vs. Partometer: a Machine Learning Model Predicts mode of Delivery as well as Physicians

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4:00 PM - 6:00 PM

Objective: Performance of predictive machine learning (ML) models has rarely been assessed against clinician intuition. The Partometer is a validated ML model which uses data from the electronic health record to generate ongoing predictions of a patient's likelihood of vaginal delivery (VD). The aim of this study is to compare calibration and accuracy of the Partometer in predicting VD compared to the physician.

Study Design: This was a prospective study of all patients presenting for a planned VD. At 4 hours, we conducted two concurrent assessments: 1) to the patient's physician "on a scale of 1-10 (ordinal; 10 = highest), what is your patient's likelihood of a vaginal delivery?"; 2) we queried the Partometer on the same continuous scale.

Patient information was chart abstracted; physician characteristics were obtained from public sources. We assessed calibration by fitting a linear mixed model for difference in Brier scores with random intercept to account for the predictions made by the same physician. For accuracy, we used >6 as predicting a VD (i.e., if the prediction was >6 and a VD occurred, this was a true positive). We stratified by patient characteristics. Subgroup analysis was performed among patients who were nulliparous, term, singleton vertex (NTSV).

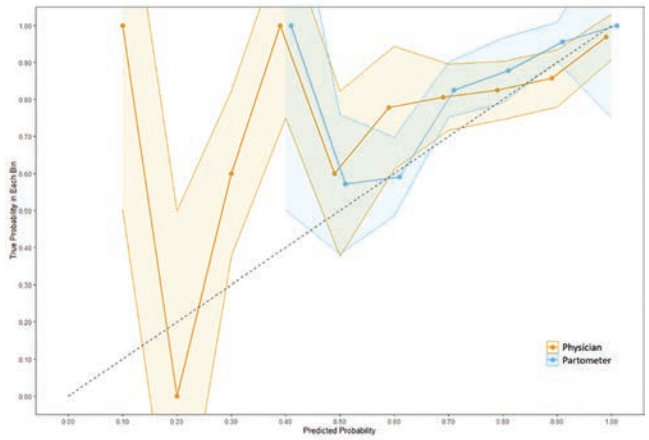
Results: There were 203 predictions from 46 clinicians. The Partometer was equally well calibrated (Partometer 0.11 +/- 0.18, physician 0.12 +/- 0.22) and accurate (85.7% [80.1-90.2] vs. 80.8% [74.7-86.0]) as physicians in predicting VD. The findings persisted after adjustment for patient and clinician characteristics. On demographic-adjusted analysis, both the Partometer and physicians were less well calibrated for patients who were non-Hispanic Black, with obesity, or nulliparous. For the NTSV subgroup, predictions on subjects age ≥35 were less well calibrated by both Partometer and physicians. Differences in calibration were found in the NTSV subgroup among the clinicians < 40 years old and/or < 10 years of practice.

Conclusion: ML model to predict mode of delivery was as well calibrated and accurate as physicians' own predictions of their patients.

Table 1. Calibration (Brier scores) of physicians vs. Partometer

	Brier Physician		Brier Partometer	
	Mean ± SD	Linear mixed model p	Mean ± SD	Linear model p
PATIENT CHARACTERISTICS				
Patient Age		0.402		0.073
<35 yrs	0.11 ± 0.21	ref	0.09 ± 0.17	ref
≥35 yrs	0.14 ± 0.24	0.403	0.13 ± 0.18	0.073
Race/ethnicity		**0.004**		**0.019**
Non-Hispanic White	0.09 ± 0.18	ref	0.09 ± 0.16	ref
Hispanic	0.16 ± 0.26	0.100	0.13 ± 0.18	0.276
Non-Hispanic Black	0.35 ± 0.36	**<0.001**	0.28 ± 0.27	**<0.001**
Non-Hispanic Asian	0.13 ± 0.22	0.472	0.11 ± 0.17	0.673
Other	0.10 ± 0.26	0.859	0.09 ± 0.20	0.932
BMI		**0.019**		**0.020**
18.5-24.9	0.10 ± 0.22	ref	0.08 ± 0.19	ref
25-29.9	0.09 ± 0.18	0.878	0.09 ± 0.15	0.847
≥30	0.18 ± 0.26	**0.046**	0.16 ± 0.19	**0.026**
Parity		**<0.001**		**<0.001**
0	0.18 ± 0.24	ref	0.15 ± 0.20	ref
1+	0.06 ± 0.18	**<0.001**	0.06 ± 0.12	**<0.001**
PHYSICIAN CHARACTERISTICS				
Age		0.699		0.645
<40 yrs	0.12 ± 0.20	ref	0.10 ± 0.16	Ref
≥40 yrs	0.13 ± 0.24	0.702	0.11 ± 0.19	0.645
Gender		0.378		0.248
Female	0.14 ± 0.22	ref	0.12 ± 0.18	ref
Male	0.11 ± 0.22	0.391	0.09 ± 0.17	0.248
Language		0.848		0.966
English only	0.13 ± 0.22	ref	0.11 ± 0.17	ref
English + other language(s)	0.12 ± 0.25	0.850	0.11 ± 0.22	0.966
Years of Practice		0.687		0.422
<10 yrs	0.12 ± 0.20	ref	0.10 ± 0.15	ref
≥10 yrs	0.13 ± 0.24	0.690	0.12 ± 0.19	0.422

Figure 1. Calibration plot and number of predictions belonging to each bin of predicted probability.



Predicted Probability	0 (0.0-0.05)	0.1 (0.05, 0.15)	0.2 (0.15, 0.25)	0.3 (0.25, 0.35)	0.4 (0.35, 0.45)	0.5 (0.45, 0.55)	0.6 (0.55, 0.65)	0.7 (0.65, 0.75)	0.8 (0.75, 0.85)	0.9 (0.85, 0.95)	1.0 (0.95, 1.00)
Physician	0	1	1	5	4	5	9	31	40	42	65
Partometer	0	0	0	0	1	7	22	46	33	90	4

1109 | Proinflammatory Omega-6 and Arachidonic Acid are Increased in Breast Milk of Mothers with Overweight/Obesity

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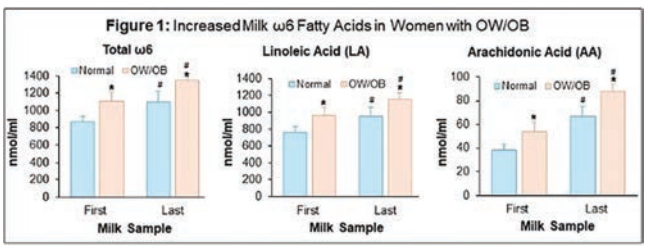
4:00 PM - 6:00 PM

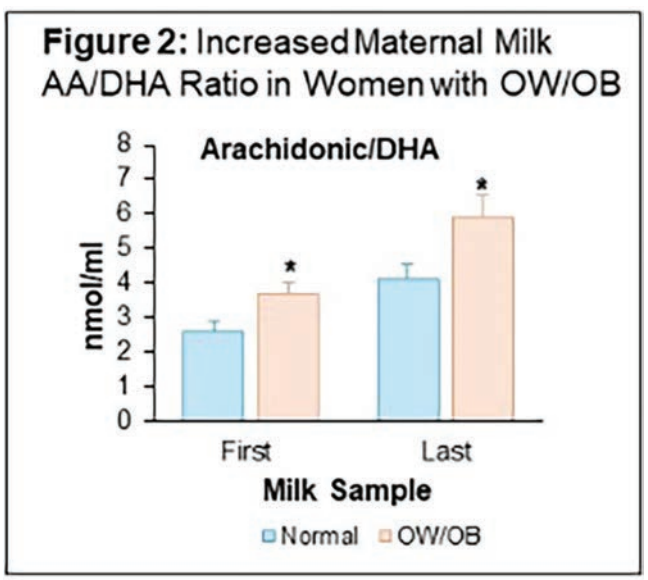
Objective: Human milk composition varies depending on maternal diet, duration of nursing, time of day and maternal body habitus. Among the critical milk components, essential polyunsaturated fatty acids (PUFA omega-6 and omega-3) must be supplied to the newborn for brain growth and development. Western diets have led to an increase in maternal consumption of omega-6 linoleic acid (LA) and a decrease in omega-3 α-linolenic acid (ALA) PUFA. Through the elongation and desaturation process, LA is converted to arachidonic acid (AA) and ALA to docosahexaenoic acid (DHA). While AA and DHA are important for brain development, an excessive amount of total omega-6 (ω6), AA and a higher AA/DHA ratio are associated with accelerated weight gain in infants, increased oxidative stress, inflammation and cognitive impairment. As women with OW/OB have increased total milk fat content, we sought to determine the influence of maternal body mass index (BMI) on specific PUFA levels.

Study Design: We studied women who delivered singleton, term neonates and were exclusive breastfeeding at 7-9 weeks postpartum. Among both normal weight (BMI 18.5-24.9 kg/m^2) and women with overweight and obesity (OW/OB; BMI$\geq$25 kg/m^2), continuous milk samples (10ml) from foremilk to hindmilk were obtained via pump until the breast was emptied. First and last pumped milk samples were analyzed. Milk and maternal plasma lipidomics were undertaken (Lipidyzer Platform).

Results: In women with OW/OB, breast milk total ω6, LA and AA levels were significantly increased in both the first (foremilk) and last (hindmilk) samples as compared to normal weight (Fig 1). Importantly, the AA/DHA ratio was significantly increased in foremilk and hindmilk of women with OW/OB (Fig 2).

Conclusion: The increased ω6, LA and AA levels including an increased AA/DHA ratio in the breast milk of women with OW/OB has a potential risk for infant obesity, inflammation and adverse cognitive/behavioral outcomes. Novel strategies to optimize milk AA/DHA are urgently needed during pregnancy and lactation, particularly in women with obesity.





1110 | Metformin Inhibits Insulin-induced Mammary Lipid Synthesis: Development of Personalized Human Milk to Prevent Childhood Obesity

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4:00 PM - 6:00 PM

Objective: Infants born to obese mothers are at increased risk of childhood obesity due to in-utero programming and accelerated infant weight gain. The increased fat/calorie content of milk of mothers with obesity suggests that the maternal metabolic milieu, including increased serum insulin, alters breast lipid synthesis. We utilized a 3-D immortalized human mammary epithelial cell (MEC) culture to examine the effects of exogenous insulin on lipid synthesis. We further hypothesized that Metformin would prevent insulin-induced milk lipid synthesis.

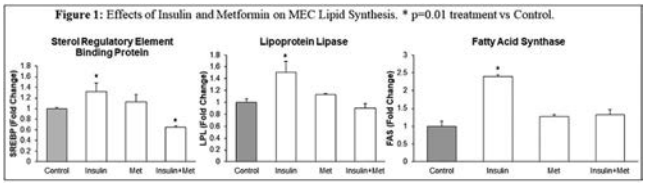
Study Design: MECs were cultured on cell inserts which separate the basolateral chamber containing "serum" from the apical chamber of milk production. Insulin (5 ng/ml), with and without

Metformin (5 μmol/L), was added to the lactogenic medium within the basolateral chamber. After 48h, MECs were analyzed for protein expression (Western Blot) of lipogenic transcription factor (sterol regulatory element-binding protein, SREBP), and enzymes involved in triglyceride uptake (lipoprotein lipase, LPL) and fatty acid synthesis (fatty acid synthase, FAS). Treated vs. untreated MECs were compared by ANOVA with Dunnett's post-hoc test. Values are fold change (mean ± SEM) of N = 4 independent cultures.

Results: In response to insulin, cellular MECs demonstrated activation of the lipid synthesis pathway as evident by increased protein expression of SREBP1 including its downstream target enzymes LPL and FAS. Metformin treatment normalized the insulin-induced upregulation of MEC lipid synthesis (Fig 1).

Conclusion: The increased fat/caloric content of milk of obese mothers is a result, in part, of insulin-enhanced mammary lipid synthesis. Consistent with hepatic effects, Metformin reduces insulin-mediated lipogenesis. These findings suggest that excess human milk lipid synthesis may be normalized by maternal diet or pharmacologic interventions which reduce serum insulin. The extension of personalized human milk from the low birth weight to macrosomic infants may prevent excess infant weight gain resulting from high caloric breast milk.

Figure 1: Effects of Insulin and Metformin on MEC Lipid Synthesis. * p=0.01 treatment vs Control.



1111 | Effect of the COVID-19 Pandemic on Sterilization Rates based on Location in Wisconsin

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4:00 PM - 6:00 PM

Objective: The COVID-19 pandemic placed significant demands on healthcare infrastructure, and medical resources were preferentially allocated to emergent or urgent services. This study aims to examine the effect of the COVID-19 pandemic on the rate of immediate and 3-month postpartum (PP) sterilization procedures in Wisconsin (WI) based on geographic location.

Study Design: A retrospective cohort of all births from 3/1/2017 to 3/31/2023 in WI was constructed using WI Hospital Association coding data. Pre-COVID was defined as 3/1/2017 - 2/29/2020 and post-COVID was defined as 3/1/2020 - 3/31/2023. Generalized additive logistic regression models were constructed for the rate of sterilization at birth and at 3 months PP as a function of geographic location (ZIP code). Statistical analyses were performed using the mgcv package in R.

Results: There were 334,408 births – 172,752 pre pandemic and 161,656 during/post pandemic. There were 15,534 sterilization events at the time of birth (4.6%)–8,263 (4.8%) pre pandemic and 7,271 (4.5%) during/post pandemic (RR 0.94, 95% CI 0.91-0.97, p = 0.0002). There was very strong evidence (p< 0.0001) of geographic variation in the impact of the pandemic on the rate of immediate sterilization. There were nominally significant (p< 0.05) elevations in the rate of immediate sterilization for zip codes in northern and western WI and nominally significant reductions in the rate of immediate sterilization for zip codes in northwest, west central, and south central WI. Similar relationships were seen at 3 months PP.

Conclusion: The COVID-19 pandemic demonstrated a significant decrease in rates of immediate to 3-month PP sterilization procedures in WI. There was strong evidence of geographic variation in the pandemic's impact on the sterilization rate statewide. The findings of this study indicate a shift in rate of sterilization during a pandemic, which demonstrates the need for development of provisions or alternatives to permanent sterilization to allow for optimal family planning and contraceptive choice for PP patients during times of healthcare crises or when access to care is limited.

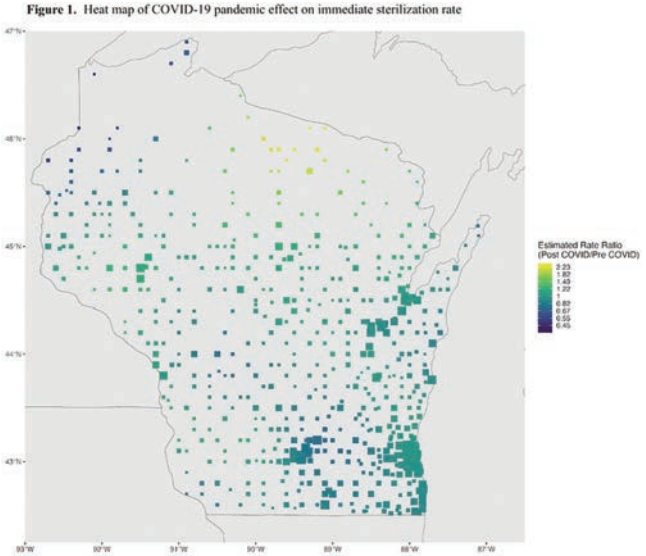
Table 1. Participant Characteristics

Characteristic	N	Overall, N = 334,408[1]	Pre/Post COVID		p-value[2]
			Pre, N = 172,752[1]	Post, N = 161,656[1]	
Race/Ethnicity	325,302				<0.001
AI/AN		3,945 (1.2%)	2,103 (1.3%)	1,842 (1.2%)	
Asian/PI		16,579 (5.1%)	8,733 (5.2%)	7,846 (5.0%)	
Black		39,517 (12%)	20,794 (12%)	18,723 (12%)	
Hispanic		31,268 (9.6%)	14,722 (8.8%)	16,546 (11%)	
White		233,993 (72%)	121,417 (72%)	112,576 (71%)	
Unknown		9,106	4,983	4,123	
Payer	332,980				0.075
Medicaid		117,015 (35%)	60,658 (35%)	56,357 (35%)	
Other Government		6,398 (1.9%)	3,217 (1.9%)	3,181 (2.0%)	
Private Insurance		207,094 (62%)	106,844 (62%)	100,250 (62%)	
Self Pay		2,473 (0.7%)	1,267 (0.7%)	1,206 (0.7%)	
Unknown		1,428	766	662	
Language	94,029				0.2
English		89,819 (96%)	5,757 (95%)	84,062 (96%)	
Hmong		338 (0.4%)	22 (0.4%)	316 (0.4%)	
Other		779 (0.8%)	56 (0.9%)	723 (0.8%)	
Spanish		3,093 (3.3%)	226 (3.7%)	2,867 (3.3%)	
Unknown		240,379	166,691	73,688	
Immediate Sterilization	334,408	15,534 (4.6%)	8,263 (4.8%)	7,271 (4.5%)	<0.001
Sterilization at 3 mo	334,408	18,031 (5.4%)	9,491 (5.5%)	8,540 (5.3%)	0.007

[1] n (%)

[2] Pearson's Chi-squared test

Figure 1. Heat map of COVID-19 pandemic effect on immediate sterilization rate



1112 | Impact of a Statewide Quality Collaborative on Screening and Referral for Perinatal Substance Use Disorders

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4:00 PM - 6:00 PM

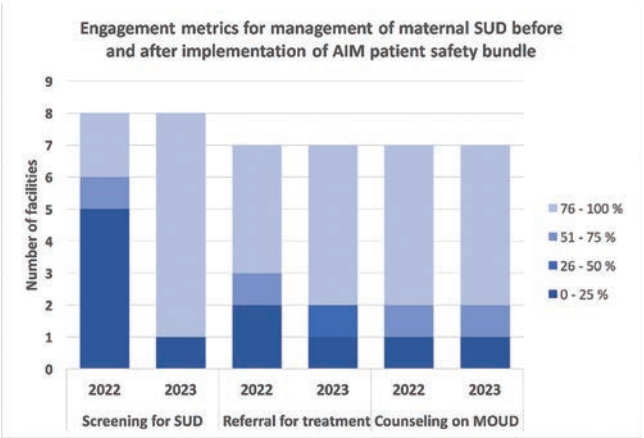
Objective: To evaluate the effectiveness of a statewide quality improvement (QI) collaborative for increasing the adoption of Screening, Brief Intervention, and Referral to Treatment (SBIRT) in pregnant persons with substance use disorder (SUD).

Study Design: We evaluated the impact of a statewide perinatal collaborative aimed at increasing the adoption of SBIRT through implementation of the Alliance for Innovation in Maternal Health (AIM) patient safety bundle on caring for pregnant and postpartum people with substance use disorder (SUD). We evaluated changes in average rates of SBIRT and bundle implementation through hospital-level chart reviews, aggregate data submission, structure measure surveys, and engagement metrics over a 2-year period from January 2022 to December 2023. QI metrics for the collaborative, including process, outcome and structure measures were defined in alignment with the AIM bundle. Hospitals with data from the initial (Jan 1 - Mar 31, 2022) and final (Oct 1–Dec 31, 2023) phase of the project were included. All study variables were coded as nominal data and analyzed using Chi-square tests; statistical significance was set at $p \leq .05$.

Results: Ten hospitals met criteria for inclusion in this QI initiative review and were evaluated for SBIRT adoption before and after implementation of the patient safety bundle. There were no significant differences among sites with regards to geographic location or obstetric bed size. Evaluation of screening patterns demonstrated a significant increase in rates of SUD screening (59.4% to 90.1%, $p < .001$) after bundle implementation (Figures 1 and 2). Rates of referral for SUD treatment (77.8% to 83.8%, $p = .21$) and counseling about medications for opioid use disorder (MOUD) (84.5% to 89%, $p = .31$) were also noted to increase over the 2-year implementation period, however–this did not reach statistical significance (Figure 1).

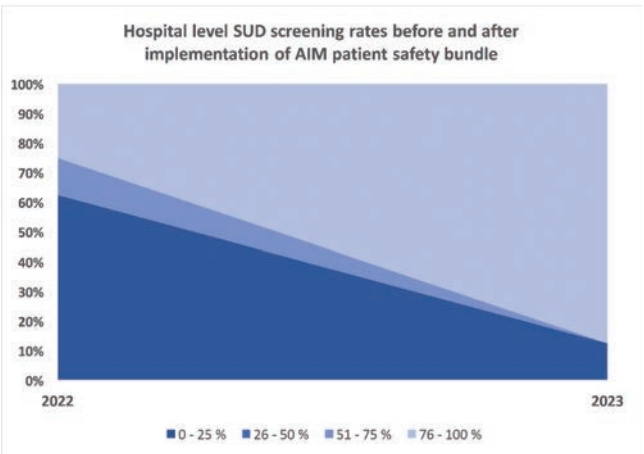
Conclusion: Adoption of a structured patient safety bundle implemented through a statewide quality collaborative has the potential to increase screening and timely referrals for enhancing care delivery in patients with perinatal SUD.

Figure 1



SUD = Substance Use Disorder
AIM = Alliance for Innovation in Maternal Health

Figure 2



SUD = Substance Use Disorder
AIM = Alliance for Innovation in Maternal Health

1113 | Magnesium Sulfate Infusion During Delivery Hospitalization is not Independently Associated with Postpartum Hemorrhage

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4:00 PM - 6:00 PM

Objective: To determine whether intravenous (IV) magnesium sulfate (Mg) use is associated with postpartum hemorrhage (PPH) and peripartum hysterectomy (hyst).

Study Design: This retrospective cross-sectional study utilizes Epic Systems' Cosmos research platform, a US-based electronic health record database with de-identified patient-level data. All deliveries from 2017-2023 without International Classification of Diseases (ICD)-10 codes for placenta accreta spectrum were included. The exposure was IV Mg use based on the medication

administration record. The outcome of PPH was defined by ICD-10 code plus red blood cell transfusion, procedure code for hemorrhage treatment, or receipt of methergine or carboprost. The outcome of hyst was based on Current Procedural Terminology codes. The associations of IV Mg and the outcomes of (1) PPH and (2) hyst were examined using bivariate and multivariate analyses. In addition, these associations were examined stratified by gestational age at delivery (< 32 vs >32 weeks' gestation).

Results: PPH was significantly associated with all listed covariates in bivariate tests (Table 1). Patients receiving IV Mg were significantly more likely to have PPH [OR 2.55 (95% CI: 2.48-2.61)], which was slightly attenuated after adjustment [aOR 2.01 (95% CI 1.95-2.08)]. Among patients with PPH, IV Mg was associated with higher odds of hyst in both models [OR 4.22 (95% CI 3.64-4.88); aOR 7.72 (95% CI 6.38-9.30)]. In stratified analyses, after adjustment, patients who delivered >32 weeks and received IV Mg had even higher odds of PPH [aOR 8.40 (95% CI 6.90-10.21)] (Table 2). There was no significant association among those who delivered < 32 weeks after adjusting for potential confounders.

Conclusion: IV Mg use was significantly associated with increased risk of PPH but only among those patients who delivered >32 weeks' gestation. Since IV Mg is administered primarily for eclampsia risk reduction and not for fetal neuroprotection after this gestational age threshold, our findings suggest that severe preeclampsia may drive the association between Mg and hemorrhage. Further exploration is needed.

Table 1: Postpartum hemorrhage and cesarean hysterectomy risk among all deliveries

Characteristic	Postpartum Hemorrhage				Cesarean Hysterectomy			
	NO n=4,222,755 (%)	YES n=71,408 (%)	Bivariate p	aOR[1] (CI)	NO n=70,381 (%)	YES n=1,027 (%)	Bivariate p	aOR[1] (CI)
IV Magnesium	247,431 (5.9)	9,839 (13.8)	<0.001	2.01 (1.95-2.08)	9434 (13.4)	405 (39.4)	<0.001	7.72 (6.38-9.34)
Maternal Age			<0.001				<0.001	
Less than 20	138,137 (3.3)	3,107 (4.4)		1.15 (1.11-1.21)	3102 (4.4)	5 (0.5)		0.34 (0.12-0.74)
20-34	3,133,418 (74.2)	51,806 (72.5)		REF	51,239 (72.8)	567 (55.2)		REF
35 or greater	951,200 (22.5)	16,495 (23.1)		1.07 (1.05-1.10)	16,040 (22.8)	455 (44.3)		1.66 (1.42-1.93)
Parity			<0.001				<0.001	
0 (nulliparous)	1,649,671 (41.4)	34,017 (47.6)		REF	33,756 (48.0)	261 (25.4)		REF
1-3	2,268,646 (53.7)	33,037 (46.3)		0.76 (0.74-0.77)	32,396 (46.0)	641 (62.4)		2.06 (1.74-2.45)
4 or more	204,438 (4.8)	4,354 (6.1)		NS	4,229 (6.0)	125 (12.2)		2.60 (2.00-3.40)
Preterm birth <37 weeks	381,201 (9.0)	8.542 (12.0)	<0.001	0.85 (0.82-0.87)	8,359 (11.9)	183 (17.8)	<0.001	0.63 (0.51-0.77)
Multiple gestation	103,185 (2.4)	5,817 (8.1)	<0.001	3.83 (3.70-3.96)	5,735 (8.1)	82 (8.0)	NS	
Birth weight ≥4000g	305,774 (7.2)	7,616 (10.7)	<0.001	1.85 (1.80-1.90)	7,505 (10.7)	82 (10.8)	NS	
Cesarean delivery	1,378,576 (32.6)	21,745 (30.5)	<0.001	0.74 (0.73-0.76)	21,009 (29.9)	763 (74.3)	<0.001	4.82 (4.10-5.67)
Race or ethnicity			<0.001				0.006	
Asian	249,230 (5.9)	4,664 (6.5)		REF	4,576 (6.5)	88 (8.6)		REF
Black	782,474 (18.5)	13,794 (19.3)		0.83 (0.80-0.86)	13,570 (19.3)	224 (21.8)		NS
Hispanic	752,920 (17.8)	16,772 (23.5)		1.12 (1.08-1.17)	16,533 (23.5)	239 (23.3)		NS
Other	133,923 (3.2)	2,561 (3.6)		0.95 (0.90-1.00)	2,521 (3.6)	40 (3.9)		NS
Unknown	57,217 (1.4)	927 (1.3)		0.83 (0.77-0.90)	919 (1.3)	8 (0.8)		NS
White	2,246,991 (53.2)	32,690 (45.8)		0.70 (0.67-0.72)	32,262 (45.8)	428 (41.7)		NS
Obesity	287,209 (6.8)	5,537 (7.8)	<0.001	1.07 (1.04-1.11)	5,447 (7.7)	90 (8.8)	NS	
Chronic hypertension	123,033 (2.9)	2,650 (3.7)	<0.001	1.04 (1.00-1.10)	2,585 (3.7)	65 (6.3)	<0.001	1.43 (1.02-1.98)
Hypertensive disorder of pregnancy	846,005 (20.0)	21,695 (30.4)	<0.001	1.45 (1.42-1.48)	21,399 (30.4)	296 (28.8)	NS	
Anti-hypertensive	340,481 (8.1)	10,058 (14.1)	<0.001	NS	6880 (9.8)	178 (17.3)	0.003	0.53 (0.41-0.66)
Preexisting diabetes mellitus	48,213 (1.1)	1,005 (1.4)	<0.001	NS	981 (1.4)	24 (2.3)	0.01	1.05 (0.62-1.68)
Gestational diabetes	730,924 (17.3)	13,766 (19.3)	<0.001	1.05 (1.03-1.08)	13,509 (19.2)	257 (25.0)	<0.001	1.19 (1.00-1.41)

aOR, adjusted odds ratio; CI, Confidence interval
Green shading denotes a protective association. Orange shading denotes an adverse association.
[1] Adjusted odds ratio: multivariable regression analysis adjusted for all significant covariates.

Table 2: Odds of postpartum hemorrhage stratified by gestational age at delivery

	<32 Weeks n = 2,037		>32 Weeks n= 79,139	
Exposure	OR (CI)	aOR[1] (CI)	OR (CI)	aOR[1] (CI)
IV Magnesium	0.87 (0.78-0.96)	0.94 (0.84-1.05)	4.54 (3.89-5.28)	8.40 (6.90-10.21)

OR, odds ratio; CI, Confidence interval; aOR, adjusted odds ratio
[1] Adjusted odds ratio: multivariable regression analysis adjusted for maternal age, parity, multiple gestation, infant birth weight ≥4000g, cesarean delivery, race/ethnicity, obesity, chronic hypertension, hypertensive disorder of pregnancy, anti-hypertensive use during delivery admission, preexisting diabetes mellitus, and gestational diabetes.

1114 | Perinatal Healthcare Inequities: a Causal Network Analysis

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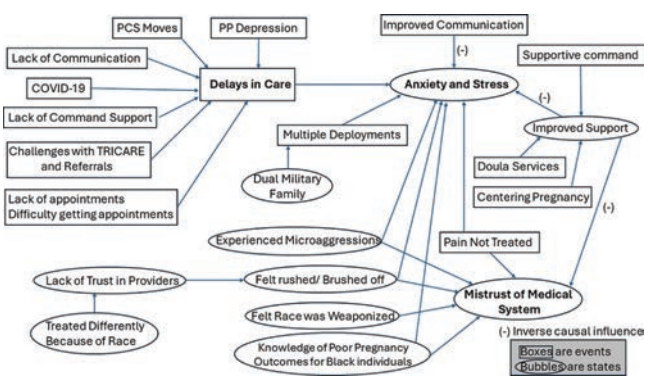
4:00 PM - 6:00 PM

Objective: Persistent healthcare disparities exist within the Military Health System (MHS). The objective of this study was to use qualitative interviews to assess the intersection of operational and cultural experiences of military service with the lived experience of individuals on their use and experience of health care.

Study Design: This is an IRB approved qualitative study of the perinatal birthing experience of servicemembers and TRICARE beneficiaries. Thirty semi-structured interviews were conducted with individuals who delivered an infant within the last five years. Causation coding and deductive methods were used to generate a variable list of antecedent variables, mediating variables and outcomes. Themes were organized into causal chains based on participant stories. A causal network was developed using cross-case mapping to generate a thematic narrative from a systematic comparison of within-case causal networks.

Results: A complex detailed causal network was developed, depicting structural and social factors affecting birth experiences. Such causal relationships impact individual experiences to varying degrees. Antecedent variables included experiences of dismissal, lack of support, concerns about the pregnancy, knowledge of poor outcomes, family experiences, and systemic issues. Mediating variables included delays in care, lack of command support, fragmented care, microaggressions and fear of medications and interventions. Outcomes included mistrust of the medical system, fear and anxiety, early cessation of human milk feeding and decreased military retention.

Conclusion: Comprehensive and logical pathways illustrate challenges faced by birthing individuals in the MHS. Outcomes including mistrust, fear and anxiety and early cessation of human milk feeding are mediated by healthcare experiences and concerns.



1115 | Fertility Treatments Resulting in Twin Pregnancy and the Risk for Childhood inFectious Disease

Moran Shahar[1]; Gil Gutvirtz[2]; Tamar Wainstock[1]; Eyal Sheiner[1]
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4:00 PM - 6:00 PM

Objective: Recent research suggests that singleton pregnancies achieved using fertility treatment are at an increased risk for long-term infectious morbidity of the offspring as compared with spontaneous singleton pregnancies. Scarce data exists regarding twins. We investigated the risk of long-term infectious morbidity among twins born following fertility treatments.

Study Design: A population-based retrospective cohort study of all twin deliveries born between the years 1991-2021 at a tertiary center. Twins born using fertility treatments including ovulation induction (OI) and in-*vitro* fertilization (IVF) were compared with twins born following spontaneous pregnancies. The long-term infectious morbidity was compared based on data from community clinics visits and hospitalizations of offspring up to the age of 18 involving an infectious morbidity. The diagnoses of infectious morbidities were based on ICD-9 codes used in the clinics and hospital wards. A Kaplan–Meier survival curve was used to compare the cumulative incidence of infectious morbidities and a Cox proportional hazards model was constructed to control for confounders.

Results: A total of 7790 twins met the inclusion criteria: 2076 twins (26.6%) were born following fertility treatments, among them 696 (8.9%) were born using OI and 1380 (17.7%) following IVF. The total infectious morbidity rate was significantly higher in twins born following fertility treatments as compared with twins from spontaneous pregnancies (73.3% for OI, 71.1% for IVF and 64.1% for spontaneous twins, $p< 0.001$). Likewise, the cumulative incidence of infectious morbidity over time was higher for twins born following fertility treatments (**Figure**). In the Cox regression model, controlling for maternal and gestational age, hypertensive disorders, diabetes mellitus and ethnicity, fertility treatments resulting in twin pregnancy were found to be an independent risk factor for long-term infectious morbidity of the offspring (**Table**).

Conclusion: In our cohort, twins born following fertility treatments were found to be at higher risk for long-term infectious morbidity.

Figure. Kaplan-Meier survival curve demonstrating the cumulative incidence of infectious morbidity among study groups

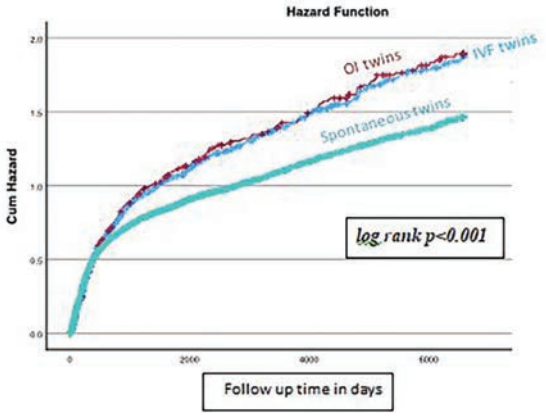

Table. Cox regression model for the association between the twin mode of conception and the offspring long-term infectious morbidity

	aHR	95%CI	p value
IVF Vs. spontaneous	1.23	1.14 - 1.32	<0.001
OI Vs. spontaneous	1.24	1.13 - 1.37	<0.001
Maternal age	0.99	0.99 - 1.01	0.399
Gestational age	1.00	0.98 - 1.00	0.399
Hypertension	1.05	0.96 - 1.15	0.238
Diabetes mellitus	0.99	0.90 - 1.08	0.814
Ethnicity	0.87	0.82 - 0.92	<0.001

1116 | Does Maternal Age at First Pregnancy Affect Long-Term Endocrine Morbidity of the Mother?

Moran Shahar[1]; Eyal Sheiner[1]; Ruslan Sergienko[2]; Naama Steiner[1]; Tamar Wainstock[1]; Gil Gutvirtz[3]; Roy Kessous[4]
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4:00 PM - 6:00 PM

Objective: Pregnancies of women of advanced maternal age are associated with various pregnancy and perinatal complications for the mother and the offspring. However, the long-term outcomes of the mothers were scarcely investigated. Our aim was to investigate the association between maternal age at first pregnancy and long-term endocrine morbidity of the mother

Study Design: In a population-based cohort study, long-term endocrine morbidity of mothers who delivered between 1991-2021 in a regional tertiary medical center was analyzed. Mothers were stratified by 4 age groups (< 30,30-35,35-40, >40). Endocrine morbidity was assessed according to a predefined set of ICD-9 codes and extracted from endocrine-related hospitalization files of the mothers. A Kaplan-Meier survival curve was used to assess cumulative incidence of endocrine morbidity and a Cox proportional hazards model was constructed to control for

confounders, comparing the groups of maternal age over 30 to a reference group of women under 30 in their first pregnancy

Results: During the study period 73258 women were included, of which 67365 (92.0%) women had their first delivery prior to 30 years of age, 4571 (6.2%) were between the ages 30-35, 1069 (1.5%) between the ages 35-40 and 253 (0.3%) were older than 40 years. The total endocrine-related hospitalization rate increased as maternal age increased among the 4 study groups (15.1%, 15.2%, 17.8% and 18.6%, respectively, $p = 0.004$). Likewise, the cumulative incidence of endocrine morbidity over time was higher for women as they were older in their first pregnancy (**Figure**). The Cox regression model, controlling for fertility treatments and ethnicity, found a 'dose dependent' effect as maternal age in the first pregnancy was an independent risk factor for long-term endocrine morbidity of the mother as compared with the reference group of women under 30 years old (**Table**)

Conclusion: As women delay their first pregnancy to an older age, they have higher long-term endocrine morbidity later in life. The risk tends to increase in a dose-dependent manner for women over the age of 30 and is highest for women over 40.

Figure. Kaplan-Meier survival curve demonstrating the cumulative incidence of endocrine morbidity among study groups divided by maternal age in the first pregnancy.

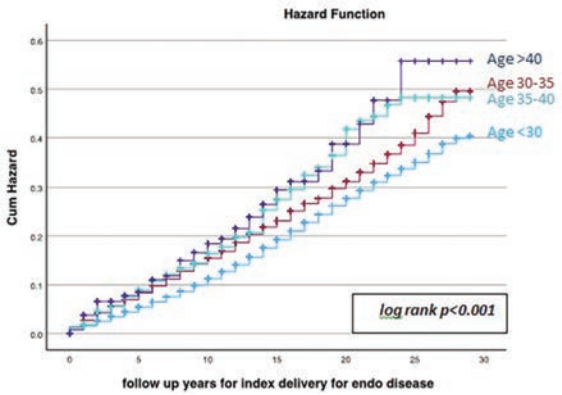

Table. Cox regression model for the association between maternal age in the first pregnancy and the mother's long-term endocrine morbidity

	aHR	95%CI	p value
Maternal age < 30 years	1 (Reference)		
30-35 vs. under 30	1.35	1.25 – 1.46	<0.001
35-40 vs. under 30	1.44	1.25 – 1.67	<0.001
Over 40 vs. under 30	1.51	1.13 – 2.01	0.005

- The model controlled for ethnicity and fertility treatments

1117 | Lactated Ringer's versus Normal Saline for Initial Fluid Resuscitation in Pregnant Patients with Diabetic Ketoacidosis

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4:00 PM - 6:00 PM

Objective: Prior studies examining diabetic ketoacidosis (DKA) outside of pregnancy show a shorter time to resolution of the anion gap when utilizing Lactated Ringer's (LR) compared to normal saline (NS) for fluid resuscitation. Our objective was to evaluate this evidence.

Study Design: This was a retrospective cohort study of pregnant individuals who present with DKA. The primary outcome was time to anion gap closure. Secondary outcomes included intensive care unit admission, total insulin infusion received, and total crystalloid volume. Continuous variables were tested for normality using the Shapiro-Wilk test, and compared using Student t-test or Mann-Whitney-U test as appropriate. Categorical variables were compared using Fisher's exact or Chi Squared test.

Results: 156 patients were included, 43 (28%) treated with LR and 113 with NS. Baseline characteristics were similar between groups. Median time to anion gap closure was shorter in the LR group (8.8 hours vs 13.2 hours, p = 0.003). Those who received LR also required less insulin from admission to anion gap closure (median 25.4 units vs 41 units, p = 0.005). Volume of crystalloid required to close the anion gap did not differ between groups.

Conclusion: The use of lactated ringers as the crystalloid solution with volume resuscitation in DKA is associated with a shorter time to anion gap closure.

Table 1: Baseline Characteristics

	Lactated ringers (n=43)	Normal saline (n=113)	p-value
Age (years)	27 [5]	26 [6]	0.37
BMI (kg/m^2)	27.8 [11.3]	27.4 [9.5]	0.67
Gestational age (weeks)	26 [16]	26 [14]	0.92
Glucose on admission (mg/dL)	262 [122]	248 [160]	0.62
Anion gap on admission (mEq/L)	19 [6]	20 [7.1]	0.27
Beta hydroxybutyrate on admission (mg/dL)	35.6 [30.6]	32.9 [39.8]	0.98
Hemoglobin A1c (%)	8.2 [2.6]	8.1 [2]	0.39
Nulliparity	19 (44)	52 (46)	0.86
Race			0.35
Black	25 (58)	73 (65)	
White	17 (40)	31 (27)	
Latinx	1 (2)	8 (7)	
Other	0	1 (1)	
Diabetes type			0.39
Type 1	30 (70)	88 (78)	
Type 2	13 (30)	22 (20)	
Gestational	0	2 (2)	
Other	0	1 (1)	

Data presented as n (%) or median [interquartile range]

Table 2: Diabetic Ketoacidosis Outcomes

	Lactated ringers (n=43)	Normal saline (n=113)	p-value
Time to gap closure (hours)	8.8 [11.4]	13.2 [16]	0.003
Insulin (units)	25.4 [44.7]	41 [50.3]	0.005
Crystalloid volume (mL)	2,850 [2,000]	3,000 [2,915]	0.09
ICU admission	5 (12)	12 (11)	0.78

Data presented as n (%) or median [interquartile range]

1118 | Outcomes of Patients with Euglycemic Versus Hyperglycemic Diabetic Ketoacidosis During Pregnancy

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4:00 PM - 6:00 PM

Objective: Euglycemic diabetic ketoacidosis (DKA) is uncommon in the adult non-pregnant diabetic population, but is more common in pregnancy. Our objective was to evaluate the outcomes of DKA admissions in pregnant patients with euglycemic versus hyperglycemic DKA.

Study Design: This was a retrospective cohort study of individuals with diabetes admitted with DKA during pregnancy. They were classified as euglycemic if their admission blood glucose was < 250 mg/dL. The primary outcome was the duration of time between diagnosis of anion gap metabolic acidosis and anion gap closure. Secondary outcomes included admission to the intensive care unit, total insulin received between diagnosis of DKA and anion gap closure, and total crystalloid volume. For continuous variables, normality testing was done using the Shapiro-Wilk test and data compared using Student t-test or Mann-Whitney-U test as appropriate. Categorical variables were compared using Fisher's exact or Chi Squared test.

Results: Euglycemic DKA was present in 78 (50%) of 156 included individuals with DKA. Those with euglycemic DKA had a lower blood glucose, beta-hydroxybutyrate, hemoglobin A1c, and anion gap compared to those with hyperglycemic DKA. Time between diagnosis of DKA and anion gap closure was longer in those with euglycemic DKA (median 14.8 hours vs 11.6 hours), however volume of crystalloid and amount of insulin did not differ between the groups.

Conclusion: Euglycemic DKA is associated with a longer time to anion gap closure despite a lower admission anion gap and beta-hydroxybutyrate level.

Table 1: Baseline Characteristics

	Hyperglycemic DKA (n=78)	Euglycemic DKA (n=78)	p-value
Age (years)	27 [6]	26.5 [6]	0.90
BMI (kg/m^2)	26.7 [10.2]	28.1 [7.7]	0.10
Gestational age (weeks)	24 [16]	28 [11]	0.01
Glucose on admission (mg/dL)	316 [99]	182.5 [72]	<0.001
Anion gap on admission (mEq/L)	21 [8]	18 [6]	0.004
Beta hydroxybutyrate on admission (mg/dL)	38.6 [39.7]	32.1 [30.7]	0.03
Hgb A1c on admission (%)	8.5 [2.2]	7.9 [1.8]	0.02
Nulliparity	31 (40)	40 (51)	0.2
Race			0.2
Black	55 (71)	43 (55.1)	
White	19 (24)	29 (37)	
Latinx	4 (5.1)	5 (6.4)	
Other	0	1 (1)	
Diabetes type			0.57
Type 1	62 (80)	56 (72)	
Type 2	15 (19)	20 (26)	
Gestational	1 (1)	1 (1)	
Other	0	1 (1)	

Data presented as n (%) or median [interquartile range]

Table 2: Diabetic Ketoacidosis Outcomes

	Hyperglycemic DKA (n=78)	Euglycemic DKA (n=78)	p-value
Time to gap closure (hours)	11.6 [10.6]	14.8 [18.1]	0.04
Insulin (units)	38.8 [43.8]	42.6 [49.2]	0.74
Crystalloid volume (mL)	3,000 [1,463]	2,825 [2,850]	0.14
ICU admission	12 (16)	5 (7)	0.12

Data presented as n (%) or median [interquartile range]

1119 | Prospective Validation of USPSTF Guidelines for Preeclampsia Prediction and Clinician Compliance with Aspirin Recommendations

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4:00 PM - 6:00 PM

Objective: United States Preventive Services Task Force (TF) guidelines recommend using risk-factors for preeclampsia (PE) in order to offer low-dose aspirin (LDA) to reduce risk. However, the predictive value is unclear. We sought to prospectively evaluate the performance and utilization of TF in predicting PE and to determine if LDA was recommended based on TF in a diverse population.

Study Design: People with a singleton pregnancy enrolled in an IRB-approved prospective, observational, cohort study < 22 weeks gestation between July 2020 - June 2023. Enrollment occurred at one of 12 clinical centers or via direct-to-participant-recruitment across the United States. Data was obtained from medical records review including TF risk-factors and if LDA had been recommended (Table 1). All PE cases were adjudicated by trained MFMs.

Results: The study enrolled 5,652 diverse participants (Table 1). Using TF recommendations for prediction of PE the sensitivity is 74% and the specificity is 48%. When including one or more moderate risk-factors the sensitivity increases to 97% and the specificity drops to 12%. 2,440 (43%) received a LDA recommendation. Of those with at least one high-risk factor, 82% had LDA recommended while in those with one or more moderate risk-factors, 37.4% received LDA recommendation (Fig 1a). 3,974 (70.3%) were in the TF's moderate risk-factors only category. For those with any risk factor, LDA was more likely to have been recommended in those who later developed PE vs those who didn't (Fig 1b).

Conclusion: TF had poor performance as a predictive screening tool for PE in the group with moderate risk factors. There was also low compliance with LDA recommendations suggesting non-adherence to TF, practice variation, or incomplete documentation. The higher rate of PE in those recommended LDA may reflect provider identification of a higher risk subgroup, non-adherence with taking aspirin, or failure of LDA to reduce PE in certain subgroups. These data highlight the opportunity and urgent need to develop better risk assessment tools based on objective biology rather than based on clinical risk factors.

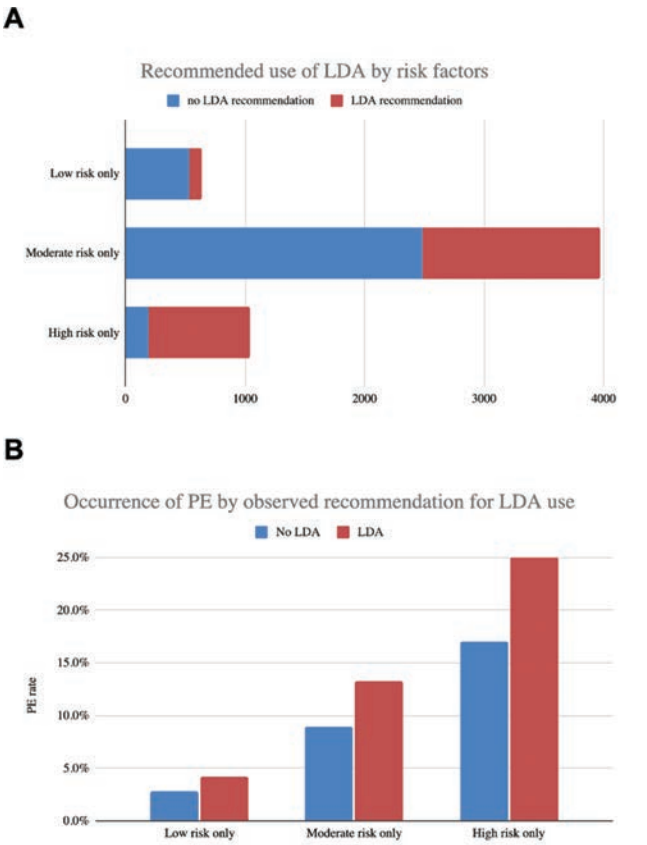

Figure 1. Recommendation of LDA and occurrence of PE. A) LDA recommendation by USPSTF risk factor. B) Rate of PE by risk group and LDA recommendation

Table 1: Screening test performance of USPSTF guidelines for preeclampsia risk prediction and resulting utilization of low-dose aspirin prophylaxis. ***LDA "recommended" if 1+ high risk factors and/or 2+ moderate risk factors. LDA to be "considered" if 1+ moderate risk factors***

Characteristic	No Aspirin recommended N = 3,214*	Aspirin recommended N = 2,438*	p-value^%	Effect size#	USPSTF Recommend Aspirin (sens/spec)	USPSTF Recommend or Consider Aspirin (sens/spec)
Demographics						
All samples (n=5,652)	3,214 (57%)	2,438 (43%)	<0.001	0.707	74%/48.3%	97.2%/12.4%
of which has PE	268 (8.3%)	416 (17%)	4.5E-23	0.327		
Race			<0.001	0.259		
Asian	189 (5.9%)	75 (3.1%)				
Black	395 (12%)	795 (33%)				
Hispanic	713 (22%)	272 (11%)				
Multiracial	303 (9.4%)	166 (6.8%)				
White	1,614 (50%)	1,130 (46%)				
Age	30.4 (26.4, 34.0)	31.4 (26.4, 35.7)	<0.001	0.157		
BMI	26 (23, 31)	30 (25, 36)	<0.001	0.485		
Smoking status	172 (5.4%)	147 (6.0%)	0.3	0.014		
Gestational age at collection	20.00 (18.86, 20.57)	20.00 (19.00, 20.71)	<0.001	0.093		
Gestational age at delivery	39.14 (38.29, 39.86)	38.86 (37.29, 39.43)	<0.001	0.258		
Infant weight	3,300 (2,990, 3,610)	3,220 (2,892, 3,550)	<0.001	0.146		
USPSTF guideline categories						
Low risk	538 (17%)	96 (3.9%)	<0.001	0.196	0%/100%	0%/100%
of which has PE	15/538 (2.8%)	4/96 (4%)	0.51 (NS)		RR 0.25	
Moderate risk factor (0 high risk)	2,488 (77%)	1,486 (61%)	<0.001	0.175	0%/100%	100%/0%
of which has PE	221/2,488 (8.9%)	198/1,486 (8.1%)	1.45E-05		RR 0.87	
1 or more high risk factors	188 (5.8%)	856 (35%)	<0.001	0.35	100%/0%	100%/0%
of which has PE	32/188 (17.0%)	214/856 (25.1%)	2.2E-02		RR 1.94	
USPSTF high risk factors						
History of PE	52 (1.6%)	397 (16%)	<0.001	0.259	100%/0%	100%/0%
of which has PE	12/52 (23.1%)	125/397 (31.5%)	0.26 (NS)			
Chronic Hypertension	59 (1.8%)	440 (18%)	<0.001	0.272	100%/0%	100%/0%
of which has PE	17/59 (28.8%)	123/440 (28.0%)	0.9 (NS)			
Pregestational type 1/2 DM	17 (0.5%)	156 (6.4%)	<0.001	0.165	100%/0%	100%/0%
of which has PE	3/17 (17.6%)	39/156 (25.0%)	0.77 (NS)			
USPSTF moderate risk factors						
Nulliparity	1,318 (41%)	954 (39%)	0.2	0.019	70.9%/44.3%	100%/0%
of which has PE	165/1,318 (12.5%)	186/954 (19.5%)	7.3E-06			
Obesity (BMI >30)	944 (29%)	1,222 (50%)	<0.001	0.206	94.9%/15.1%	100%/0%
of which has PE	105/944 (11.1%)	248/1,222 (20.3%)	7.5E-09			
Black persons	395 (12%)	795 (33%)	<0.001	0.239	93.5%/12.3%	100%/0%
of which has PE	44/395 (11.1%)	140/795 (17.6%)	3.7E-03			
Age 35 years or older	601 (19%)	716 (29%)	<0.001	0.124	92.7%/20.7%	100%/0%
of which has PE	50/601 (8.3%)	128/716 (17.9%)	4.2E-07			

* - n (%); Median (interquartile range)

^ - Pearson's Chi-squared test; Wilcoxon rank sum test

- Cohen's d; contingency coefficient

% - Fisher's exact test

NS, not significant; RR, relative risk

1120 | Time Interval from Antenatal Corticosteroid Administration to Delivery and Severe Neonatal Morbidity

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4:00 PM - 6:00 PM

Objective: To evaluate the association between time interval from ACS administration to delivery and severe neonatal morbidity (SNM) among periviable, early, and late preterm births

Study Design: Retrospective cohort of singleton preterm births (PTBs) between 22 0/7-36 6/7 weeks' gestational age (GA) at 2 tertiary academic medical centers from 2019-2022. All patients exposed to ACS prior to delivery were eligible for inclusion. Patients who had neonates that were not actively resuscitated, intrauterine fetal demise, and missing data were excluded. The primary outcome was SNM, a standardized composite neonatal adverse outcome indicator which includes diagnoses and procedures from the neonatal intensive care unit indicative of severe morbidity. Baseline characteristics and outcomes were compared by time interval from the first dose of ACS administration to

delivery in 3 groups: < 2, 2-7, and >7 days. Multivariate logistic regression was performed to evaluate the association between the ACS timing and SNM within planned stratification by GA if there was evidence of interaction. Models were adjusted for potential confounders, and delivery within 2-7 days was as the reference group. Data were presented as adjusted odds ratios (aOR) with 95% confidence intervals (CI).

Results: Of the 2,367 patients included, 518 (21.9%) delivered after 2-7 days of ACS administration, 1,215 (51.3%) at < 2 days after ACS and 634 (26.8%) at >7 days after ACS. An interaction was noted between GA and time interval from ACS to delivery, where time interval from ACS to delivery was associated with more benefit in reducing SNM at earlier GA ($P < 0.001$). There was no association between ACS timing and SNM in PTBs occurring between 22 0/7-33 6/7 weeks (Table). Among late PTBs, ACS exposure < 2 days before delivery was associated with an increased risk of SNM (Table).

Conclusion: The likelihood of ACS administration occurring within 2-7 days of PTBs is low. ACS exposure < 2 days before delivery in the late preterm period was associated with an increased risk of SNM. Optimizing timing of ACS in the late preterm period requires further study.

Table. The association between time interval from antenatal corticosteroid administration to delivery and severe neonatal morbidity

Gestational age at delivery	Time interval from ACS administration to delivery	Severe neonatal morbidity*	aOR** with 95% CI
22 0/7 – 25 6/7 weeks	< 2 days	24/33 (72.7)	1.00 (0.27-3.74)
	2-7 days	26/36 (72.2)	Reference
	> 7 days	10/14 (71.4)	0.86 (0.17- 4.47)
26 0/7 – 29 6/7 weeks	< 2 days	72/86 (83.7)	0.60 (0.23-1.52)
	2-7 days	78/88 (88.6)	Reference
	> 7 days	73/87 (83.9)	0.65 (0.23-1.84)
30 0/7 – 33 6/7 weeks	< 2 days	189/275 (68.7)	1.46 (0.98- 2.17)
	2-7 days	141/224 (62.9)	Reference
	> 7 days	117/179 (65.4)	0.95 (0.59-1.53)
34 0/7 – 36 6/7 weeks***	< 2 days	189/821 (23.0)	1.89 (1.14-3.25)
	2-7 days	40/170 (23.5)	Reference
	> 7 days	110/354 (31.1)	1.02 (0.63-1.67)

Data are presented as number (percentage).
*Composite of ≥ 1 of the following: neonatal resuscitation, continuous positive airway pressure, respiratory distress syndrome, mechanical ventilation, any body cavity surgical procedure, blood transfusion, Intraventricular hemorrhage, sepsis, pneumothorax, chest tube insertion, pneumonia, bronchopulmonary dysplasia, necrotizing enterocolitis, periventricular leukomalacia, hypoxic ischemic encephalopathy, cerebral infarction, exchange transfusion, retinopathy of prematurity, seizures, brachial plexus injury, neonatal death within 28 days of birth or before discharge from hospital.
**Models adjusted for maternal age, race/ethnicity, body mass index, nulliparity, pregestational diabetes, chronic hypertension.
***Patients with pregestational diabetes were excluded from this analysis.

1121 | Trends in Previable Antenatal Corticosteroid Administration Among Singletons After Implementation of a Practice Advisory

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[1]Sidney Kimmel Medical College of Thomas Jefferson University, Philadelphia, PA; [2]New York University Rory Meyers College of Nursing, New York, NY; [3]Northwell Lenox Hill Hospital, Lenox Hill Hospital, NY; [4]Thomas Jefferson University Hospital, Philadelphia, PA; [5]Northwell Lenox Hill Hospital, New Hyde Park, NY

4:00 PM - 6:00 PM

Objective: We aimed to evaluate national trends in antenatal corticosteroid administration among previable singletons after implementation of a practice advisory by the American College of Obstetricians and Gynecologists (ACOG) recommending consideration of ACS use as early as 22 0/7 weeks of gestation.

Study Design: Retrospective analysis of the United States Centers for Disease Control and Prevention Natality Live Birth Database (2016-2022). All patients with in-hospital, non-anomalous, singleton previable live births (20 0/7-23 6/7 weeks' gestation) were eligible for inclusion. Cases where ACS exposure was unknown were excluded. Rates of ACS exposure among all births were compared before and after ACOG's practice advisory published online in September, 2021 using Pearson's chi-squared test. September to December 2021 was considered an implementation period and therefore excluded from the analysis. Statistical significance was set at $P < 0.05$.

Results: A total of 33,570 previable live births comprised the study cohort. There was a significant increase in rates of ACS administration among singletons after ACOG's practice advisory compared to before (1,304/4,827 [27.0%] vs. 6,014/28,743 [20.9%], $P < 0.001$). Rates of ACS exposure stratified by gestational age before and after ACOG's practice advisory are displayed in the Table. Trends in ACS exposure over time among births occurring before and after ACOG's practice advisory is illustrated in the Figure.

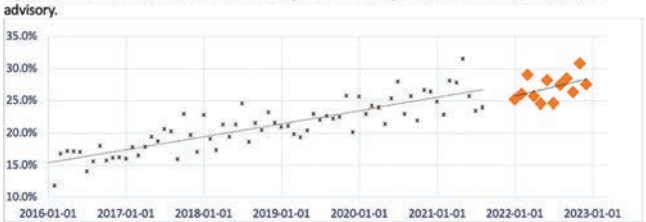
Conclusion: Data from this large cohort demonstrates the immediate impact ACOG's practice advisory had on administering previable ACS in singleton gestations. A significant increase in ACS exposure occurred at all previable gestational ages. Future research evaluating the impact of this practice change on neonatal outcomes during this time period is needed.

Table. Rates of ACS exposure stratified by gestational age before and after ACOG's practice advisory.

Gestational age	ACS exposure before practice advisory	ACS exposure after practice advisory	*P* value
20 0/7-20 6/7 weeks	77/4,524 (1.7)	17/771 (2.2)	<0.001
21 0/7-21 6/7 weeks	138/5,562 (2.5)	36/927 (3.9)	
22 0/7-22 6/7 weeks	1,143/7,304 (15.6)	337/1,201 (28.1)	
23 0/7-23 6/7 weeks	4,656/11,353 (41.0)	914/1,928 (47.4)	

Data are presented as number (percentage).

Figure. Trends in ACS exposure over time among births occurring before and after ACOG's practice advisory.



1123 | Survey of Individuals with HDP on Cardiovascular Disease Risk Awareness and Prevention Perspectives

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4:00 PM - 6:00 PM

Objective: To survey individuals with hypertensive disorders of pregnancy (HDP) on their knowledge of cardiovascular disease (CVD) risk and their views on prevention and treatment.

Study Design: A 22-question prospective survey on postpartum HDP management preferences and future cardiovascular risk was administered to postpartum individuals with HDP (gestational hypertension or preeclampsia) during postpartum days 1-4 before hospital discharge. The survey was validated through six cognitive interviews with HDP individuals.

Results: Of 185 individuals with HDP that were approached, 158 (85.4%) completed the survey with their characteristics described in Table 1. Regarding short-term risks, 57% thought that the risk of developing severe-range blood pressures (BPs) is the highest during labor admission with 29% estimating the risk to be highest during the first week postpartum. Many individuals were aware of the risk of stroke, severe hypertension, kidney problems, and other CVD during the first 6 weeks postpartum. When asked about treatment for high BPs in the first 6 weeks after delivery, 29% prefer to start with daily exercise, 52% prefer to start with eating healthier with limited salt intake, and only 19% prefer to start with an antihypertensive medication. If exercise and diet were unsuccessful, 61% stated they will consider medications. Table 2 describes participants' perspectives on facilitators and barriers to starting antihypertensive medications postpartum. 92% reported that doing physical activity regularly and eating healthy may prevent hypertension. 74% thought that eating healthy and engaging in physical activity are easy to do after delivery, and 72% were planning to pursue these activities to lower the risk of hypertension. When asked about future risk of CVD, 40% reported they are well or very well informed on future risk of CVD; however, 74% underestimated the future risk to be ≤10%.
Conclusion: Most individuals with HDP recognized short-term risks and preferred lifestyle changes over medication initially. However, despite 40% feeling well-informed, many underestimated their long-term CVD risk.

Table 1. Respondent sociodemographic and clinical characteristics

	N = 158
Maternal age	
<20 years	2 (1.3)
20-29 years	54 (34.4)
30-39 years	91 (58.0)
40-49 years	10 (6.4)
Race	
American Indian or Alaska Native	1 (0.7)
Asian	5 (3.3)
Black or African American	31 (20.5)
White	114 (75.5)
Hispanic or Latino ethnicity	16 (10.2)
Education	
High school/GED completed or less	19 (12.1)
Some college or associate/technical degree	38 (24.2)
Bachelor's degree	58 (36.9)
Graduate degree	42 (26.8)
Employed	132 (85.2)
Married or partnered	125 (79.6)
Income category	
<$50,000	33 (21.6)
$50,000 – $149,999	73 (47.7)
≥$150,000	47 (30.7)
Commercial health insurance	91 (58.7)
Hypertensive disorder this pregnancy	
Gestational hypertension	102 (64.6)
Preeclampsia	56 (35.4)
History of hypertensive disorder in prior pregnancy (multiparous denominator n = 81)	
Gestational hypertension	20 (24.7)
Preeclampsia	13 (16.0)
None	48 (59.3)
Not sure	3 (3.7)
Aspirin use during this pregnancy	68 (43.0)
Cigarette smoking during this pregnancy	2 (1.3)

Data presented as N (%).
Abbreviations: GED, General Educational Development.

Table 2. Survey responses

What do you think will happen to your blood pressure readings once you are discharged home after delivering your baby?	
My blood pressure will *go back to what it was* before pregnancy.	136 (87.2)
My blood pressure will *go lower than what it was* before pregnancy.	12 (7.7)
My blood pressure will *remain high like it was* during my pregnancy / during delivery.	8 (5.1)
Out of the following options, when do you think your risk of developing severely high blood pressure (160/110 or higher) is the highest?	
During labor	71 (46.1)
In the hospital after delivery	16 (10.4)
Within the first week after delivery	45 (29.2)
Within the first month after delivery	22 (14.3)
In the first 6 weeks after delivery, people with gestational hypertension or preeclampsia are at increased risk of developing…	
Heart attack	84 (56.4)
Stroke	97 (65.1)
Hospital readmission	106 (71.1)
Very high blood pressures	126 (84.6)
Kidney problems	77 (51.7)
Heart failure	59 (39.6)
Bleeding	59 (39.6)
In people with a history of gestational hypertension or preeclampsia, what do you think is the likelihood of developing high blood pressure or heart disease later in life? (question from Jeiks et al., AJOG MFM 2023)	
1 in 100 (1%)	10 (6.5)
1 in 50 (2%)	21 (13.6)
1 in 20 (5%)	40 (26.0)
1 in 10 (10%)	43 (27.9)
1 in 5 (20%)	40 (26.0)
If you required treatment for high blood pressures in the first 6 weeks after delivery, which method of treatment would you prefer to start with?	
Starting daily exercise	45 (29.0)
Eating a healthier diet with limited salt intake	81 (52.3)
Starting blood pressure medication	29 (18.7)
If your preferred method of treatment was ineffective in lowering your blood pressure, would you be willing to start a blood pressure medication? (n = 126, if "Starting daily exercise" or "Eating a healthier diet with limited salt intake.")	
Yes	77 (61.1)
No	7 (5.6)
It depends.	42 (33.3)
Why would you *not* start a medication as treatment for high blood pressure after delivering your baby? (n = 7, if "No.")	
I do not want side effects.	3 (42.9)
I am afraid of being harmed by medication in the long term.	3 (42.9)
I do not want to be dependent on medication.	5 (71.4)
I usually forget to take medication.	1 (14.3)
I do not always take medication as prescribed.	1 (14.3)
I had normal blood pressure before pregnancy, and it should go back to normal after delivery.	6 (85.7)

What would affect your decision to start a blood pressure medication? (n = 41, if "It depends.")	
Less frequent dosing	15 (36.6)
Little to no effect on breastfeeding	27 (65.9)
Minimal side effects	23 (56.1)
Low cost of medication	7 (17.1)
Reduced risk of postpartum hospital readmission, emergency room visits, and/or additional clinic visits	13 (31.7)
Long-term health benefit	19 (46.3)
My doctor's recommendations	22 (53.7)
A professional society's recommendations	11 (26.8)
If I am going to get high blood pressure, there is not much I can do about it in my opinion.	
Strongly agree	3 (1.9)
Agree	25 (15.8)
Disagree	72 (45.6)
Strongly disagree	58 (36.7)
I think that my personal efforts will help control my risks of getting high blood pressure.	
Strongly agree	34 (21.5)
Agree	100 (63.3)
Disagree	19 (12.0)
Strongly disagree	5 (3.2)
I think that eating healthy and doing physical activity takes a lot of effort.	
Strongly agree	19 (12.2)
Agree	53 (34.0)
Disagree	60 (38.5)
Strongly disagree	24 (15.4)
I think that doing physical activity regularly and eating healthy may prevent high blood pressure from developing.	
Strongly agree	58 (36.9)
Agree	87 (55.4)
Disagree	11 (7.0)
Strongly disagree	1 (0.6)
I think that eating healthy and physical activity are easy for me to do after delivery.	
Strongly agree	30 (19.1)
Agree	86 (54.8)
Disagree	39 (24.8)
Strongly disagree	2 (1.3)
In the near future, are you planning to make changes in eating or physical activity to lower your chances of getting high blood pressure?	
Definitely not	1 (0.6)
Probably not	5 (3.2)
Probably	44 (27.8)
Definitely	69 (43.7)
I am already doing my best to lower my chances of getting high blood pressure.	39 (24.7)
How informed are you about the future risk of high blood pressure and heart disease after a pregnancy with high blood pressure?	
Not at all informed	28 (17.7)
Moderately informed	67 (42.4)
Well informed	43 (27.2)
Very well informed	20 (12.7)

Data presented as N (%).

1124 | Risk Factors for Dual Demise in Monochorionic Pregnancies Undergoing Radiofrequency Ablation for Discordant Anomalies

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4:00 PM - 6:00 PM
Objective: To determine the rate and risk factors for dual demise in monochorionic pregnancies with discordant malformation (DM) managed with selective cord occlusion (SCO) via radiofrequency ablation (RFA) of the affected fetus.
Study Design: Single center retrospective analysis of a prospective registry of complex monochorionic pregnancies managed with SCO via RFA for DM between 2010 and 2023. DM as indication for procedure was stratified by type of anomaly. Outcomes were analyzed based on the intended outcome of single survivor versus dual demise. Risk factors as defined by DM were compared between groups as well to the cohort of all MC pregnancies undergoing SCO via RFA during the same time period. Mann-Whitney U test was used for continuous variables and Fisher's exact test was used for categorical variables.
Results: A total of 213 pregnancies underwent RFA in the study period; 38 performed for the indication of DM. For the total registry cohort, the incidence of postprocedural dual demise regardless of indication was 23/213 (10.8%). The risk increased more than twofold when analyzed specifically for the indication of DM, 9/38 versus 14/175 when compared to other indications **(23.7% vs 8%; p = 0.009)**. Limb body wall complex (LBWC) yielded the highest risk for dual demise; 3 of 4 cases and 33.3% of all DM with dual demise. The remaining variables analyzed were not significant (Table)
Conclusion: Selective cord occlusion via RFA remains a safe and reasonable option in complex MC pregnancies. In the cohort where RFA was indicated for DM, the significantly increased

risk of dual demise in cases of LBWC should be reviewed when counseling patients.

Demographics and operative variables for pregnancies with dual demise vs single survivor in MCDA twins after undergoing RFA for DM

	Dual demise N=9	Single survivor N=29	P-value
Maternal age, years	32.5 [25.5-33.3]	30 [27-33]	0.81
BMI, kg/m^2	24.3 [24.0-30.1]	25.7 [22.2-29.3]	0.66
Number of fetuses Twins Triplet	 9 (100) -	 25 (86.2) 4 (13.8)	0.55
GA at procedure, weeks	18.3 [17.3-20.6]	19.2 [17.3-21.3]	0.93
Anterior placenta, N(%)	4 (44.4)	17 (58.6)	0.70
% Intertwin discordance	18 [10.5-25]	21 [14-27]	0.51
Fetus A reduced, N(%)	2 (22.2)	11 (37.9)	0.46
Number of RFA cycles	3	3	0.97
Operative time total, min	16.5 [12.5-18.5]	16.0 [12-19]	0.99
PCI distance, cm	7 [6.1-11.2]	8.4 [7.1-11.7]	0.56
Stratified by anomaly			
CNS	4 (44.4)	9 (31.0)	0.69
Skeletal	-	1 (3.4)	1.00
Cardiac	-	3 (10.3)	1.00
GU	-	4 (13.8)	0.55
MCA	2 (22.2)	11 (37.9)	0.46
LBWC	3 (33.3)	1 (3.4)	0.03

1125 | Is the Etiology of Fetal Death Associated with Adverse Health Outcomes During Second-Trimester Medication Abortion?

Neha Reddy[1]; Vanya Manthena[2]; Jocelyn Wascher[1]; Eryn Wanyonyi[1]; Camille Johnson[1]; Lahari Vuppaladhadiam[3]; Julie Chor[1]; Beth Plunkett[4]; Isa Ryan[5]; Olivert Mbah[5]; Jungeun Lee[6]; Emily Barker[7]; Laura Laursen[8]; Leanne McCloskey[9]; Sloane York[8]; Ashish Premkumar[2]

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4:00 PM - 6:00 PM

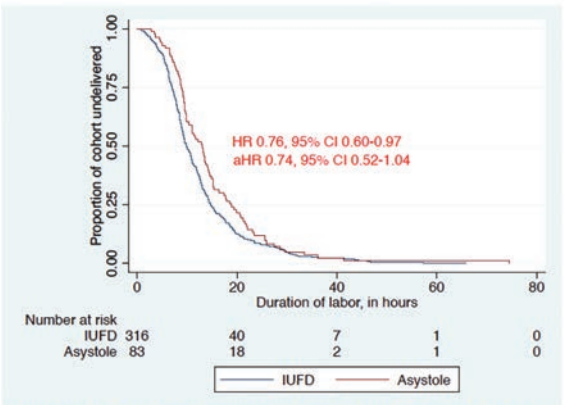
Objective: Induction of fetal asystole (IFA) is commonly used before second-trimester medication abortion (MAB). Data suggest a higher risk for adverse health outcomes when compared to MAB without IFA. Yet there is a poor understanding of whether the etiology of fetal death (IFA or intrauterine fetal demise [IUFD]) is associated with adverse health outcomes.

Study Design: We analyzed a retrospective cohort of people undergoing second-trimester MAB of a singleton at 4 centers from 2009-2019. Eligible individuals underwent IFA or had IUFD and did not have rupture of membranes, preterm labor, or cervical insufficiency. The primary exposure was etiology of fetal death. Fetal asystole was induced with potassium chloride. The primary outcome was duration of labor. The secondary outcomes were composite morbidity (i.e. uterine rupture, need for blood transfusion, clinical chorioamnionitis, intensive care unit admission, or need or readmission) and its components. Bivariate and multivariate analyses were performed. For the primary outcome, a survival curve was generated, censoring at the time of delivery, and a hazard ratio (HR) was computed. A sensitivity analysis was performed, matching participants based on gestational age and history of uterine scarring.

Results: 399 participants were analyzed. 83 (20.8%) underwent IFA and 316 (79.2%) had IUFD (Table). For the primary outcome, IFA was associated with a longer duration of labor, which was nonsignificant after adjusting for race/ethnicity and receipt of mifepristone (Figure). For the secondary outcomes, there was no difference in composite morbidity between the groups. However, IFA was associated with a higher frequency of uterine rupture and need for blood transfusion on bivariate analyses (Table). On sensitivity analysis, there was only a significant difference in frequency of blood transfusion.

Conclusion: The etiology of fetal death is not consistently associated with an increased length of labor or increased risk of most adverse health outcomes. IFA may be associated with the need for blood transfusion when compared to IUFD, which requires further investigation.

Figure: The relationship between etiology of fetal death and duration of labor, in hours



*Unadjusted and adjusted hazard ratios are depicted. Adjusted model accounts for receipt of mifepristone and participant self-reported race/ethnicity

Table. Sociodemographic and biomedical data of pregnant people undergoing second-trimester induction of labor, by etiology of fetal death (n=399)

	Fetal asystole (n=83)	*IUFD (n=316)*	*p-value[a]*
Age, in years	32 (28-35)	32 (27-36)	0.97
Self-reported race/ethnicity			
NHW	36 (43.4)	105 (33.2)	**<0.001**
NHB	6 (7.2)	87 (27.5)	
Latinx	13 (15.7)	66 (20.9)	
AAPI	5 (6.0)	17 (5.4)	
Other or not defined	23 (27.7)	41 (13.0)	
Gestational age, in weeks	23 (22-23)	20 (18-22)	**<0.001**
Body mass index (kg/m^2)[b]	27.1 (23.8-32.0)	27.3 (23.7-32.9)	0.80
Nulliparous	28 (33.7)	103 (32.6)	0.84
History of uterine scar[c]			
No uterine scarring	60 (72.3)	252 (79.7)	**0.03**
1 prior scar	19 (22.9)	35 (11.1)	
2 prior scars	4 (4.8)	20 (6.3)	
3 or more prior scars	0 (0.0)	9 (2.9)	
Site of delivery			
Site #1	6 (7.2)	51 (16.1)	**<0.001**
Site #2	68 (81.9)	137 (43.3)	
Site #3	1 (1.2)	75 (23.7)	
Site #4	1 (1.2)	75 (23.7)	
Mifepristone administered	66 (79.5)	25 (79)	**<0.001**
Method of induction of labor			
Misoprostol	74 (89.2)	285 (90.2)	0.30
Intracervical balloon catheter	0 (0.0)	7 (2.2)	
Oxytocin	1 (1.2)	7 (2.2)	
Artificial rupture of membranes	7 (8.4)	16 (5.1)	
Laminaria	1 (1.2)	1 (0.3)	
Total misoprostol administered (mcg)[d]	1800 (1600-2400)	1200 (800-1600)	**<0.001**
Duration of labor, in hours	13.1 (8.8-18.9)	9.9 (7.1-14.7)	**<0.001**
Primary composite outcome	18 (21.7)	63 (19.9)	0.72
Composite outcome without clinical chorioamnionitis	9 (10.8)	19 (6.0)	0.15
Components of primary composite outcome[e]			
Uterine rupture[f]	2 (2.4)	0 (0.0)	**0.04**
Need for blood transfusion[g]	6 (7.2)	6 (1.9)	**0.02**
Clinical chorioamnionitis	11 (13.2)	49 (15.5)	0.61
Intensive care unit admission	1 (1.2)	5 (1.6)	1.0
Need for hospital readmission	2 (2.4)	11 (3.5)	1.0

[a]Data are median (IQR) or n (%) unless otherwise specified. Bold indicates statistical significance < 0.05
[a]Chi-squared or Fisher's exact test for categorical variables, Wilcoxon rank-sum test for continuous variables
[b]Available for 387 participants
[c]Prior uterine scar includes prior low transverse; classical, t-shaped, or unknown hysterotomy
[d]Available for 397 participants
[e]Defined as one or more of the following: need for a blood transfusion, clinical chorioamnionitis, intensive care unit admission, uterine rupture, and need for readmission. Participants could meet one or more of the outcomes associated with the primary composite outcome. Therefore, frequencies may not summate to the total sample size meeting the primary composite outcome.
[f]Both uterine ruptures occurred among individuals with 2 prior uterine scars
[g]11/12 blood transfusions occurred with an estimated blood loss greater than 500 milliliters

AAPI = Asian-American/Pacific Islander; m=meter; mcg = micrograms; kg = kilogram; NHB = Non-Hispanic Black; NHW = Non-Hispanic White

1126 | Prescribing less than or greater than 150 MME after Cesarean Delivery: A Cost Effectiveness Analysis

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4:00 PM - 6:00 PM

Objective: Cesarean delivery is the most common major surgery performed in the United States, with an estimated 1,178,066 cesareans performed in 2022 alone. Current standards for postoperative pain management of cesarean deliveries include the use of nonsteroidal anti-inflammatory drugs (NSAIDs) combined with opioids for breakthrough pain. Despite increased caution around the over-prescription of opioids, more than 75% of post-cesarean patients fill an opioid prescription with wide variances in dosing. Previous studies indicate higher rates of adverse outcomes for opioid prescriptions exceeding 150 morphine milligram equivalents(MME). In this study, we evaluated cost-effectiveness of prescribing greater than or less than 150 MME(e.g. 20 oxycodone tablets, 5 mg each) on developing an opioid use disorder (OUD), overdose, and opioid-related death.

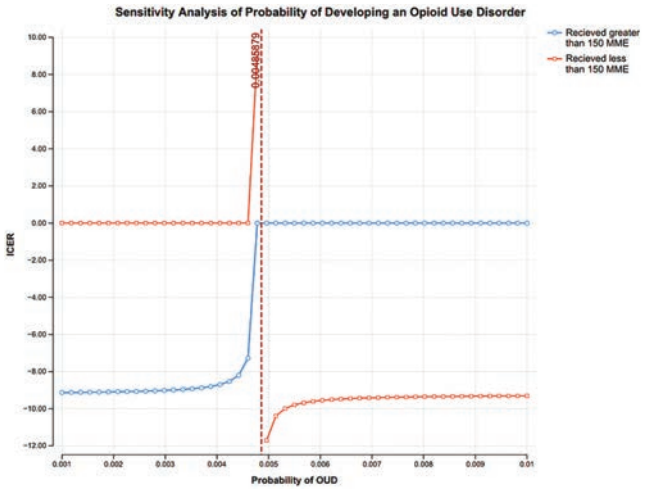
Study Design: We constructed a decision-analytic model to compare outcomes between receiving greater than 150 MME and less than 150 MME. Our theoretical cohort included 1,178,066 individuals, the number of cesareans performed in 2022. Outcomes were development of an OUD, overdose, opioid use-related death, costs, and quality adjusted life years (QALYs). We used a willingness-to-pay for the incremental cost-effectiveness ratio of $100,000/QALY. Model inputs were derived from the literature and assessed with sensitivity analyses.

Results: In our cohort, prescribing less than 150 MME was associated with 1587 fewer cases of developing an OUD. Prescribing less than 150 MME was cost-effective with an ICER of $8.94/QALY. In one way sensitivity analysis, receiving greater than 150 MME would only be cost effective if the probability of developing an OUD were below 0.005, above this probability, prescribing less than 150 MME is the only cost effective strategy.

Conclusion: In our study, prescribing less than 150 MME was a cost-effective strategy to improve outcomes and minimize the adverse events associated with opioid prescription. Adopting a standard of prescribing less than 150 MME post-cesarean delivery would be advantageous for recovery of patients and the health system.

Table 1. Outcomes in a theoretical cohort of 1,178,066 post-cesarean individuals.

	Greater than 150 MME	Less than 150 MME	Difference (>150 - <150)
Diagnosis of OUD	5,657	4,069	1,588
Overdose	3	4	-1
Opioid-related Death	0	0	0
Cost (USD)	$14,026,449,346	$14,026,340,908	$108,438
Effectiveness (QALYs)	31,003,979	31,016,110	-12,131
Incremental Cost Effectiveness Ratio (ICER)	$8.94/QALY		



1127 | Improved AI Prediction of Preterm Birth by Expanded Training and Retraining

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4:00 PM - 6:00 PM

Objective: To assess improvements in Artificial Intelligence (AI) for predicting preterm birth (PTB) after the addition of 1,165,618 images to the training dataset and an 8-month retraining period.

Study Design: Proprietary AI software (V1) was initially trained on 877,141 de-identified ultrasound images from 19,940 unique ultrasound exams from a cohort of women who delivered at the University of Kentucky from 2017 to 2021. The AI trained on 79% of exams, and predictive performance was validated on a separate 21% of unique exams (n = 4306). Only de-identified ultrasound images were used to predict the days until delivery. Statistical analyses utilized R^2 values and mean absolute error (MAE).

An additional 1,165,618 ultrasound images with corresponding patient data from 2021 to 2023 were added to the training set (V2). The AI underwent 8 months of retraining (V3). The original validation set remained blinded and was utilized to evaluate the AI's performance using the original algorithm (V1) and dataset versus its performance in V2 (expanded images dataset) and V3 (expanded images dataset with retraining).

Results: After introduction of additional data and retraining, the AI's predictive performance improved across all outcomes (Table 1). The correlation coefficient for spontaneous PTB increased from 0.48 (V1) to 0.64 (V2) and 0.72 (V3). Correlation coefficients for prediction of Term+ all PTB increased from 0.85 (V1) to 0.88 (V2) to 0.92 (V3).

MAE was reduced (Table 2) in all categories from V2 and V3. For Term + all PTB, the MAE reduced from 14.30 days (V2) to 12.90 days (V3). Notable reductions were observed in the MAE for spontaneous PTB (22.08 days (V2) to 19.99 days (V3)), and for iatrogenic PTB (2.44 days (V2) to 19.33 days (V3)).

Conclusion: AI's ability to learn and improve its performance in PTB prediction is demonstrated. Expansion of the dataset and retraining sequentially improved its predictive ability and notably reduced the MAE.

Table 1. Correlation Coefficients for AI Predictions of Preterm Birth in the 4306 Exams of Validation Set between AI Versions

	Initial AI	Additional Images AI	Retrained AI
	V1	V2	V3
Term + all PTB	0.85	0.88	0.92
Term Births Alone	0.90	0.91	0.95
Term + Spontaneous PTB	0.88	0.90	0.94
Spontaneous PTB	0.48	0.64	0.72
Iatrogenic PTB	0.52	0.63	0.75

Table 2. Mean Absolute Error for Prediction of Time to Delivery Across All Categories in the Training Set: Expanded Training Dataset (V2) and Retrained AI (V3).

	Mean Absolute Error (days)	
	Additional Images AI	Retrained AI
	V2	V3
Term + all PTB	14.30	12.90
Term Births Alone	11.71	10.76
Term + Spontaneous PTB	12.67	11.62
Spontaneous PTB	22.08	19.99
Iatrogenic PTB	22.44	19.33

1128 | Mid-Trimester Concentrations of Total Cell-Free DNA in Amniotic Fluid–A Pilot Study

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4:00 PM - 6:00 PM

Objective: 1) To test the feasibility of measuring total cell-free DNA (cfDNA) concentration in amniotic fluid, using a unique direct fluorometric assay; and 2) to determine the association between amniotic fluid total cfDNA concentration and gestational age at amniocentesis, establishing reference values for further studies.

Study Design: A prospective cohort pilot study was conducted, including women undergoing elective mid-trimester amniocentesis for genetic or other evaluation, between 16-23 weeks of gestation. Following written consent, an additional 1-2 ml of amniotic fluid were collected during amniocentesis. Total cfDNA was quantified by a validated rapid fluorometric assay, using the fluorochrome SYBR Gold without requiring prior DNA extraction and amplification.

Results: A total of 82 women were enrolled. Seventy-seven women were included in the analysis, as five were excluded due to preterm delivery (n = 4) or a genetic disorder (x-linked ichthyosis, n = 1). All samples had measurable total cfDNA concentrations. Maternal characteristics including indications for amniocentesis are presented in Table 1. Total cfDNA concentrations correlated significantly with gestational age at sample collection (rho = 0.41, p value< 0.001), as presented in Figure 1.

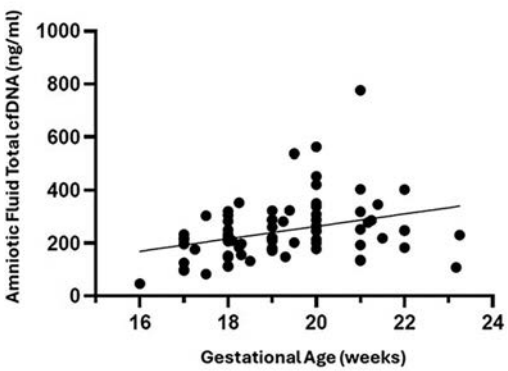
Conclusion: 1) Total cfDNA amniotic fluid concentrations in the mid-trimester, correlate with gestational age at sampling; 2) This simple assay enables rapid quantitative measurements, and thus should be further evaluated as an amniotic fluid biomarker for obstetric complications.

Table 1: Maternal characteristics (n=77)

Characteristic	
Maternal age (years); (mean ± SD)	34.69 (±4.04)
BMI (mean ± SD)	24.76 (±5.05)
Gestational age at amniocentesis (weeks); (mean ± SD)	19.4 (±1.61)
Gestational age at delivery (weeks); (mean ± SD)	39.21 (±1.17)
Birth weight (grams); (mean ± SD)	3319 (±431.1)
Indication for amniocentesis (n)	
Abnormal Down syndrome screening test	18
Maternal age	36
Maternal request	19
Other (CMV seroconversion, past fetal genetic abnormality)	4

SD – Standard deviation; BMI – Body mass index; CMV – Cytomegalovirus.

Figure 1: Amniotic Fluid Total cfDNA Concentrations (ng/ml) by gestational age (n=77)



1129 | Work-Related Musculoskeletal Disorders (WRMSD) among Ultrasound Sonographers

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4:00 PM - 6:00 PM

Objective: Sonographers are at high risk for serious work-related musculoskeletal injuries. Despite ergonomic solutions, nearly 90% of sonographers experience chronic pain for more than half of their career, and one in five sustain a career-ending injury. Work-related musculoskeletal disorders (WRMSD) among sonographers have been an understudied topic. We aim to 1) assess the prevalence of WRMSD among sonographers in our local health system, 2) correlate workplace environment with the development of WRMSD, 3) assess the perception of WRMSD among sonographers, and 4) evaluate the impact of WRMSD on the career of affected sonographers.

Study Design: A cross-sectional study using a 40-question anonymous survey was electronically distributed to sonographers in our local health system. The survey was developed from previous research and had four main sections 1) demographic information, 2) work schedule and tasks, 3) pain and discomfort, 4) work environment.

Results: 91 surveys were distributed with a 45% response rate (n = 41). The majority were age < 29 (34.2%) with a BMI between 18.5-24.9 (39%). 60.9% scan patients with obesity most of the time. 17.1% gets no breaks during a typical shift and 31.6% disagreed that they can take scheduled breaks. 46.2% reports that pain is most pronounced during work hours, and 81.6% reports that scanning patients with obesity aggravates their pain the most. Of those who sought treatment for their injuries, only 17% reported that the interventions were successful and 59% continues to scan with pain. 100% of respondents are concerned about developing work-related injury. 84.6% know of other sonographers who have left the field due to their work-related injury or pain. Most respondents (29.3%) would modify the current equipment design and maneuverability to improve their workplace.

Conclusion: Our study shows that sonographers are at an increased risk for WRMSD. These injuries can potentially impact quality of life and can ultimately be career-ending. More research and advocacy are needed to improve ergonomics and working conditions to help reduce the rate of WRSMD among sonographers.

Table 1. Summary of Responses by Participants to Survey Questions

I. Demographics		n (%)	
Age			
	<29	14 (34.2%)	
	30-39	7 (17.1%)	
	40-50	9 (21.9%)	
	50+	11 (26.8%	
BMI (kg/m²)			
	<18.5	1 (2.4%)	
	18.5-24.9	16 (39%)	
	25-29.9	15 (36.6%)	
	30-39	9 (21.9%)	
	39+	0 (0%)	
II. Work Schedule & Tasks			
How many (at least 10 minute) breaks per shift do you get?			
	No breaks	7 (17.1%)	
	Once	18 (43.9%)	
	Twice	7 (17.1%)	
	Over twice	7 (17.1%)	
How often do you scan patients with obesity? (BMI >30)			
	Never	0 (0%)	
	Rarely	0 (0%)	
	About half of the time	8 (19.5%)	
	Most of the time	25 (60.9%)	
	Always	8 (19.5%)	
III. Pain & Discomfort			
When are your symptoms most pronounced?			
	Morning	1 (2.6%)	
	Night	5 (12.8%)	
	During work hours	18 (46.2%)	
	After work hours	15 (38.5%)	

Work activities that aggravate your work-related pain or discomfort:	Not Aggravating	Mildly to Moderately Aggravating	Severely Aggravating
Holding the transducer	16 (41%)	21 (53.8%)	2 (5.1%)
Applying sustained transducer pressure	3 (7.7%)	16 (41%)	20 (51.3%)
Lifting/assisting patients	13 (35%)	18 (48.7%)	6 (16.2%)
Scanning patients with BMI >30	0 (0%)	7 (18.4%)	31 (81.6%)
Sustained shoulder abduction	1 (2.6%)	20 (51.3%)	18 (46.2%)
Sustained twisting of the neck & trunk	6 (15.4%)	10 (25.7%)	23 (59.0%)
Repetitive twisting of the neck & trunk	7 (18%)	11 (28.2%)	21 (53.9%)
Scanning with outdated equipment	16 (43.2%)	14 (37.8%)	7 (19%)
Performing portable on-site scans	8 (21.1%)	17 (44.7%)	13 (34.2%)
Control panel manipulation	25 (64.1%)	14 (35.9%)	0 (0%)
Transporting equipment	23 (63.9%)	13 (36.1%)	0 (0%)

1130 | Cesarean Delivery on Maternal Request Among Nulliparous Women: Rates, Timing and 10-Year Trends

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4:00 PM - 6:00 PM

Objective: Cesarean delivery on maternal request (CDMR) is defined as caesarean delivery (CD) performed without a clinical reason, i.e. no fetal or maternal indication. It is a controversial area of practice with huge variation in general CDMR rates globally (1,2). However it is difficult to ascertain nulliparous rates resulting in the primary CD. The aims of this study were to determine the following: 1. CDMR rate for nullipara in Irish obstetric practice; 2. Contribution of CMDR to overall CD rates; 3. Associated demographic features and models of obstetric care; 4. Trends in CDMR rates throughout 2014-2023.

Study Design: The data were obtained from EuroKing Obstetric Database at Galway University Hospital, a tertiary referral center in the West of Ireland. The information had been entered prospectively during 2014-2023. Descriptive statistics were calculated for each year, and compared using Chi2 for proportions and trend, using the program GraphPad Prism v10.2.3. Ethical Committee approval for the study was obtained.

Results: There were 28,264 deliveries of which 10,259(36.3%) were nullipara with singleton pregnancies ^{3} 36 weeks. There were n = 134 CDs performed solely for maternal request which represented 1.3% of all nullipara. CDMR contributed to 3.8% of all nulliparous CDs, and constituted 1.4% of all hospital CDs. The maternal age, BMI, and birthweight characteristics of these pregnancies are shown in Table 1. The prevalence of CDMR among nullipara attending a private obstetrician for care was 5.9% and was 0.7% ($P < 0.0001$) for women attending for public hospital care. The CDMR rate among nullipara increased significantly over the duration of the study from 0.9% in 2014 to 2.7% in 2023 ($P < 0.0001$), Figure 1.

Conclusion: These findings describe the prevalence of CDMR among nulliparous women and the subsequent contribution to overall CD rates. A significant increase in rates was observed in the last decade. The rates of CDMR were higher among women attending a private obstetric service.

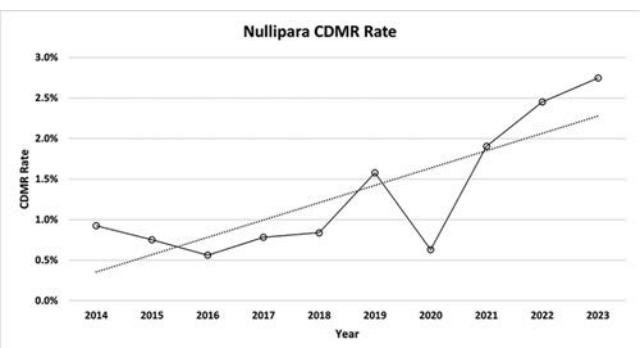
References

1. Jenabi E et al. J Mat-Fetal & Neo Med 2020; 33: No.22, 3867-3872
2. Begum T et al. BJOG 2020; 128:798-806

Variable	(n)	%
Total number of women	134	100.0%
Maternal Age		
< 20 years	0	0.0%
20-29 years	7	5.2%
30-39 years	56	41.8%
≥ 40 years	71	53.0%
Birthweight (g)		
< 2500	5	3.7%
2500-3999	111	82.8%
≥ 4000	18	13.4%
BMI (kg/m^2)		
< 18.5	2	1.5%
18.5-24.9	19	14.2%
25-29.9	21	15.7%
30-34.9	7	5.2%
35-39.9	2	1.5%
≥ 40	2	1.5%
No data	81	60.4%

BMI: Body Mass Index

Table 1: Population Characteristics



1131 | Categorizing the cause of Maternal Instability with MEOWS

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4:00 PM - 6:00 PM

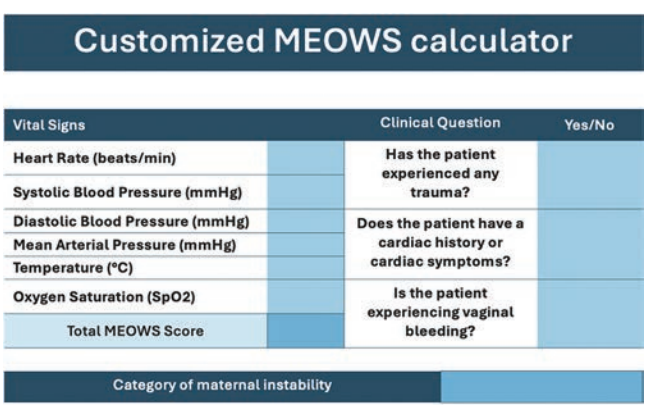
Objective: To investigate the ability of a customized MEOWS (Modified Early Obstetric Warning System) calculator to categorize the cause of maternal critical illness.

Study Design: This retrospective self-controlled cohort study evaluated all pregnant people admitted to an intensive care unit at two separate delivering hospitals in Cincinnati, Ohio, between January 1, 2018, and August 1, 2023. Inclusion required study participants to be at least 20 weeks' gestation through 6 weeks postpartum. Vital signs obtained within the 4 hours prior to the decision for ICU admission were compared to participants' prior vitals from earlier triage visits. These values were then put into a customized MEOWS calculator (Figure 1) that incorporated additional history-based questions to categorize the patient into a MEOWS subset (stable, hypertensive emergency, hemorrhage, cardiac/possible peripartum cardiomyopathy, sepsis, trauma, or not otherwise classified). The calculated MEOWS category was then compared to the final discharge diagnosis to determine accuracy using Exact Methods.

Results: Vital signs from 87 patients were obtained and used in the modified MEOWS calculator. Our modified MEOWS calculator could predict maternal instability with a sensitivity of 93.3% and a specificity of 83.3%. The calculator was able to correctly categorize the cause of maternal morbidity with a sensitivity of 89.8% and a specificity of 67.8%. The individual sensitivities and specificities for the individual categories of the cause of maternal morbidity can be seen in table 1.

Conclusion: The use of a modified MEOWS calculator can better help determine the cause of maternal instability. This type of modified MEOWS calculator could better help categorize the cause maternal instability and thus allow for the effective use of an appropriate clinical protocol.

Category of Maternal Instability	Specificity	Sensitivity
Stable	94.9%	87.5%
Stable Cardiac Patient	97.5%	50%
Trauma or Abruption	97.3%	63%
Sepsis	84.3%	95.6%
Hypertensive Emergency	94.5%	76.5%
Possible Peripartum Cardiomyopathy	95.7%	76.9%
Not otherwise classified	100%	12.5%



1132 | Validating the Use of Epigenetic Clocks in a Preconception Population

Nicola C. Perlman[1]; Jiaqi Zhang[1]; Andrea Cipriano[2]; Stephanie A. Leonard[1]; Xixi D. Plummer[1]; Samantha L. Kruger[1]; Arian Korshid[2]; Janet Hurtado[1]; Vittorio Sebastiano[2]; Danielle M. Panelli[1]; Ruth B. Lathi[1]; Katherine Bianco[1]
[1]Stanford University, Palo Alto, CA; [2]Stanford University, Stanford, CA

4:00 PM - 6:00 PM

Objective: Prior studies have attempted to use epigenetic clocks to correlate biologic age with pregnancy outcomes. Despite this, no epigenetic clock has been validated for use in pregnancy, and

biologic age outputs can vary in different tissues and populations. This study assessed the validity of 9 epigenetic clocks in a preconception cohort.

Study Design: This study utilized biobanked samples from preconception patients between 2020-2023. Peripheral blood mononuclear cell DNA was extracted from buffy coat, and DNA methylation was profiled using Illumina Infinium MethylationEPIC BeadChip array, allowing prediction of biologic age via 9 epigenetic clocks. Pearson correlation coefficients were calculated for biologic age and chronologic age (defined as age by birthdate) for each clock. An epigenetic clock was defined as valid if the correlation coefficient (r) was >0.800, in accordance with prior literature.

Results: 68 blood samples from people assigned female at birth were analyzed. The median chronologic age was 38.0 years [Q1-Q3 33.0-40.3]. No sample had the same biologic age in all 9 clocks. Of the epigenetic clocks evaluated, the correlation coefficient ranged from 0.673 to 0.916 (Table 1). Three clocks exceeded the preset validity threshold of r >0.800; the SkinBlood Clock (r = 0.916), the Zhang Clock (r = 0.915), and the Hannum Clock (r = 0.822). Each of the top 3 performing clocks had a different range of biologic age outputs (Figure 2). Although the Zhang and the SkinBlood Clock had similar correlation coefficients, the SkinBlood Clock produced biologic ages more akin to chronologic ages (median 35.8 years [32.6-39.2]) compared to the Zhang Clock (56.02 years [54.39-56.81]).

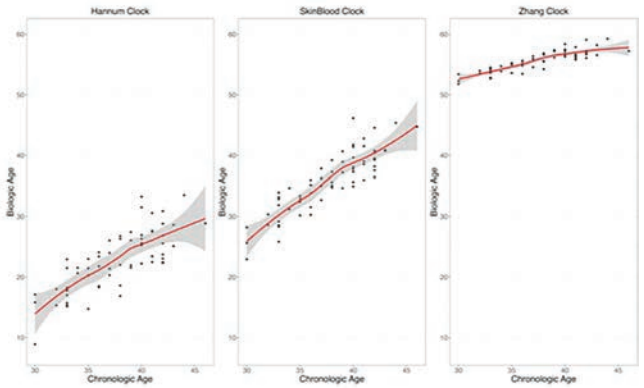
Conclusion: In this validation study we considered 9 different clocks for use in a preconception cohort. The SkinBlood Clock performed best with high correlation and chronologic age congruency. Epigenetic clocks are an exciting new technology for studying aging. Research using epigenetic clocks in pregnancy and fertility should assess validity prior to testing for association with perinatal outcomes.

Table 1: Correlation Between Biologic Age and Chronologic Age in a Preconception Population in 9 Frequently Cited Epigenetic Clocks.

DNA clock	Correlation coefficient (r)*	Clock Description
SkinBlood Clock	0.916	A widely used clock to predict lifespan and age related disease, for use with whole blood or buccal samples.
Zhang Clock	0.915	Based on specific sites of methylation changes related to mortality. For use with whole blood samples.
Hannum Clock	0.822	Based on specific sites of methylation changes related to mortality. For use with whole blood samples.
GrimAge Clock	0.796	Based On Predicted Age. Used in prior obstetric literature. For use with blood, sometimes saliva.
GrimAge2 Clock (Based on predicted HgbA1c, C-reactive protein)	0.793	Updated GrimAge Clock based on predicted HgbA1c, C-reactive protein. For use with blood samples.
DNAmAge Clock	0.781	The "Horvath" Clock. An early clock using pan-tissue samples.
GrimAge3 Clock	0.733	Updated GrimAge Clock based on predicted age, HgbA1c, c-reactive protein, and tuned for methylation variability.
GrimAge4 Clock	0.732	Updated GrimAge Clock based on predicted age, HgbA1c, c-reactive protein.
DNAmPhenoAge	0.673	Based on methylation loss and 10 measures of aging including chronologic age, albumin, and glucose. For use with blood.

*P-value <0.001 for all correlation coefficients.

Figure 1: Biologic versus Chronologic Age using Epigenetic Clocks with High Correlation Coefficients (>0.80).



1133 | The Association of Preconception Epigenetic Changes of Aging with Live Birth and Pregnancy Outcomes

Nicola C. Perlman[1]; Jiaqi Zhang[1]; Andrea Cipriano[2]; Stephanie A. Leonard[1]; Xixi D. Plummer[1]; Samantha L. Kruger[1]; Arian Korshid[2]; Janet Hurtado[1]; Vittorio Sebastiano[2]; Danielle M. Panelli[1]; Katherine Bianco[1]

[1]Stanford University, Palo Alto, CA; [2]Stanford University, Stanford, CA

4:00 PM - 6:00 PM

Objective: Biologic age from epigenetic clocks has been used to predict diseases of aging such as cardiac disease, however its association with fertility and pregnancy complications is not known. We examined the relationship between biologic age and both live birth and pregnancy complications.

Study Design: This study analyzed biobanked serum samples of people desiring pregnancy from 2020-2023. Pregnancy outcomes were followed for 1-4 years after sample collection. Peripheral blood mononuclear cell DNA was extracted and >850,000 CpG methylation loci were interrogated. This allowed prediction of biologic age (bio-age) using the SkinBlood Clock, which had the highest validity in the cohort. The difference between chronological age (chrono-age, measured from birthdate) and bio-age was calculated (chrono-bio age difference); decelerated aging was defined if bio-age was less than chrono-age. A multivariable logistic regression was performed to test the association between the chrono-bio age difference and (1) live birth in the entire cohort, and (2) a composite of pregnancy complications related to aging (miscarriage/fetal demise, preterm labor/delivery, hypertensive disorders, gestational diabetes, or placental insufficiency) in a sub-cohort which achieved pregnancy.

Results: Among 64 patients, the median chrono-age was 38.0 years (Q1-Q3 34.8-41.0), and bio-age was 35.8 (32.6-39.2). 46 patients achieved pregnancy; 38 (83%) had a live birth, and 23 (50%) had at least one pregnancy complication. Bio-ages differed between people with versus without a live birth (Table 1). When controlled for confounders, for every year that bio-age was less than chrono-age, there was a two-fold increased odds of live birth (aOR: 2.02; 1.20-4.11, Table2). There was no significant association between the chrono-bio age difference and the composite outcome of pregnancy complications.

Conclusion: In this study, decelerated biologic aging was associated with higher rate of live birth. Robust studies are needed to

understand ways to reverse biologic aging and use it to predict and optimize perinatal outcomes.

Table 1: Chronologic Age versus Biologic Age Overall and within Live Birth and No Live Birth Groups.

Age Instrument:	Overall Cohort n = 64	Live Birth n = 40	No Live Birth n = 24	p-value[i]
Chronologic Age *(median, IQR)*	38.0 (34.8, 41.0)	37.0 (34.0, 40.0)	40.0 (35.8, 41.3)	0.20
SkinBlood Clock *(median, IQR)*	35.8 (32.6, 39.2)	35.0 (31.8, 37.8)	38.6 (33.6, 41.4)	0.03

i) P-values calculated with the Wilcoxon Rank Sum Test

Table 2: Association Between Decelerated Aging via Chronologic-Biologic Age Difference and Both Live Birth and a Composite of Pregnancy Complications

	Live Birth (n = 38 / 64 overall cohort)		Composite Pregnancy Outcome[i] (n = 23 / 46 pregnancies)	
	Adjusted OR (95%CI)	p value	Adjusted OR (95%CI)	p value
SkinBlood Clock Chronologic Age – Biologic Age[ii]	2.02 (1.2-4.11)	0.02	1.43 (0.64, 3.30)	0.38
Chronologic Age alone[iii]	0.87 (0.70, 1.07)	0.20	0.92 (0.70, 1.18)	0.53

i) Composite pregnancy outcome included: miscarriage/fetal demise, preterm labor/delivery, hypertensive disorders, gestational diabetes, or placental insufficiency
ii) Multivariable logistic regression adjusted for chronologic age, race, parity, past medical history, recurrent pregnancy loss.
iii) Multivariable logistic regression adjusted for race, parity, past medical history, recurrent pregnancy loss.

1134 | Safety and Efficacy of Influenza Vaccination in Pregnancy: Umbrella Review and Meta-Analyses

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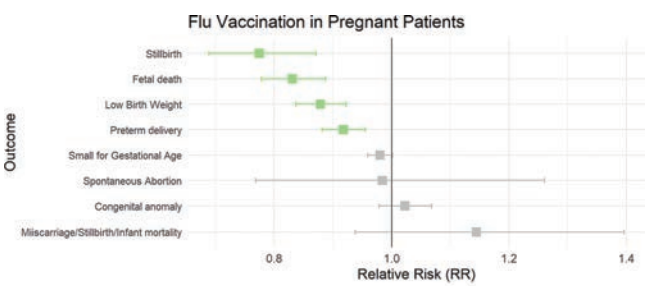
4:00 PM - 6:00 PM

Objective: Although influenza vaccination during pregnancy is known to prevent seasonal flu outbreaks, reliable and contemporary quantitation of benefits and safety has not been performed. The aim of the current umbrella review to synthesize evidence from multiple meta-analyses was to reliably and robustly provide quantitative measures of the effectiveness and safety of influenza vaccines among gravidae.

Study Design: We conducted a systematic search of PubMed, Scopus, Web of Science, and Embase from inception to 09/13/2023, including over 100 individual studies retaining 38 million pregnancies. Data were extracted from multiple meta-analyses, and included studies were filtered to ensure no duplication within outcomes. Risk ratios (RRs) and pooled proportions were calculated using R, with aggregate effect sizes and random-effects models applied. Egger's test was used to assess publication bias. PROSPERO registration: CRD42024519189.

Results: As shown in Figure & Table, influenza vaccination during pregnancy resulted in a significant risk reduction of fetal death or stillbirth (RR 0.83 & 0.77, 95% CI 0.78–0.89 and 0.69–0.87), PTB (RR 0.92, 95% CI 0.88–0.96), and LBW neonates (RR 0.88, 95% CI 0.84-0.93). Reflective of changes in co-morbidities and other respiratory illness pandemics over the study interval, there was heterogeneity in some outcomes, such as PTB (I^2: 63.06%), while other outcomes showed low to moderate heterogeneity. Egger's test for publication bias indicated no significant bias across the studies.

Conclusion: Influenza vaccination during pregnancy is associated with significant and quantifiable reductions in the risk ratio of multiple adverse perinatal outcomes. Providing these quantitative estimates may aid in public health messaging and shared decision-making with patients and their families.



Outcome	Pooled RR	Lower CI	Upper CI	I^2	Lower CI (I^2)	Upper CI (I^2)	Number Studies	p-value for Egger test
Fetal death	0.83	0.78	0.89	0	0	0	33	0.98
LBW	0.88	0.84	0.93	53.02	36.48	69.55	36	0.26
Preterm delivery	0.92	0.88	0.96	63.05	46.83	79.28	35	0.31
Stillbirth	0.77	0.69	0.87	28.66	9.76	47.55	23	0.93

RR: Risk ratio; CI: Confidence interval; LBW: Low birthweight

1135 | Risk of Hypertensive Disorders of Pregnancy in GLP-1 Agonist Exposed and Unexposed Patients

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[1]Yale School of Medicine, New Haven, CT; [2]Yale New Haven Hospital, New Haven, CT

4:00 PM - 6:00 PM

Objective: To understand the effect of GLP-1 agonist use in the year prior to conception on risk of developing hypertensive disorders of pregnancy (HDP).

Study Design: All patients delivering between 2014-2024 with evidence of GLP-1 exposure in the year prior to conception were identified through electronic medical record (EMR) query with hand review to confirm exposure. GLP-1 exposed patients were classified according to GLP-1 indication for use: 1) pregestational diabetes mellitus (PGDM) or 2) weight management (WM) for increased body mass index (BMI). Control groups for each indication cohort were identified from 2021-2022 delivery EMR

data. PGDM controls were patients with pregestational DM1 or DM2 managed with medication other than GLP-1 agonist in the year prior to conception. WM controls were a stratified random sample of patients without PGDM not on antihyperglycemic medication in the year prior to conception with BMIs between 30 < 40 kg/m^2 (n = 100) and ≥ 40 kg/m^2 (n = 100). Demographic and clinical characteristics and obstetrical outcomes were compared. Logistic regression was employed to assess the crude (OR) and adjusted odds ratios (aOR) for HDP controlling for covariates significant in bivariate tests at < 0.05.

Results: 246 patients had GLP-1 exposure in the year prior to conception. Of these, 104 were exposed for PGDM and 142 for WM. For the PGDM cohort, 175 controls were identified from the two years of EMR data interrogated. For the WM cohort, random sampling yielded 200 controls.

Bivariate tests for race/ethnicity, pre-pregnancy BMI, and chronic hypertension identified significant differences between exposed and unexposed patients in the PGDM cohort. For the WM cohort, exposed and unexposed patients had significant differences in PCOS diagnosis, gestational weight gain, and HDP. For both the PGDM and WM cohort, exposed patients were half as likely to develop HDP compared to unexposed counterparts (PGDM aOR = 0.47 (0.27-0.83); WM aOR = 0.48 (0.29-0.80)).

Conclusion: GLP-1 use in the year prior to conception significantly reduced the likelihood of developing HDP for patients with PGDM and undergoing WM.

Table 1. Bivariate Comparisons between GLP-1 Agonist Exposed and Unexposed Patients for the Two GLP-1 Indication Cohorts

	Pre-Gestational Diabetes Mellitus				Weight Management			
	Total	GLP-1 Exposure			Total	GLP-1 Exposure		
Patient Characteristics	N (%) N=279 (100%)	No N=175 (62.7%)	Yes N=104 (37.3%)	P-value	N (%) N=342 (100%)	No N=200 (58.5%)	Yes N=142 (41.5%)	P-value
Age ≥35 yo	116 (41.6)	71 (25.5)	45 (16.1)	0.66	84 (24.6)	43 (12.6)	41 (12.0)	0.12
Public Insurance	155 (55.6)	99 (35.5)	56 (20.1)	0.66	176 (51.5)	100 (29.2)	76 (22.2)	0.52
Parity								
Nulliparous	95 (34.3)	58 (20.9)	37 (13.4)	0.73	119 (34.8)	71 (20.8)	48 (14.0)	0.75
Multiparous	182 (65.7)	115 (41.5)	67 (24.2)		223 (65.2)	129 (37.7)	94 (27.5)	
Race/ethnicity								
Hispanic	86 (30.8)	61 (21.9)	25 (9.0)	0.003	105 (30.7)	55 (16.1)	50 (14.6)	0.55
Black	81 (29.0)	37 (13.3)	44 (15.8)		89 (26.0)	54 (15.8)	35 (10.2)	
White	84 (30.1)	57 (20.4)	27 (9.7)		133 (38.9)	81 (23.7)	52 (15.2)	
Asian	19 (6.8)	15 (5.4)	4 (1.4)		5 (1.5)	4 (1.2)	1 (0.3)	
Other	9 (3.2)	5 (1.8)	4 (1.4)		10 (2.9)	6 (1.8)	4 (1.2)	
Pre-Pregnancy BMI (N=254)								
≥30 kg/m^2	182 (71.7)	90 (35.4)	93 (36.2)	<0.0001				
Polycystic Ovary Syndrome (PCOS)	71 (25.5)	42 (15.1)	29 (10.4)	0.47	64 (18.7)	20 (5.9)	44 (12.9)	<0.0001
Chronic Hypertension	140 (50.2)	77 (27.6)	63 (22.6)	0.007	104 (30.4)	55 (16.1)	49 (14.3)	0.17
Obstetrical Outcomes								
Large for Gestational Age	83 (30.6)	56 (20.7)	27 (10.0)	0.32	40 (11.8)	23 (6.8)	17 (5.0)	0.84
Fetal Growth Restriction	23 (8.2)	15 (5.4)	8 (2.9)	0.80	19 (5.6)	13 (3.8)	6 (1.8)	0.37
Maternal Gestational Weight Gain[1]								
Under recommended	59 (23.3)	38 (15.0)	21 (8.3)	0.55	103 (30.2)	77 (22.6)	26 (7.6)	0.0003
Recommended	59 (23.3)	36 (14.2)	23 (9.1)		59 (17.3)	32 (9.4)	27 (7.9)	
Over recommended	135 (53.4)	76 (30.0)	59 (23.3)		179 (52.5)	91 (26.7)	88 (25.8)	
Pre-Term Birth	85 (30.7)	55 (19.9)	30 (10.8)	0.67	39 (11.4)	20 (5.9)	19 (5.6)	0.33
Gestational Diabetes Mellitus					69 (20.2)	45 (13.2)	24 (7.0)	0.20
Hypertensive Disorders of Pregnancy	136 (48.8)	93 (33.3)	43 (15.4)	0.06	108 (31.6)	75 (21.9)	33 (9.7)	0.005

[1] Maternal gestational weight gain categories determined by patient's pre-pregnancy BMI based on the American College of Obstetricians and Gynecologists' 2013 Committee Opinion *Weight Gain During Pregnancy*, reaffirmed in 2023.

Table 2: Crude and Adjusted Odds Ratios (OR) for Hypertensive Disorders of Pregnancy (HDP) Among Patients with Pregestational Diabetes Mellitus and Patients Undergoing Weight Management with and without Exposure to GLP-1 Agonists in the Year Prior to Pregnancy

	HDP (PGDM cohort)		HDP (WM cohort)	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)*	Unadjusted OR (95% CI)	Adjusted OR (95% CI)**
No Exposure	Ref	Ref	Ref	Ref
GLP-1 Exposure	0.62 (0.38-1.02)	0.47 (0.27-0.83)	0.50 (0.31-0.82)	0.48 (0.29-0.80)

* Adjusted for pre-pregnancy BMI and Race

**Adjusted for PCOS and maternal weight gain

1136 | Early Pregnancy Cortisol Levels in Women with and without a History of Preterm Deliveries

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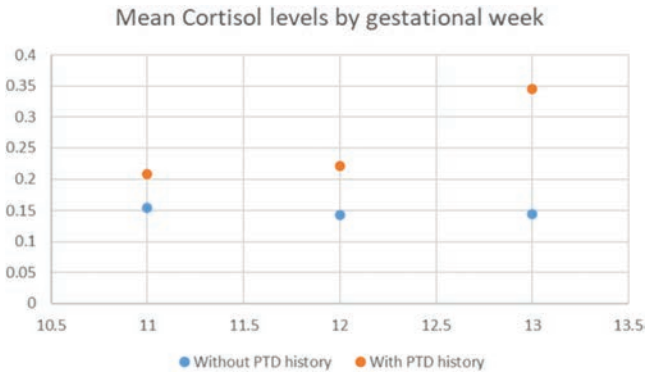
4:00 PM - 6:00 PM

Objective: Elevated cortisol levels during pregnancy have been associated with an increased risk for preterm delivery (PTD). However, the precise nature of this relationship and its potential mechanisms remain poorly understood, particularly concerning cortisol levels in early pregnancy. The present prospective study was designed to investigate the association between early pregnancy cortisol levels and perceived stress, and adverse pregnancy outcomes in women with and without a history of PTD.

Study Design: In this prospective study, women with or without a history of PTD were recruited during 11-13 weeks of gestation at a tertiary medical center. All participants provided a saliva sample and answered a health and stress questionnaire. Pregnancy outcomes were compared between women with high and low salivary cortisol levels. Mean salivary cortisol levels were also compared between women with and without a history of PTD and between women with and without selected pregnancy complications.

Results: The study included 375 women, out of them 194 with, and 181 without previous PTD. The levels of cortisol were higher among women with vs. without PTD (0.1440 ug/dL $\pm$ 0.095 and 0.297 ug/dL $\pm$ 0.23, respectively, p-value$<$ 0.001) in total, and when comparing the groups at each gestational week (Figure 1). Women who had high cortisol levels were not at increased risk for adverse pregnancy outcomes including PTD (Table 1). No association was found between the perceived stress based on the questionnaire and the measured cortisol levels.

Conclusion: Although cortisol levels were higher among women with previous PTD, cortisol levels were not associated with the risk for PTD and other adverse pregnancy outcomes, possibly due to the early gestational age at which the cortisol was measured. Further study on early pregnancy markers for potential complications is needed to facilitate effective intervention and prevention.



	High (>75th percentile) of salivary cortisol	P value	levels salivary cortisol		P value
			mean	Std. Deviation	
Gestational age					
Term	24.8%, 71	1.000	0.260	0.250	0.305
PTD	25.6%, 11		0.217	0.181	
Gestational diabetes					
Yes	30.3%, 10	0.524	0.415	0.214	0.082
No	24.3%, 72		0.221	0.191	
Preeclampsia					
Yes	50%, 2	0.260	0.123	-	0.601
No	24.6%, 80		0.224	0.193	
5 minutes Apgar Score<7					
Yes	50%, 1	0.370	0.159	0.100	0.574
No	20.4%, 53		0.204	0.178	

1137 | Brain Imaging for Evaluation of Severe Headache in Pregnancy

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4:00 PM - 6:00 PM

Objective: Headache is the most common neurologic symptom in pregnancy. There is a debate on the necessity and imaging indications for headache evaluation. We aimed to assess the effectiveness of brain imaging for persistent severe headaches in pregnant individuals.

Study Design: This retrospective study included pregnant individuals with headaches requiring brain imaging at a tertiary center from 2011 to 2024. Those with "red flags" (neurological signs, severe headaches, or lack of response to analgesics) were evaluated by a neurologist for imaging needs. Abnormal imaging was defined as new brain findings explaining the headache. The study details patient characteristics, etiologies, clinical features, immediate treatments, and impacts on pregnancy management.

Results: During the study period, 458 pregnant individuals had brain imaging due severe headache. Of them only 34 (7.4%) had positive imaging. Abnormal Imaging results included stroke (n = 10,29.4%), space-occupying lesion (n = 7,20.6%), Idiopathic Increased Intracranial Pressure (n = 6,6%.71), Cavernoma (n = 5, 14.7%), and other less frequent causes such as Multiple Sclerosis, Posterior Reversible Encephalopathy Syndrome (PRES) (n = 2, 5.9%) Acute Disseminated Encephalomyelitis (ADEM), Optic Neuritis, Subarachnoid Hemorrhage, Reversible cerebral vasoconstriction syndrome (RCVS), Internal carotid thrombus (n = 1, 2.9% each).

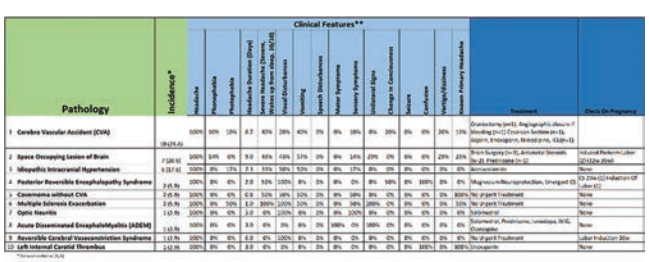
There were no differences in maternal and pregnancy baseline characteristics (Table 1).

Among individuals with abnormal imaging 19 (55.9%) needed medical or surgical treatment including 4 (11.7%) brain surgeries, 1 (2.9%) angiographic intervention, 16 individuals (47.0%) received medical treatment such as aspirin, low molecular weight heparin, nimodipine, steroids, and acetazolamide. Five (14.7%) patients underwent an early delivery between 29-36 weeks (Table 2).

Conclusion: At a tertiary care center, the yield of brain imaging to diagnose significant etiologies in pregnant individuals is 7.4% with CVA being the most common etiology. Medical or surgical treatment was required in 55.9% of the positive imaging group.

Table 1: Maternal and Obstetrical Characteristics

Variable	Overall, N = 458[1]	Normal, N = 424[1]	Abnormal, N = 34[1]	p-value[2]
Maternal Age	31.36 (5.72)	31.31 (5.75)	32.03 (5.44)	0.37
Nulliparous	119 (27%)	110 (27%)	9 (26%)	0.98
BMI	27.70 (5.50)	27.62 (5.41)	28.71 (6.48)	0.48
Smoking	28 (7.7%)	25 (7.4%)	3 (11%)	0.464
Hyper coagulability	29 (6.3%)	27 (6.4%)	2 (5.9%)	>0.999
Past Thrombosis	16 (3.5%)	16 (3.8%)	0 (0%)	0.621
Known Primary Headache	11 (20%)	3 (13%)	8 (25%)	0.326
Chronic Hypertension	18 (3.9%)	18 (4.2%)	0 (0%)	0.384
Gestational Hypertension	0 (0%)	0 (0%)	0 (0%)	
Preeclampsia	23 (5.0%)	22 (5.2%)	1 (2.9%)	>0.999
Superimposed PET	8 (1.7%)	8 (1.9%)	0 (0%)	>0.999
Multiple Gestation	19 (4.3%)	18 (4.4%)	1 (2.9%)	>0.999
In Vitro Fertilization	38 (76%)	36 (78%)	2 (50%)	0.240
Trimester				0.503
First	82 (18%)	74 (17%)	8 (24%)	
Second	143 (31%)	135 (32%)	8 (24%)	
Third	233 (51%)	215 (51%)	18 (53%)	



1138 | Impact of Residence in a Food Desert on Prenatal Metabolic Health and Diet Indices

Noor K. Al-Shibli[1]; Anne L. L. Dunlop[2]; Suchitra Chandrasekaran[3]
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4:00 PM - 6:00 PM

Objective: With increasing rates of metabolic syndrome and associated adverse pregnancy outcomes, there is a need to better understand risks for poor nutritional status. Little is known about the impact of the lived food environment on prenatal diet quality. We aimed to explore impact of living in a food desert (FD) on prenatal dietary scores & metabolic health indices.

Study Design: We performed a single-center prospective pregnancy cohort study from 2014-2024. Participants were a subset of those enrolled in the Atlanta African American Maternal-Child Cohort, which included pregnant people ages 18-40 with a singleton 8-14 weeks' gestation who identified as Black/African American. Block-Bodnar food frequency questionnaires (FFQ) were administered at 8-14 or 24-30 weeks' gestation. Dietary scores and indices were calculated from FFQ responses. FD status was assigned to participants residing in low-income/low-access census tracts according to U.S. Department of Agriculture (USDA) definitions. Descriptive and bivariate statistics were utilized.

Results: Of n = 543 pregnancies, n = 242 (45%) lived in a FD. Median cohort age was 25 and BMI 29.8 kg/m2. There were no significant differences in glycemic/lipid indices (Table 1) or diet quality scores (Table 2) by FD status. Notably, median Alternate Healthy Eating Index-Pregnancy (AHEI-P) scores showed low-moderate adherence to dietary guidelines for those residing in FD and non-FDs (41.5 & 40.2, respectively). Both groups demonstrated pro-inflammatory Dietary Inflammatory Index (DII) scores.

Conclusion: Prenatal glycemic/lipid intake and diet quality did not significantly differ by FD status. Rather, those residing in FD & non-FD demonstrated high intake of total sugar, mono/poly-unsaturated fat, low-moderate adherence to pregnancy dietary guidelines, and pro-inflammatory diets. This suggests that metabolic dietary risks in pregnancy are common, irrespective of FD status. Future directions should focus on nutrition education and behavioral approaches for all pregnant people regardless of their geographic food environment.

Table 1: Median Glycemic and Lipid Indices by Food Desert Status

	Non-Food desert	IQR [Q1-Q3]	Food Desert	IQR [Q1-Q3]	p-value
Glycemic Indices:					
Glycemic Index (glucose), average daily	0.916	4.18 [50.53-54.7]	1.598	4.83 [50.1-54.9]	0.720
Glycemic Load (glucose), average daily	52.72	106.1 [66.7-172.9]	52.6	105.1 [71.9-177.0]	0.562
Total Sugar, g	105.4	115.6 [59.3-174.9]	109.2	120.6 [60.8-181.4]	0.730
Dietary Fiber, g	102.0	15.84 [10.1-25.9]	101.0	13.25 [10.85-24.10]	0.766
Soluble Fiber, g	16.43	5.50 [3.46-8.96]	15.33	4.66 [3.50-8.15]	0.629
Fructose, g	5.76	32.92 [14.91-47.83]	5.34	33.59 [14.70-48.29]	0.845
Lactose, g	27.15	12.05 [3.28-15.33]	25.97	11.25 [3.11-14.36]	0.662
Maltose, g	7.97	2.9 [1.56-4.46]	6.88	2.74 [1.68-4.41]	0.482
Galactose, g	2.51	0.203 [0.0899-0.293]	2.77	0.150 [0.0911-0.241]	0.171
Lipid indices:					
Saturated fat, g	1.916	23.73 [14.65-38.38]	1.981	23.12 [14.90-38.02]	0.995
Monounsaturated fat, g	22.65	25.70 [17.64-43.34]	23.355	25.85 [18.28-44.13]	0.874
Polyunsaturated fat, g	27.65	14.72 [9.38-24.10]	28.785	13.65 [10.00-23.64]	0.793
Cholesterol, mg	15.11	280.8 [135.2-416.1]	15.87	270.9 [135.3-406.3]	0.748
Omega-6 fatty acids, g	0.0348	12.35 [7.93-20.3]	0.0298	12.56 [8.42-20.98]	0.799
Omega-3 fatty acids, g	12.91	1.47 [0.91-2.38]	13.24	1.31 [0.94-2.25]	0.869

*g = grams, mg = milligrams

Table 2: Dietary Scores by Food Desert Status

Dietary score	Non-Food Desert	IQR [Q1-Q3]	Food Desert	IQR [Q1-Q3]	p-value	Reference Range
Healthy Eating Index-2015 (HEI 2015)	59.5	14.0 [51.5-65.6]	58.4	14.0 [50.0-64.5]	0.134	0-100
Alternate Health Eating Index-for Pregnancy (AHEI-P)	41.5	30.8 [28.1-58.9]	40.2	26.4 [29.2-55.7]	0.648	0-100
Dietary Approach to Stop Hypertension score (DASH)	24	8 [20-28]	23	7 [20-27]	0.220	0-9
Mediterranean Diet score (MED)	4	4 [2-6]	3	3 [2-5]	0.154	0-9
Dietary Inflammatory Index (DII)	0.988	5.85 [-2.29-3.56]	1.544	5.68 [-1.81-3.87]	0.339	Pro-inflammatory: >0 Neutral: -1 to 0 Anti-inflammatory: < -1

1139 | Hypertensive Disorders and Postpartum Follow up: Care in and Outside the Hospital

Oladunni Ogundipe[1]; Michelle Carfagno[2]; Adeola F. Adeyeye[3]; Cassandra Heiselman[3]; Kimberly Herrera[4]

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4:00 PM - 6:00 PM

Objective: We sought to evaluate the role of social determinants of health (SDH) in postpartum care delivery and utilization among patients with hypertensive disorders of pregnancy (HDP) by examining rates of 6 week follow up and unscheduled healthcare utilization.

Study Design: This was a retrospective cohort study of patients who delivered at a single hospital between 12/2020 and 2/2023 including those diagnosed with preeclampsia with/without severe features during pregnancy or in the postpartum period. Exclusion criteria: < 18 years of age, delivered < 20 weeks GA, or delivered with community practices. SDH included age, self-identified race and ethnicity, marital status, number of living

children, health insurance, and area deprivation index (a mapping tool from 1 [most advantaged] to 10 [least advantaged] obtained from census data displaying relative socioeconomic conditions of regions). Statistical analysis included cross-tabulation, chi-square tests, independent samples t-tests, bivariate analyses, and multivariable logistic regression analyses. Statistical significance was determined using a threshold of $p < 0.05$.

Results: 257 patients were included (Table 1). Being single, having prior living children, and belonging to a racial or ethnic group other than White non-Hispanic was significantly associated with poor attendance at the six-week postpartum visit (Table 2). Unscheduled hospital admissions were also significantly associated with being black, higher ADI scores, and having living children ($p< 0.05$) (Table 3).

Conclusion: SDH were significantly associated with poor postpartum follow up and higher rates of unscheduled health care utilization.

Table 1: Patient Characteristics

Characteristics	BP check within 1 week		*p*-value
	No n (%)	Yes n (%)	
Race and ethnicity			0.04
White non-Hispanic	38 (29.0)	93 (71.0)	
Black	15 (33.3)	30 (66.7)	
Hispanic	30 (48.4)	32 (51.6)	
Multi or other	8 (50.0)	8 (50.0)	
Primary language spoken			0.10
English	77 (34.1)	149 (65.9)	
Not English	14 (50.0)	14 (50.0)	
Relationship status			0.60
Married or domestic partnership	55 (35.0)	102 (65.0)	
Unpartnered	36 (38.3)	58 (61.7)	
Living children			0.67
No	50 (34.7)	94 (65.3)	
Yes	41 (37.3)	69 (62.7)	
Health insurance			0.29
Private	49 (32.9)	100 (67.1)	
Government assistance	41 (39.4)	63 (60.6)	
Self-pay	1 (100.0)	0 (0.0)	
Area Deprivation Index (ADI)	5.48 ± 1.41	5.49 ± 1.37	0.97

Table 2. Associations Between Patient Characteristics and Postpartum Visit Attendance

Characteristics	Six week PPV		*p*-value
	No n (%)	Yes n (%)	
Race and ethnicity			0.04
White-non Hispanic	46 (35.1)	85 (64.9)	
Black	18 (40.0)	27 (60.0)	
Hispanic	30 (48.4)	32 (51.6)	
Multi or other	11 (68.8)	5 (31.3)	
Primary language spoken			0.16
English	90 (39.8)	136 (60.2)	
Not English	15 (53.6)	13 (46.4)	
Relationship status			0.03
Married or domestic partnership	57 (36.3)	100 (63.7)	
Unpartnered	47 (50.0)	47 (50.0)	
Living children			0.01
No	50 (34.7)	94 (65.3)	
Yes	55 (50.0)	55 (50.0)	
Health insurance			0.01
Private	51 (34.2)	98 (65.8)	
Government assistance	53 (51.0)	51 (49.0)	
Self pay	1 (100.0)	0 (0.0)	
Area Deprivation Index (ADI)	5.50 ± 1.29	5.48 ± 1.44	0.87

1140 | Characterization of a 96-Cytokine Panel in Blood of Women with Healthy Pregnancies

Viktoriia Kolesnyk[1]; Colleen Sinnott[2]; Tobias Hartwich[2]; Yang Yang-Hartwich[1]; Olga Grechukhina[1]
[1]Yale School of Medicine, New Haven, CT; [2]Yale University, New Haven, CT

4:00 PM - 6:00 PM

Objective: Serological cytokines are potential biomarkers of pregnancy pathology. While this is a convenient non-invasive technique, establishing normal *versus* abnormal levels in pregnancy has been challenging, limiting its diagnostic value. Some cytokines vary between individuals or due to physiological factors. By evaluating a panel of 96 cytokines in serum from patients with normal pregnancies, our objective is to devise a comprehensive nomogram that integrates a complex cytokine profile and will allow determination of the normal versus abnormal cytokine levels.

Study Design: Serum samples collected at four timepoints (~12 weeks, 18-22 weeks, 26-30 weeks, 34-38 weeks) from 15 healthy pregnant subjects who had no pregnancy complications and delivered full-term were obtained from an institutional biobank. Human Cytokine 96-Plex Discovery Assay was performed. One-way ANOVA was used to analyze trends in each cytokine for each pregnancy. Cytokines with both low variability between timepoints and consistent trends across individuals were identified for further testing in clinical setting.

Results: Among the 96 cytokines (growth factors, chemokines, interleukins and others) that were assessed, levels of 54 significantly increased or decreased during pregnancy while 42 remained stable. Of those that showed change, 7 with low variability were manually picked: GROa, IL-27 and VEGF-A increased while BCA-1, IL-24, Lymphotactin, MCP-4 decreased during the course of pregnancy. Among those that showed no change during pregnancy IL-22, 6CKine (aka CCL21), Exotaxin 3, HMGB1, IL-11, IL-28A, MIP-3b were identified to have low variability.

Conclusion: Out of 96 tested cytokines, 54 change significantly during healthy pregnancy, which should be accounted for when studying maternal serum cytokines in various pregnancy pathologies. The remaining cytokines do not show level change over the course of pregnancy. Specific cytokines that are better suited for clinical setting were identified, setting up a foundation for studying cytokine levels and identifying cytokine footprint in specific pregnancy pathologies.

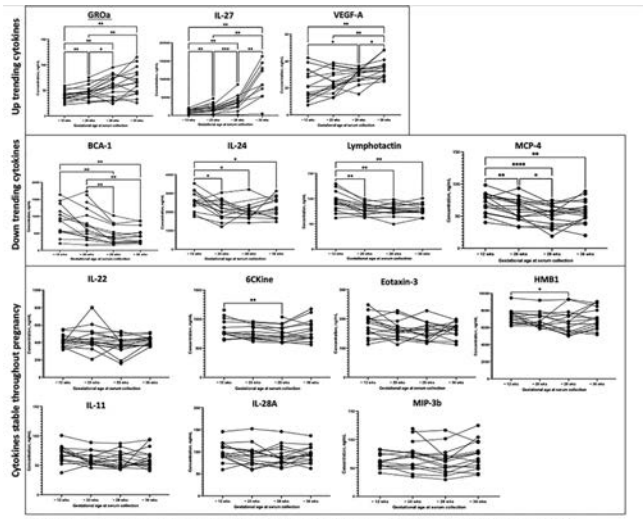

Figure 1. Cytokines with relatively narrow variability and consistent trends (up or down) or stable levels throughout the pregnancy.

1141 | Impact of Fetal Surgery Type and Complications on Maternal Perinatal Mental Health

Olivia Liseth[1]; Jessica Weng[1]; Mauro Schenone[2]; Katherine Moore[2]; Hannah Betcher[2]; Yan Li[2]; Megan E. Branda[2]; Enid Rivera-Chiauzzi[2]; Alyssa Larish[2]
[1]Mayo Clinic MSTP, Rochester, MN; [2]Mayo Clinic, Rochester, MN

4:00 PM - 6:00 PM

Objective: Previous work has identified high rates of depression and anxiety in fetal surgery patients, therefore, we sought to determine the effect of fetal surgery approach type and outcomes on perinatal mood and anxiety disorders (PMAD).

Study Design: A retrospective chart review was conducted of fetal surgery patients from 2017-2024 at a tertiary care center. Demographics, surgical, obstetric, and psychiatric diagnoses were recorded. Complications included surgical site infection, chorioamnionitis, NICU admission > 45 days, PPROM, preterm labor, or delivery < 34 weeks gestation. Severe complications included delivery < 30 weeks gestation, unplanned delivery at the time of the procedure, maternal ICU admission, and fetal or neonatal death. Minimally invasive surgery (MIS) included both fetoscopic and ultrasound guided.

Results: Our cohort had an average age of 30.5 yrs and a mean gravidity of 2.7 (n = 141). Of 141 surgeries, 32 (22.7%) were open and 109 (77.3%) were MIS. Pregnancy complications occurred in 115, with severe complications in 64 patients (Table 1). The rates of any or severe complications were 75.0%, 21.9%, respectively, for open procedures and 83.5%, 52.3%, respectively, for MIS. MIS patients did not have a lower rate of exacerbation or de novo PMAD (25/109, 22.9%) compared to open surgery (8/32, 25.0%, p = 0.8084; X^2 test). Patients with any complication did not have a higher risk of exacerbation or de novo PMAD (30/115, 26.1%), versus patients without any complications (3/26, 11.5%, p = 0.1315; Fisher's exact test). After adjusting for multiple testing, no individual complication was predictive of subsequent PMAD. Among patients with baseline mood disorders, complications did not result in increased exacerbation compared to no complications (2/5, 40% without vs 25/48, 52.1% with, p = 0.6687; Fisher's exact test).

Conclusion: Both complications and surgical approach are not predictive of PMAD; universal follow-up and screening are needed. Further research is necessary to determine the most effective timepoints and methods of screening in this population with a uniquely challenging life event.

Table 1. Pregnancy complications, stratified by fetal surgical approach.

Complications	Total (n = 141)	Open (n = 32)	Minimal Invasive (n = 109)	p-value
Maternal surgical site infection	7 (5.1%)[5]	3 (9.4%)	4 (3.8%)[5]	0.3548
Chorioamnionitis	11 (8.1%)[6]	2 (6.2%)	9 (8.7%)[6]	1.0000
Prolonged NICU admission >45 days; n (%)	33 (30.3%)[32]	6 (21.4%)[4]	27 (33.3%)[28]	0.2372
PPROM <34 weeks	33 (23.9%)[3]	7 (21.9%)	26 (24.5%)[3]	0.7578
Preterm labor <34 weeks	44 (31.9%)[3]	8 (25.0%)	36 (34.0%)[3]	0.3404
Gestational age at birth <34 weeks	71 (51.1%)[2]	11 (34.4)	60 (56.1)[2]	0.0312
Severe complications				
Gestational age at birth <30 weeks	40 (28.8%)[2]	5 (15.6%)	35 (32.7%)[2]	0.0757
Unplanned delivery at time of surgical procedure	7 (5.0%)	2 (6.3%)	5 (4.6%)	0.6571
Maternal ICU admission	2 (1.4%)[3]	1 (3.1%)	1 (0.9%)[3]	0.4113
Neonatal demise	25 (18.1%)[3]	4 (12.5%)	21 (19.8%)[3]	0.4389
Fetal demise	20 (14.8%)[6]	0 (0)	20 (19.4%)[6]	0.0037

Table 1. *Pregnancy and surgical outcomes for the general fetal surgery cohort. Data are represented as mean (standard deviation) when stated and count (percentage of total population subtract missing) otherwise. Superscripts indicate the counts of missing values, which are excluded from the percentage calculation. d, days; w, weeks; SD, standard deviation.*

1142 | Intrapartum Maternal Bacteremia: an Important Predictor of Puerperal Adverse Outcomes

Omer Nir[1]; Tal Israeli[2]; Michal Axelrod[2]; Sharon Amit[3]; Shali Mazaki-Tovi[2]; Michal Fishel Bartal[4]
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4:00 PM - 6:00 PM

Objective: We aimed to assess the risk factors, pathogens, and outcomes in Individuals with intrapartum fever with and without proven bacteremia bacteremia.

Study Design: We conducted a retrospective study at a single tertiary center (October 2011 to February 2024). Included in the study were individuals with singleton pregnancies in labor beyond 24 weeks who experienced intrapartum fever (defined as > 38 degrees Celsius). We excluded those with unavailable blood cultures for review. Baseline demographic and delivery characteristics were compared between those with positive cultures and those with negative or non-pathogenic blood cultures (contaminants). The primary outcome was a composite adverse maternal outcome (CAMO), which included any of the following: length of stay > 4 days, ICU admission, CT-guided drainage, fever-related surgery, and death. A multivariable regression analysis was performed for the primary outcome, with adjusted odds ratios (aOR) and 95% confidence intervals (CI) reported.

Results: Out of 86,904 deliveries, 3,603 (4.1%) had intrapartum fever, and 3,047 (85%) met inclusion criteria. Among these, 117 (3.8%) had positive blood cultures, with the most common blood-borne pathogens being non-hemolytic Streptococci, Enterobacterales, and GBS (Figure). Those with bacteremia differed from those without in terms of age, rate of nulliparity, rate of spontaneous labor onset, preterm delivery, and neuraxial analgesia. Furthermore, patients with bacteremia had a higher maximal temperature and WBC count, had a higher rate of cesarean delivery, and required additional broad-spectrum second-line antibiotics. Following multi-variable regression, those with

bacteremia had a higher rate of CAMO (85.5% vs. 38.6%, aOR 16.0, CI 7.2-35.8, Table) compared to those without bacteremia.

Conclusion: Intrapartum fever accompanied by bacteremia is associated with an increased need for second-line antibiotic use and poorer maternal outcomes. This study underscores the importance of blood culture among individuals at risk in guiding treatment and identifying individuals at higher risk of adverse maternal complications.

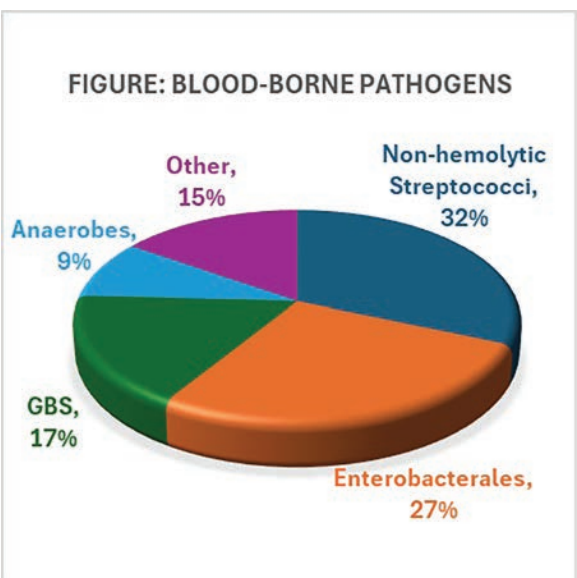
Table: Baseline characteristics and outcomes

	Bacteremia N=117	No Bacteremia N=2930	p value	
Baseline characteristics				
Maternal age, years	32.2 ± 5.8	30.9 ± 4.9	0.004	
BMI, Kg/M²	28.3 (25.2-32.0)	28.0 (25.5-31.2)	0.44	
Nulliparity	82 (70.1)	2343 (80.0)	0.009	
Spontaneous labor onset	40 (34.2)	1485 (50.7)	< 0.001	
GBS positive	8 (7.6)	334 (11.6)	0.21	
Neuraxial anesthesia	89 (76.1)	2517 (88.3)	< 0.001	
Duration of ROM, hours	14.4 (6.1-26.1)	11.9 (19.8-74.0)	0.19	
IUFD	8 (6.8)	69 (2.4)	0.009	
Max Temperature, Celsius	38.6 (38.3-39.1)	38.3 (38.1-38.6)	< 0.001	
Max WBC	19.8 (15.3-25.0)	18.3 (15.4-22.0)	< 0.001	
Gestational Age at Delivery	39.6 (40.4-37.6)	40.0 (40.5-38.6)	0.05	
Preterm labor < 37w	27 (23.1)	177 (6.0)	< 0.001	
Cesarean delivery	44 (37.6)	780 (26.6)	0.009	
Second-line antibiotics				
Carbapenems	7 (6.0)	12 (0.4)	< 0.001	
Ceftriaxone	41 (35.0)	67 (2.3)	< 0.001	
Metronidazole	13 (11.1)	57 (1.9)	< 0.001	
Piperacillin-tazobactam	5 (4.3)	20 (0.7)	0.002	
Outcomes				**aOR (95%CI)**
CAMO*	100 (85.5)	1132 (38.6)	< 0.001	8.5 (4.9-14.6)#
LOS >4 days	99 (84.6)	1129 (38.9)	< 0.001	
ICU admission	6 (5.4)	7 (0.2)	< 0.001	
CT-guided drainage	2 (1.7)	5 (0.2)	0.03	
Fever Related surgery**	3 (2.6)	8 (0.3)	0.007	
Maternal Death	1 (0.9)	0 (0.0)	0.04	
CAMO (without LOS)	10 (8.5)	17 (0.6)	< 0.001	7.8 (3.2-19.2)##
Admission Duration, days	6.33 (4.7-9.6)	3.47 (2.6-4.9)	< 0.001	
CT imaging	15 (12.8)	48 (1.6)	< 0.001	

Data are presented as n (%), mean (±SD), or median (IQR).

BMI, Body Mass Index; GBS, group B streptococcus; IUFD, intrauterine fetal death; WBC, white blood cell; CAMO, composite maternal adverse outcome; ICU, intensive care unit; CT, computed tomography; LOS, length of stay.

*Composite includes any of the following: length of stay ≥4 days, ICU transfer, CT-guided drainage, fever-related surgery, maternal death.
**Fever-related surgery includes laparoscopy, laparotomy, and hysterectomy.
#Adjusted for maternal age, nulliparity, induction of labor, preterm birth, and cesarean delivery.
Adjusted for maternal age, preterm birth, and cesarean delivery.



1143 | Maternal Lipidomics for the Accurate Prediction of Fetal Cyanotic Congenital Heart Defects

Onur Turkoglu[1]; Nadia Ashrafi[2]; Ali Yilmaz[2]; Romana Ashrafi[2]; Abdullah Khan[2]; Perry Friedman[3]; Ciara Talbot[4]; Stewart graham[2]; Ray Bahado-Singh[5]

[1]Baylor College of Medicine, Houston, TX; [2]William Beaumont University Hospital, Research Institute, Metabolomics Division, Royal Oak, William Beaumont University Hospital, Research Institute, Metabolomics Division, Royal Oak, MI; [3]Memorial Healthcare System, Memorial Healthcare System, FL; [4]Kaiser Permanente, Kaiser Permanente Brookwood at Peachtree Medical Office, GA; [5]Corewell Health William Beaumont University Hospital, Oakland University William Beaumont School of Medicine, Royal Oak, MI

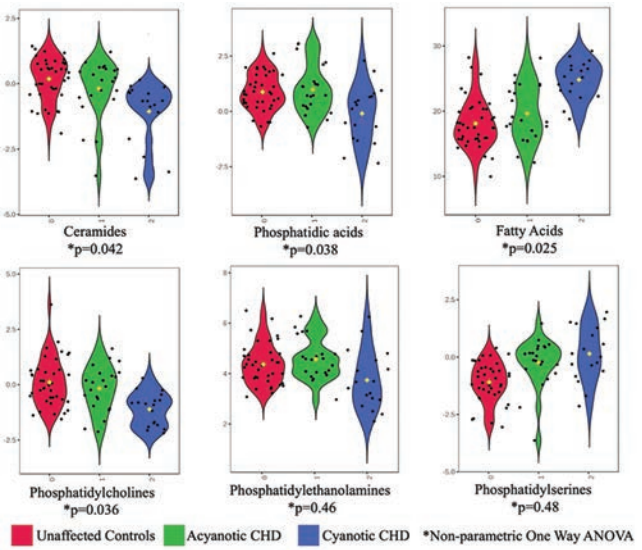
4:00 PM - 6:00 PM

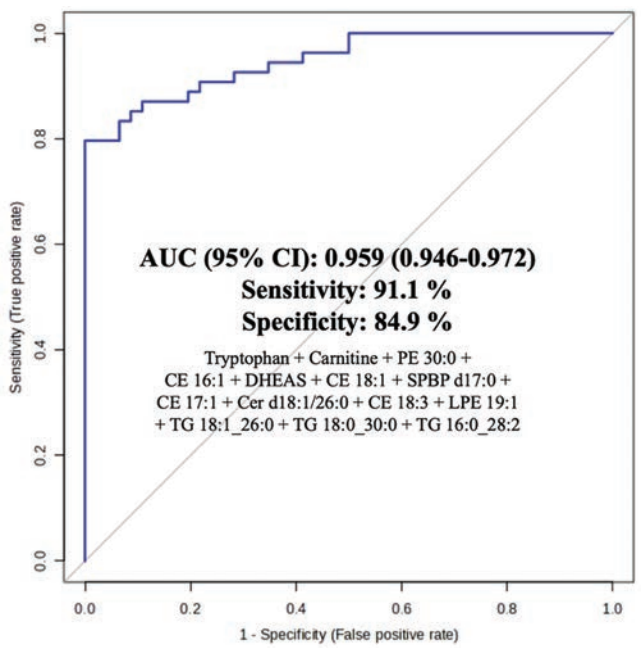
Objective: Late diagnosis of cyanotic congenital heart defects (CCHD) significantly increases newborn morbidity and mortality. However, a significant percentage of CCHD cases remain undetected prenatally. Our objectives were therefore to evaluate the accuracy of maternal serum lipidomic markers for the prenatal detection of CCHD and also to elucidate the pathogenesis of these disorders.

Study Design: This prospective case-control study included 40 cases of CHD (22 cyanotic, 18 acyanotic) and 39 unaffected controls. Maternal serum samples were profiled via a combination of Ultra-High-Performance Liquid Chromatography coupled with Mass Spectrometry and Nuclear Magnetic Resonance. The mean of each lipid specie was compared between CCHD vs all others. Logistic regression models were developed for the detection of CCHD. Areas under the receiving operating curve (AUC), sensitivity, and specificity values were calculated. Metabolite Set Enrichment Analysis (MSEA) was also performed to discover the top dysregulated biochemical pathways in CCHD.

Results: In total, 803 lipids and 97 metabolites were profiled in the maternal serum. In CCHD cases, concentrations of ceramides, phosphatidic acids, phosphatidylcholines, and phosphatidylethanolamines were decreased while fatty acids and phosphatidylserines were elevated ($p < 0.05$) (Fig1). The lipidomics model (Fig2) achieved outstanding predictive accuracy: AUC (95%) = 0.959 (0.946-0.972). This outperformed the accuracy of routinely used standard clinical risk predictors for CHD (diabetes + obesity + hypertension + in vitro fertilization + family history of CHD + alcohol or tobacco exposure). MSEA analysis revealed profound alterations of mitochondrial beta-oxidation of short and long-chain fatty acids involved in lipid metabolism, in CCHD.

Conclusion: Fetal CCHD was associated with significant disturbance of lipid metabolism. Maternal lipid biomarkers were highly accurate for the detection of fetal CCHD. This has the potential for the development of non-invasive pregnancy population screening which could help to reduce mortality and morbidity in CCHD.





1144 | Association Between Health Literacy and Cardiovascular Health in Early Pregnancy

Onyinye Ohamadike[1]; Xiaoning Huang[2]; Sadiya S. Khan[1]; William A. Grobman[3]; Philip Greenland[4]; David M. Haas[5]; Uma M. Reddy[6]; Lynn M. Yee[1]

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4:00 PM - 6:00 PM

Objective: Inadequate health literacy (HL) has been associated with adverse pregnancy outcomes, yet it is not well understood to what extent HL is associated with early pregnancy cardiovascular health (CVH). We aimed to understand the association between inadequate HL and CVH in early pregnancy.

Study Design: In this secondary analysis of cross-sectional data from a large, multi-site cohort of nulliparous people enrolled in a prospective observational study conducted at 8 US medical centers, we included participants who completed an assessment of HL at 6 to 13 weeks of gestation. HL, assessed using the Rapid Estimate of Adult Literacy in Medicine-Short Form (REALM-SF), was categorized as inadequate if the REALM-SF score was < 7 (8th grade level or lower) and adequate if score 7 or greater. The primary outcome was CVH at 6-13 weeks of gestation, quantified by a modified (i.e., non-fasting) version of the American Heart Association's Life's Essential 8 (LE8) score, a validated marker of CVH in which lower scores indicate worse CVH. Multivariable linear regression was performed to evaluate the association of inadequate HL with early pregnancy modified LE8 score.

Results: Of the 4,424 participants who completed the REALM-SF, 825 (18.6%) had REALM-SF scores representative of inadequate HL. People with adequate HL were older, less likely to identify as non-Hispanic Black or Hispanic, had higher incomes and education, and were less likely to have public insurance. Participants with adequate HL had higher early pregnancy LE8 scores [79.0 ± 13.3 vs. 73.0 ± 14.2, p< 0.001; mean difference 7.1 (95% CI 5.2-8.8)] compared to participants with inadequate HL. This association persisted after adjustment for age, insurance type, and family income (aβ 3.8, 95% CI 2.2-5.5). The overall association between adequate HL and better CVH was driven by the glucose, diet, physical activity, and sleep subcomponents of the LE8 (Table).

Conclusion: Adequate HL was associated with better CVH scores in early pregnancy. These findings highlight the importance of optimizing HL prior to pregnancy which might promote CVH in the peripartum period.

Table. Association of health literacy with cardiovascular health in early pregnancy

CVH[1]	Adequate HL[2] Mean difference (95% CI)	Adequate HL[3] Adjusted β (95% CI)
Overall LE8	**7.04 (5.23, 8.84)**	**3.83 (2.17, 5.50)**
Blood Pressure	0.19 (-1.87, 2.26)	0.080 (-0.62, 0.78)
Lipid	-1.53 (-3.90, 0.84)	0.79 (-1.48, 3.06)
Glucose	1.02 (-1.94, 3.98)	**2.48 (0.23, 4.73)**
Body mass index	**5.41 (2.30, 8.52)**	**3.49 (1.51, 5.47)**
Diet	**14.6 (8.42, 20.8)**	**5.36 (2.64, 8.08)**
Physical Activity	**16.1 (8.05, 24.2)**	**7.76 (2.76, 12.8)**
Nicotine Exposure	3.06 (-5.66, 11.8)	0.79 (-6.94, 8.52)
Sleep Health	**7.02 (5.91, 8.12)**	**3.12 (0.92, 5.32)**

1. Cardiovascular health (CVH) measured by American Heart Association Life's Essential 8 (LE8) score with subcomponents including blood pressure, lipids, glucose, BMI, diet, physical activity, nicotine exposure, and sleep health
2. Data presented as mean difference (95% confidence interval) in overall LE8 score and subcomponents of LE8 score between participants with inadequate health literacy (HL, reference point) and adequate HL in early pregnancy
3. Multivariable linear regression models were adjusted for maternal age, insurance type, and family income.

1145 | Association Between Health Literacy and Cardiovascular Health at 2-7 Years After First Birth

Onyinye Ohamadike[1]; Xiaoning Huang[2]; Sadiya S. Khan[1]; William A. Grobman[3]; Philip Greenland[4]; David M. Haas[5]; Uma M. Reddy[6]; Lynn M. Yee[1]
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4:00 PM - 6:00 PM

Objective: Inadequate health literacy (HL) is associated with worse cardiovascular health (CVH) in non-pregnant individuals and, among pregnant individuals, adverse pregnancy outcomes (APO). We aimed to study the association between HL in early pregnancy and CVH at 2-7 years after first birth.

Study Design: In this secondary analysis of longitudinal data from a large, multi-site cohort of nulliparous people enrolled in a prospective observational study at 8 US medical centers, we included participants who completed an assessment of HL. HL, assessed using the Rapid Estimate of Adult Literacy in Medicine-Short Form (REALM-SF), was categorized as inadequate if the REALM-SF score was < 7 and adequate if score 7 or greater. The primary outcome was CVH, quantified by the American Heart Association's Life's Essential 8 (LE8) score, a validated marker of CVH in which lower scores indicate worse CVH. Multivariable linear regression models were performed to evaluate the association of inadequate HL in early pregnancy (6-13 weeks of gestation) with LE8 score at 2-7 years after first birth.

Results: Of the 4,424 participants who completed the REALM-SF in early pregnancy and had 2-7 year follow-up data, 825 (18.6%) had REALM-SF scores representative of inadequate HL. People with adequate HL were older, less likely to identify as non-Hispanic Black or Hispanic, had higher incomes and education, and were less likely to have public insurance. Participants with adequate HL in early pregnancy had higher postpartum LE8 scores [80.5 ± 13.3 vs. 73.2 ± 13.8, p< 0.001; mean difference 7.3 (95% CI, 3.5-11.1)] compared to those with inadequate HL. When adjusted for age, insurance type, and family income, this relationship persisted (aβ 3.3, 95% CI 0.4-6.2). Findings were driven by higher scores for the body mass index, diet, physical activity, nicotine exposure, and sleep subcomponents of the LE8 (Table).

Conclusion: Adequate HL in early pregnancy is associated with better CVH scores at 2-7 years after first birth, suggesting interventions to optimize maternal HL should be evaluated as a strategy for long-term CVH promotion.

Table. Association of health literacy in early pregnancy with cardiovascular health at 2-7 years after first birth

CVH[1]	Adequate HL[2] Mean difference (95% CI)	Adequate HL[3] Adjusted β (95% CI)
Overall LE8	**7.28 (3.46, 11.1)**	**3.29 (0.44, 6.15)**
Blood Pressure	2.18 (-1.30, 5.67)	1.58 (-2.02, 5.18)
Lipid	-2.41 (-4.89, 0.07)	-0.57 (-1.99, 0.85)
Glucose	2.04 (-0.51, 4.60)	0.34 (-2.00, 2.68)
Body mass index	**12.5 (6.11, 18.9)**	**7.66 (3.12, 12.2)**
Diet	**11.8 (3.08, 20.6)**	4.41 (-3.23, 12.1)
Physical Activity	**15.0 (10.4, 19.5)**	6.23 (-1.83, 14.3)
Nicotine Exposure	**13.1 (2.91, 23.3)**	4.11 (-3.22, 11.4)
Sleep Health	**5.36 (0.96, 9.75)**	2.61 (-2.10, 7.32)

1. Cardiovascular health (CVH) measured by American Heart Association Life's Essential 8 (LE8) score with subcomponents including blood pressure, lipids, glucose, BMI, diet, physical activity, nicotine exposure, and sleep health
2. Data presented as mean difference (95% confidence interval) in overall LE8 score and subcomponents of LE8 score in postpartum period between participants with inadequate health literacy (HL, reference point) and adequate HL in early pregnancy
3. Multivariable linear regression models were adjusted for maternal age, insurance type, and family income.

1146 | Association of Aspirin Use and Preeclampsia in Pregnancy after Kidney Transplant

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4:00 PM - 6:00 PM

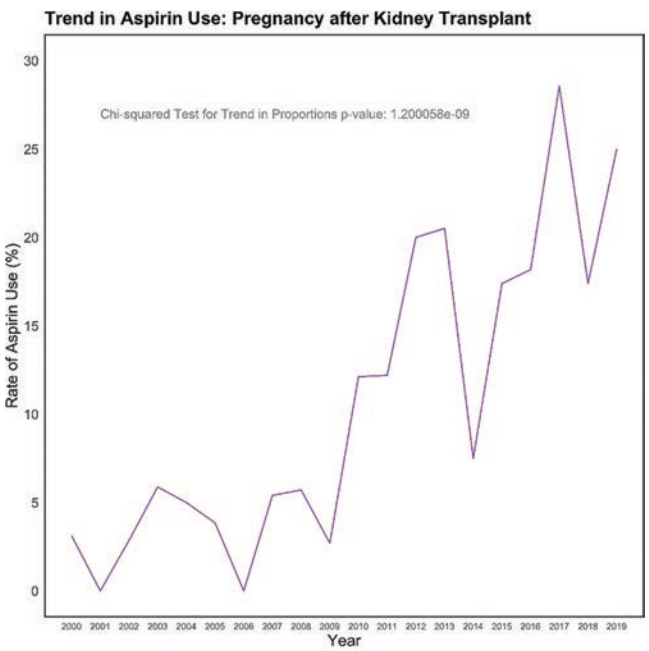
Objective: We aim to characterize trends in aspirin use in the kidney transplant population and the associations of aspirin use with preeclampsia, obstetric outcomes, and graft function.

Study Design: We conducted a retrospective cohort study using the Transplant Pregnancy Registry International of pregnancies after kidney transplant reaching 20 weeks gestation with year of conception from 2000 onwards. The primary outcome was preeclampsia with delivery at < 37 weeks. Univariate and multivariable logistic regression was performed in R.

Results: Our analysis included 708 pregnancies after kidney transplant resulting in 723 livebirths. Of the 708 pregnancies, 74 (10.5%) reported aspirin use and 634 (89.5%) reported no aspirin use in pregnancy. There was a significant increase in aspirin use over time, from 3.1% in 2000 to 25.0% in 2019, p< 0.001 (Figure 1). Aspirin use was associated with higher body mass index (BMI) (27 vs 25 kg/m^2), later year of conception (2014 vs 2009), and living unrelated kidney donor (32.4% vs 15.7%), all p< 0.01. After adjustment for chronic hypertension, year, diabetes,

pre-pregnancy creatinine, multiple gestation, donor type, and BMI, preeclampsia with delivery < 37 weeks occurred in 20 (27.0%) of aspirin use and 135 (21.3%) of no aspirin use pregnancies, (aOR 1.22, 95% CI 0.64 to 2.24, p = 0.5). Aspirin use was associated with postpartum hemorrhage (6.8% vs 2.2%, p = 0.04) but not blood transfusion (5.4% vs 1.7%, p = 0.06) and aspirin use was associated with reduced rates of small for gestational age neonates (9.1% vs 19.8%, p = 0.02). Aspirin use was not associated with any adverse graft outcomes including creatinine changes in pregnancy, acute graft rejection, or graft loss 2 years from time of delivery.

Conclusion: In kidney transplant recipients who reported aspirin use in pregnancy, there was no difference in rates of preeclampsia with preterm delivery. The lack of association could be due to variation in dosage, timing of use, and indication. The increased rates of postpartum hemorrhage and reduction in rates of small for gestational age babies warrants future prospective investigation.



Aspirin Use in Pregnancy after Kidney Transplant			
Maternal and Graft Variables	**No Aspirin (N=634)**	**Aspirin (N=74)**	**p value**
Age (years)	31.6	32.3	0.21
Body mass index (kg/m2)	25	27	< 0.01
Year of Conception	2009	2014	< 0.01
Nulliparous	343.0 (54.1%)	37.0 (50.0%)	0.50
In vitro ferilization	26.0 (4.5%)	6.0 (8.5%)	0.15
White Race	423.0 (66.7%)	58.0 (78.4%)	0.27
Diabetes	22.0 (3.5%)	4.0 (5.4%)	0.78
Multiple gestation	29 (4.6%)	3 (4.1%)	1.00
Chronic hypertension	279.0 (44.0%)	28.0 (37.8%)	0.32
Transplant conception interval (years)	5.5	5.1	0.69
Kidney donor type			< 0.01
Deceased	189.0 (30.0%)	20.0 (27.0%)	
Living Related	343.0 (54.4%)	30.0 (40.5%)	
Living Unrelated	99.0 (15.7%)	24.0 (32.4%)	
Preeclampsia diagnosis	196.0 (30.9%)	28.0 (37.8%)	0.24
Preeclampsia with delivery < 37 weeks	135.0 (21.3%)	20.0 (27.0%)	0.30
Preeclampsia with delivery <=34 weeks	77.0 (12.1%)	12.0 (16.2%)	0.35
Acute peripartum kidney rejection	11.0 (1.8%)	2.0 (2.7%)	0.64
Graft loss at 2 years from end of pregnancy	41.0 (6.5%)	2.0 (2.7%)	0.30
Postpartum hemorrhage	14.0 (2.2%)	5.0 (6.8%)	0.04
Transfusion	11 (1.7%)	4 (5.4%)	0.06
Severe maternal morbidity	24.0 (3.8%)	6.0 (8.1%)	0.12
Neonatal Livebirth Variables	**No Aspirin (N=646)**	**Aspirin (N=77)**	**p value**
Cesarean birth	350.0 (54.5%)	46.0 (59.7%)	0.40
Gestational Age (weeks)	37	36.3	0.42
Birthweight (grams)	2693.2	2749.9	0.81
Small for gestational age	126.0 (19.8%)	7.0 (9.1%)	0.02

1147 | Transcriptional Meta-Analysis of Preeclampsia Compared to Placenta Accreta: Implications for Placentation

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4:00 PM - 6:00 PM

Objective: To compare the transcriptomic signature of early onset preeclampsia with placenta accreta to gain insight into genes and pathways relevant to placentation at the maternal-fetal interface.

Study Design: The Gene Expression Omnibus (GEO) was queried for preeclampsia and placenta accreta transcriptional datasets derived from human placental tissue from 2010 onwards. Microarray analysis was conducted in R and performed with *crossmeta* or *oligo* and batch corrected with *ComBat.* Differential gene expression using *Limma* was adjusted for cell type. Processing of single cell data was performed using *Seurat* with *MAST*. Gene hyper enrichment, correlation testing, and gene set enrichment analysis with *clusterprofiler* was performed for pathway analysis.

Results: We performed a gene expression meta-analysis of placental samples from 86 patients with early onset preeclampsia and 65 preterm controls from 4 publicly available microarray datasets. This preeclampsia gene signature was compared to 1 placenta accreta microarray with 6 accreta and 3 preterm controls and 1 placenta accreta single-cell dataset with 3 accreta and 3 controls. Comparing the 4,903 differentially expressed genes in the early onset preeclampsia meta-analysis to 416 differentially expressed genes in placenta accreta microarray, we found 120 overlapping genes with significant negative correlation in expression (r = -0.39, p = 8.06e-6). Key genes included *ANKRD37, AOX1, CP, GBP3, IFIT1, IGFBP6, NEK11, OPRK1,* and *SERPINA3* (Figure 1). Comparing to single-cell placenta accreta, we found that preeclampsia genes were enriched in all cell types and negatively correlated for decidua type, endothelial, and extravillous trophoblasts (Table 1). Shared pathways included hypoxia, glycolysis, oxidative phosphorylation, and early estrogen response.

Conclusion: We identified early onset preeclampsia genes that are oppositely regulated in placenta accreta, both in bulk tissue and in specific cell types at the maternal-fetal interface. We hypothesize that these candidate genes underly the biology of placental attachment and spiral artery remodeling for both disorders.

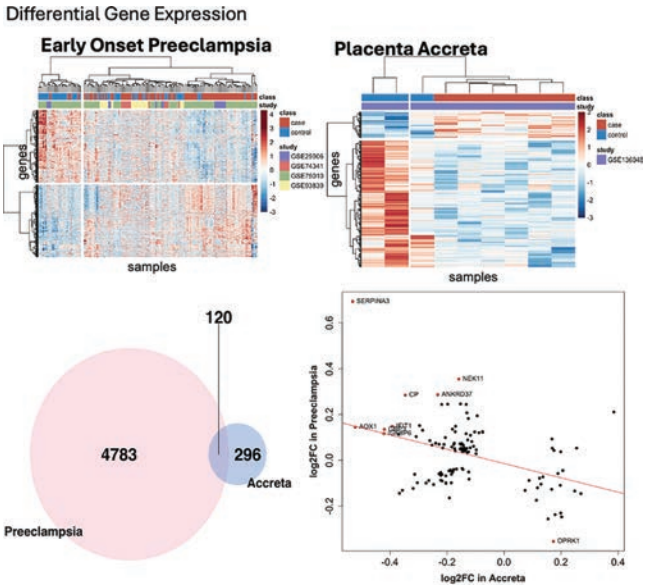

Table 1: Comparison of Early Onset Preeclampsia (Microarray) and Single-Cell Placenta Accreta

Placenta Cell Type	# Accreta Differentially Expressed Genes	# Overlap Genes with Early Onset Preeclampsia	Hyper enrichment p-value	Correlation coefficient *r*	Correlation p-value
Decidua 1	**410**	**103**	**3.04E-07***	**-0.38**	**7.11E-05***
Decidua 2	25	10	3.00E-03*	-0.49	1.50E-01
Decidua 3	**2180**	**417**	**1.12E-06***	**-0.13**	**8.00E-03***
Endothelial	**3282**	**710**	**5.58E-25***	**-0.18**	**9.20E-07***
Cytotrophoblast	51	20	3.88E-05*	-0.42	6.00E-02
Syncytiotrophoblast	1343	278	1.28E-07*	-0.01	8.40E-01
Extravillous trophoblast	**1713**	**411**	**6.17E-22***	**-0.16**	**2.00E-03***
Lymphoid	31	13	4.00E-04*	-0.42	1.60E-01
Myeloid	222	50	4.00E-04*	-0.15	2.90E-01

1148 | Nomogram for Predicting Obstetric Anal Sphincter Injuries in Nulliparous Women

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4:00 PM - 6:00 PM

Objective: To develop a predictive model for obstetric anal sphincter injuries (OASIS) in nulliparous women.

Study Design: This retrospective observational study analyzed data from a tertiary care center. Inclusion criteria encompassed all singleton deliveries at ≥ 37 gestational weeks from January 2007 to December 2019, involving nulliparous women. The primary outcome was the occurrence of OASIS. The full multivariate logistic regression included variables such as age, body mass index (BMI), mode of delivery (MOD) (vaginal or vacuum-assisted), use of oxytocin, spontaneous or induced labor, birth weight, neuraxial analgesia, and episiotomy. The stepwise model, selected based on the Akaike Information Criterion, retained the variables BMI, MOD, induction, and birth weight. A nomogram was then developed using the best-fitting model to visually represent the predicted probability of OASIS. The nomogram was calibrated and validated internally to ensure accuracy and reliability.

Results: The study cohort comprised 22,738 deliveries: 17,518 vaginal deliveries (77%) and 5,220 vacuum-assisted deliveries (23%). Overall, 221 cases (1%) were diagnosed with OASIS. The variables significantly associated with the primary outcome in the multivariate model were BMI ($p = 0.034$), MOD ($p < 0.001$), induction of labor ($p = 0.010$), and birth weight ($p < 0.001$). Their respective predicted probabilities are represented in the nomogram (Figure 1).

Conclusion: The developed nomogram allows for the calculation of individual risk scores for OASIS, identifying patients with a very high risk for OASIS (above 10%) versus those with low risk (less than 1%).

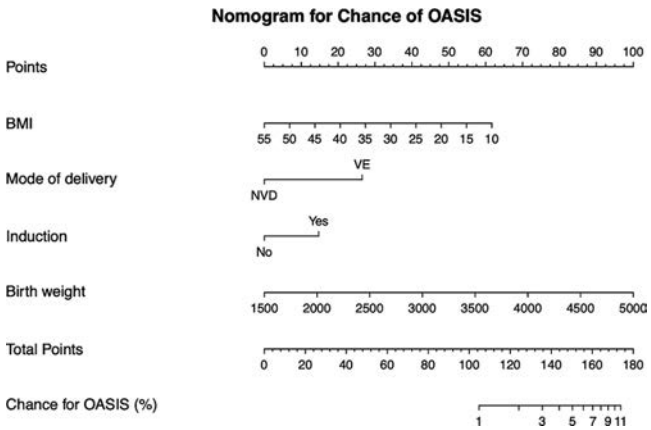

Table 1. Patient Characteristics

Variable	No OASIS, N = 22,517[1]	OASIS, N = 221[1]	p-value[2]
Age	28.00 (25.00, 31.00)	27.00 (24.00, 30.00)	0.090
Gestational age	39.71 (39.00, 40.29)	40.00 (39.00, 40.86)	<0.001
BMI	27.00 (21.91, 29.00)	24.44 (20.75, 29.00)	0.001
MOD			<0.001
VD	17,389 (77%)	129 (58%)	
VE	5,128 (23%)	92 (42%)	
Oxytocin	10,670 (47%)	113 (51%)	0.003
Second stage length	90.00 (38.00, 154.00)	136.00 (63.75, 184.25)	<0.001
Induction of labor	5,268 (23%)	78 (35%)	<0.001
Neuraxial analgesia	17,931 (80%)	162 (73%)	0.020
PGDM	94 (0.4%)	1 (0.5%)	0.590
GDM	1,236 (5.5%)	17 (8.0%)	0.108
Episiotomy	10,592 (47%)	118 (53%)	0.060
Birth weight	3,188.00 (2,926.00, 3,458.00)	3,398.00 (3,116.00, 3,642.00)	<0.001

[1]Median (IQR) or Frequency (%)

[2]Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test

BMI body mass index; GDM gestational diabetes; MOD mode of delivery; OASIs obstetrics anal sphincter injury PGDM pregestational diabetes mellitus; VD vaginal delivery; VE vacuum extraction;

1149 | Intra-Operative Clinical 2019 FIGO Classification has High Correlation with Histologic PASD in a High-Risk Population

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4:00 PM - 6:00 PM

Objective: Accurate confirmation of intra-operative diagnosis of placenta accreta spectrum disorder (PASD) is essential for proper use of resources, use or withhold uterine artery embolization, transfusion strategy, anesthesia care and post operative management. To date there is limited data to suggest how clinical findings

correlate to microscopic or histologic diagnosis, when universal clinical FIGO staging is used intra-operatively.

Study Design: We conducted a retrospective review of all patients evaluated and delivered in our center with suspected PASD between January 2022 and July 2024. At our institution we implemented a universal reporting protocol for macroscopic PASD findings during cases with suspected PASD.

Results: During the study interval, 56 cases of PASD were delivered at our center. Of these cases, 50 had FIGO staging documentation of macroscopic PASD findings intra-operatively and were included in analysis. Clinical staging was done by the operative members of our PASD team. Histologic findings were uniformly documented by a designated pathologist. Coefficients of correlation were assessed between the clinical grade and the histologic grade. There was a very strong coefficient of correlation between clinical and histologic FIGO grading in cases with suspected PASD–0.96. This correlation was even stronger when analyzed grouped cased with accreta/increta/percreta 3A versus PASD cases with severe invasion (percreta 3B and 3C)–0.99.

Conclusion: Our data demonstrated a very strong correlation between clinical and histologic/microscopic FIGO grading when used in cases with suspected PASD.

	Clinical grading based on FIGO 2019	Histologic grading based on FIGO 2019	Correlation coefficient CC/ Determination Coefficient R^2/p-value
Grade 1 (accreta)	5 (10%)	4 (8%)	CC = 0.96
Grade 2 (increta)	6 (12%)	3 (6%)	R^2=0.92
Grade 3 A (percreta abounding serosa)	21 (42%)	30 (60%)	p<0.00001
Grade 3B (percreta with bladder involvement)	2 (4%)	2 (4%)	
Grade 3C (percreta with pelvic organs involvement)	3 (6%)	1 (2%)	
No PASD	13 (26%)	10 (20%)	

1150 | What type of Anesthesia Causes Worse Maternal Outcomes in Patients with Hypertensive Disorders of Pregnancy?

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4:00 PM - 6:00 PM

Objective: Hypertensive disorders of pregnancy (HDP) are a leading cause of adverse obstetrical and neonatal outcomes. No optimal anesthesia strategy is established for pregnancies affected by HDP. The study objective is to compute the association between type of anesthesia and maternal and short-term neonatal adverse outcomes among patients with HDP undergoing cesarean delivery (CD).

Study Design: Secondary analysis was performed on a cohort of 736 patients who underwent CD at our institution from 2022-2023. HDP was stratified into five groups: chronic hypertension (HTN), gestational HTN, preeclampsia without severe features (SF), preeclampsia with SF (including HELLP and eclampsia), and superimposed preeclampsia. The primary outcome was a composite of maternal morbidity (CMM) (postoperative (PO) fever, PO antibiotics, blood transfusion, intensive care unit (ICU) admission, reoperation, readmission and death) in patients undergoing general vs. neuraxial anesthesia for CD. Secondary outcomes were Apgars < 7 and neonatal ICU admission. Multivariate logistic regression was performed. Adjusted odds ratios (aOR) with 95% confidence intervals (CI) for primary and secondary outcomes were calculated after controlling for potential confounders.

Results: In the cohort, 546 patients (74%) had HDP and were included in the analyses. Of these, 14% received general anesthesia and 86% received neuraxial anesthesia. Demographic characteristics and other preoperative risk factors were similar in both groups (Table 1). After adjusted analysis, general anesthesia was associated with higher rates of CMM when compared to neuraxial anesthesia among all groups (aOR 3.96, 95% CI 1.54, 10.22). The association was maintained after controlling for urgency, gestational age and delivery indication. We found no association between the type of anesthesia and 5-minute Apgar < 7 or neonatal ICU admission (Table 2).

Conclusion: Among patients with HDP undergoing CD, general anesthesia is associated with higher rates of adverse maternal outcomes even after controlling for urgency and delivery indication.

Table 1. Baseline Characteristics

	Neuraxial Anesthesia	General Anesthesia
Age (years)	31.3 (5.8)	30.3 (5.7)
BMI (kg/m^2)	37.9 (8.2)	39.2 (10.9)
Gestational age (weeks)	35. 8 (3.5)	34.6 (4.6)
Ethnicity		
Not Hispanic or Latino	492 (92.0)	40 (93.0)
Hispanic or Latino	25 (4.7)	2 (4.7)
Not reported	16 (3.0)	17 (2.3)
Race		
White	402 (75.1)	35 (81.4)
Black	80 (15.0)	4 (9.3)
Hispanic	9 (1.7)	0 (0.0)
Other	44 (8.2)	4 (9.3)
Parity		
Primigravida	299 (55.9)	26 (60.5)
Multiparous	236 (44.1)	17 (39.5)
Indication for CD		
NR FHT	179 (33.5)	23 (53.5)
Arrest of dilation	30 (5.6)	1 (2.3)
Arrest of decent	15 (2.8)	1 (2.3)
Fetal Malpresentation	75 (14.0)	5 (11.6)
Prior uterine scar	133 (24.9)	4 (9.3)
Other	103 (19.3)	9 (20.9)
Delivery Urgency		
Scheduled	104 (19.4)	4 (9.3)
Unplanned Urgent	408 (76.3)	14 (32.6)
Emergent	23 (4.3)	25 (58.1)

CD, Cesarean Delivery; BMI, Body Mass Index; NR, Non-Reassuring; FHT, Fetal Heart TracingData are mean (Standard Deviation) or number (percentage).

Table 2. Statical Analysis Primary and Secondary Outcomes

	aOR (95% CI)
Maternal outcomes	
Composite of maternal morbidity (n=546)	3.96 (1.54, 10.22)
Postoperative fever (n=3)	0.00
Postoperative antibiotics (n=31)	1.28 (0.30, 5.50)
Blood transfusion (n=27)	10.57 (2.84, 39.30)
ICU admission (n=6)	11.73 (0.98, 141.10)
Reoperation (n=5)	0.00
Readmission (n=29)	0.85 (0.15, 4.84)
Death (n=0)	0.00
Short-term neonatal outcomes	
1 Min Apgar < 7 (n=101)	1.38 (0.57, 3.25)
5 Min Apgar < 7 (n=33)	3.05 (0.76, 12.34)
NICU admission (n=260)	0.84 (0.27, 2.61)

aOR, adjusted odd ratio; CI, confidence interval; n, number; ICU, Intensive Care Unit; Min, minute; NICU, Neonatal Intensive Care Unit

1151 | Does an Early Isolated Increase in Fetal Abdominal Circumference Heighten the Risk of Macrosomia?

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4:00 PM - 6:00 PM

Objective: To determine if an isolated second trimester fetal abdominal circumference (AC) >90th %tile is an independent risk factor for large for gestational age (LGA) neonates and macrosomia.

Study Design: This multi-center retrospective cohort study analyzed patients who delivered term singletons between 1/1/2019-1/1/2024. The exposed group involved normally grown fetuses with isolated AC's >90th %tile, measured between 18 and 24 weeks gestation. Control subjects were matched in a 1:1 ratio from the same period. Congenital anomalies were excluded. Statistical analyses included independent t-tests for continuous variables, chi-squared tests for categorical variables, and binary logistic regression models for LGA and macrosomia.

Results: Of the 1,188 patients screened, 752 met inclusion criteria (n = 376 per cohort). Mean AC in the AC >90 group was 94%tile compared to 51%tile in controls. Birthweights were higher in the AC >90 group (3,629g vs. 3,257g, p< 0.001). Rates of LGA (29.5% vs. 6.6%, p< 0.001) and macrosomia (15.2% vs. 2.9%, p< 0.001) were higher in the AC >90 group. AC >90%tile was an independent risk factor for both LGA (AOR 7.05 [3.43, 14.52]) and macrosomia (AOR 4.51 [2.78, 7.32]). Additional logistic regressions are shown in Table 1. Higher maternal BMI increased the risk of LGA and macrosomia. There were no differences in parity, pregestational or gestational diabetes, or mode of delivery between cohorts. Gestational hypertension was more prevalent in the AC >90 group (13.8% vs. 9.0%, p = 0.039), whereas chronic hypertension was more prevalent among controls (13.3% vs. 7.2%, p = 0.006). A sub-analysis of macrosomic infants is shown in Table 2. Macrosomic infants in the AC >90 group trended toward higher rates of lacerations (72.7% vs. 33.3%) and shoulder dystocia (9.1% vs. 0%), although overall incidence was low.

Conclusion: An isolated second trimester AC >90th %tile in an otherwise normally grown fetus is an independent risk factor for both LGA and macrosomia. An isolated increase in AC may also be a risk factor for lacerations and shoulder dystocia at birth, but further research is required.

Table 1: Binary Logistic Regression to Determine Factors Related to LGA and Macrosomia

	LGA				Macrosomia			
	UOR (95%CI)	p-value	AOR (95%CI)	p-value	UOR (95%CI)	p-value	AOR (95%CI)	p-value
AC >90%tile	5.88 (3.70, 9.34)	<.001	4.51 (2.78, 7.32)	<.001	5.93 (3.06, 11.50)	<.001	7.05 (3.43, 14.52)	<.001
Age at Delivery	1.03 (1.00, 1.07)	.057	1.00 (0.97, 1.04)	.829	1.04 (1.00, 1.09)	.066	1.04 (0.98, 1.10)	.167
Race/Ethn (Ref: White)								
Asian	0.32 (0.10, 1.08)	.066	0.34 (0.10, 1.20)	.094	0.23 (0.03, 1.73)	.154	0.24 (0.03, 1.91)	.178
Black	0.45 (0.25, 0.79)	.006	0.41 (0.22, 0.78)	.006	0.51 (0.24, 1.09)	.083	0.63 (0.27, 1.46)	.280
Hispanic/Latino	0.80 (0.53, 1.22)	.303	0.76 (0.48, 1.20)	.233	0.82 (0.47, 1.43)	.493	0.99 (0.54, 1.81)	.971
Multiparity	1.63 (1.07, 2.47)	.023	1.59 (0.99, 2.57)	.056	1.18 (0.69, 2.02)	.549	1.37 (0.73, 2.57)	.328
Pregestational Diabetes	0.61 (0.18, 2.07)	.426	0.43 (0.11, 1.60)	.206	1.39 (0.41, 4.77)	.602	3.24 (0.84, 12.54)	.089
Gestational Diabetes	2.11 (1.31, 3.42)	.002	1.26 (0.71, 2.23)	.433	1.15 (0.57, 2.34)	.694	1.40 (0.61, 3.21)	.432
Chronic HTN	0.91 (0.49, 1.71)	.772	0.75 (0.35, 1.59)	.451	0.84 (0.35, 2.00)	.687	1.11 (0.39, 3.11)	.848
Gestational HTN	2.05 (1.23, 3.41)	.006	1.04 (0.53, 2.03)	.914	0.88 (0.39, 1.99)	.756	0.75 (0.27, 2.08)	.581
Pre-eclampsia	2.31 (1.16, 4.60)	.018	1.56 (0.66, 3.67)	.314	1.13 (0.39, 3.26)	.828	1.80 (0.49, 6.59)	.375
Gestational Age at Birth	0.67 (0.56, 0.81)	<.001	0.74 (0.59, 0.94)	.012	1.12 (1.19, 1.93)	.001	2.30 (1.64, 3.21)	<.001
BMI at Delivery	1.06 (1.04, 1.09)	<.001	1.06 (1.03, 1.09)	<.001	1.06 (1.03, 1.09)	<.001	1.06 (1.02, 1.10)	.002
Cesarean Delivery	2.19 (1.50, 3.19)	<.001	1.65 (1.08, 2.53)	.021	2.16 (1.30, 3.59)	.003	2.13 (1.19, 3.79)	.011

Note: UOR is the Unadjusted Odds Ratios with corresponding 95% Confidence Intervals (CI); AOR is the Adjusted Odds Ratios with the corresponding 95% CI's.

Table 2. Comparisons of Delivery Outcomes in Macrosomic (Birthweight ≥4000g) Infants

	Control Group AC 10-90 n =11	Comparison Group AC >90 n = 57	p-value and Cohen's d effect size
Birthweight			
Grams	4284.5 (143.9)	4339.0 (307.5)	p = .568
Percentile	92.5% (7.8%)	95.7 % (4.6%)	p = .212
LGA	81.8% (9)	91.2% (52)	p = .316
Unplanned C-Section	45.5% (5/11)	14.0% (8/57)	p = .057
Reason?			
Arrest of Descent/Failure to Progress	60.0% (3/5)	87.5% (7/8)	–
Non-Reassuring Fetal Heart Tones	20.0% (1/5)	50.0% (4/8)	–
Malpresentation	9.1% (1)	15.8% (9)	–
APGAR Score			
1 minute	7.90 (0.6)	7.75 (1.1)	p = .678
5 minutes	8.80 (0.4)	8.78 (0.8)	p = .830
Estimated Blood Loss (ml)	646.1 (212.9)	507.2 (334.0)	p = .192
Cesarean	680.1 (231.1)	639.4 (329.9)	p = .306
Vaginal	555.3 (150.2)	289.1 (203.7)	**p = .026**
Hemorrhage Medications Given	27.3% (3)	15.8% (9)	p = .651
Additional Oxytocin	9.1% (1)	7.0% (4)	p = .740
Misoprostol	27.3% (3)	5.3% (3)	p = .143
Methylergonovine	27.3% (3)	7.0% (4)	p = .189
Carboprost	18.2% (2)	1.8% (1)	p = .168
Tranexamic Acid	18.2% (2)	1.8% (1)	p = .168
Vaginal Deliveries Only	n = 3	n = 24	
Infection	0.0% (0/3)	4.8% (1/21)	–
Prolonged ROM (>18 hr)	0.0% (0/3)	0.0% (0/22)	–
Shoulder Dystocia	0.0% (0/3)	9.1% (2/22)	–
Laceration	33.3% (1/3)	72.7% (16/22)	p = .231
Laceration Degree			
1	0.0% (0)	36.4% (8/22)	p = .108
2	0.0% (0)	31.8% (7/22)	
3	33.3% (1)	4.5% (1/22)	

Note: Continuous variables are represented as Means (Standard Deviations) and categorical variables are represented as Percentages (Counts).

1152 | Mode of Delivery and Neonatal Survival Among Periviable Vertex Singleton Pregnancies

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4:00 PM - 6:00 PM

Objective: To determine the association between mode of delivery and neonatal survival for periviable, vertex, singleton gestations.

Study Design: Retrospective cohort study using a maternal-infant linked database of live births in Florida from 2006 to 2019. Vertex, singleton deliveries of infants born at 22w0d to 25w6d with attempted neonatal resuscitation were included. We calculated risk ratios (RRs) for binary outcomes and hazard ratios (HRs) for time-to-event outcomes that were adjusted for confounders. Outcomes were examined overall and stratified by week of gestation. A planned sensitivity analysis was performed examining outcomes in neonates who survived beyond 24 hours of life.

Results: A total of 4,820 periviable deliveries were identified. Of those, 2,472 (51.3%) were cesarean deliveries. People who underwent cesarean delivery were more likely to have hypertension and diabetes. In the overall model, vaginal delivery was associated with a higher risk of mortality at 24 hours (aRR 1.20, 95% CI 1.01-1.44), lower risk of mortality at 7 days (aRR 0.88, 95% CI 0.79-0.99), but no difference in mortality at 28 days (aRR 0.94, 95% CI 0.86-1.02) or 1 year (aRR 0.95, 95% CI 0.89-1.03). After excluding neonates who died within the first 24 hours, vaginal delivery was associated with lower risk of mortality, with aRR of 0.70 (95% CI

0.59-0.83) at 7 days, aRR of 0.87 (95% CI 0.77-0.97) at 28 days, and aRR of 0.91 (95% CI 0.83-1.00) at 1 year. Stratified analyses by gestational age demonstrated increased mortality with vaginal delivery among 22w- and 23w-neonates (aHR 1.48, 95% CI 1.06-2.06 and aHR 1.19, 95% CI 1.01-1.43 respectively), but decreased mortality with vaginal delivery among 24w- and 25w-neonates (aHR 0.75, 95% CI 0.63-0.89 and aHR of 0.72, 95% CI 0.58-0.90 respectively).

Conclusion: Our study demonstrates the effect of mode of delivery on neonatal survival in the periviable period is dependent upon gestational age. Further study is needed to understand the clinical situations in which cesarean is most likely to improve neonatal outcome in order to balance this against potential maternal complications.

Table 2. Neonatal Outcomes Among Singleton Neonates Born 22w0d to 25w6d, by Method of Delivery

Neonatal Outcomes	Method of Delivery: Cesarean Delivery N = 2,472[1]	Vaginal Delivery N = 2,348[1]	Adjusted Risk Ratio (95% CI)[2]	Adjusted Risk Difference % (95% CI)[2]
Died within the 1st 24 hours	158 (6.4%)	287 (12.2%)	1.20 (1.01, 1.44)	1.7 (0.1, 3.3)
Died in early neonatal period	446 (18.0%)	507 (21.6%)	0.88 (0.79, 0.99)	-2.5 (-4.7, -0.2)
Died in neonatal period	664 (26.9%)	748 (31.9%)	0.94 (0.86, 1.02)	-1.9 (-4.4, 0.6)
Died in 1st year	838 (33.9%)	919 (39.1%)	0.95 (0.89, 1.03)	-1.7 (-4.4, 0.9)
Sepsis	1,459 (59.0%)	1,352 (57.6%)	0.97 (0.92, 1.02)	-1.9 (-4.7, 1.0)
Intraventricular hemorrhage grade III-IV	393 (15.9%)	480 (20.4%)	1.19 (1.05, 1.35)	3.1 (0.9, 5.4)
Intraventricular hemorrhage (any grade)	937 (37.9%)	1,029 (43.8%)	1.14 (1.06, 1.22)	5.2 (2.3, 8.1)
Necrotizing enterocolitis stage II-III	92 (3.7%)	90 (3.8%)	1.16 (0.86, 1.55)	0.5 (-0.6, 1.7)
Necrotizing enterocolitis (any stage)	340 (13.8%)	296 (12.6%)	0.94 (0.81, 1.10)	-0.8 (-2.8, 1.2)
Retinopathy of Prematurity	1,053 (42.6%)	891 (37.9%)	1.04 (0.98, 1.11)	1.7 (-0.9, 4.3)
Chronic lung disease (RDS/BPD)	2,024 (81.9%)	1,815 (77.3%)	0.98 (0.95, 1.00)	-2.0 (-4.4, 0.4)

[1]n (%)
[2]The measures of association are comparing vaginal delivery to the reference level of Cesarean delivery. Adjusted for maternal age, pre-pregnancy BMI, insurance, pre-pregnancy hypertension, pre-pregnancy diabetes, connective tissue / autoimmune disease, chorioamnionitis, birth hospital volume, infant sex, year of birth, gestational age at birth, parity, betamethasone.

Table 3. Survival Probabilities, Stratified by Gestational Age Week

Variable	Cesarean Delivery: 1 days	7 days	28 days	365 days	Vaginal Delivery: 1 days	7 days	28 days	365 days	Adjusted Hazard Ratio 95% CI[1]
Overall	89.6% (88.5%, 90.9%)	81.1% (79.6%, 82.7%)	73.0% (71.3%, 74.8%)	66.1% (64.3%, 68.0%)	84.2% (82.7%, 85.7%)	77.4% (75.7%, 79.1%)	68.1% (66.2%, 70.0%)	60.9% (58.9%, 62.9%)	0.97 (0.88, 1.07)
Gestational age									
22w0d-22w6d	64.0% (54.6%, 75.0%)	53.5% (43.9%, 65.1%)	45.3% (36.0%, 57.2%)	41.9% (32.6%, 53.7%)	53.3% (48.0%, 59.2%)	40.8% (35.7%, 46.7%)	29.7% (25.0%, 35.3%)	25.5% (21.0%, 30.9%)	1.48 (1.06, 2.06)
23w0d-23w6d	81.5% (78.0%, 85.2%)	71.4% (67.3%, 75.7%)	59.9% (55.5%, 64.6%)	53.2% (48.7%, 58.0%)	77.5% (74.4%, 80.9%)	68.0% (64.4%, 71.7%)	54.9% (51.2%, 59.0%)	45.4% (41.7%, 49.4%)	1.19 (1.01, 1.43)
24w0d-24w6d	89.1% (87.1%, 91.2%)	78.6% (75.9%, 81.3%)	70.0% (67.0%, 73.1%)	62.7% (59.6%, 66.0%)	92.7% (90.8%, 94.6%)	85.9% (83.4%, 88.5%)	78.1% (75.1%, 81.2%)	68.9% (65.6%, 72.4%)	0.75 (0.63, 0.89)
25w0d-25w6d	95.6% (94.3%, 96.8%)	89.6% (87.8%, 91.5%)	83.3% (81.1%, 85.6%)	76.3% (73.8%, 78.9%)	95.0% (93.4%, 96.6%)	93.0% (91.2%, 94.9%)	86.5% (84.0%, 89.1%)	81.9% (79.1%, 84.8%)	0.72 (0.58, 0.90)

[1]The hazard ratios are comparing vaginal delivery to the reference level of Cesarean delivery. Adjusted for maternal age, pre-pregnancy BMI, insurance, pre-pregnancy hypertension, pre-pregnancy diabetes, connective tissue / autoimmune disease, chorioamnionitis, birth hospital volume, infant sex, year of birth, gestational age at birth, parity, betamethasone.

1153 | Fetal Fraction in Patients with Autoimmune Diseases of the Gastrointestinal Tract

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4:00 PM - 6:00 PM

Objective: We sought to evaluate differences in fetal fraction (FF) in individuals with autoimmune diseases of the gastrointestinal (GI) tract compared to those without autoimmune disease. Additionally, we assessed whether use of immunomodulating medications (IM) at time of cell-free DNA (cfDNA) screening has any effect on FF for patients with autoimmune diseases of the GI tract

Study Design: We performed a retrospective cohort study of singleton pregnancies who had cfDNA testing 2017-2024. Patients without autoimmune disease served as controls and were matched to patients with GI autoimmune diseases (ulcerative colitis and Crohn's) during pregnancy in a 3:1 fashion, controlling for gestational age and BMI. Exclusion criteria included those on anticoagulants, history of organ transplant, and/or high-risk cfDNA results concerning for aneuploidy. IM therapy included mesalamine, infliximab, vedolizumab, and adalimumab. We used the student t-test for normally distributed variables, chi-square and Fisher's exact tests for categorical variables and ANOVA to compare three groups. Multivariate regression analysis was performed to evaluate the effect of immunomodulator use on fetal fraction, after adjusting for BMI and gestational age at the time of cfDNA draw.

Results: We included 300 patients in the study (75 with GI autoimmune disease and 225 without disease). Baseline demographics between the two groups were similar with respect to BMI, race, and smoking status (Table 1) with a statistically significant difference in age. Mean fetal fractions were similar in those with and without disease (Table 1). In the subset of individuals with GI autoimmune disease, use of IM medication did not result in higher fetal fraction compared to individuals with GI autoimmune disease not on IM medication, even after adjusting for gestational age and BMI (aβ .072, 95%CI -1.2, 2.3)

Conclusion: Contrary to other reports, this study found no effect of GI autoimmune disease on FF, even when adjusting for IM use. Further research is needed to assess the impact of various autoimmune diseases on FF.

Table 1: Characteristics of Patients with and without Autoimmune GI Disease

	GI N = 75	Without GI (control) N = 225	P -value
Ulcerative Colitis Crohn's	23 52	N/A	N/A
Age (years)	31.5 ± 5.6	29.8 ± 5.5	**0.08**
BMI	26.7 ± 5.9	26.2 ± 5.6	.23
GA NIPT drawn (weeks)	12.3 ± 2.0	12.5 ± 2.0	.3
Race White Black Other	 46 (61.3%) 22 (29.3%) 7 (9.3%)	 123 (54.7%) 61 (27.1%) 41 (18.2%)	 .19
Tobacco Use No Yes	 72 (96%) 3 (4%)	 207 (92%) 18(8%)	 0.10
Fetal Fraction (%)	10.1 ± 4.0	9.5 ± 3.3	.10
Continuous variables are expressed as mean +/- standard deviation and categorical variables as n (%)			

Effect of Immunomodulator Use on fetal fraction

	GI + IM N = 40	GI w/o IM N = 35	Control B = 225	P-Value
Fetal Fraction (%)*	10.4 ± 3.5	9.7 ± 4.6	9.5 ± 3.3	0.277

	Regression Coefficient from Simple Linear Regression Models			Regression Coefficient from Multiple Linear Regression Models**		
Explanatory Variable	Estimate	95% CI	P-value	Estimate	95% CI	P-value
GI	0.101	-1.1, 2.7	0.389	0.072	-1.2, 2.3	.525

** Continuous variables are expressed as mean +/- standard deviation and categorical variables as n (%)*
***Multiple linear regression model adjusted for body mass index and gestational age*

1154 | Novel uEMG Technology Significantly Improves Preterm Birth Prediction: The Labor Status Monitor

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4:00 PM - 6:00 PM

Objective: Using current methods, sensitivity for predicting preterm birth (PTB) in patients presenting with contractions before 37 weeks GA is < 50%. While not all contractions contribute towards labor, legacy toco cannot distinguish those who will deliver preterm. We developed a novel Labor Status Monitor that uses uterine bioelectrical synchronization and between-contraction, tissue-level stimulation to predict PTB < 7 days.

Study Design: Multicenter, prospective cohort study of pregnant individuals between 26-36 weeks GA, with a cervix £ 5 cm and self-reporting ³ 1 contraction in 10 minutes (min). 6-channel

uEMG recordings were obtained using PreTeL's directional uEMG sensors applied to the abdomen for up to 4 hours (hr). uEMG data were classified on a channel-by-channel basis as rest, contraction-associated signals (CAS), or fasciculation-like signals (FLS, tissue-level stimulation between contractions). Contraction Synchronization Index (CSI) was calculated as CAS in $\geq$ 5 channels observed over the previous 10-min, averaged over 60 min. FLS index (FLSi) was calculated as the fraction of time FLS occurred in each channel over the previous 10-min, averaged over all 6 channels, and then averaged over 1 hr. Primary outcome was delivery < 7 days of uEMG recording. Sensitivity and specificity were analyzed from receiver operator characteristic curves.

Results: 43 subjects were evaluated; 63% (27/43) delivered < 37 weeks GA, 34% (15/43) delivered < 7 days. AUC was 0.74 for CSI and 0.66 for FLSi for delivery < 7 days. Based on AUC, optimal sensitivities and specificities were 74% and 70% for CSI and 56% and 70% for FLSi. Assuming test independence, by applying CSI first, then applying FLSi to indeterminate results, sensitivity and specificity were 89% and 91% for delivery < 7 days.

Conclusion: Our analysis of the Labor Status Monitor suggests that uEMG significantly improves PTB prediction compared to current methods. Ability to predict PTB < 7 days has the potential to meaningfully impact management, particularly administration of antenatal corticosteroids. Further studies are needed to validate these findings.

1155 | Identifying Markers for Gestational Diabetes Using Continuous Glucose Monitoring

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4:00 PM - 6:00 PM

Objective: Per ACOG, all pregnant women should be screened for gestational diabetes (GDM) with an oral glucose tolerance test (OGTT). As continuous glucose monitor (CGM) use increases, CGM goals "target range" and "time in range" have been set for diabetes in pregnancy. This study aims to identify CGM metrics that may be linked to GDM diagnosis in patients considered at high risk.

Study Design: This single-institution pilot prospective observational study includes pregnant individuals at 24-28 weeks' with singleton gestation and 1-hour OGTT of 140-200mg/dl, without previous Type 1 or 2 Diabetes, PCOS, or recent metformin, insulin, or corticosteroid administration. Upon IRB approval, participants were screened through electronic medical records and recruited to wear Dexcom G6 CGM in blinded mode for 7-10 days. Patients completed a 3-hour OGTT, determining GDM diagnosis. Pearson's chi-square, independent samples t-test, and Mann-Whitney U tests were used as appropriate for analysis.

Results: CGM was worn by 22 participants, with 7 subsequently diagnosed with GDM. Metrics of CGM average glucose (124 vs. 111, p = 0.011), time in range (82% vs. 90%, p = 0.047), time above range (17% vs. 7%, p = 0.021), and glucose management indicator (GMI), analogous to HbA1c, (6.3 vs. 6.0, p = 0.009) significantly differed for those diagnosed with and without GDM, respectively (Table 1). Significant differences have not resulted in birth outcomes yet, with recruitment ongoing.

Conclusion: This study highlights CGM metrics that may be used as potential markers for patients at risk for GDM.

GROUP STATISTICS				INDEPENDENT T-TEST (EQUALITY OF MEANS)
MATERNAL CHARACTERISTICS	3-HR OGTT RESULT	N	MEAN	P-VALUE
BMI (kg/m²)	PASSED FAILED	15 7	31.89 32.63	0.86
1-HOUR GCT (mg/dL)	PASSED FAILED	15 7	153 163	0.15
CGM METRIC	3-HR OGTT RESULT	N	MEAN	P-VALUE
AVERAGE GLUCOSE (mg/dL)	PASSED FAILED	15 7	111 124	0.011
TIME IN RANGE (%)	PASSED FAILED	15 7	90 82	0.047
TIME ABOVE RANGE (%)	PASSED FAILED	15 7	7 17	0.021
MAXIMUM GLUCOSE (mg/dL)	PASSED FAILED	15 7	211 211	0.407
GMI (%)	PASSED FAILED	15 7	6.0 6.3	0.009

1156 | Interpregnancy Development of Chronic Hypertension after a Hypertensive Disorder of Pregnancy and Subsequent Pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: Hypertensive disorders of pregnancy (HDP) are associated with future cardiovascular (CV) risk, likely mediated through development of chronic hypertension (CHTN). We sought to assess if development of interpregnancy CHTN following a pregnancy complicated by an HDP was associated with adverse outcomes in the subsequent pregnancy.

Study Design: This is a cohort study of individuals with consecutive pregnancies with an index pregnancy complicated by an HDP. We compared demographics and outcomes in the subsequent pregnancy between those who developed interpregnancy CHTN with those who had blood pressure (BP) normalization. We included patients with a known diagnosis of CHTN and those who had 2 or more BPs $\geq$ 140/90 mmHg prior to 20 weeks. The primary outcome was preterm birth < 37 weeks (PTB). Secondary outcomes included a small-for-gestational age (SGA) newborn and recurrent pre-eclampsia. The association of all outcomes with interpregnancy CHTN was adjusted for age, BMI, and maternal self-identified race (as a social construct) via multivariable logistic regression.

Results: We included 4,437 individuals with an HDP during the index pregnancy. 523 (11.8%) developed interpregnancy CHTN. Individuals who developed interpregnancy CHTN were older, more likely to identify as Black race, had a higher index pregnancy BMI, and were more likely to have had preeclampsia with severe features in the index pregnancy compared to those with BP normalization (Table 1). Those who developed interpregnancy HTN were more likely to have a preterm birth, (19.5% vs.11%; aOR 2.25; 95% CI 1.66-3.04, p< 0.001), an SGA newborn (14.2% vs. 8.3%; aOR 2.48; 95% CI 1.76-3.48, p< 0.001) and develop recurrent pre-eclampsia (22.2% vs.12.6; aOR 2.27; 95% CI 1.70-3.04, p< 0.001) in the subsequent pregnancy compared to those with BP normalization.

Conclusion: Individuals with interpregnancy development of CHTN after an HDP have an increased odds of adverse pregnancy outcomes compared to those with BP normalization. Postpartum interventions to reduce the risk of interpregnancy CHTN may improve long-term CV health and future pregnancy outcomes.

Table 1. Characteristics of index and subsequent pregnancy by development of interpregnancy chronic hypertension (CHTN) after a hypertensive disorder of pregnancy

Index Pregnancy	**No Interpregnancy CHTN**	**Developed Interpregnancy CHTN**	**p-value**
	N=3,914	N=523	
Maternal Age (years)	27.28 (5.27)	28.03 (5.29)	0.003
BMI (kg/m²)	25.97 (22.77-30.86)	29.77 (25.00-35.98)	<0.001
Maternal Race			0.005
White	2,966 (75.8%)	384 (73.4%)	
Black	738 (18.9%)	123 (23.5%)	
Other	210 (5.4%)	16 (3.1%)	
Small for Gestational Age	566 (14.5%)	98 (18.8%)	0.013
Preterm Birth	598 (15.4%)	116 (22.4%)	<0.001
Hypertensive Diagnosis			<0.001
Gestational Hypertension/Pre-Eclampsia without Severe Features	3,280 (83.8%)	394 (75.3%)	
Preeclampsia with Severe Features	634 (16.2%)	129 (24.7%)	
Subsequent Pregnancy	**No Interpregnancy CHTN**	**Developed Interpregnancy CHTN**	**p-value**
Maternal Age (years)	30.03 (5.07)	31.39 (4.9)	<0.001
Maternal BMI (kg/m2)	27.46 (23.38-32.74)	32.14 (26.75-39.12)	<0.001
Maternal Race			0.020
White	3,006 (76.8%)	384 (73.4%)	
Black	743 (19.0%)	124 (23.7%)	
Other	165 (4.2%)	15 (2.9%)	

Data are mean (SD)
BMI: body mass index: Median (IQR)

1157 | Prenatal Detection of Structural Heart Defects in Pre-Gestational Diabetes with Expanded Cardiac Screening

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4:00 PM - 6:00 PM

Objective: Pregnancies affected by pre-gestational diabetes mellitus (PDM) are recommended to have a fetal echocardiogram (ECHO). In an institution with expanded cardiac screening on level II ultrasounds, we aimed to examine detection of congenital heart disease (CHD) in pregnancies affected by PDM with selective referrals for fetal ECHOs.

Study Design: This was a retrospective cohort of pregnancies who received level II ultrasounds in a two-year period. Ultrasounds were performed by experienced MFM sonographers competent in image optimization techniques to visualize the fetal heart, including utilizing system settings that maximize frame rate and applying color Doppler. Standard and extended views of the heart were obtained and recorded using still frame and cine clips (Table 1). Patients were included if they had a diagnosis of prediabetes, type I, or type diabetes mellitus. Demographics were collected, and neonatal charts were reviewed for CHD. Groups were analyzed using one-way ANOVA, student's t-test, chi-squared or fisher exact test.

Results: 306 pregnancies complicated by PDM were included; 66% with type 2 diabetes mellitus, 19% with type I diabetes mellitus and 15% with prediabetes (Table 1). Of these, 64 (21%) had a fetal ECHO, with the indications of suboptimal cardiac views on level II ultrasound (n = 22, 34%), suspected anomaly (n = 20, 31%), other maternal indication (n = 13, 20%) and high initial A1C (n = 9, 14%). In total, 28 (7.8%) neonates had confirmed postnatal diagnosis of CHD, and 16 (57%) of the defects were diagnosed prenatally. CHD detected prenatally had higher A1C (8.1% vs 6.5%, P = 0.016), but no significant difference in maternal BMI (33.2 kg/m^2 vs 32.5 kg/m^2, p = 0.74). Of the 12 CHD that were diagnosed only postnatally, there were minor defects (small septal defects, bicuspid aortic valve), but no major cardiac defects.

Conclusion: In a tertiary center with expanded cardiac level II ultrasound protocols and selective ECHOs, all major CHD in PDM was detected prenatally. Protocols for selective fetal ECHOs in pregnancies affected by PDM may be considered in experienced tertiary centers.

Table 1. Characteristics of included pregnancies.

	Prediabetes		Type 1 Diabetes Mellitus		Type II Diabetes Mellitus		p-value
BMI (kg/m2)	34.2 ± 9.16		27.8 ± 4.65		36.2 ± 6.72		**<0.001**
First Trimester A1C (%)	5.8 ± 0.3		6.6 ± 1.4		7.1 ± 1.6		**<0.001**
Gestational Age at US	20w4d ± 1w6d		20w3d ± 2w2d		21w1d ± 2w2d		**0.007**
	n=46	%	n=60	%	n=200	%	
All Prenatal ECHO	2	4.3%	10	16.7%	49	24.5%	**0.008**
All Prenatal Diagnosis	1	2.2%	3	5.0%	12	6.0%	0.69
All Postnatal Diagnosis	3	6.5%	8	13.3%	17	8.5%	0.41
Only Postnatal Diagnosis	2	4.3%	5	8.3%	6	3.0%	0.47

Table 2. American Institute of Ultrasound Medicine recommended criteria for cardiac views in a Detailed Anatomy Survey (76811) compared to institutionally expanded cardiac screening performed at 2nd trimester ultrasound.

	AIUM Detailed Anatomy 2D Cardiac Views	Expanded Cardiac Views		
		2D Views	Color Doppler	Cine Clip
Situs	☑	☑		
Four-chamber view	☑	☑	☑	☑
Right Outflow Tract	☑	☑	☑	☑
Left Outflow Tract	☑	☑	☑	☑
3-Vessel View	☑	☑		
3-Vessel Trachea View	☑	☑	☑	☑
Interventricular septum	☑	☑	☑	☑
Aortic Arch (sagittal view)	☑	☑	☑	☑
Superior and Inferior Vena Cava	☑	☑		
Ductal Arch	☑			
Crossing Great Vessels				☑
Pulmonary Veins		☑	☑	☑

1158 | Methods of Estimating Blood Loss and Clinical Outcomes

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4:00 PM - 6:00 PM

Objective: ACOG released a Committee Opinion stating quantitative blood loss (QBL) was more accurate than visually estimated blood loss (EBL), however the clinical impact of QBL remains uncertain.

Study Design: This was a secondary analysis of a retrospective cohort study of all singletons delivered at $\geq$ 20 weeks at a Level IV center during 24 months. This time period included an institutional transition from EBL to QBL, and patients with both methods of estimation recorded were included. Composite maternal adverse outcome included additional surgical techniques, transfusion of $\geq$ 4 units, balloon tamponade, intensive

care unit (ICU) admission, venous thromboembolism (VTE), hysterectomy or death. The diagnostic accuracy of CMAO for EBL and QBL were assessed by using the area under the curve (AUC) of receiver-operating characteristics (ROC) curves, and diagnostic test statistics were calculated and compared using overlapping confidence intervals.

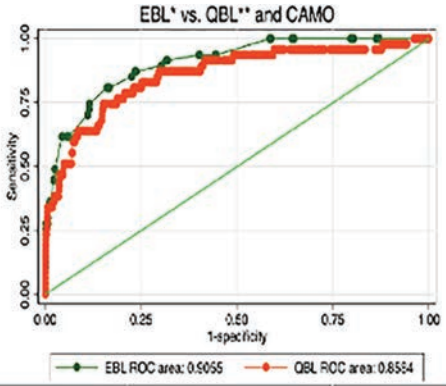
Results: Of 8,623 deliveries, 1,530 (18%) had both EBL and QBL recorded; the demographics are included in Table 1. QBL identified more postpartum hemorrhages (PPH; blood loss ≥ 1000 mL) than EBL (9.0% vs. 6.0%; p< 0.01). CAMO occurred in 42 (3.0%) of patients, and Figure 1 shows the ROC curve for detecting CAMO with a nonsignificant difference in AUC of 0.91 for EBL and 0.86 for QBL (p = 0.07). Using the threshold for PPH of ≥ 1000 mL, EBL and QBL were equally sensitive, but EBL was more specific (95.8%; 95% CI 94.6% - 96.7% vs 92.6%; 95% CI 91.1% - 93.9%, Figure 1). While positive and negative predictive power and likelihood ratio did not differ significantly, negative predictive power and likelihood ratio performed better with EBL.

Conclusion: While QBL and EBL are both predictive for maternal morbidity, estimated blood loss is less likely to meet the threshold for PPH, EBL is more specific and may predict adverse outcomes better. The benefits of QBL over EBL and clinical outcomes need to be evaluated in prospective trials.

Table 1. Maternal Demographics with and without composite maternal adverse outcome.

	No CAMO		CAMO		P-value
	n = 1483	%	n=47	%	
Age (Years)					0.96
< 20	82	5.5%	3	6.4%	
20-34	1155	77.9%	36	76.6%	
35 or older	246	16.6%	8	17.0%	
Self Reported Race/Ethnicity					0.17
Black/AA	508	34.3%	17	36.2%	
White/Caucasian	387	26.1%	6	12.8%	
Hispanic	358	24.1%	16	34.0%	
Other (Asian, Pacific Islander, Native American)	230	15.5%	8	17.0%	
Nulliparous	602	40.6%	18	38.3%	0.75
Private Insurance	798	53.8%	21	44.7%	0.84
Diabetes	150	10.1%	9	19.1%	0.05
Hypertensive disorder	514	34.7%	24	51.1%	**0.02**
Gestational Age					**<0.01**
< 32.0	85	5.7%	8	17.0%	
≥ 32.0 - <37.0	182	12.3%	11	23.4%	
≥ 37.0	1216	82.0%	28	59.6%	
Induction/Augmenation	763	51.4%	45	95.7%	0.45
Route of Delivery					**<0.01**
Vaginal	1122	75.7%	14	29.8%	
Operative Vaginal	57	3.8%	3	6.4%	
Cesarean	304	20.5%	30	63.8%	
Scheduled	192	12.9%	14	29.8%	
Unscheduled	112	7.6%	16	34.0%	

CAMO, composite adverse maternal outcomes, wich included any of the following: additional surgical techniques (uterine artery ligation, compression sutures or uterine artery embolization), transfusion of ≥ 4 units, balloon tamponade, intensive care unit (ICU) admission, venous thromboembolism (VTE), hysterectomy or death



	Estimated Blood Loss		Quantitative Blood Loss	
		95% CI		95% CI
Area Under the Curve	0.91	0.86 - 0.95	0.86	0.80 - 0.92
Sensitivity	61.7%	46.4% - 75.5%	59.6%	44.3% - 73.6%
Specificity	**95.8%**	**94.6% - 96.7%**	**92.6%**	**91.1% - 93.9%**
Positive Predictive Value	31.5%	22.2% - 42.0%	20.3%	13.9% - 28.0%
Negative Predictive Value	98.7%	98.0% - 99.3%	98.6%	97.9% - 99.2%
Likelihood Ratio	14.52	10.44 - 20.21	8.03	5.97 - 10.8

*EBL = Estimated Blood Loss; **QBL = Quantitative Blood Loss

Figure 1. Receiver Operator Characteristic curves of estimated blood loss compared to composite materna adverse outcomes, and diagnostic test statistics using the existing definition of PPH of blood loss > 1000 mL.

1159 | Concordance of Early Pregnancy Smoking Disclosure Rates with DNA Methylation among Pregnant Patients

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4:00 PM - 6:00 PM

Objective: Prenatal substance use is an increasing cause of morbidity and mortality. Changes in gene function that do not affect nucleotide sequence, or epigenetics, has emerged as a screening mechanism for substance use. We evaluated the application of serum-validated epigenetic DNA methylation markers in human placental tissues to assess the correlation between reported smoking and placental epigenetic markers.

Study Design: This is a secondary analysis of the Stress, Pregnancy, and Health Study, a prospective study of 605 patients at an urban hospital from 2018-2022. Patients completed the Health Practices Survey (HPS) during mid-trimester and reported cigarette or marijuana use during pregnancy (current use) or in the 3 months prior to pregnancy (former use). We evaluated the degree of methylation in placental DNA using CPG sites previously associated with smoking. Differences in site cg05575921 have been reported from placental tissue, while sites cg23079012 and cg22112841 have been associated in serum. Methylation

percentages were determined using absolute values; p-values were calculated from log-transformed data.

Results: Among 488 patients who completed HPS, 440 (90.2%) reported never using cigarettes or marijuana, while 27 (6%) reported current smoking and 21 (5%) former smoking. Current smoking was not associated with placental DNA methylation of cg05575921 (51% vs 53% methylation in never users, p = 0.13). This finding was similar for the other sites (Table 1). A sensitivity analysis comparing current and former users to never users also yielded non-significant results.

Conclusion: In this novel exploration of placental DNA methylation using validated sites, we did not find significant DNA methylation changes with smoking status. However, methylation was lower in current than never smokers, which is similar to the change observed in serum. This study is amongst the first to explore the application of validated DNA methylation markers of smoking on placental tissues, and will inform larger explorations of the association between placental DNA methylation and reported substance use during pregnancy.

Table 1. DNA Methylation by Smoking Status

Methylation Site	Current Smoker	Never Smoker	p-value*
	n = 27	n = 440	
	mean ± std. dev.	mean ± std. dev.	
cg05575921[a], range (0.30 - 0.75)	0.51 ± 0.05	0.53 ± 0.06	0.131
cg23079012[b], range (0.11 - 0.90)	0.47 ± 0.13	0.48 ± 0.12	0.438
cg22112841[b], range (0.19 - 0.44)	0.29 ± 0.04	0.30 ± 0.04	0.132
	Current or Former Smoker	Never Smoker	p-value*
N = 502	n = 48	n = 440	
	mean ± std. dev.	mean ± std. dev.	
cg05575921[a], range (0.30 - 0.75)	0.53 ± 0.05	0.53 ± 0.06	0.909
cg23079012[b], range (0.11 - 0.91)	0.48 ± 0.14	0.48 ± 0.12	0.964
cg22112841[b], range (0.19 - 0.44)	0.30 ± 0.04	0.30 ± 0.04	0.824

*p-value determined using Log-transformed data; [a]methylation validated in placental tissue; [b]methylation validated in serum samples

1160 | Psychopharmacotherapy Use in Pregnancies Conceived with IVF and Risk of Postpartum Hemorrhage

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Northwell, New Hyde Park, NY

4:00 PM - 6:00 PM

Objective: To determine differences in the frequency of psychopharmacotherapy (PPT) use during pregnancies conceived with and without in vitro fertilization (IVF). Secondary objectives were to evaluate rates of PPT drug classes among the cohorts and their associations with postpartum hemorrhage (PPH) requiring transfusion of packed red blood cells (pRBC) among IVF pregnancies.

Study Design: Retrospective cohort study of all deliveries that occurred at ≥ 23 weeks gestational age in a New York academic health system from January 2019 to December 2022. Adjusted odds ratios for non-Hispanic White ethnicity, public insurance, and obesity were calculated using a logistic regression in R version 4.3.1.

Results: A total of 3,383 IVF and 104,297 non-IVF pregnancies were included. Patients who conceived via IVF were more likely to self-identify as non-Hispanic white (54.9% vs. 43.1%), be nulliparous (59.0% vs. 48.7%), and have private insurance (92.3% vs. 64.4%), p< 0.001. Prenatal PPT exposure was more common in pregnancies conceived with IVF, 6.4% vs. 3.5%; aOR 1.62 (95% CI, 1.39 - 1.88; Table 1). IVF pregnancies exposed to PPT had nearly double the odds of experiencing a PPH requiring pRBC (aOR 1.90; 95% CI, 1.18-2.95). Selective Serotonin Reuptake Inhibitors (SSRIs) were associated with a two-fold increase in the odds of PPH requiring pRBC, aOR 2.11 (95% CI, 1.10 - 3.51), and benzodiazepines with three-fold increased odds, aOR 3.22 (95% CI, 1.56 - 6.12).

Conclusion: Prenatal PPT use is higher during IVF pregnancies, specifically SSRIs and benzodiazepines. Their use is associated with increased odds of clinically significant postpartum hemorrhage. While these findings suggest potential risks, they should not discourage mental health treatment, as untreated conditions are also associated with adverse outcomes. These results contribute to comprehensive counseling and informed decision-making when selecting PPT class during pregnancy.

Table 1: Rates of PPT use during IVF vs. Non-IVF pregnancies

	IVF n= 3,383	Non-IVF n= 104,297	P-value	aOR (95% CI)
PPT Exposure			**<0.001**	**1.62 (1.39 - 1.88)**
yes	215 (6.4)	3,637 (3.5)		
no	3,168 (93.6)	100,660 (96.5)		
SSRI			**<0.001**	**1.55 (1.29 - 1.86)**
yes	144 (4.3)	2,230 (2.1)		
no	3,239 (95.7)	102,067 (97.9)		
SNRI			0.168	1.41 (0.66 - 2.61)
yes	9 (0.3)	174 (0.2)		
no	3,374 (99.7)	104,123 (99.8)		
Bupropion			0.124	1.38 (0.48 - 3.08)
yes	6 (0.2)	98 (0.1)		
no	3,377 (99.8)	104,199 (99.9)		
Benzodiazepines			**<0.001**	**2.53 (1.90-3.32)**
yes	56 (1.7)	678 (0.7)		
no	3327 (98.3)	103619 (99.3)		
Other (buspirone, trazadone, zolpidem)			0.840	1.21 (0.79 - 1.79)
yes	26 (0.8)	770 (0.7)		
no	3,357 (99.2)	103,527 (99.3)		

Data are presented as number (%).

1161 | Using Neighborhood-Level Indices to Discriminate Small for Gestational Age Birthweight Among Racial and Ethnic Groups

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4:00 PM - 6:00 PM

Objective: To examine the performance of publicly available neighborhood-level indices of the built and social environment in the prediction of small for gestational age (SGA) in different racial/ethnic groups.

Study Design: This was an a priori secondary analysis of a retrospective cohort study examining risk of sPTB of 1000 patients who delivered at a tertiary, urban academic hospital between January 2013 and August 2023 with ≥ 1 transvaginal cervical length during pregnancy. The primary outcome was SGA, defined by birth weight ≤ 10th percentile for gestational age (GA), using Intergrowth-21st growth curves. Medical history, race, delivery GA, and birth weight were abstracted from electronic

medical records. The Childhood Opportunity Index (COI), Social Vulnerability Index (SVI) and Index of Concentrations at the Extremes (ICE) were determined through patients' listed 2020 census tracts. We used logistic regression models to predict the probability of SGA, incorporating neighborhood-level indices and clinically relevant individual-level covariates in the whole group and stratified by patient race. We compared model discrimination using the area under the receiver operating characteristics curve (AUC). All analyses were performed in R version 4.4 (24 April 2024).

Results: 1038 pregnancies among the 1000 patients met inclusion criteria, 105 of which resulted in SGA infants. 45% of patients were Hispanic, 25% were Black and 18% were White (Table 1). Models with all three neighborhood indices had an AUC of 0.49 in Black, 0.52 in Hispanic, and 0.68 in White patients (Table 2). The addition of socioeconomic and obstetric covariates improved discrimination in each model, particularly in the Black (AUC 0.74) and White (AUC 0.73) patients.

Conclusion: Individual neighborhood level indices were poorly predictive of SGA in each racial group. Including all indices improved model ability to discriminate SGA in White patients. The addition of sociodemographic and obstetric characteristics led to improved predictive ability in all racial groups, particularly among Black and White births.

Table 1: Demographics

	Total = 1038	
Characteristic	**N**	**%**
Age at Delivery		
≤ 25	209	20.13
26 - 30	268	25.82
31 - 35	327	31.50
36 - 40	174	16.76
> 40	60	5.78
Race and Ethnicity		
Asian, Native Hawaiian, Pacific Islander	44	4.24
Black or African American	256	24.66
Hispanic or Latina	463	44.61
White	185	17.82
Other	79	7.61
Missing	11	1.06
Insurance Coverage		
Public	503	48.46
Private	457	44.03
None	78	7.51
Pre-Pregnancy BMI		
<= 30	650	62.62
30-35	209	20.13
35-40	96	9.25
> 40	76	7.32
Missing	7	0.67
Tobacco Use During Pregnancy	27	2.60
Alcohol Use During Pregnancy	3	0.29
Substance Use During Pregnancy	20	1.93
Gestational Hypertension	64	6.17
Chronic Hypertension	77	7.42
Type 2 Diabetes Mellitus	24	2.31
Autoimmune Disorder	9	0.87

Table 2. Logistic regression models predicting small for gestational age

Overall					White				
	OR	95% CI	AUC	95% CI		OR	95% CI	AUC	95% CI
Model 1			0.52	0.47, 0.57	**Model 1**			0.51	0.46, 0.65
SVI	1.03	0.52, 2.12			SVI	0.68	0.10, 3.91		
Model 2			0.50	0.48, 0.56	**Model 2**			0.50	0.44, 0.64
COI	1.00	0.99, 1.01			COI	1.01	0.99, 1.03		
Model 3					**Model 3**			0.53	0.44, 0.68
ICE	0.76	0.41, 1.38	0.53	0.48, 0.59	ICE	0.95	0.20, 5.42		
Model 4			0.56	0.51, 0.62	**Model 4**			0.68	0.44, 0.82
SVI	0.45	0.06, 3.65			SVI	0.60	0.01, 41.08		
COI	1.01	0.99, 1.03			COI	1.05	1.00, 1.12		
ICE	0.18	0.02, 1.36			ICE	0.01	0.01, 1.54		
Model 5*			0.64	0.58, 0.70	**Model 5***			0.73	0.60, 0.85
SVI	0.56	0.07, 4.99			SVI	0.24	0.01, 26.1		
COI	1.01	0.98, 1.03			COI	1.06	1.00, 1.13		
ICE	0.29	0.03, 2.54			ICE	0.01	0.01, 1.15		
Black/African American					**Hispanic/Latinx**				
	OR	95% CI	AUC	95% CI		OR	95% CI	AUC	95% CI
Model 1			0.58	0.48, 0.68	**Model 1**			0.58	0.48, 0.68
SVI	0.72	0.15, 4.42			SVI	1.76	0.40, 11.04		
Model 2			0.54	0.47, 0.63	**Model 2**			0.54	0.46, 0.65
COI	1.00	0.99, 1.02			COI	0.99	0.98, 1.01		
Model 3			0.52	0.46, 0.63	**Model 3**			0.57	0.49, 0.66
ICE	0.97	0.21, 3.75			ICE	0.36	0.08, 1.27		
Model 4			0.49	0.44, 0.62	**Model 4**			0.52	0.47, 0.63
SVI	0.21	0.01, 14.73			SVI	1.01	0.03, 49.72		
COI	0.98	0.94, 1.03			COI	1.00	0.96, 1.05		
ICE	1.38	0.04, 47.71			ICE	0.24	0.01, 6.86		
Model 5*			0.74	0.64, 0.82	**Model 5***			0.65	0.54, 0.74
SVI	0.50	0.01, 44.32			SVI	0.97	0.03, 53.70		
COI	0.99	0.94, 1.04			COI	1.00	0.96, 1.04		
ICE	1.07	0.02, 60.83			ICE	0.44	0.01, 14.68		

*Including individual-level covariates: Age, insurance status, pre-pregnancy BMI, tobacco use, substance use, type 2 diabetes mellitus, gestational diabetes mellitus, chronic hypertension, gestational hypertension, and autoimmune disorder

1162 | Increased Adverse Perinatal Outcomes (APO) for Twin Pregnancies Complicated by Congenital Heart Disease (CHD)

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4:00 PM - 6:00 PM

Objective: APO, namely preterm birth (PTB), hypertensive disorders of pregnancy (HDP), and placental abruption have been associated with CHD in singleton pregnancies. This association has not been investigated in twin pregnancies. The aim of this study is to 1) evaluate the prevalence of APO in twin pregnancies affected by CHD using a large national database; 2) identify pregnancy characteristics associated with the APOs using a local database.

Study Design: A retrospective case-control study of twin pregnancies with CHD was conducted on Center of Disease Control and Prevention Natality Database from 1995-2000 (403,018 births) and 2016-2022 (842,878 births). Maternal demographics and perinatal outcomes were compared. Subsequently a local twin case series with CHD was reviewed for characteristics leading to APO.

Results: Demographically, there was no significant difference in twin pregnancies with or without CHD in both periods The CHD group showed significantly increased PTB: 1995-2000: < 37

weeks: Odds Ratio [OR], 2.37; (2.04-2.77 95% Confidence Interval [95%CI]); < 28 weeks: OR, 3.07; (2.54-3.71 95%CI); 2016-2022: < 37 weeks: OR, 1.91; (1.64-2.24 95%CI); < 28 weeks: OR, 2.18; (1.70-2.80 95%CI). Eclampsia was higher with CHD: 1995-2000: OR, 3.35; (2.30-4.89 95%CI); 2016-2022: OR, 5.32; (3.60-7.90 95%CI). Other HDP were not significantly increased in either cohort. Local center case series revealed that PTB was due to 6.7% spontaneous and 93.3% iatrogenic (18.2% for maternal indications, 81.8% for fetal indications).

Conclusion: CHD is associated with increased odds of PTB and eclampsia in twin pregnancies in CDC database collected in 1995-2000 and 2016-2022. Our single center study shed light on the common reasons for PTB in this CHD population. Further characterization with a larger sample size is needed to elucidate the incidence of APOs in twin pregnancies complicated by CHD.

Table 1. ECG Features Associated with Trimesters Compared to State Outside of Pregnancy or Postpartum

	1995-2000			2016-2022		
Adverse perinatal outcome	**CHD (n=879)**	**Controls (n=402,139)**	**Odds ratio (95% CI)**	**CHD (n=790)**	**Controls (n=842,088)**	**Odds ratio (95% CI)**
PTB <37 weeks, n (%)	652 (74.2)	219,970 (54.7)	2.37 (2.04-2.77)	571/790 (72.3)	485,525/842,088 (57.7)	1.91 (1.64-2.24)
PTB <28 weeks, n (%)	128 (14.6)	21,313 (5.3)	3.07 (2.54-3.71)	67/790 (8.5)	34,291/842,088 (4.1)	2.18 (1.70-2.80)
Eclampsia, n (%)	28 (3.2)	3,941 (0.98)	3.35 (2.30-4.89)	26/790 (3.3)	5,249/842,088 (0.64)	5.32 (3.60-7.87)
Hypertensive disorder in pregnancy, n (%)*				126/790 (15.9)	118,442/842,088 (14.1)	1.16 (0.96-1.40)
Placenta disorders, n (%)*	28 (3.2)	6,434 (1.6)	1.99 (1.37-2.90)			

* Data for hypertensive disorder in pregnancy is not available for CDC database in 1995-2000, and placenta disorder is not available for CDC database in 2016-2022. PTB = preterm birth. 95%CI = 95% confidence interval.

Table 2a. Subtypes of major congenital heart defects

CHD subgroup (n=30)	N (%)
Transposition of great arteries	2 (6.7)
Pulmonary stenosis	3 (10)
AVSD	1 (3.3)
TOF	4 (13.3)
Coarctation of aorta/interrupted aortic arch	1 (3.3)
DORV	2 (6.7)
Pulmonary atresia	1 (3.3)
Dextrocardia	2 (6.7)

* Abbreviations: CHD = congenital heart defect; AVSD = atrioventricular septal defect; TOF = tetralogy of Fallot; DORV = doublet outlet right ventricle

Table 2b. Preterm delivery indications in twin pregnancies

<37 weeks delivery (n=22)	Mo-Di N (%)	Di-Di N (%)	Mo-Mo N (%)	UNK N (%)
Spontaneous	1 (7.7)			1 (100)
Iatrogenic	12 (92.3)	7 (100)	1 (100)	
Preeclampsia with severe features	2 (15.4)	2 (28.5)		
IUGR	3 (23.1)	3 (42.9)		
NRFHT	4 (30.8)	1 (14.3)		
Malpresentation/breech	2 (15.4)	1 (14.3)		
Pleural effusions and cardiac anomalies (TOF)	1 (7.7)			
PPROM	1 (7.7)		1 (100)	

* Abbreviations: Mo-Di = Monochorionic Diamniotic; Di-Di = Dichorionic Diamniotic; Mo-Mo = Monochorionic Monoamniotic; UNK = unknown; IUGR = Intrauterine growth restriction; NRFHT = non-reassuring fetal heart rate tracing; TOF = tetralogy of Fallot; PPROM = preterm premature rupture of membranes

1163 | Rate of Tethered Spinal Cord Release After Fetoscopic Repair of Open Spina Bifida

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4:00 PM - 6:00 PM

Objective: A recent meta-analysis reported approximately 22% rate of symptomatic tethered spinal cord (TSC) at 4.1 years median age of follow-up after prenatal closure of open spina bifida (OSB). TSC was defined as either neurologic deterioration, urological deterioration, or need for a surgical TSC release. The aim of this study was to assess the rate of surgical TSC release in a cohort of patients who underwent fetoscopic repair of OSB, followed between 2.5 and 5 years of life.

Study Design: This was a prospective study of patients who underwent percutaneous or percutaneous mini-laparotomy fetoscopic OSB repair between 24 and 28 gestational weeks and who were followed for 2.5 to 5 years of life. The postnatal evaluation and treatment were at the discretion of the referring team and based on clinical findings and symptoms.

Results: Of 105 consecutive patients who received the fetoscopic OSB repair and achieved 30 months of age, 6 (5.7%) underwent a surgical TSC release procedure. Table 1 shows specific details of these 6 cases. Four of these 6 patients developed symptomatic hydrocephalus and were treated with a shunt or endoscopic third ventriculostomy, two at the same time of the TSC release. Because of the small number of affected patients, risk factors for receiving a detethering procedure could not be assessed.

Conclusion: Of patients who underwent fetoscopic OSB repair and were between 2.5 to 5 years of age, 5.7% underwent a surgical TSC release procedure. As TSC symptomology may not arise until the later childhood or adolescent period, further long term follow up is necessary. Understanding the risk factors for development of symptomatic TSC will be important to optimize the prenatal surgical approach.

Table 1. Characteristics of patients that underwent surgical tethered spinal cord (TSC) release.

Case Patient	Lesion type	Largest ventricle size (mm)	Two Layer vs Three Layer Closure	Anatomical level of the lesion	Hydro-cephalus treated by shunt or ETV	Symptoms of tethered spinal cord	Procedure	Age (mo) at release of TSC
1	Myelomeningocele	13.2	2	L4	No	Pain in legs and loss of function of bladder and bowel	Release of tethered spinal cord	26
2	Myeloschisis	10.1	2	L4	Yes	Development of site leakage	VPS insertion, detethering of spinal cord, and expansile duraplasty	16
3	Myelomeningocele	12.4	3	L3	Yes	Recurrent urinary tract infections	VPS insertion, Chiari decompression, detethering of spinal cord, and syrinx to peritoneal shunt	23
4	Myeloschisis	14.0	3	L5	No	Progressive scoliosis, shortened hamstrings, back pain	Release of tethered spinal cord	62
5	Myeloschisis	10.0	2	L5	Yes	Lower extremity spasticity	Release of tethered spinal cord	40
6	Myeloschisis	15.0	2	L4	Yes	Worsening neurogenic bowel symptoms	Release of tethered spinal cord	37

*VPS: ventriculo-peritoneal shunt

1164 | Maternal Outcomes of First- Versus Second-Line Intrapartum Antibiotic Prophylaxis for Group B Streptococcus: A Retrospective-Study

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4:00 PM - 6:00 PM

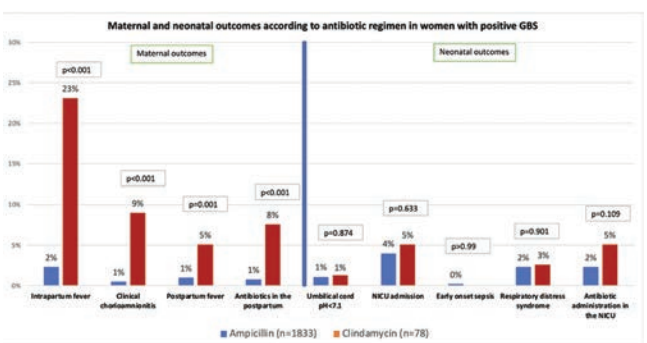
Objective: The incidence of maternal infectious morbidity according to the intrapartum antibiotic prophylaxis (IAP) regimen used for Group B streptococcus (GBS) prophylaxis is poorly described. We aimed to compare maternal peripartum infections and microbiological outcomes among GBS carriers according to IAP regimen.

Study Design: This retrospective study included women hospitalized in a tertiary university-affiliated hospital between March 2021 and March 2024, who were GBS positive at term and received first-line ampicillin (n = 1833), or second-line clindamycin (n = 78) due to penicillin allergy. The co-primary outcomes were clinical chorioamnionitis and neonatal intensive care admission rates. Univariate and multivariate analyses were performed. Chorioamniotic swabs were obtained after delivery, and microbiological outcomes were compared according to IAP regimen.

Results: Among GBS carriers who received clindamycin vs. ampicillin, the rates were higher of chorioamnionitis (p< 0.001), intrapartum fever (p< 0.001), postpartum fever (p = 0.001) and antibiotics use (p< 0.001) (Figure). The cesarean delivery rates were similar (p = 0.086). The rate of neonatal intensive care admission and other neonatal complications were similar. In multivariate analysis, the factors that were independently associated with clinical chorioamnionitis were: clindamycin-IAP, odds ratio (OR) 20.1, 95% confidence interval (CI) (6.6-61.4), p< 0.001; cervical ripening by catheter balloon, OR 4.1, 95%CI (1.2-13.6), p = 0.023; and prolonged rupture of membranes, OR 4.9, 95%CI (1.6-15.7), p = 0.006 (Table). In chorioamniotic swabs, among women who received clindamycin vs. ampicillin, rates were higher of positive GBS isolates, 28% vs. 11%, p< 0.001 and of overall positive cultures, 32.1% vs. 16.4%, p< 0.001.

Conclusion: Clindamycin compared with ampicillin was associated with a higher rate of maternal peripartum infectious morbidity.

This underscores the importance of minimizing clindamycin use for GBS prophylaxis. Further research is warranted to evaluate alternative second-line IAP options and their effectiveness in preventing GBS-related infections.



Multivariate logistic regression model of clinical chorioamnionitis				Multivariate logistic regression model of neonatal intensive care unit admission			
Factor	Odds Ratio	95% Confidence interval	p	**Factor**	Odds Ratio	95% Confidence interval	p
Clindamycin vs. ampicillin	20.1	6.6 - 61.4	<0.001	**Clindamycin vs. ampicillin**	1.1	0.4 - 3.5	0.759
Nulliparity	2.4	0.7 - 7.4	0.132	**Birthweight<2500g**	6.5	2.8 - 14.6	<0.001
Cervical ripening by catheter balloon	4.1	1.2 - 13.6	0.023	**Cervical ripening by catheter balloon**	1.2	0.6 - 2.6	0.476
Induction of labor by oxytocin	1.3	0.2 - 6.7	0.708	**Induction of labor by oxytocin**	0.9	0.4 - 2.1	0.876
Artificial rupture of membranes	0.8	0.2 - 2.5	0.735	**Artificial rupture of membranes**	0.7	0.4 - 1.1	0.140
Meconium staining	3.3	0.9 - 11.8	0.065	**Meconium staining**	1.6	0.9 - 2.9	0.110
Delivery week≥41	2.3	0.6 - 8.3	0.197	**Umbilical cord pH<7.1**	3.8	1.1 - 12.4	0.027
Prolonged rupture of membranes≥18 hours	4.9	1.6 - 15.7	0.006	**Clinical chorioamnionitis**	2.3	0.4 - 11.6	0.289

1165 | Contraceptive Counseling and use Among Pregnant Individuals who Underwent Spontaneous Versus Medically Indicated Preterm Birth

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4:00 PM - 6:00 PM

Objective: Preterm birth (PTB) contributes to maternal and neonatal morbidity. Adequate contraceptive uptake can help reduce rates of PTB, however, individuals who undergo PTB are less likely to obtain contraception than those who undergo term delivery. We sought to describe rates of contraceptive uptake and patient reported recollection of contraceptive counseling in our population who underwent PTB, as stratified by etiology.

Study Design: This retrospective cohort study examined all liveborn PTBs within a single regional academic medical center between January 2023-April 2024. Demographic and contraceptive data was collected via EMR and confirmed through billing data. Etiology of preterm birth was abstracted from the medical record and categorized by a single physician. Chi-square, t-test, and Mann-Whitney U were used to compare populations and outcomes, as appropriate.

Results: Of the 6,058 total births at our institution during the study, 934 (15.4%) delivered in the preterm period (< 37 weeks) and were analyzed. Of these, 426 (45.6%) were considered spontaneous (SPTB) and 508 (54.4%) were considered medically indicated (IPTB). Demographic information did not significantly differ between SPTB vs IPTB, other than median gestational age at delivery (34.6 weeks vs 35.3 weeks, p =˙.002) and limited/no prenatal care (11.3% vs 5%, p< .001). Those who underwent IPTB were more likely to recall contraceptive counseling (41.7% vs 30%, p< .001) and to identify their contraceptive desires at discharge (84.5% vs 77.9%, p = 0.24). Similar trends are present when stratifying each type of preterm birth by above and below 32 weeks at time of delivery (Table 2).

Conclusion: Pregnant individuals who undergo IPTB are more likely to recall contraceptive counseling and to identify their contraceptive desires at discharge than those who undergo SPTB. Future research will focus on identifying reasons why those who undergo IPTB vs SPTB recall differences in contraceptive counseling, given the importance of contraception in helping to reduce the risk of recurrent PTB.

Table 1. Demographic and outcome information comparing SPTB to IPTB

	SPTB (n=426)	IPTB (n=508)	p-value
Maternal Characteristics			
Age (years)	28.5 +/- 6.0	29.3 +/- 5.9	**.046**
Gravidity	2 (1,4)	2 (1,4)	.272
Parity	1 (0,2)	1 (0,2)	.233
Gestational Age at Delivery	34.6 (33.0, 36.1)	35.3 (33.5, 36.2)	**.002**
Race/ethnicity			
White, Non-Hispanic	325 (76.7)	421 (83.0)	.068
Black, Non-Hispanic	32 (7.5)	25 (4.9)	
Other, Non-Hispanic	7 (1.7)	10 (2.0)	
Hispanic	60 (14.2)	51 (10.1)	
Education			
< High School (1-11 years)	51 (12.0)	45 (8.9)	.443
High School (12 years)	169 (39.7)	191 (37.6)	
Some College/Associate's degree (13-15 years)	88 (20.7)	114 (22.4)	
Bachelor's degree (16-17 years)	68 (16.0)	100 (19.7)	
Graduate or Professional degree (18 or more years)	37 (8.7)	45 (8.9)	
Did not disclose	13 (3.1)	13 (2.6)	
Public insurance at delivery	268 (62.9)	320 (63.0)	.087
Limited/No Prenatal Care	43 (11.3)	23 (5.0)	**<.001**
Tobacco use during pregnancy	44 (10.7)	59 (11.9)	.746
Recall contraceptive counseling	128 (30.0)	212 (41.7)	**<.001**
Contraceptive Desired at Discharge	261 (77.9)	370 (84.5)	**.024**
Effectiveness of Contraceptive at Discharge			
None	74 (22.1)	68 (15.5)	.072
Least	25 (7.5)	27 (6.2)	
Moderate	88 (26.3)	119 (26.9)	
Most	148 (44.2)	225 (51.4)	
Obtained planned contraception	250 (61.3)	329 (67.6)	.058

Significantvalues (p<0.05) are highlighted in bold

Table 2. Demographic and outcome information comparing SPTB to IPTB, stratified by gestational age of <32 weeks and >32 weeks at delivery

	SPTB <32w0d (n=81)	SPTB ≥32w0d (n=345)	IPTB <32w0d (n=65)	IPTB ≥32w0d (n=443)	p-value
Maternal Characteristics					
Age (years)	29.3+/-5.7	28.4 +/-6.1	29.7+/-5.5	29.3+/-6.0	.233 (SPTB) .607 (IPTB)
Gravidity	2 (1,4)	2 (1,4)	2 (1,4)	2 (1,4)	.990
Parity	1 (0,2)	1 (0,2)	1 (0,2)	1 (0,2)	.649
Race/ethnicity					
White, Non-Hispanic	54 (66.7)	271 (79.0)	53 (81.5)	368 (83.3)	.093
Black, Non-Hispanic	9 (11.1)	23 (6.7)	3 (4.6)	22 (5.0)	
Other, Non-Hispanic	3 (3.7)	4 (1.2)	2 (3.1)	8 (1.8)	
Hispanic	15 (18.5)	45 (13.1)	7 (10.8)	44 (10.0)	
Education					
< High School (1-11 years)	6 (7.4)	45 (13.0)	3 (4.6)	42 (9.5)	**.015**
High School (12 years)	39 (48.1)	130 (37.7)	28 (43.1)	163 (36.8)	
Some College or Associate's degree (13-15 years)	16 (19.8)	72 (20.9)	14 (21.5)	100 (22.6)	
Bachelor's degree (16-17 years)	9 (11.1)	59 (17.1)	15 (23.1)	85 (19.2)	
Professional degree (18 or more years)	4 (4.9)	33 (9.6)	2 (3.1)	43 (9.7)	
Did not disclose	7 (8.6)	6 (1.7)	3 (4.6)	10 (2.3)	
Public insurance at delivery	50 (61.7)	218 (63.2)	38 (58.5)	282 (63.7)	.151
Limited/No Prenatal Care	7 (11.1)	36 (11.4)	4 (7.1)	19 (4.7)	**.008**
Current tobacco use	9 (11.8)	35 (10.4)	6 (9.5)	53 (12.3)	.669
Recall contraceptive counseling	13 (16.0)	115 (33.3)	21 (32.3)	191 (43.1)	**<.001**
Contraceptive Desired at Discharge	45 (68.2)	216 (80.3)	47 (88.7)	323 (83.9)	**.010**
Effectiveness of Contraceptive at Discharge					
None	21 (31.8)	53 (19.7)	6 (11.3)	62 (16.1)	.072
Least	2 (3.0)	23 (8.6)	2 (3.8)	25 (6.5)	
Moderate	17 (25.8)	71 (26.4)	17 (32.1)	101 (26.2)	
Most	26 (39.4)	122 (45.4)	28 (52.8)	197 (51.2)	
Obtained planned contraception	41 (53.2)	209 (63.1)	39 (63.9)	290 (68.1)	.075

Significant findings (p<0.05) highlighted in bold.

1166 | First Trimester Machine Learning to Predict Preeclampsia in Normotensive Pregnancies by American Heart Association Guidelines

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4:00 PM - 6:00 PM

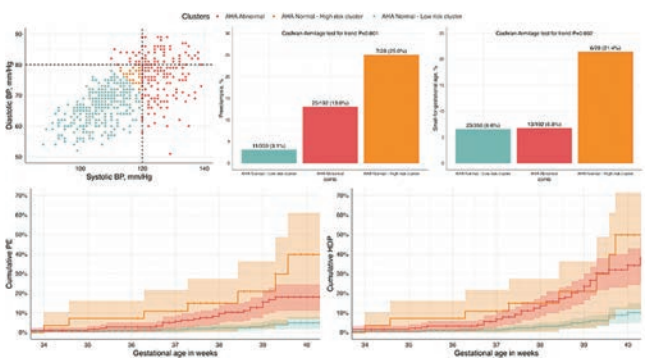
Objective: The threshold to define normal blood pressure (BP) outside pregnancy have been lowered. We assessed if machine learning can identify patients at high risk of hypertensive disorders of pregnancy (HDP) amongst normotensive first-trimester patients per American Heart Association (AHA) guidelines.

Study Design: This was a prospective cohort study which enrolled patients at ≤ 13+6 weeks' gestation without fetal,

umbilical cord or placental abnormalities. For this analysis, patients with chronic hypertension were excluded. Baseline maternal BP was classified according to the AHA guidelines (normal, elevated, stage I hypertension, stage II hypertension). The primary outcome was the incidence of HDP diagnosed per ACOG criteria. First trimester BP values were clustered using unsupervised machine learning models and patients were categorized as; AHA normal BP, low risk clustering; AHA normal BP, high risk clustering and AHA abnormal BP (elevated or above). Association with outcomes were assessed with regression analyses, which were adjusted for race, body-mass index, and risk factors for preeclampsia (PE).

Results: 570 patients were included in this analysis, with 43 developing PE and 73 any HDP. After clustering, 350 patients fell within the AHA normal BP low-risk cluster, 28 AHA normal BP high-risk cluster and 192 patients AHA abnormal BP (elevated or above). The PE rates in these categories were 3.1%, 25.0% and 13.0%, respectively (P< 0.001). The rate of small for gestational age (SGA) were 6.6%, 21.4% and 6.8% respectively (P = 0.032). The hazard of PE was higher in patients with AHA normal BP, high risk clustering (adjusted HR: 8.51, 95% CI: 3.30-22.0, P< 0.001) compared to AHA abnormal BP (adjusted HR: 4.33, 95% CI: 2.12-8.84, P< 0.001) (Figure). Similar findings were observed for any HDP (adjusted HR:4.15 vs 5.77, P< 0.001 both, Figure).

Conclusion: A cohort of patients with AHA normal BP, identified by unsupervised machine learning models, had significantly higher risk of preeclampsia and neonatal SGA than those with AHA abnormal BP or AHA normal BP clustered in the low-risk group.



1167 | Preeclampsia Associated Morbidity Requires a Double hit from First-Trimester Maternal Characteristics and Placental Dysfunction

Rebecca Horgan[1]; Erkan Kalafat[2]; Elena Sinkovskaya[1]; Alfred Z. Abuhamad[1]; George R. Saade[1]
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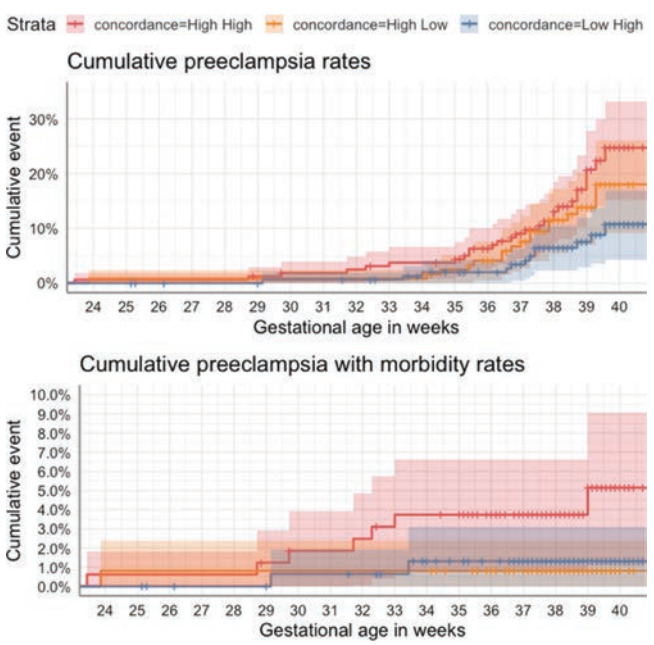
4:00 PM - 6:00 PM

Objective: To evaluate whether unsupervised machine learning clustering of first-trimester data can identify pregnancies at high risk for preeclampsia associated morbidity.

Study Design: This is a prospective cohort study which enrolled patients at ≤ 13+6 weeks' gestation without fetal, umbilical cord or placental abnormalities. Baseline maternal characteristics, blood pressure, and first trimester ultrasound including uterine and placental artery (spiral artery and intervillous arteriole) Dopplers were obtained. The primary outcome was the prevalence of preeclampsia with associated morbidity defined as delivery at < 34 weeks, eclampsia, HELLP syndrome or placental abruption. Patients were followed throughout pregnancy and outcomes collected by trained research coordinators. Maternal characteristics (BMI and blood pressure) and uterine & placental Dopplers (uterine, spiral, and intervillous artery pulsatility index) were used to create their distinct risk groups using unsupervised machine learning models. Outcomes of patients who were labeled as high risk in both (maternal characteristics and Doppler) or just one (Maternal characteristics or Doppler) were compared using cox-proportional hazard models.

Results: Analysis included 617 patients. Machine learning identified 164 patients as high risk of preeclampsia by both maternal characteristics and Dopplers, 126 by maternal characteristics alone, 161 by Dopplers alone, and 166 as low risk. Preeclampsia rates were highest in the dual high-risk group (17.1%), compared to maternal characteristics alone (13.5%) or Dopplers alone (7.5%) (HR: 1.80, 95% CI: 1.07-3.03, P = 0.026). The low-risk group had a 2.4% preeclampsia rate. 70% of preeclampsia cases with associated morbidity were in the dual high-risk group, significantly higher than those identified by only one criterion (HR: 4.15, 95% CI: 1.07-16.0, P = 0.039).

Conclusion: Preeclampsia with associated morbidity mostly occurs in patients with abnormalities in both first trimester blood pressure values and placental Doppler values.



1168 | Clinical Factors Associated with Survival of Periviable Rupture of Membranes

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4:00 PM - 6:00 PM

Objective: The aim of this study is to assess neonatal survival to discharge and factors that may influence survival in pregnancies affected by rupture of membranes (ROM) less than 25 weeks gestation (w).

Study Design: This is a retrospective cohort study of non-anomalous, singleton pregnancies with ROM prior to 25w delivered at a tertiary care center from 2005-2024. Patients included in the study elected for expectant management at the diagnosis of ROM and delivered a liveborn neonate that was a candidate for resuscitation. Patients who elected comfort care were excluded. Patients were stratified by neonatal survival to discharge. Maternal, obstetric, and neonatal variables were compared between survival groups. Chi-square and student's t-test were used to compare categorical and continuous variables.

Results: Of 90 patients with ROM less than 25 w, 54 (60%) neonates survived to discharge, and 36 (40%) had a neonatal demise. Gestational age (GA) at ROM (23.2w IQR 22.6-24 v 23.1w IQR 22.5 - 24, p = 0.318), GA at delivery (24.4w IQR 23.7-24.9 v 24.2w IQR 23.6-24.9, p = 0.197), and latency from ROM to delivery (4.6d (IQR 2-16) v 4 (IQR 2-16), p = 0.623) were not statistically different between survivors and non-survivors. Six percent of patients delivered prior to 23w0d. Residual amniotic fluid values were not statistically different between survivors and non-survivors (p = 0.42). Antenatal interventions, including antenatal corticosteroid (100% v 94.4%, p = 0.157) and antibiotic administration (90.7% v 83.3%, p = 0.337) were not different between groups. Mode and indication for delivery did not impact neonatal survival to discharge.

Conclusion: In our cohort, overall survival of expectantly managed pregnancies affected by ROM less than 25 weeks gestation is 60%. Survival to discharge is multi-factorial, and is challenging to predict in the periviable period.

	Survivors n=54	Non-survivors n=36	p-value
GA at ROM	23.2 (22.6-24)	23.1 (22.5-24)	0.318
ROM <22 wga (n=18)	8 (14.8%)	10 (27.8%)	0.179
GA at Delivery	24.4 (23.7-24.9)	24.2 (23.6-24.9)	0.197
Latency (days)	4.6 (2-16)	4 (2-16)	0.623
Residual AFI			0.424
Anhydramnios	9 (22.5%)	9 (36%)	
Oligohydramnios	14 (35%)	10 (40%)	
Normal fluid	17 (42.5%)	6 (24%)	
Antenatal Corticosteroids	54 (100%)	34 (94.4%)	0.157
Antibiotics	49 (90.7%)	30 (83.3%)	0.337

	Survivors n=54	Non-survivors n=36	p-value
Mode of Delivery			0.031
Vaginal Delivery	24 (44%)	8 (22.2%)	
Cesarean	30 (55.6%)	28 (77.8%)	
Indication for Delivery			0.751
Gestational Age	2 (3.7%)	0 (0%)	
Preterm Labor	28 (51.9%)	16 (44.4%)	
Chorioamnionitis	8 (14.8%)	7 (19.4%)	
Equivocal Testing	9 (16.7%)	7 (19.4%)	
Abruption	4 (44.4%)	5 (13.9%)	
Cord Prolapse	3 (5.6%)	1 (2.8%)	

1169 | Impact of Gestational Age on Outcomes in Periviable Rupture of Membranes

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4:00 PM - 6:00 PM

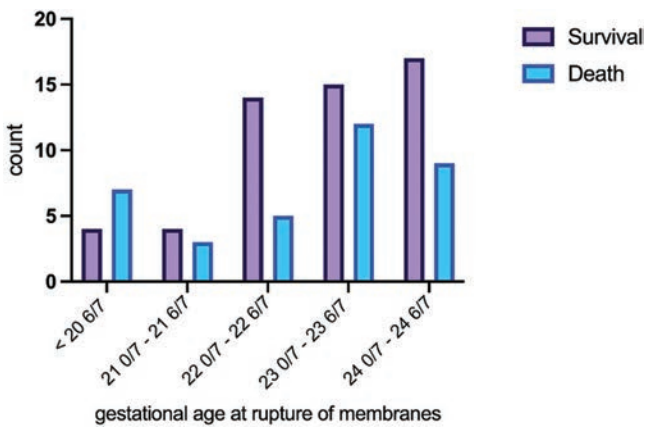
Objective: The aim of this study is to evaluate neonatal survival to discharge and neonatal outcomes based on gestational age of rupture of membranes (ROM) in pregnancies affected by ROM less than 25 weeks gestation (w).

Study Design: This is a retrospective cohort study of non-anomalous, singleton pregnancies with ROM prior to 25w delivered at a tertiary care center from 2005-2024. Patients included in the study elected for expectant management at the diagnosis of ROM and delivered a liveborn neonate that was a candidate for resuscitation. Patients who elected comfort care were excluded. Patients were stratified by gestational age at ROM (early ROM less than 22w, late ROM greater than 22w). The primary outcome was neonatal survival to discharge; secondary outcomes included neonatal variables amongst survivors. Chi-square and student's t-test were used to compare categorical and continuous variables.

Results: Of 90 patients with ROM less than 25w, 18 (20%) had early rupture and 72 (80%) had late ROM. Overall survival to discharge in the study group was 60% (n = 54). There was no statistical difference in survival to discharge when comparing early versus late ROM (44.4% v 63.9%, p = 0.132). Gestational age at delivery was not significantly different between early and late ROM groups (24w3d IQR 23w0d-27w5d v 24w2d IQR 23w5d-24w5d); however, the early ROM group did have greater latency to delivery (6.14 days v 0.4 days, p< 0.01). Six percent of patients delivered before 23 w. All neonates were affected by respiratory distress syndrome; remaining neonatal outcomes including bronchopulmonary dysplasia, intraventricular hemorrhage, retinopathy of prematurity, necrotizing enterocolitis, and sepsis were similar between groups.

Conclusion: In our cohort, gestational age at ROM did not affect neonatal survival to discharge. Patients with ROM less than 22w have greater latency to delivery, but no difference in gestational age at delivery or survival.

	Early ROM (<22w) n=18	Late ROM (≥22w) n=72	p-value
Survival to discharge	8 (44.4%)	46 (63.9%)	0.132
Gestational age at delivery (weeks)	24w3d (23w0d-27w5d)	24w2d (23w5d-24w5d)	0.62
Latency from ROM to delivery (days)	6.14 (2.60-8.46)	0.4 (0.15-1.10)	<0.01
Birthweight (grams)	605.0 (542.5-1013.0)	636.0 (572.5-728.0)	0.966
Neonatal Complications			
RDS	13 (100%)	70 (100%)	
BPD	10 (76.9%)	40 (59.7%)	0.351
IVH	4 (30.8%)	29 (43.3%)	0.402
ROP	10 (76.9%)	39 (58.2%)	0.205
NEC	2 (15.4%)	12 (17.9%)	1.000
Sepsis	9 (69.2%)	40 (59.7%)	0.519



1170 | Machine Learning Algorithm for the Point of Care Prediction of Preterm Labor

Reetam Ganguli[1]; Stephen Wagner[2]
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4:00 PM - 6:00 PM

Objective: Preterm birth is the leading cause of neonatal mortality and is 25-fold more expensive than term deliveries to payors. Relevant literature has demonstrated that clinical intervention indicated by early risk screening tests can reduce preterm birth occurrence by 20% and can save over $800 per patient. Current screening methods to detect patients at risk of preterm labor are limited with some studies suggesting established protocols such as cervical length screening have a sensitivity as low as 11%. Our goal was to develop a machine learning model to non-invasively predict risk of preterm birth at the point of care.

Study Design: We conducted a cohort study utilizing sociodemographic and clinical data obtainable in the 1st trimester from the CDC Vital Statistics System. Deliveries with missing preterm labor data and deliveries in hospitals not reporting preterm labor were excluded. The primary outcome was spontaneous preterm birth < 37 weeks.

Models were trained on years 2018-2020 of the CDC Vital Statistics System and were tested on a hold-out set of year 2021.

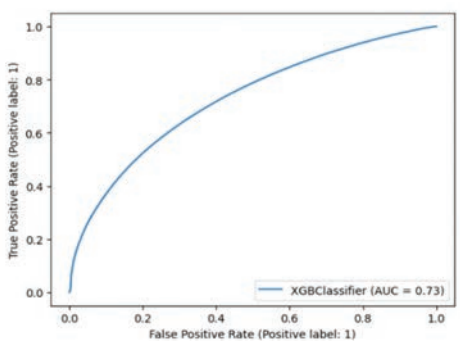
Results: 40 clinical variables for 12,476,992 obstetric patients were included in the training data. 2,685,095 (21.5%) patients had a preterm birth.

The model was tested on 3,666,801 patients, of which 450,318 (12.3%) patients went into preterm labor. The developed model had an area under the receiver operating characteristic curve of 0.73, sensitivity of 0.65, and F1 score of 0.68.

The highest weighted factors in the model were: number of prenatal visits, trimester that prenatal care was initiated in, and interval since last live birth.

Conclusion: Our developed ML model leveraging data available at early stages of pregnancy harbors the potential to identify women at increased risk for spontaneous preterm birth at nearly 6 times the sensitivity than existing cervical length measurement tests as soon as the point of care and may allow for targeted interventions to reduce spontaneous preterm labor incidence/lower healthcare expenditures related to preterm birth.

AUC Curve for Preterm Labor Machine Learning Model



1171 | Maternal Hypertension Care Bundle Implementation at an Academic Tertiary Hospital: System Redesign using Improvement Science

Isabella Toledo[1]; Joyce H. Xu[2]; Lori Fannin[2]; Mary Giles[2]; Heather N. Czarny[2]; Stephen Afflito[3]; Muhammad Zafar[2]; Robert M. Rossi[2]; On behalf of the Maternal Safety Quality Improvement Initiative of the Ohio Department of Health
[1]Indiana University School of Medicine, Indianapolis, IN; [2]University of Cincinnati College of Medicine, Cincinnati, OH; [3]Ohio Colleges of Medicine, Government Resource Center, Columbus, OH

4:00 PM - 6:00 PM

Objective: Uncontrolled hypertension in pregnancy is a major cause of maternal morbidity and mortality. Application of best-practice maternal hypertension care bundle reduces severe maternal morbidity. Our objective was to implement an in-patient, maternal hypertension bundle (HTN-bundle) with reliable adherence of >80% in an academic tertiary care hospital.

Study Design: University of Cincinnati Medical Center is a level IV maternal care academic center, safety net hospital. We participated in the AIM Hypertension Quality Improvement Project (AIM-QIP) by the Ohio Colleges of Medicine Government Resource Center.

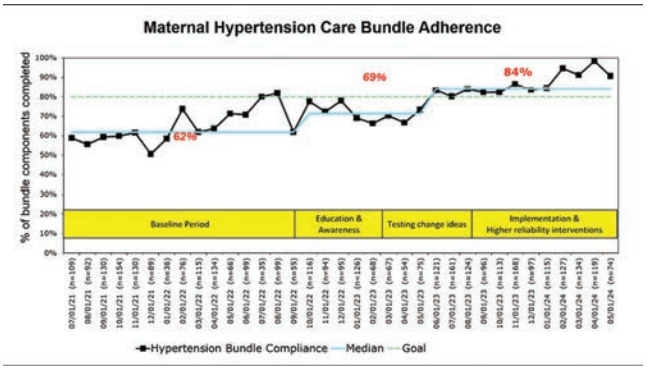
The HTN-bundle consisted of 1) treatment of systolic blood pressure (BP) or diastolic BP ≥ 160/110 in < 60 min, 2) appropriate medication use for acute HTN treatment, 3) patient education, 4) timely discharge follow-up, 5) blood pressure cuff provision. We aimed to improve the adherence to bundle components from 62% (baseline) to >80% within 6-months.

Staff education was led by the medical director and facilitated by AIM-QIP. We performed detailed process maps, Pareto analyses, empathy mapping, and Go-see activities to identify improvement opportunities. Interventions for redesign were testing using iterative Plan-Do-Study-Act (PDSA) cycles (Fig 1). Bundle adherence was tracked by chart reviews and plotted on run-chart.

Results: The baseline HTN-bundle adherence was 62%. We performed 33 PDSA cycles, testing 16 interventions. By 6-months, HTN-Bundle adherence reached 84% with a sustainable system shift on the run-chart (Fig 2). The highest increases were noted in provision of BP cuffs and 3-day follow-up BP check appointments. The HTN-bundle delivery now relies on different team members performing inter-dependent task, making it a system property rather than an individual's responsibility.

Conclusion: Using improvement science methods, adherence to HTN-bundle can be made a part of reliable, standard-of-care for all affected patients. Key success factors were setting a clear aim, team engagement, QI expertise, data-guided change efforts, and availability of resources.

Key Drivers	Interventions with Level 1 Reliability	Interventions with Level 2-3 Reliability
Standard notification Process	1. Case review and follow-up feedback loops 2. Visual aids for staff on unit 3. MEWS education	1. HTN coordination added to discharge huddle discussion 2. Charge RN notified of severe range BP 3. Best practice advisory notification for severe HTN
Early recognition and Timely response	1. Case review and follow-up feedback loops 2. Visual aids for staff on unit 3. MEWS education for all staff	1. New HTN order set in Epic 2. Charge RN notified of severe range BP 3. Best practice advisory notification for severe HTN
Ease of access to medications	1. Visual aids for staff on unit	1. New HTN order set in Epic
Standard protocol for communications	1. MEWS education for all staff 2. Unit visual aids for communication	1. HTN coordination added to discharge huddle 2. Charge RN notified of severe range BP 3. Creation of BP smartphrases in Epic for documentation for nurses and providers
Timely access to follow up appointment	1. Case review and follow-up feedback loops	1. Prioritization of BP check appts in outpatient obstetric clinic (Mon-Fri) 2. Weekend telehealth BP visits
Reliable provision of BP cuff	1. Case review and follow-up feedback loops	1. Hospital discharge pharmacy providing BP cuff (meds to bed) 2. HTN coordination added to discharge huddle 3. Discharge flowsheet with BP cuff selection
Access to remote BP monitoring	1. Case review and follow-up feedback loops	1. Utilization of BabyScripts App for remote BP monitoring



1172 | Xenobiotic Transfer of Tranexamic Acid Through an ex vivo Placental Perfusion Model

Roshini Zachariah[1]; Helen Zhao[2]; Andrea D. Shields[3]; Richard Wagner[1]

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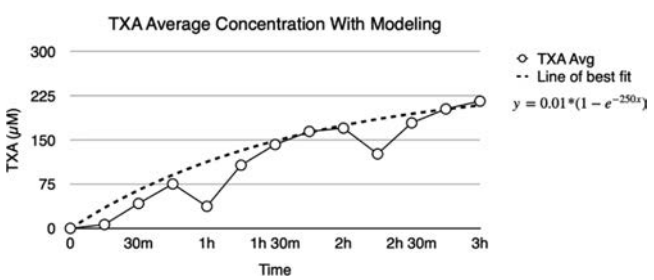
4:00 PM - 6:00 PM

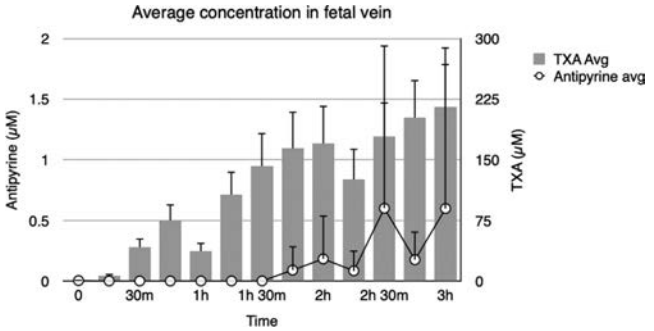
Objective: In obstetrics, intravenous tranexamic acid (TXA) is used to treat postpartum hemorrhage via inhibition of fibrinolysis and is effective in reducing mortality from postpartum hemorrhage. TXA is not currently approved for prophylactic use of postpartum blood loss but existing meta-analyses suggest it may reduce the incidence of postpartum hemorrhage and overall blood loss. However, data on use of TXA for antepartum bleeding is limited.

Study Design: We used an *ex vivo* placental perfusate model to study the rate of transfer of TXA across the placental interface. Placentas from term uncomplicated singleton pregnancies were obtained immediately after scheduled cesarean deliveries. A fetal vein-artery pair supplying a cotyledon was isolated, cannulated and perfused. Maternal circulation was also established through placental storm. After addition of TXA and antipyrine (positive control) to the system, fetal samples were collected every 15 minutes for 3 hours with two parallel closed circulations (maternal and fetal). Fetal artery pressure and pH of the maternal and fetal reservoir were monitored every 15 minutes to continuously assess the integrity of the model. Fetal vein samples were analyzed via HPLC to quantify TXA and antipyrine concentrations.

Results: TXA rapidly crosses the placental interface within 15 minutes of administration. TXA levels in the fetal vein rose over 3 hours and was modeled with a logarithmic curve. The predicted final fetal vein concentration was 250 μM. The *in vivo* fetal concentration would likely be lower due to increased maternal circulating volume and renal clearance. Based on transfer seen in this *ex vivo* model, we would predict an *in vivo* fetal vein concentration of 7 μg/mL (clinical effects are seen at 10-15 mg/mL).

Conclusion: Tranexamic acid rapidly crosses the placental interface in an ex vivo model. However, the fetal vein concentration is reduced compared to maternal concentration. This suggests that in vivo use may be ethically safe to test as expected fetal concentrations would be below the clinically effective threshold.





1173 | Amlodipine Versus Nifedipine ER for Managing Postpartum Hypertension: Medication Continuation Beyond 6 weeks Postpartum

Ross F. Lordo[1]; Alondra DeSantiago[2]; Zachary C. Travis[2]; Himashreya Katti[2]; Stella Self[3]; Laura Carlson[4]; Katelyn Pratt[4]
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4:00 PM - 6:00 PM

Objective: Despite being a leading cause of maternal morbidity, data on optimal management of postpartum (PP) hypertension (HTN) is limited. Our parent study demonstrated noninferiority of amlodipine for treatment of PP HTN in the immediate PP period when compared to nifedipine ER. In this secondary analysis, we sought to assess use of antihypertensives beyond 6 weeks PP. We hypothesized that the majority of patients using either medication would discontinue treatment prior to 6 weeks PP and that of those who continued treatment, participants assigned to amlodipine would be more likely to continue the assigned study drug than those assigned to nifedipine ER, as use of amlodipine is more common in the non-obstetric setting.

Study Design: This was a secondary analysis of a randomized controlled noninferiority trial. 175 patients were enrolled in the parent study, with 120 patients started on either amlodipine or nifedipine ER in the per protocol cohort (n = 51 amlodipine, 69 nifedipine ER). Charts of the per protocol cohort were abstracted to assess continuation of the initially assigned antihypertensive at 6 weeks, 12 weeks, and 12 months PP. Data was analyzed utilizing chi-squared and Fishers exact test.

Results: Overall, forty percent of patients remained on antihypertensives at 6 weeks PP. No significant differences were found in rates of continuation of any antihypertensive at 6 weeks, 12 weeks, or 12 months PP. Those assigned to amlodipine were significantly more likely to be continued on their assigned study medication at 6 weeks and 12 weeks, but not 12 months, PP (Table 1).

Conclusion: While the majority of patients discontinue antihypertensives by 6 weeks PP, some patients with hypertensive disorders of pregnancy will require prolonged treatment. In patients requiring prolonged treatment, patients assigned to amlodipine were significantly less likely to be changed to an alternative antihypertensive. Although this was not statistically significant at 12 months PP, this may be due to sample size. Our findings support that amlodipine should be considered for treatment of postpartum hypertension.

	Amlodipine (N = 51)	Nifedipine ER (N = 69)	p-value
Any antihypertensive at 6 weeks*	20 (39.2)	28 (40.6)	1
Any antihypertensive at 12 weeks*	10 (19.6)	11 (15.9)	0.779
Any antihypertensive at 12 months*	7 (13.7)	8 (11.6)	0.944
Changed antihypertensive at 6 weeks†	0 (0)	6 (21.4)	< 0.033
Changed antihypertensive at 12 weeks†	0 (0)	5 (45.5)	0.035
Changed antihypertensive at 12 months†	1 (14.3)	5 (62.5)	0.119

Reported as N (%). *Reported as percentage of overall per protocol cohort. † Reported as percentage of patients remaining on medication.

1174 | Impact of Chorioamnionitis on Maternal and Neonatal Outcomes Categorized by Presence or Absence of Fever

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Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA

4:00 PM - 6:00 PM

Objective: To examine the impact of a chorioamnionitis diagnosis on maternal and neonatal outcomes categorized by the presence or absence of documented fever.

Study Design: We conducted a secondary analysis using data from the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-Be. We excluded individuals who delivered before 20 weeks' gestation and those with missing chorioamnionitis data, then categorized participants based on the diagnosis of chorioamnionitis with versus without fever. Data was obtained prospectively by trained research coordinators. Our primary outcome was the neonatal composite outcome including suspected or confirmed neonatal sepsis, necrotizing enterocolitis, respiratory distress/transient tachypnea of the newborn (RDS/TTN), seizure, hypoglycemia, and hyperbilirubinemia. We also examined maternal outcomes (cesarean delivery, endometritis, and postpartum hemorrhage). We calculated adjusted relative risks (aRRs) with 95% confidence intervals (95% CIs) using modified Poisson regression.

Results: Of 9,432 individuals, 574 (6.1%) had chorioamnionitis with fever and 46 (0.5%) had chorioamnionitis without fever. Proportions and relative risks of outcomes are present in Tables 1 and 2. Compared to individuals with no chorioamnionitis, chorioamnionitis without fever was associated with higher risks of neonatal composite outcomes, neonatal sepsis, RDS/TTN cesarean delivery and postpartum hemorrhage. Compared to individuals with no chorioamnionitis, chorioamnionitis with fever was associated with higher risks of neonatal composite outcomes, neonatal sepsis, RDS/TTN, hypoglycemia, cesarean delivery, endometritis; and lower risk of hyperbilirubinemia.

Conclusion: Chorioamnionitis is associated with adverse maternal and neonatal outcomes regardless of fever, supporting ACOG's recommendations for diagnosing intraamniotic infections without maternal fever.

Table 1. Proportions of primary and secondary outcomes.

	No chorio	Chorio without fever	Chorio with fever	P-value
Neonatal outcomes				
Neonatal composite	1256 (14.5)	14 (31.1)	141 (24.8)	<0.001
Neonatal sepsis (suspected/confirmed)	270 (3.1)	10 (22.2)	79 (13.9)	<0.001
Respiratory distress/TTN	582 (6.7)	8 (17.8)	78 (13.7)	<0.001
Hypoglycemia	219 (2.5)	2 (4.4)	25 (4.4)	0.02
Hyperbilirubinemia	766 (8.8)	6 (13.3)	32 (5.6)	0.017
Maternal outcomes				
Cesarean	2318 (26.8)	23 (51.1)	239 (42.1)	<0.001
Endometritis	63 (0.7)	1 (2.2)	23 (4.0)	<0.001
Postpartum hemorrhage	78 (0.9)	2 (4.4)	9 (1.6)	0.015

Table 2. Relative risks of primary and secondary outcome.

	No chorio	Chorio without fever	Chorio with fever
Neonatal outcomes			
Neonatal composite	Reference	2.04 (1.22-3.41)	1.77 (1.51-2.08)
Neonatal sepsis (suspected/confirmed)	Reference	5.95 (3.24-10.92)	4.46 (3.49-5.69)
Respiratory distress/TTN	Reference	2.42 (1.15-5.09)	2.09 (1.66-2.63)
Hypoglycemia	Reference	2.27 (0.57-9.06)	2.03 (1.33-3.08)
Hyperbilirubinemia	Reference	1.85 (0.86-3.97)	0.64 (0.45-0.92)
Maternal outcomes			
Cesarean	Reference	1.88 (1.39-2.54)	1.53 (1.37-1.70)
Endometritis	Reference	2.98 (0.43-20.85)	4.33 (2.56-7.32)
Postpartum hemorrhage	Reference	4.54 (1.11-18.55)	1.42 (0.66-3.08)

1175 | Predicting Gestational Latency Using Serial Monitoring Among Nulliparous, Singleton Pregnancies with low-Normal Mid-Trimester Cervical Lengths

Sandhya Chandrasekaran[1]; Vanya Manthena[2]; Andrew Rausch[2]; Ryan E. Longman[2]; Ashish Premkumar[2]
[1]University of Chicago School of Medicine, Chicago, IL; [2]Pritzker School of Medicine, University of Chicago, Chicago, IL

4:00 PM - 6:00 PM

Objective: Preterm births account for approximately 70% of neonatal deaths and 36% of infant deaths. In this setting, cervical length screening is of utmost importance as a predictor of preterm birth. Nulliparous patients pose a particularly difficult challenge with respect to counseling reading cervical insufficiency given their lack of pregnancy history. We sought to explore predictive trends in serial CLs associated with preterm birth in this otherwise low-risk population.

Study Design: We performed a retrospective case control analysis of all nulliparous, singleton pregnancies from 2021 to 2023 who underwent an anatomy scan with an initial low-normal cervical length (CL) >25mm and < 30mm followed by at least one serial CL with available gestational age at the time of delivery. The primary outcome was gestational latency (GL), defined as time of diagnosis of low-normal cervical length to delivery. Trajectory analysis was performed to gauge CL changes as a function of time from delivery between the two groups, using linear regression models. Bivariate analyses were performed.

Results: 30 nulliparous, singleton pregnancies with initial low-normal CL were evaluated, with 23 resulting in term deliveries ("tb", > = 37 weeks) and 7 resulting in preterm deliveries ("ptb", < 37 weeks, Table). When plotting serial CLs as a function of time, CL in the "tb" controls generally increased with GL (slope: 0.05), while CLs in the "ptb" controls demonstrated a modest decrease with GL (slope: -0.12). Importantly, there was a high degree of individual variability in CL trajectories among those whose pregnancies resulted in preterm deliveries (Figure).

Conclusion: 23% of individuals with a low-normal cervix will deliver preterm. However, high individual variability exists across groups. These data point to the use of serial monitoring in the setting of low-normal cervix and the need for further work into deciphering individuals factors contributing to these differences to drive novel interventions aimed at stabilizing the cervix with the goal of minimizing risk of preterm birth.

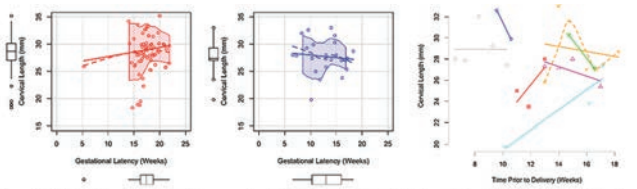

Figure. Serial CL trends in nulliparous, singleton pregnancies with initial low-normal CL resulting in term ("tb", n=23; left) and preterm ("ptb", n=7; middle) births, depicted as time to prior to delivery (ie, gestational latency) vs. CL (mm). Right: Individual trajectories of serial CL trends in the "ptb" group. Different colors/lines depict distinct individuals.

Table. Sociodemographic and biomedical characteristics.

	Preterm Birth (n=7)	Term Birth (n=23)	p value
Maternal Age	28 (8.5)	28 (7)	0.84
Race			
Black	5 (71.4%)	11 (47.8%)	<0.001
White	0 (0%)	5 (21.7%)	
Asian/Pacific Islander	1 (14.3%)	3 (13.0%)	
Other	1 (14.3%)	4 (17.5%)	
Maternal Pre-Pregnancy BMI	24.39 (4.6)	23.17 (6.4)	0.33
Maternal Tobacco Use	0 (0%)	1 (4.3%)	0.30
Prior Cervical Procedure (LEEP/CKC)	1 (14.3%)	2 (8.7%)	1
Assisted Reproductive Technologies	1 (14.3%)	1 (4.4%)	0.42
Initial CL	27.4 (1.1)	28 (1.95)	0.87
GA at Initial CL	19.71 (0.6)	19.71 (1.1)	0.81
Total Number of CL US	3 (2)	3 (1)	0.68
Progressing to Low CL	2 (28.6%)	6 (26.1%)	1
Vaginal Progesterone Use	2 (28.6%)	7 (30.4%)	1
Cerclage Placement	0 (0%)	0 (0%)	1
GA at delivery	36.14 (3.6)	39.29 (1.8)	<0.001

Unless otherwise noted, data are reported as mean (standard deviation) or n (%)
BMI = body mass index, CKC = cold knife cone, CL = cervical length; GA = gestational age, LEEP = loop electrosurgical excision procedure, US = ultrasound

1176 | COVID-19 Vaccine Uptake Amongst Adult Women of Reproductive Age in the United States

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[1]Corewell Health West/Michigan State University, Grand Rapids, Michigan., Grand Rapids, MI; [2]Rutgers University, New Jersey, Rutgers University, NJ; [3]Maimonides Medical Center, Brooklyn,

NY; [4]Montefiore St. Luke's Cornwall, Newburgh, NY; [5]East Tennessee State University, Johnson City, TN; [6]Saint Peter's Healthcare System, New Jersey., Jersey City, NJ; [7]University of Chicago, Chicago, IL; [8]Oklahoma University Health Science Center, Tulsa, OK

4:00 PM - 6:00 PM

Objective: To evaluate COVID-19 vaccine uptake rate and the association between COVID-19 vaccine uptake and race/ethnicity and, education in women of reproductive age in the United States.

Study Design: A secondary data analysis was conducted using United States COVID-19 Vaccine Hesitancy Survey dataset from the OpenICPSR database. The final sample size was 681 for females aged 18 to 49 years. Descriptive statistics (unweighted and weighted) frequencies and percentages, multivariable and adjusted bivariate logistic regression analyses were obtained for COVID-19 vaccine uptake, race/ethnicity, age, educational achievement, urbanicity, and chronic disease status.

Results: The COVID-19 vaccine uptake rate was found to be 32.2%. The population consisted of individuals from different racial backgrounds, with the majority identifying as non-Hispanic White (49.7 %), followed by Hispanic (25.4%), non-Hispanic Black (14.4%), non-Hispanic Asian (7.8%), and others (2.9%). The education level varied similarly: Bachelor's degree (36%), associate's or trade school (33%) and high school or less (32%). After adjusting for all predictor variables, only educational achievement of bachelor's degree or higher (AOR: 3.60, C.I: (2.20,5.91), p-value: < .0001) and urbanicity-not living in rural area (AOR: 0.55, C.I: (0.37,0.82), p-value: 0.0031) retained statistical significance in predicting uptake of any COVID-19 vaccine. Those who had a bachelor's degree or higher were 3.6 times more likely to have received any COVID-19 vaccine compared to those who had high school education or less (AOR: 3.60, C.I: (2.20,5.91), p-value: < .0001). There was no statistically significant association between COVID-19 vaccine uptake and race/ethnicity and age (table 2).

Conclusion: This study found statistically significant association between COVID-19 vaccine uptake and having a bachelor's degree or higher amongst adult women of reproductive age in the United States. Interventions to increase bachelor education can increase COVID-19 vaccine uptake and other vaccine uptake amongst women of reproductive age in the United States.

Table 1: Univariate Analysis Table (With Weighting Variables)

	Unweighted		Weighted	
Covariates	**n**	**%**	**n**	**%**
Total observations in final dataset	681	100		
COVID-19 Vaccine uptake				
No	471	69.2	313	67.8
Yes	210	30.8	149	32.2
Race/ethnicity				
Hispanic	103	15.1	117	25.4
NH Asian	53	7.8	35	7.6
NH Black	87	12.8	66	14.4
NH White	420	61.7	229	49.7
Other	18	2.6	14	2.9
Educational Achievement				
Associate's or trade school	217	32.4	149	32.8
Bachelor's or above	247	36.9	161	35.5
High school or less	206	30.8	144	31.7
Missing variables	11			
Urbanicity/ Is living area rural?				
No	416	61.1	282	61.2
Yes	265	38.9	179	38.8
Do you have chronic disease?				
No	549	81.9	373	82.1
Yes	121	18.1	81	17.9
Missing	11			
Age				
Range: 18-49	681	Mean: 33.67 Median: 34.00 Mode: 33.00	Mean: 32.99 Median: 32.62	
18-24	133	19.5	101	21.8
25-34	223	32.8	155	33.6
35-44	226	33.2	144	31.2
45-49	99	14.5	62	13.3

Table 2: Bivariate and Multivariable Analyses table with Probability modeled being COVID-19 vaccine uptake = Yes

	Unadjusted/Crude			Adjusted		
	Point Estimate (Odds Ratio)	Estimate Confidence Interval	p-value	Point Estimate (Beta/Odds Ratio)	Estimate Confidence Interval	p-value
Race/ethnicity						
NH White	Ref	Ref	Ref	Ref	Ref	Ref
Hispanic	1.56	(0.98,2.49)	0.0622	1.73	(1.05,2.86)	0.0561
NH Asian	1.78	(0.98,3.26)	0.0599	1.64	(0.82,3.26)	0.2012
NH Black	0.73	(0.43,1.27)	2.2655	0.76	(0.42,1.36)	0.1366
Other	0.85	(0.26, 2.75)	0.7861	0.80	(0.23,2.77)	0.5101
Education						
High sch./less	Ref	Ref	Ref	Ref	Ref	Ref
Assoc./ trade	1.29	(0.78,2.14)	0.3250	1.43	(0.85,2.41)	0.1795
Bache./above	3.19	(1.99,5.11)	<.0001	3.60	(2.20,5.91)	<.0001
Is living area rural?						
Yes	Ref	Ref	Ref	Ref	Ref	Ref
No	0.62	(0.43,0.89)	0.0092	0.55	(0.37,0.82)	0.0031
Chronic disease?						
Yes	Ref	Ref	Ref	Ref	Ref	Ref
No	0.76	(0.48,1.20)	0.2328			
Age						
18-24	Ref	Ref	Ref	Ref	Ref	Ref
25-34	1.17	(0.70,1.96)	0.5526	1.10	(0.63,1.93)	0.8506
35-44	1.12	(0.68,1.86)	0.6526	1.00	(0.57,1.76)	0.4230
45-49	1.67	(0.91,3.02)	0.0963	1.49	(0.76,2.94)	0.1757

1177 | Collaborative Care Model Reduces Perinatal Mood and Anxiety Symptoms

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4:00 PM - 6:00 PM

Objective: Collaborative care (CC) models, which embed mental health care into the outpatient setting, have been shown to improve mental health outcomes in primary care settings, but evidence is still scarce for effectiveness in perinatal settings. We aimed to determine if our CC intervention model would decrease depressive and anxiety symptoms in our perinatal population.

Study Design: Patients from three prenatal clinics at Weill Cornell Medicine were systematically screened and those with an Edinburgh Postnatal Depression Scale (EPDS) ≥9 were eligible for referral. EPDS, Perinatal Anxiety Screening Scale (PASS), Generalized Anxiety Disorder Screen (GAD-7), Adverse Childhood Experiences Questionnaire (ACE) and Client Satisfaction Questionnaire (CSQ-8) were measured at the intake and discharge visits. Treatment plans included psychotherapy, medication management, or referral to psychiatry for long-term management. Differences in depression and anxiety scales were compared between the intake and discharge visits.

Results: During 1/23/23-07/24/24, 219 patients completed the CC program. Demographics and patient treatment plans are shown in Table 1. 158 (72.5%) of enrolled patients had a past mental health history. Most patients had current anxiety or obsessive-compulsive disorder, adjustment disorder, or a depressive disorder at the intake visit. 42 (19.4%) patients were taking psychiatric medications at the intake visit and 33 of those patients (78.6%) were on an SSRI. 72 (33%) were on a medication at time of discharge, with 83.3% being an SSRI. There were significant changes in EPDS, PASS and GAD-7 scores from intake to discharge visit ($p < 0.001$) (Table 2). Patients showed high scores on the CSQ-8, indicating high satisfaction with the CC.

Conclusion: A CC program within the OB setting is an effective intervention to reduce perinatal symptoms of anxiety and depression.

Table 1: Psychiatric Characteristics

	Intake visit N = 219	Discharge visit N = 218[1]
Psychiatric diagnosis[2]		
Depressive Disorders	77 (35.2)	63 (28.9)
Anxiety and Obsessive-compulsive Disorders	77 (35.2)	73 (33.5)
PTSD and trauma	11 (5.02)	1 (0.46)
Adjustment disorder	86 (39.3)	78 (35.8)
Panic attacks	2 (0.91)	0 (0)
Other	7 (3.20)	3 (1.38)
Past mental health history reported	158 (72.5)	
Taking psychotropic medications	42 (19.4)	72 (33)
CC treatment plan		
1. Brief psychotherapy with the PWM	120 (55.8)	
2. Brief psychotherapy with the PWM, with medications as needed, prescribed by the obstetrician	44 (20.5)	
3. Referral to psychiatry to enhanced treatment for long-term psychotherapy or more complicated medication management using a psychologist and a nurse practitioner.	38 (17.7)	
4. In-person consultation with the Perinatal Wellness Program psychiatrist for complex medication management.	5 (2.33)	
5. Perinatal Wellness Program Medication Management with Outside Therapy	8 (3.72)	
Average number of sessions with PWM attended[3]	4 (2, 9)	

Data presented as mean (SD) or N (%)
[1]Data missing for one patient
[2]41 patients had two diagnoses at intake visit
[3]Data presented as median (IQR)
Abbreviations: CC: Collaborative Care; PTSD: post-traumatic stress disorder; PWM: perinatal wellness manager

Table 2: Mean Psychiatric Assessment Score

Mean Psychiatric Assessment Score			
Scales	Intake visit Mean (SD)	Discharge visit Mean (SD)	Visit Differences p-value
EPDS	13.2 (5.29) (N=211)	8.38 (5.78) (N=178)	**<0.001**
PASS	32.1 (16.2) (N=159)	17.2 (13.7) (N=37)	**<0.001**
GAD-7	9.70 (N=197)	5.80 (5.05) (N=157)	**<0.001**
ACE	1.94 (2.07)	-	
CSQ-8[1]	-	30.5 (2.56)	

[1]Scores can range from 8-32.

1178 | Low-Fetal Fraction on NIPT: The Role of the 11-14 week Ultrasound

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4:00 PM - 6:00 PM

Objective: Low fetal fraction (LFF) on non-invasive prenatal testing (NIPT) is associated with a higher risk of chromosomal abnormalities. Our goal was to determine the negative predictive value (NPV) of a normal 11-14 week ultrasound (US) in the setting of LFF on NIPT.

Study Design: This was a retrospective review of patients with LFF on first-trimester NIPT who had an 11-14 week US from 2021-2024. Patients with multiple gestations were excluded. Body mass index (BMI), age and estimated gestational age (EGA) at time of NIPT were assessed. Normal genetic outcomes were defined as normal repeat NIPT, normal invasive testing or normal postnatal evaluation. The primary outcome was the negative predictive value of the 11-14 week US in those with LFF. Fisher's exact test was used for statistical comparison.

Results: 179 patients with LFF were included. Five (2.8%) had chromosomal abnormalities including Trisomy 18 (n = 3), Trisomy 21 (n = 1) and Monosomy X (n = 1). Eight patients (4.5%) had an abnormal US: all eight had abnormal nuchal translucency, and two had additional structural abnormalities. 167 patients (93.3%) had a normal repeat NIPT or underwent invasive testing. Of those who underwent repeat NIPT, LFF was found again in 18.3%. Of these patients, one patient had an abnormal genetic result of Monosomy X. There was a strong correlation between abnormal US and chromosomal abnormalities (50% vs. 0.6%; $p < 0.001$), with four of five affected pregnancies having an abnormal US. The NPV of normal US after LFF result was 99.4% and the sensitivity of the 11-14 week US was 80%. There was no significant difference in BMI or gestational age at NIPT between those with normal and abnormal outcomes, and rates of obesity were similar in those with normal vs abnormal outcomes (36.1% vs 40%; p = 1.0).

Conclusion: In patients with LFF choosing between repeat NIPT vs invasive testing, the 11-14 week US has high sensitivity and NPV in screening for chromosomal abnormalities. As with all screening tests, patients must be counseled about the potential for false-negative results.

Table 1: Patient Characteristics

Characteristic	Patients N = 179
Age	35.0 (32.0, 38.0)
BMI at time of NIPT	27 (23, 33)
EGA at NIPT	10.00 (10.00, 10.00)
Repeat NIPT done?	159 (89%)
Timing of repeat NIPT	12.00 (12.00, 13.00)
Repeat NIPT result	
Normal	127 (80%)
Trisomy 18	2 (1.3%)
Trisomy 21	1 (0.6%)
Low fetal fraction	29 (18%)
Abnormal 11-14 week US	8 (4.5%)
Invasive testing done?	58 (32%)
Normal pregnancy outcome[1]	174 (97%)

Data presented as Median (IQR); n (%)
Gestational ages are reported as completed weeks
Abbreviations: BMI: body mass index; EGA: estimated gestational age; NIPT: non-invasive prenatal test; US: ultrasound.
[1]Normal pregnancy outcome was defined as normal repeat NIPT, or normal invasive testing result or postnatal evaluation

Table 2: Details of Abnormal Results

Karyotype	11-14 Week Ultrasound Results	Ascertainment Method
Trisomy 18	NT 3.3 mm	CVS
Trisomy 18	NT 3.2mm, omphalocele, clenched hands	CVS
Trisomy 18	Normal	Amniocentesis
Trisomy 21	NT 3.1 mm	CVS
Monosomy X	NT > 1 cm, septated cystic hygroma, single ventricle cardiac anatomy	Tissue

Abbreviations: CVS: chorionic villus sampling; NT: nuchal translucency

1179 | Utero-Cervical Angle in Standing Position Improves Prediction of Spontaneous Preterm Birth: A Multicenter Cohort Study

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[1]Research Centre of Centre hospitalier de l'Université de Montréal, Montreal, PQ; [2]University of Montreal, Montreal, PQ; [3]Université de Sherbrooke, Sherbrooke, PQ; [4]Hopitaux Universitaires Genève (HUG), Geneve, Geneve; [5]Ste-Justine Hospital, Montreal, PQ; [6]Research Center Of Centre Hospitalier De L'Université De Montréal, Montreal, PQ; [7]Université Laval, PQ

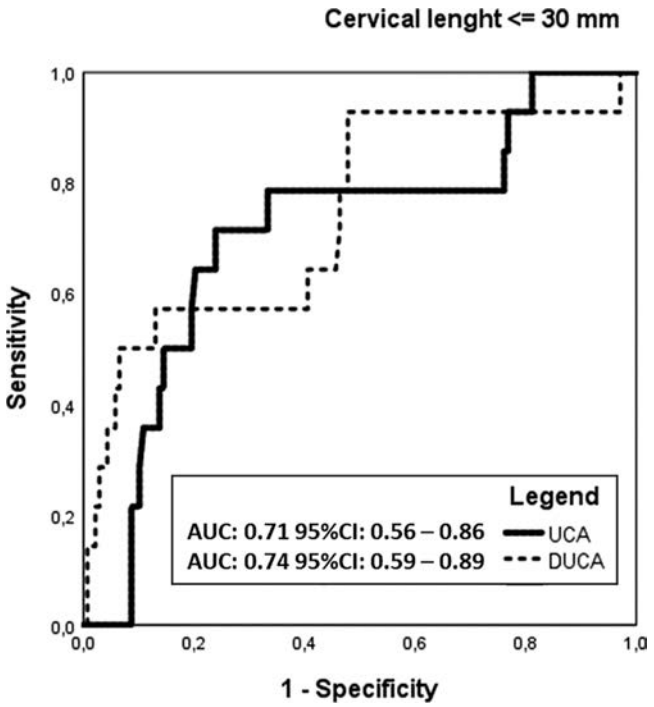
4:00 PM - 6:00 PM

Objective: Measuring cervical length (CL) is a standard practice of stratifying the likelihood of preterm birth (PTB). Dynamic changes in the cervix can also be explored by placing the patient in the upright position, i.e. in the usual position of activity and measuring the shortening of the cervix and changes in the utero-cervical angle (UCA). The aim of this study is to determine whether dynamic measurement of CL and UCA improves prediction of PTB compared additionally to the CL measurement performed in a gynecological position.

Study Design: This is a prospective cohort study of women who had vaginal ultrasound exam for CL measurement at 4 institutions in Canada and Switzerland. The ultrasound exam was performed endovaginally in the supine position, then in the standing position with measurements taken at 1 minute, 3 minutes and during standing Valsalva (SV). UCA were measured after the exam on the images according to a standardized measurement procedure and the differences in UCA (DUCA) between the supine and standing positions were calculated.

Results: 253 participants were included, with a mean age at ultrasound of 27.4 weeks of gestation (WG), a median CL of 26 mm, and a funneling present in 29% of cases in the gynecological position. Among those women, 68 (26.8%) experienced PTB. LC mean was 28.5mm (standard deviation (SD) 10) at rest and 27.3mm (11.5) in SV in the term group, compared with 23.5mm (10.2) and 21.4mm (10) in the PB group respectively. The UCA mean was 113° (25) at rest and 115° (28) in SV in the term group compared with 88.6° (25) and 99° (27) in the PTB group respectively. From the ROC curves, we chose a threshold for UCA of 104° and 5° for DUCA (figure 1). Among participants with LC<31mm, the use of UCA and DUCA significantly improved the prediction of PB but not the LC.

Conclusion: Using endovaginal screening to select a population at risk of PB (LC<31mm), the use of UCA measurement and its variation between the supine and upright positions (DUCA) improves prediction of PB.



1180 | McDonald versus Shirodkar Cervical Cerclage for the Prevention of Preterm Birth in Patients with Obesity

Sarah H. Abelman; Frank I. Jackson; Nathan A. Keller; Julie Chen; Luis A. Bracero; Matthew J. Blitz
Northwell, New Hyde Park, NY

4:00 PM - 6:00 PM

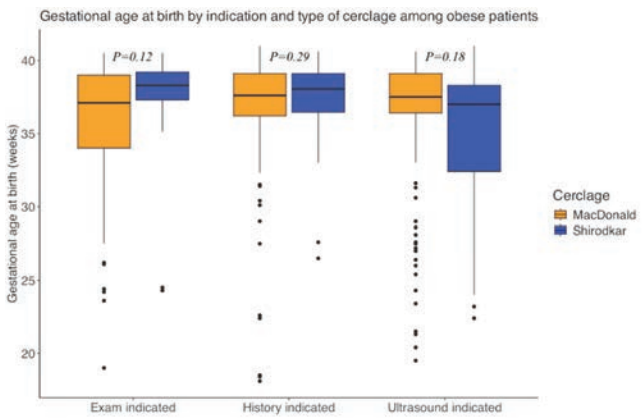
Objective: Differences in outcomes after Shirodkar versus McDonald cerclage techniques remain unclear. Some evidence suggests a potential benefit of Shirodkar cerclage in obese patients. This study aims to compare gestational age at delivery of patients with obesity who received either McDonald or Shirodkar cerclages.

Study Design: This was a retrospective cohort study of all patients with obesity (BMI $\geq$ 30 kg/m^2) who received cerclage during pregnancy between January 2018 and December 2023 within a large health system in New York. The primary exposure was cerclage type. The primary outcome evaluated was gestational age at delivery. Outcomes were compared using a linear mixed model regression analysis, and were then adjusted for maternal age, BMI, nulliparity, history of prior preterm birth, cerclage indication, and gestational age at cerclage placement. A

subgroup analysis was performed based on cerclage indication, additionally adjusting for very short cervix less than 1 cm in the ultrasound-indicated cerclage subgroup.

Results: 517 pregnant patients with obesity who received cerclages were included in this study. 238 (46%) were ultrasound-indicated, 118 (23%) were exam-indicated, and 158 (31%) were history-indicated cerclages. 385 (74%) received a McDonald cerclage and 132 (26%) received a Shirodkar cerclage. The mean gestational age at placement was 17.0 weeks (SD 3.5) for the McDonald group and was 17.3 (SD 3.4) for the Shirodkar group. Unadjusted and adjusted analyses showed no significant difference in pregnancy duration between the two groups, with the mean gestational age at delivery being 36.2 weeks (SD 4.4) for the McDonald group and 35.8 (SD 4.5) for the Shirodkar group (P = 0.48). Subgroup analyses by cerclage indication also showed no difference in gestational age at delivery based on Shirodkar versus McDonald technique (figure 1).

Conclusion: In this large cohort of patients with obesity undergoing cerclage placement during pregnancy, there was no difference in delivery timing based on cerclage technique. Both techniques appear equally effective in prolonging pregnancy.



1181 | Screening and Diagnosis of Gestational Diabetes, and Perinatal Outcomes in Patients with Bariatric Surgery History

Silpa Annavarapu[1]; Charlette Williams[2]; Rodney A. McLaren, Jr., Jr.[3]; Sarah Boudova[4]

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4:00 PM - 6:00 PM

Objective: History of bariatric surgery is increasingly common in pregnancy. The glucose tolerance test (GTT) is the gold standard for diagnosing gestational diabetes (GDM), however individuals with a history of bariatric surgery may not tolerate the sugar load and there is concern that the test may be inaccurate in this population. There are no current ACOG guidelines regarding screening for GDM in patients with a history of bariatric surgery. We aimed to characterize how individuals with a history of bariatric surgery were screened and diagnosed with GDM and describe pregnancy outcomes by screening method.

Study Design: This was a retrospective cohort study of pregnancies with a history of bariatric surgery delivered at a major urban referral hospital from 1/17-12/23. Demographics, bariatric surgery history, GDM screening method, pregnancy outcomes and neonatal outcomes were abstracted. The protocol was IRB approved. Data were analyzed with descriptive statistics.

Results: Of the 192 identified pregnancies with a history of bariatric surgery, 17 (8.9%) had pregestational diabetes and 11(5.7%) had no data on screening and were excluded from analysis. Among the remaining 164 pregnancies, 29 (17.7%) were diagnosed with GDM, and 59 (36.0%) did not complete screening. The most common screening method was exclusive GTT (47, 28.7%), followed by glucose fingersticks (34, 20.7%), followed by mixed screening methods (18, 11.0%) (Table 1). GTT was most commonly used for those with sleeve gastrectomy, while fingersticks were most commonly used for Roux-en-Y. Cesarean delivery occurred in 68, 41.5% pregnancies. Hypertensive disorder of pregnancy occurred in 28, 17.1% pregnancies. The composite adverse neonatal outcome occurred in 40 (24.4%) deliveries and was more common among those diagnosed with GDM (Table 2).

Conclusion: Among pregnancies with a history of bariatric surgery, GDM was common, however, there was a low rate of completed GDM screening. GTT was the most common screening method. Further research is needed to determine the reason for low rates of GDM screening.

Table 1: Demographics of patients by screening method

	GTT only n= 48	Finger stick only n=36	Mixed screening methods n=21	None or incomplete screening n=59
Age* (mean, SD)	32.3 (5.3)	33.6 (4.7)	31.6 (4.7)	31.4 (6.1)
Gravidity (mean, SD)	3.3 (2.5)	4.3 (2.7)	3.0 (2.3)	3.4 (2.2)
Race (n, %):**				
American Indian or Alaska Native	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Asian	2 (4.2%)	0 (0%)	3 (14.3%)	2 (3.4%)
Black or African American	31 (64.6%)	24 (66.7%)	10 (47.6%)	36 (61%)
Native Hawaiian or Other Pacific Islander	0 (0%)	0 (0%)	6 (28.6%)	0 (0%)
White	6 (12.5%)	7 (19.4%)	2 (9.5%)	11 (18.6%)
Other	9 (18.8%)	5 (13.9%)	0 (0%)	9 (15.3%)
Not Specified	0 (0%)	0 (0%)	0 (0%)	1 (1.5%)
Ethnicity (n, %)**				
Hispanic	8 (16.7%)	5 (13.9%)	2 (9.5%)	9 (15.3%)
Non-Hispanic	38 (79.2%)	31(86.1%)	19 (90.5%)	48 (81.4%)
Other	2 (4.2%)	0 (0%)	0 (0%)	1 (1.7%)
Not specified	0 (0%)	0 (0%)	0 (0%)	2 (3.4%)
Insurance type (n,%)				
Government/Federal	23 (47.9%)	27 (75%)	12 (57.1%)	43 (72.9%)
Private	24 (50%)	4 (11.1%)	8 (38.1%)	15 (25.4%)
None	1 (2.1%)	5 (13.9%)	1 (4.8%)	1 (1.7%)
BMI* (mean, SD)	36.9 (6.9)	41 (6.9)	38.1 (5.8)	40.6 (7.5)
Years since bariatric surgery* (mean, SD)	20.3 (5.3)	21.6 (4.7)	19.6 (4.7)	19.4 (6.1)
Type of bariatric surgery (n, %)				
Roux-en-Y Gastric bypass	5 (10.4 %)	19 (52.8%)	5 (23.8%)	15 (25.4%)
Sleeve gastrectomy	43 (90.0%)	16 (44.4%)	16 (76.2%)	38 (64.4%)
Biliopancreatic diversion with duodenal switch	0 (0%)	0 (0%)	0 (0%)	3 (5.1%)
Single-anastomosis duodeno-ileal bypass with sleeve gastrectomy	0 (0%)	0 (0%)	0 (0%)	1 (1.7%)
Gastric banding	0 (0%)	0 (0%)	0 (0%)	1 (1.7%)
Not specified	0 (0%)	1(2.8%)	0 (0%)	1 (1.7%)
Diagnosed with GDM (n, %)	5 (10.4%)	16 (44.4%)	8 (38.1%)	N/A
Early GDM screening performed	6 (12.5%)	7 (19.4%)	12 (57.1%)	29 (49.2%)

*At time of initial obstetric visit
**As self-reported in the electronic medical record

Table 2: Pregnancy and neonatal outcomes by GDM diagnosis and screening method*

	Not diagnosed with GDM					Diagnosed with GDM			
	GTT only n=43	Finger stick only n=20	Mixed screening n=13	None or incomplete screening n=59	Total n=135	GTT only n=5	Finger stick only n=16	Mixed screening n=8	Total n=29
Cesarean delivery (n,%)	19, 44.2%	7, 35%	4, 30.8%	21, 35.6%	**51, 37.8%**	3, 60%	10, 62.5%	4, 50%	**17, 58.6%**
Hypertensive disorder of pregnancy (n, %)	6, 14.0%	0, 0%	3, 23.1%	12, 20.3%	**21, 15.6%**	2, 40%	4, 25%	1, 12.5%	**7, 24.1%**
Gestational hypertension (n,%)	3, 7.0%	0, 0%	2, 15.4%	10, 16.9%	**15, 11.1%**	1, 20%	3, 18.8%	0, 0%	**4, 13.8%**
Preeclampsia (n,%)	3, 7.0%	0, 0%	1, 7.7%	2, 3.4%	**4, 3.0%**	1, 20%	1, 6.3%	1, 12.5%	**3, 10.3%**
Composite adverse neonatal outcome* (n, %)	6, 14.0%	6, 30%	2, 15.4%	14, 23.7%	**28, 20.7%**	3, 60%	4, 25%	4, 50%	**11, 37.9%**
Shoulder dystocia (n,%)	0, 0%	0, 0%	0, 0%	0, 0%	**0, 0%**	1, 20%	0, 0%	1, 12.5%	**2, 6.9%**
Polyhydramnios (n,%)	0, 0%	0, 0%	0, 0%	0, 0%	**0, 0%**	0, 0%	1, 6.3%	0, 0%	**1, 3.4%**
Neonatal weight >4500g (n, %)	1, 2.3%	0, 0%	0, 0%	0, 0%	**1, 0.1%**	0, 0%	0, 0%	0, 0%	**0, 0%**
Neonatal hypoglycemia (n, %)	0, 0%	1, 5%	0, 0%	3, 5.1%	**4, 3.0%**	0, 0%	0, 0%	0, 0%	**0, 0%**
Neonatal hyperbilirubinemia (n, %)	3, 7.0%	3, 15%	1, 7.7%	7, 11.9%	**14, 10.4%**	2, 40%	1, 6.3%	2, 25%	**5, 17.2%**
NICU admission (n, %)	2, 4.7%	2, 10%	0, 0%	6, 10.2%	**10, 7.4%**	0, 0%	3, 18.8%	1, 12.5%	**4, 44.4%**
Neonatal respiratory distress (n, %)	2, 4.7%	0, 0%	1, 7.7%	2, 3.4%	**5, 3.7%**	0, 0%	2, 12.5%	1, 12.5%	**3, 10.3%**

*Composite includes the presence of any of the following: shoulder dystocia, polyhydramnios, neonatal weight >4500g, neonatal hypoglycemia,neonatal hyperbilirubinemia, NICU admission or neonatal respiratory distress

1182 | The Effect of Gestational Weight Gain on Successful Operative Vaginal Delivery

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4:00 PM - 6:00 PM

Objective: Successful operative vaginal delivery (OVD) has been associated with reduced maternal and neonatal morbidity. However, appropriate patient selection is necessary to reduce the risks of failed OVD. Previous studies have shown mixed results regarding the effect of body mass index (BMI) on rates of OVD success. However, no studies have examined the effect of gestational weight gain (GWG) on OVD success. Therefore, we sought to investigate the effect of excessive GWG on OVD success.
Study Design: This was an IRB-approved retrospective cohort study of birth certificate data from our institution from 2014 to 2023. We included singleton, term, vertex livebirths with no major fetal anomalies who attempted OVD. Those with excessive GWG based on the Institute of Medicine guidelines were compared to those with adequate GWG. The primary outcome was successful OVD. Secondary outcomes included composite maternal and neonatal morbidity among those who achieved successful OVD. Logistical regression models estimated the odds ratios (OR) of successful OVD by GWG adjusted for maternal age and race, infant birthweight, gestational diabetes, gestational hypertension, previous cesarean section, prolonged labor, prior vaginal delivery, and BMI.
Results: 2,433 patients were included. 1,055 had adequate GWG (43%). 1,378 had excessive GWG (57%). 2,271 had a successful OVD (93%) and 162 had a failed OVD (7%). OVD was not affected by GWG (aOR 0.99, CI 0.64-1.55). Subgroup analyses based on pre-pregnancy BMI revealed no effect of weight gain on the success rate of OVD across all BMI groups. Finally, there was no difference in both maternal and neonatal outcomes in those with excessive GWG who had a successful OVD (14%, p-value 0.6 versus 14% for those with adequate GWG and 14%, p-value 0.095 versus 11% for those with adequate GWG, respectively).
Conclusion: Excessive GWG is not associated with a reduction in the rate of successful OVD or with adverse maternal or neonatal outcomes in those who do achieve successful OVD. Excessive GWG should not be considered a relative contraindication to OVD.

Table 1: Multivariate analysis of operative vaginal delivery success by GWG

Characteristic	OR[1]	95% CI[1]	p-value
Year	1.02	0.96, 1.08	0.6
Maternal Age	0.97	0.94, 1.00	0.091
Maternal Race			
1. White, NH	—	—	
2. Black, NH	0.66	0.41, 1.10	0.10
3. Other, NH	0.92	0.54, 1.71	0.8
4. Hispanic	0.52	0.28, 1.01	0.039
Infant Bwgt	1.00	1.00, 1.00	0.001
Gest. Diabetes	0.48	0.28, 0.86	0.010
Gest. HTN	0.90	0.38, 2.55	0.8
Previous CS	0.64	0.37, 1.18	0.13
Prolonged Labor	0.46	0.17, 1.63	0.2
Prepregnancy BMI	0.98	0.88, 1.09	0.7
Delivery BMI	0.98	0.88, 1.10	0.7
Weight Gain			
1. Adequate	—	—	
2. Excessive	0.99	0.64, 1.55	>0.9

[1]OR = Odds Ratio, CI = Confidence Interval

Table 2: Neonatal and maternal outcomes among those with successful OVD by GWG

Characteristic	1. Adequate, N = 990[1]	2. Excessive, N = 1,281[1]	p-value[2]
Neonatal Composite	**112 (11%)**	**175 (14%)**	**0.095**
Immediate Ventilation	75 (7.6%)	109 (8.5%)	0.4
Ventilation > 6hrs	6 (0.6%)	11 (0.9%)	0.5
NICU Admission	68 (6.9%)	112 (8.7%)	0.10
Seizures/Neurologic Dysfunction	0 (0%)	2 (0.2%)	0.5
Significant Birth Injury	0 (0%)	1 (<0.1%)	>0.9
5 Min Apgar < 7	17 (1.7%)	20 (1.6%)	0.8
Maternal Composite	**143 (14%)**	**175 (14%)**	**0.6**
Maternal Transfer	3 (0.3%)	3 (0.2%)	>0.9
3rd or 4th Degree Laceration	135 (14%)	165 (13%)	0.6
ICU Admission	0 (0%)	0 (0%)	
Unplanned Hysterectomy	0 (0%)	0 (0%)	
Unplanned OR Procedure	8 (0.8%)	11 (0.9%)	0.9

[1]n (%)

[2]Pearson's Chi-squared test; Fisher's exact test

1183 | Monogeneic Disorder (MD) Screening using Cell-Free DNA (cfDNA) In Routine Practice

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4:00 PM - 6:00 PM

Objective: More pregnancies are affected by MDs than by trisomy 21. MDs are often not identified on ultrasound, standard invasive testing, or microarray. Clinical studies of cfDNA detection of MD report >99% sensitivity and specificity, with a 1:600 incidence of positive results in a high-risk population. We sought to determine (1) the feasibility of offering routine cfDNA for MD, (2) false positive rate of MD diagnosed at the time of cfDNA for

aneuploidy, (3) accuracy of cfDNA for MD when routinely offered to low-risk patients.

Study Design: From 10/11/2021-7/15/2024 all patients in a single obstetrical practice were offered MD screening (25 conditions in 47 genes) at the time of cfDNA screening for aneuploidy. Patients with egg donors, multiple gestation, and vanishing twins were excluded, as were those who had testing for ultrasound findings or other risk factors. Genetic counseling, diagnostic CVS/amniocentesis, and parental testing were recommended for patients with positive results. Repeat testing was recommended for patients who did not receive a result.

Results: 1831 pregnancies in 1746 women were included. Results were positive in 5 pregnancies (0.28%) (**Table**), negative in 1730 (94%), and 96 (5.2%) received no initial result. 75/96 patients repeated testing: 63 were negative and 12 did not result (0.66% final no-call rate). Of the positive tests, 4 were true positive on confirmatory testing with CVS or amniocentesis and one was negative for both fetus and parents. MD testing was positive in 1:366 patients; incidence of the disorders was 1:458. False positive results occurred in < 1% of tests.

Conclusion: MDs affected >1:500 pregnancies. Screening for MDs is not recommended by professional societies or offered as part of routine care. Screening for MD in low-risk pregnancies is feasible. MD screening in the general population should be considered, as it is unlikely to significantly increase unnecessary invasive testing and may prenatally diagnose conditions and afford women reproductive choice in the current pregnancy and the future.

Table: Summary of positive cfDNA results

ID	Gene (Condition)	cfDNA sent (GA)	cfDNA returned (GA)	Confirmatory test returned (GA)	Fetal/Maternal results	Pregnancy outcome
1	PTPN11 (Noonan)	10w3d	13w1d	20w2d	+/+	TOP
2	MECP2 (Rett)	9w6d	11w5d	14w2d	+/-	TOP
3	FGFR3 (Hypochondroplasia)	11w0d	13w4d	17w0d	+/+	Ongoing
4	COL1A1 (OI)	10w2d	12w5d	16w5d	+/+	Term Delivery
5	COL1A1 (OI)	10w0d	13w1d	17w2d	-/-	Ongoing

Abbreviations: GA Gestational Age; OI | Osteogenesis imperfecta; TOP Termination of pregnancy

1184 | Tighter Blood Pressure Control Targets to Reduce Adverse Pregnancy Outcomes for Patients with Chronic Hypertension

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4:00 PM - 6:00 PM

Objective: The Chronic Hypertension and Pregnancy (CHAP) Trial demonstrated improved outcomes for pregnant women with mild chronic hypertension (HTN) assigned strict blood pressure (BP) target of ≤ 140/90 compared to controls with target of ≤ 160/110. CHAP-based treatment guidelines were implemented at our health system in 2022. We hypothesize that implementation of CHAP guidelines in a large, socio-demographically diverse population reduced HTN-related morbidity.

Study Design: This is a retrospective cohort study of singleton pregnancies with a known or new diagnosis of mild HTN receiving prenatal and delivery care at a large regional health system in 2021 and 2023. In April 2022, BP targets of ≤ 140/90 were implemented. We compared 2021 with 2023 deliveries, with 2022 a washout period. Multiple gestations, major fetal anomalies, > 1 baseline antihypertensive, phospholipid syndrome or HTN-related cardiac or kidney disease were excluded. Primary outcome per CHAP was a composite of medically indicated preterm birth before 35 weeks, superimposed preeclampsia with severe features, placental abruption & perinatal death. Secondary outcomes included small-for-gestational-age and preterm birth before 37. Outcome adjusted odds ratios were generated via regression analyses controlling for maternal age, body mass index, public insurance, history of preeclampsia, and pre-existing diabetes.

Results: Of 1626 pregnant women with HTN, 134 were excluded for twins, congenital anomalies, >1 baseline antihypertensive or HTN-related comorbidities. Of the 1492 remaining, 710 were pre-, while 782 were post-implementation. The post-intervention group had higher BMI and higher public payor insurance status (Table 1). The primary composite outcome occurred in 30.9% of pre-implementation pregnancies compared to 29.2% of post-implementation pregnancies (aOR 0.84, 95% CI 0.66-1.09). Medically indicated delivery before 35 weeks was lower in the post-intervention group (10.4% vs 12.1%, aOR 0.7, 95% CI 0.47-0.99, Table 2).

Conclusion: Tighter BP control targets did not reduce the CHAP-defined outcome.

	Pre-Implementation (n=710)	Post-Implementation (n=782)	P
Median Age at Delivery	31.0 [27.0, 35.0]	32.0 [27.0, 35.0]	0.391
Median BMI	33.46 [27.13, 39.76]	35.04 [29.05, 41.48]	0.004
Hispanic	25 (3.5%)	22 (2.8%)	0.526
Black	451 (63.6%)	476 (60.9%)	0.315
Public Payor Status	283 (39.9%)	469 (60.1%)	<0.001
Type I Diabetes	6 (0.8%)	10 (1.3%)	0.575
Type II Diabetes	31 (4.4%)	33 (4.2%)	0.991
HIV	5 (0.7%)	3 (0.4%)	0.623
Hx Cesarean Section	20 (2.8%)	41 (5.2%)	0.026

Table 1. Baseline characteristics of patients with chronic hypertension before and after implementation of strict blood pressure targets.

	Pre-Implementation (n=710)	Post-Implementation (n=782)	aOR	95% Confidence Interval
Primary Composite Outcome	219 (30.9%)	228 (29.2%)	0.84	0.66, 1.09
Secondary Outcomes				
Superimposed Preeclampsia w/SF	128 (18.1%)	146 (18.7%)	0.95	0.7, 1.28
Medically Indicated Preterm Birth	86 (12.1%)	81 (10.4%)	0.68	0.47, 0.99
Placental Abruption	5 (0.7%)	4 (0.5%)	1.13	0.22, 5.83
Perinatal Death	24 (3.4%)	21 (2.7%)	0.72	0.35, 1.48
SGA	66 (9.3%)	56 (7.2%)	0.75	0.48, 1.16
Overall Preterm Birth	202 (28.5%)	201 (25.7%)	0.71	0.55, 0.92

Table 2. Pregnancy outcomes of patients with chronic hypertension before and after implementation of strict blood pressure targets.

1185 | Intertwin EFW Discordance and Perinatal Loss in Monochorionic Diamniotic Twins with Selective Fetal Growth Restriction

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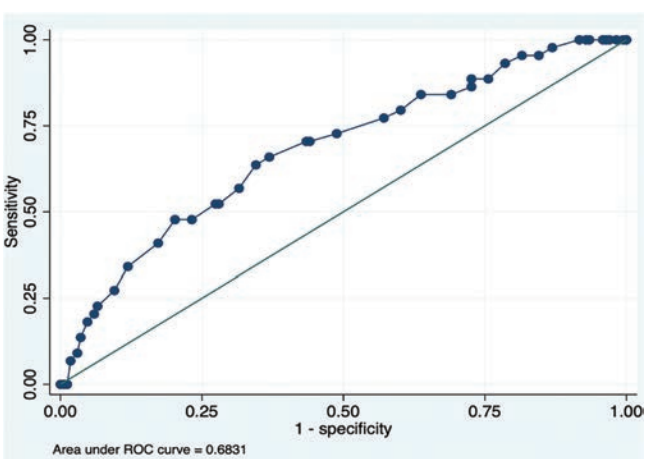
4:00 PM - 6:00 PM

Objective: To identify the association between the degree of intertwin estimated fetal weight (EFW) discordance and perinatal loss in monochorionic diamniotic (MCDA) twin pregnancies complicated by selective fetal growth restriction (sFGR).

Study Design: Single center retrospective review of MCDA twins diagnosed with sFGR that opted for expectant management between 2010-2021. The relationship between intertwin EFW discordance and perinatal loss was evaluated using receiver–operating characteristics (ROC) and survival analysis to identify the optimal cut-off for EFW discordance. The 2 groups of different intertwin discordance were compared to evaluate and identify other risk factors.

Results: A total of 212 MCDA twin pregnancies with sFGR underwent expectant management in the study period. 18 pregnancies (8.5%) were dual demise and 11 (5.2%) had demise of one fetus. Of those born alive, dual neonatal demise was seen in 5 (2.4%) pregnancies whereas neonatal demise of one twin was seen in 11 pregnancies (5.2%). Further, of the 11 pregnancies with one fetal demise, 5 (2.4%) had neonatal demise. Total perinatal loss rate was 73 fetuses/neonates (17.2%) of 424 (212 twins). The area under curve (AUC) ROC curve for intertwin EFW discordance and perinatal loss was 0.68 [95% CI 0.59-0.78] with a p-value of 0.0001 (Graph 1). A discordance of ≥ 33% was 56.82% sensitive and 68.45% specific in predicting perinatal loss. The gestational age at delivery and two survivors to discharge were significantly lower in pregnancies with a discordance of ≥ 33% (Table). Kaplan–Meier analysis showed that pregnancies with a discordance of ≥ 33% had a significantly lower survival trend with a p-value of 0.0001 and hazards ratio for risk of perinatal loss of 3.83 [95% CI 1.85-7.95] (Graph 2).

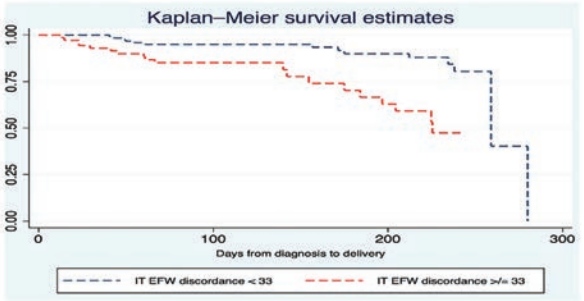
Conclusion: Intertwin EFW discordance of ≥ 33% can be used as the optimal cut-off for prediction of perinatal loss in cases of MCDA twin with sFGR.



AUC for intertwin EFW discordance and perinatal loss

	Intertwin EFW discordance < 33% (N=134)	Intertwin EFW discordance ≥ 33% (N=78)	P value
Maternal age, years	31 [26-35]	30 [26.7-33]	0.45
BMI, kg/m²	26.9 [24.5-31.4]	27.4 [24.6-31.3]	0.84
GA at evaluation, weeks	20.1 [17.5-21.5]	19.3 [17.4-22.4]	0.96
Anterior placenta, N(%)	59 (44.0)	36 (46.2)	0.78
%age IW EFW discordance	25 [21-29]	37 [35-40.3]	<0.0001
sFGR type I, N(%)	82 (61.2)	41 (52.6)	0.25
sFGR type II, N(%)	14 (10.4)	9 (11.5)	0.82
sFGR type III, N(%)	38 (28.4)	28 (35.9)	0.28
GA at delivery, weeks	32.4 [30-34.1]	31.6 [28.3-34]	0.04
Two live births, N(%)	123 (91.8)	60 (76.9)	0.003
Two survivors to discharge, N(%)	114 (85.1)	53 (67.9)	0.005

Results are given in [median, interquartile range] or proportions. (BMI=body mass index; GA=gestational age; %age=percentage; IW=intertwin; EFW=estimated fetal weight; sFGR=selective fetal growth restriction)



1186 | A Scoring System for Estimating Risk of Perinatal Loss in Monochorionic Diamniotic Twins with sFGR

Shelly Soni[1]; Juliana S. Gebb[2]; Christina Paidas Teefey[1]; Edward R. Oliver[2]; Julie S. Moldenhauer[1]; Nahla Khalek[1]

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4:00 PM - 6:00 PM

Objective: To evaluate a novel scoring system based on markers of placental insufficiency and fetal physiology that can assist in predicting perinatal loss in monochorionic diamniotic (MCDA) twins complicated by selective fetal growth restriction (sFGR).

Study Design: Single center retrospective review of MCDA twins diagnosed with sFGR that opted for expectant management between 2010-2021. Various demographic and outcome variables were compared in pregnancies with and without perinatal loss. Significant variables were analyzed in a multiple logistic regression model with backward elimination method to identify factors predictive of perinatal loss. The identified significant factors were re-run in multiple logistic regression to assess individual effect on outcomes. A score was then assigned based on the strength of the effect. The relationship between the assigned score and perinatal loss was evaluated using receiver–operating characteristics (ROC) and survival analysis to identify optimal cut-off.

Results: A total of 212 MCDA twin pregnancies with sFGR underwent expectant management in the study period. Perinatal loss occurred in 44 pregnancies (20.8%). Of the significant variables from univariate analysis (Table 1); intertwin EFW discordance, and abnormal findings in growth restricted twin including low amniotic fluid, abnormal UA Dopplers and abnormal MCA Dopplers were identified as significant in the stepwise multiple logistic regression. These variables were re-entered into a logistic regression model and a score was assigned according to the relative contribution of each variable in this model (Table 2). The area under ROC curve(AUC) for the score and perinatal loss was 0.78 [95% CI 0.7-0.85] with a p-value of 0.0001 (Graph 1). A score of ≥ 3 was 70.5% sensitive and 76.2% specific in predicting perinatal

loss. Kaplan–Meier analysis showed that pregnancies with a high score (≥ 3) had a significantly lower survival trend with a p-value of < 0.0001 (Graph 2).

Conclusion: This novel scoring system in MCDA twins with sFGR can be used to assess risk of perinatal loss that can be used to assist in counseling.

Table 1: Univariate analysis of various variables in pregnancies with and without perinatal loss

ALL Subjects (n=212)	Perinatal loss N=44	No perinatal loss N=168	p-value
Maternal age, years	29 [25.3-34]	31 [27-34]	0.45
BMI, kg/m²	29.3 [25.5-32.6]	26.8 [24.4-31]	0.14
Anterior placenta, N(%)	20 (45.5)	75 (44.6)	1.00
GA at initial consult, weeks	19.9 [17.0-21.5]	19.6 [17.5-22.1]	0.26
% age intertwin EFW discordance	34 [28-39]	28 [23-34]	0.0002
IW EFW discordance ≥ 33%, N(%)	25 (56.8)	53 (31.5)	0.003
IW EFW discordance ≥ 35%, N(%)	21 (47.7)	34 (20.2)	0.0004
Type of sFGR, N(%)			
Type I	17 (38.6)	106 (63.1)	0.006
Type II	10 (22.8)	13 (7.7)	0.01
Type III	17 (38.6)	49 (29.2)	0.27
Low AF in GR fetus (DVP < 2), N(%)	15 (34.1)	20 (11.9)	0.001
Abnormal UA Dopplers in GR fetus, N(%)	27 (61.4)	62 (36.9)	0.005
Abnormal DV dopplers in GR fetus, N(%)	12 (27.3)	16 (9.5)	0.005
Abnormal MCA Dopplers in GR fetus, N(%)	13 (29.5)	16 (9.5)	0.002
GA delivery, weeks	26.4 [23.6-30]	32.5 [30.6-34.1]	<0.0001

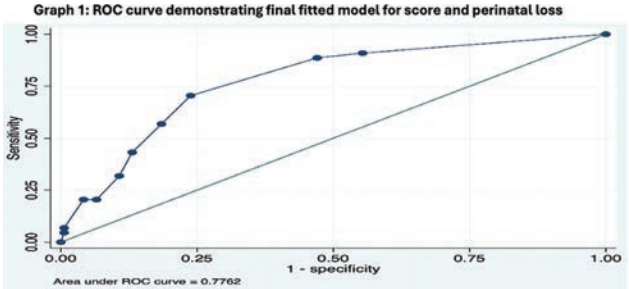
Results are given in [median, interquartile range] or proportions. (BMI=body mass index; GA=gestational age; %age=percentage; IW=intertwin; EFW=estimated fetal weight; AF=amniotic fluid; GR=growth restricted; UA=umbilical artery; DV=ductus venosus; MCA=middle cerebral artery)

Table 2: Logistic regression model to assess relative contribution of each variable

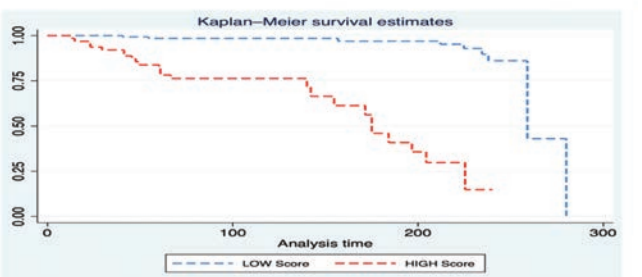
Variables	Odds ratio	Std. err.	p-value	95% CI
IW EFW discordance ≥ 35%	2.4	0.9	0.02	1.1-5.2
Low AF	3.1	1.4	0.008	1.3-7.4
Abnormal UA Dopplers	2.5	0.9	0.01	1.2-5.3
Abnormal MCA Dopplers	3.1	1.4	0.01	1.3-7.6

(IW=intertwin; EFW=estimated fetal weight; AF=amniotic fluid; UA=umbilical artery; DV=ductus venosus; MCA=middle cerebral artery)

Graph 1: ROC curve demonstrating final fitted model for score and perinatal loss



Graph 2: Kaplan-Meier survival estimates of pregnancies with low score (<3) and high score (≥3)



1187 | Association Between Being Born Small for Gestational Age and the Risk for Childhood Celiac Disease

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4:00 PM - 6:00 PM

Objective: Celiac disease is a common immune disorder, frequently associated with other autoimmune conditions. Autoimmunity is recognized as a potential factor contributing to placental insufficiency, by affecting placental development and structure, which may lead to fetal growth restriction. Based on the possible correlation between autoimmunity, celiac disease and placental insufficiency, we sought to investigate whether small for gestational age (SGA) newborns are at an increased risk of developing celiac disease during childhood.

Study Design: A population-based cohort study was conducted to evaluate the risk of celiac disease during childhood (up to the age of 18 years) among individuals who were born SGA between the years 1991-2021, in a single tertiary medical center. Data for the diagnosis of celiac disease was extracted from community-based clinics and hospitalization records. Kaplan-Meier survival curve was used to compare the cumulative incidence of celiac disease between the study groups (SGA vs. no SGA). A cox proportional hazards model was used to control for confounders.

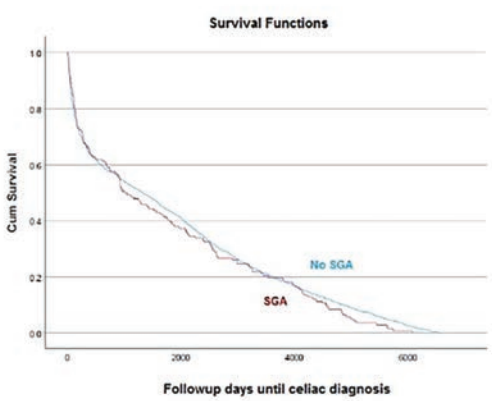
Results: During the study period, 356,356 newborns were included in the analysis; of which 16,210 (4.5%) were born SGA. Being born SGA was associated with higher risk for celiac disease as compared to children who were not born SGA (0.9% vs 0.5%, P< 0.001, Table). However, the Kaplan-Meier survival curve did not demonstrate higher cumulative incidence rates of celiac disease in infants born SGA (Log Rank p = 0.287, Figure). Likewise, using a Cox proportional hazards model, adjusted for maternal celiac disease, maternal age and gestational age at birth, the finding was no longer statistically significant (adjusted HR 1.10, 95% CI 0.92-1.30, p = 0.274, Table).

Conclusion: According to our results, being born SGA is not an independent risk factor for long-term childhood celiac disease.

The association between being born SGA and celiac disease; univariable analysis, Kaplan-Meier survival curve and a Cox proportional hazards model

	SGA (n=16,210) n (%)	No SGA (n=340,146) n (%)	OR (95% CI)	P value	Adjusted HR* (95% CI)	P* value
Celiac disease	142 (0.9%)	1819 (0.5%)	1.6 (1.38-1.95)	<0.001	1.1 (0.92-1.30)	0.274

*Adjusted for gestational age, maternal age at birth and maternal celiac disease



1188 | Risk of Severe Maternal Morbidity in Pregnant People with Malignant Neoplasm Using a Population Database

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4:00 PM - 6:00 PM

Objective: The objective of this study was to determine the difference in odds of severe maternal morbidity (SMM) in people with and without malignant neoplasm in pregnancy using a real-world sample derived from TriNetX, a research network containing de-identified electronic health record data from 93 health care organizations and > 131 million patients.

Study Design: This population-based, retrospective cohort study queried TriNetX from inception to 8/2024 for subjects 12-55 years with a diagnosis of pregnancy. Two cohorts were derived: subjects with and without active diagnosis of any malignant neoplasm within one year prior to, or up to one month after, first instance of pregnancy. Cohorts were propensity score matched 1:1 based on demographic characteristics (age, race, and ethnicity) and comorbidities (diabetes, hypertension, obesity, cardiovascular disease, asthma, and tobacco use) by TriNetX analysis tools. SMM was defined as CDC's 21 indicators and corresponding ICD-10 codes. The primary outcome was difference in odds ratio (OR) between cohorts of composite SMM occurring up to one year after first instance of pregnancy. Secondary outcomes were differences in odds of individual indicators of SMM. All statistical analyses were conducted 8/2024 using the TriNetX platform.

Results: Of 5567972 pregnant subjects, 5373233 had no malignancy history. After propensity score matching, subjects with and without (n = 51484 for both) malignant neoplasm in pregnancy were analyzed (Table). Subjects with malignant neoplasm in pregnancy had significantly higher odds of composite SMM (OR 3.43 (95% CI 3.24-3.64), p< 0.001) compared to those without malignant neoplasm in pregnancy. Cases of malignant neoplasm in pregnancy had significantly higher odds of all individual indicators of SMM compared to controls, except for eclampsia (Table).

Conclusion: Subjects with malignant neoplasm in pregnancy had over threefold increased odds of composite SMM, as well as significantly increased odds of 16 of the 21 individual indicators of SMM, compared to those without malignancy in pregnancy.

TABLE. Severe maternal morbidity (SMM) in patients with malignant neoplasm in pregnancy

SMM Indicator	Rate of SMM		Odds Ratio	95% Confidence Interval (lower limit, upper limit)	p value
	Malignant Neoplasm in Pregnancy (n=51484)	Pregnancy, No Cancer History (n=51484)			
Composite	12.9%	4.1%	3.43	(3.24, 3.64)	<0.001
Acute myocardial infarction	1.7%	0.6%	2.79	(2.44, 3.18)	<0.001
Aneurysm and dissection	0.5%	0.2%	2.80	(2.22, 3.53)	<0.001
Acute renal failure	1.4%	0.6%	2.40	(2.09, 2.75)	<0.001
Acute respiratory distress syndrome	7.7%	2.2%	3.76	(3.50, 4.05)	<0.001
Amniotic fluid embolism	0%	0%	~	~	N/A
Cardiac arrest/ventricular fibrillation	0.5%	0.2%	2.70	(2.12, 3.43)	<0.001
Conversion of cardiac rhythm	0.1%	0.1%	1.84	(1.20, 2.84)	0.005
Disseminated intravascular coagulation	4.3%	1.3%	3.30	(3.02, 3.61)	<0.001
Blood transfusion	1.2%	0.7%	1.90	(1.66, 2.17)	<0.001
Eclampsia	0.2%	0.2%	1.02	(0.77, 1.35)	0.910
Heart failure/arrest during surgery or procedure	0.0%	0.0%	~	~	N/A
Puerperal cerebrovascular disorders	4.5%	1.2%	3.69	(3.37, 4.05)	<0.001
Pulmonary edema/acute heart failure	1.9%	0.8%	2.58	(2.29, 2.90)	<0.001
Severe anesthesia complications	0%	0%	~	~	N/A
Sepsis	2.1%	0.7%	3.17	(2.80, 3.58)	<0.001
Shock	1.0%	0.4%	2.71	(2.30, 3.20)	<0.001
Sickle cell disease with crisis	0.0%	0.0%	~	~	N/A
Air and thrombotic embolism	1.7%	0.6%	2.97	(2.60, 3.39)	<0.001
Hysterectomy	0.6%	0.2%	3.54	(2.78, 4.50)	<0.001
Temporary tracheostomy	0.1%	0.1%	2.21	(1.42, 3.43)	<0.001
Ventilation	0.5%	0.2%	2.08	(1.66, 2.59)	<0.001

1189 | Prevalence of Severe Maternal Morbidity Associated with Different Cancer Types in Pregnancy

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4:00 PM - 6:00 PM

Objective: To describe prevalence of composite severe maternal morbidity (SMM) in the top ten most common types of female cancers in the United States using a real-world sample derived from TriNetX, a research network containing de-identified electronic health record data from 93 health care organizations and > 131 million patients.

Study Design: This descriptive cohort study queried TriNetX from inception to 8/2024 for subjects 12-55 years with a diagnosis of malignant neoplasm within one year prior to, or up to one month after, first instance of pregnancy. A cohort of all malignant neoplasm types, further subdivided by individual types, were analyzed. Included malignant neoplasm types were identified from CDC's most recently reported female cancer types associated with new cancer diagnoses, or cancer deaths, in the United States. SMM was defined as CDC's 21 indicators and corresponding ICD-10 codes. The primary outcome was prevalence of composite SMM occurring up to one year after first instance of pregnancy. Secondary outcomes included prevalence of individual indicators of SMM. All descriptive analyses were conducted 8/2024 using the TriNetX platform.

Results: There were 51484 individuals with malignant neoplasm in pregnancy. Mean age was 32.4 years and comorbid conditions included hypertension (12.3%), diabetes mellitus (11.1%), obesity (13.6%), asthma (11.3%) and tobacco use (13.0%). Breast cancer and skin cancer/melanoma were the most common malignancies co-occurring with pregnancy (Table). The prevalence of composite SMM for all cancer type in pregnancy was 12.9% with morbidity most often acute respiratory distress syndrome (7.7%) (Table). Composite SMM prevalence was highest for liver/bile duct cancer (17.4%). Thyroid cancer in pregnancy had the lowest composite SMM rate of 6.5%.

Conclusion: Close to one in eight patients with a malignant neoplasm in pregnancy will experience SMM, with prevalence of composite SMM differing by malignancy type. Further research is needed to evaluate the short- and long-term outcomes of patients with cancers during pregnancy.

Table. Prevalence of severe maternal morbidity associated with different cancer types in pregnancy

Population	Composite SMM Rate (%)	Most Prevalent Individual Indicators of SMM		
		First	Second	Third
All Cancer in Pregnancy (n=51484)	12.9	ARDS (7.7%)	PCD (4.5%)	DIC (4.3%)
Cancer Type in Pregnancy				
Liver and Bile Duct (n=1274)	17.4	ARDS (11.6%)	PCD (4.6%), Sepsis (4.6%)	DIC (4.4%)
Colorectal (n=7570)	17.2	ARDS (11.6%)	DIC (5.5%)	PCD (5.0%)
Uterus (n=2395)	16.4	ARDS (8.9%)	PCD (5.1%)	DIC (4.6%)
Lung (n=2143)	15.8	ARDS (10.8%)	PCD (6.2%)	DIC (5.7%)
Ovary (n=1700)	15.2	ARDS (5.7%)	PCD (5.0%)	DIC (3.5%)
Pancreas (n=533)	14.9	ARDS (9.3%)	PCD (5.7%)	DIC (4.8%)
Leukemia (n=2333)	14.8	ARDS (8.5%)	Sepsis (5.8%)	DIC (5.1%)
Kidney and Renal Pelvis (n=754)	14.7	ARDS (7.9%)	PCD (7.4%)	DIC (4.8%)
Breast (n=9937)	14.4	ARDS (8.5%)	PCD (5.2%)	DIC (4.3%)
Non Hodgkin's Lymphoma (n=2487)	13.2	ARDS (8.9%)	DIC (5.8%)	PCD (5.7%)
Brain (n=719)	12.6	PCD (6.6%)	ARDS (4.4%)	Sepsis (4.1%)
Skin and Melanoma (n=9342)	10.7	ARDS (7.6%)	DIC (4.1%)	PCD (4.0%)
Thyroid (n=2708)	6.5	ARDS (3.8%)	PCD (2.8%)	DIC (2.6%)

Abbreviations: ARDS= acute respiratory distress syndrome, DIC = disseminated intravascular coagulation, PCD = puerperal cerebrovascular disorder, SMM = severe maternal morbidity

1190 | Risk of Severe Maternal Morbidity Among Pregnant People with Breast Cancer Using a Population Database

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4:00 PM - 6:00 PM

Objective: A new breast cancer diagnosis is more common than all other cancer types in females 15-39 years in the United States and is the second leading cause of female cancer deaths. Our objective was to determine the odds of severe maternal morbidity (SMM) in breast cancer in pregnancy using TriNetX, a research network containing real-world data from 93 health care organizations and > 131 million patients.

Study Design: This retrospective cohort study queried TriNetX from inception to 8/2024 for subjects 12-55 years with a pregnancy diagnosis. Two cohorts were derived: (1) individuals with an active diagnosis of breast cancer 1 year prior to, or up to 1 month after, first instance of pregnancy and (2) those without a history of any cancer type in pregnancy. Cohorts were propensity score matched 1:1 by demographics and comorbidities by TriNetX built-in analysis tools. SMM was defined as CDC's 21 indicators and corresponding ICD-10 codes. The primary outcome was odds ratio (OR) between cohorts of composite SMM occurring up to 1 year after first instance of pregnancy. Secondary outcomes were odds of individual indicators of SMM. All statistical analyses were conducted in the TriNetX platform.

Results: Propensity score matching yielded 9937 cases of breast cancer in pregnancy and 9937 cases of pregnancy without cancer history (Table). Subjects with breast cancer in pregnancy had significantly higher odds of composite SMM (OR 3.61 (95% confidence interval (CI) 3.17-4.12), p< 0.001) compared to those without malignancy in pregnancy. The odds of acute respiratory distress syndrome (ARDS) were highest (OR 3.89 (95% CI 3.31-4.56), p< 0.001), followed by cerebrovascular disorders (OR 3.30 (95% CI 2.73-3.98), p< 0.001) and disseminated intravascular coagulation (DIC) (OR 3.01 (95% CI 2.47-3.67), p< 0.001).

Conclusion: Individuals with breast cancer in pregnancy have more than three-fold increased odds of composite SMM compared to those without cancer history, with considerably higher risk of ARDS, cerebrovascular disorders, and DIC.

TABLE. Severe maternal morbidity (SMM) in pregnant people with breast cancer

SMM Indicator	Rate of SMM		Odds Ratio	95% Confidence Interval (lower limit, upper limit)	p value
	Breast Cancer in Pregnancy (n=9937)	Pregnancy without Cancer (n=9937)			
Composite	14.5%	4.5%	3.61	(3.17, 4.12)	<0.001
Acute myocardial infarction	1.6%	0.6%	2.51	(1.86, 3.39)	<0.001
Aneurysm and dissection	0.5%	0.3%	1.90	(1.18, 3.06)	0.007
Acute renal failure	1.2%	0.6%	1.95	(1.42, 2.68)	<0.001
Acute respiratory distress syndrome	8.5%	2.3%	3.89	(3.31, 4.56)	<0.001
Amniotic fluid embolism	0%	0%	~	~	N/A
Cardiac arrest/ventricular fibrillation	0.5%	0.3%	1.68	(1.05, 2.68)	0.029
Conversion of cardiac rhythm	0.1%	0.1%	1.00	(0.42, 2.40)	0.998
Disseminated intravascular coagulation	4.3%	1.5%	3.01	(2.47, 3.67)	<0.001
Blood transfusion	0.8%	0.6%	1.23	(0.88, 1.72)	0.234
Eclampsia	0.2%	0.1%	1.49	(0.73, 3.01)	0.267
Heart failure/arrest during surgery or procedure	0.1%	0.1%	1.00	(0.42, 2.40)	0.999
Puerperal cerebrovascular disorders	5.2%	1.6%	3.30	(2.73, 3.98)	<0.001
Pulmonary edema/acute heart failure	2.1%	0.9%	2.27	(1.77, 2.93)	<0.001
Severe anesthesia complications	0%	0%	~	~	N/A
Sepsis	1.8%	0.6%	2.88	(2.14, 3.87)	<0.001
Shock	0.9%	0.5%	1.94	(1.35, 2.80)	<0.001
Sickle cell disease with crisis	0.1%	0.1%	1.00	(0.42, 2.41)	0.999
Air and thrombotic embolism	1.8%	0.7%	2.68	(2.01, 3.58)	<0.001
Hysterectomy	0.2%	0.1%	1.65	(0.85, 3.21)	0.136
Temporary tracheostomy	0.1%	0.1%	1.00	(0.42, 2.40)	0.999
Ventilation	0.2%	0.2%	0.83	(0.46, 1.50)	0.536

1191 | Timing of Alpha-Feto Protein (AFP) Screening: Unveiling the Best Predictor for Adverse Pregnancy Outcomes

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4:00 PM - 6:00 PM

Objective: AFP at second trimester is used for prediction of neural tube defects and adverse pregnancy outcomes (APO). We hypothesized that first trimester is a better time for screening APOs than second trimester.

Study Design: This secondary analysis of a prospective cohort study included 2,245 patients. Pregnancies with known structural or chromosomal abnormalities, multifetal gestation, or incomplete data were excluded. Primary outcomes were preterm premature rupture of membranes (PPROM), preterm delivery (PD), and composite outcomes (CO: any occurrence of PPROM, PD, placental abruption, or preeclampsia). Alpha-fetoprotein (AFP) levels were measured in the first and second trimesters. A cutoff of 1.33 multiples of the median (MoM) for first trimester AFP, determined via receiver operating curve analysis, was used to predict adverse pregnancy outcomes (APOs) in the 1,713 first-trimester cases. The routine 2.5 MoM threshold was applied for second trimester AFP. A statistical model, adjusted for common risk factors (maternal age, sepsis, chronic hypertension, and preeclampsia), was used to assess associations with APOs, and

the predictive values of first and second trimester AFP levels were compared in the statistical model.

Results: In the final analysis, 1,224 patients were included (Figure 1). Those with elevated first trimester AFP were more likely to be nulliparous (53.4% vs. 36.0%, p< 0.001) and have elevated second trimester AFP (5.54% vs. 0.65%, p< 0.001). Adjusted odds ratios for elevated first trimester AFP were 2.28 (p = 0.004) for PPROM, 3.42 (p< 0.001) for PD, and 1.66 (p = 0.009) for CO. A high negative predictive value (92.4-96.6%) was observed (Table 1). More patients with APOs were detected using first trimester AFP compared to second trimester AFP (p< 0.001 for all, Table 2).

Conclusion: First trimester AFP is a reliable biomarker with a high negative predictive value for excluding pregnancies at risk for APOs. In our study, it effectively replaced second trimester AFP, potentially eliminating the need for second trimester blood draws in care centers with advanced ultrasound capabilities.

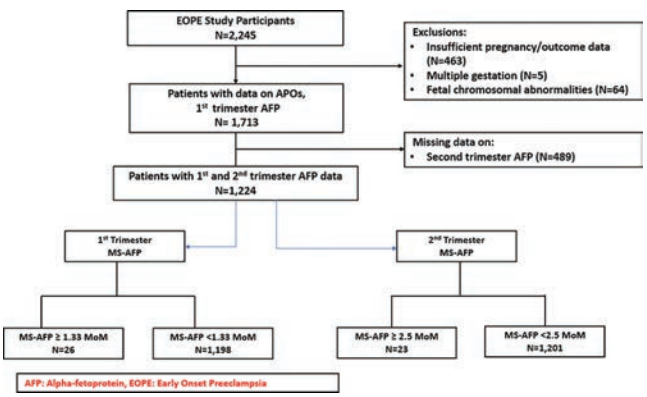

Table 1: Test Characteristics for Adverse Pregnancy Outcomes by 1st Trimester MS-AFP ≥ 1.33 MoM

	PPROM	PTD	CO
Sensitivity	42.5	51.3	32.08
Specificity	75.7	75.1	75.96
PPV	7.49	20.68	16.61
NPV	96.62	92.46	88.22

Table 2: Comparisons of number of APOs detected by 1st and 2nd trimester AFP

	1st trimester MS-AFP ≥ 1.33	2nd trimester MS-AFP ≥ 2.5	P value
PPROM	23/56 (41%)	3/56 (5%)	<0.0001
PTD	19/40 (48%)	3/40 (8%)	<0.0001
CO	67/205 (33%)	10/205 (5%)	<0.0001

PPROM: preterm premature rupture of membranes, PTD: Preterm delivery, CO: Composite outcome, PPV: Positive predictive value, NPV: Negative predictive value, AFP: Alpha feto protein

1192 | The Diagnostic Accuracy of the sFlt-1/PlGF Ratio vs. PlGF alone for Preeclampsia

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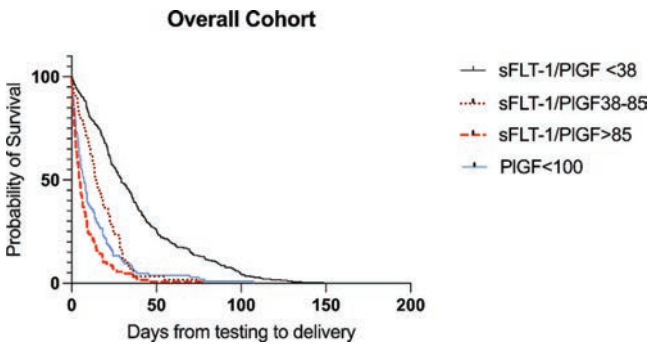
4:00 PM - 6:00 PM

Objective: Preeclampsia is a leading cause of maternal and fetal morbidity and mortality. Abnormal levels of the angiogenic proteins soluble fms-like tyrosine kinase (sFLT-1) and placental growth factor (PlGF) have been shown to be predictive of preeclampsia. However, it remains unclear whether the combination of these proteins in the form of the sFlt1/PlGF ratio performs better than PlGF alone. The objective of the current study was to compare the diagnostic accuracy of the sFlt1/PlGF ratio for preeclampsia with that achieved with PlGF alone under real-life settings.

Study Design: A retrospective cohort study of patients with a singleton pregnancy evaluated in a single center for suspected preeclampsia using the Roche Elecsys sFlt1/PlGF Ratio Assay between 2020-2023. The sFlt1/PlGF ratio was interpreted as low-risk (≤ 38), moderate-risk (38-85), or high-risk (> 85), while PlGF was defined as low-risk (≥ 100 pg/mL) or high-risk (< 100 pg/mL).

Results: Of the 509 patients who met the study criteria, 206 (40.5%) had a final diagnosis of preeclampsia. When compared to PlGF< 100 ng/pL, a sFLT-1/PlGF ratio > 85 was associated with a greater risk of delivery within < 14 (RR = 2.0 [1.8-2.4] vs 1.4 [1.3-1.6]), < 7 (RR = 2.7 [2.1-3.5] vs 1.5 [1.3-1.8]), and < 3 days (RR = 2.7 [2.0-3.8] vs 1.4 [1.2-1.8]). In addition, the area under the ROC curve was higher for the sFLT-1/PlGF ratio to PlGF for delivery within < 7 days (0.86 [0.83-0.89] vs. 0.64 [0.58-0.71]) and preeclampsia diagnosis within < 7 days (0.91 [0.91-0.95] vs. 0.72 [0.65-0.78]). Finally, in a time-to-event analysis, the cumulative risk of delivery was significantly higher among patients with sFLT-1/PlGF ratio > 85 compared to those with PlGF < 100 ng/pL (p< .001) (Figure 1).

Conclusion: The diagnostic accuracy and prognostic value of the sFLT-1/PlGF ratio appears to be greater than that achieved with PlGF alone.



1193 | Small-For-Gestational-Age Predictors in Gestational Diabetes Mellitus: The Impact of Metformin use in GDMA2 Pregnancies

Sivan Farladansky Gershnabel; Dina Lidsky-Sachs; Nur Abd El Qadir; Ronny Ram Biton; Tal biron shental; Michal Kovo; Dorit Ravid
Meir Medical Center, Kfar Saba, HaMerkaz

4:00 PM - 6:00 PM

Objective: Gestational diabetes mellitus (GDM) affects 3% - 25% of pregnancies worldwide, posing risks to maternal, fetal, and neonatal health. GDM is often associated with macrosomia and large-for-gestational-age (LGA) infants. However, the relationship between GDM and small-for-gestational-age (SGA) infants is less understood. This study aims to identify predictors of SGA in women with GDM.

Study Design: This retrospective study included GDM patients (GDM A1 and A2) admitted to the high-risk unit between 2014 and 2023. The study population was divided into those who delivered an appropriate for gestational age (AGA) neonate (AGA group) and those who delivered an SGA neonate (SGA group), defined as birthweight < 10th percentile. Women with pregestational diabetes mellitus were excluded. Obstetric and neonatal outcomes were compared between the groups. A subgroup analysis focused on GDMA2 patients, comparing maternal and neonatal outcomes and treatment regimens (insulin and metformin use).

Results: The study included 894 GDM patients. Compared to the AGA group (n = 712), the SGA group (n = 182) had lower maternal BMI (p = 0.02). Maternal age (p = 0.04), rates of GDMA2 (30.2% vs. 23.45%, p = 0.07), and hypertensive disorders (7.2% vs. 5.1%, p = 0.21) did not differ significantly between the groups. The SGA group had lower neonatal birthweight (2375 ± 432 g vs. 3021 ± 165 g, p = 0.005) and a higher rate of CD due to NRFHR (51% vs. 27.2%, p< 0.01). Among GDMA2 patients (n = 222), more women in the SGA group (n = 55) were treated with metformin compared to the AGA group (n = 167) (72.7% vs. 28.7%, p< 0.001). Multivariate regression analysis revealed that metformin treatment was independently associated with the risk of SGA among GDMA2 patients (OR 1.7, CI 1.18-1.35, p< 0.01).

Conclusion: Metformin use in GDMA2 pregnancies may be linked to SGA neonates. The impact of metformin on fetal growth highlights the need for careful monitoring and individualized treatment strategies in managing GDMA2.

Maternal characteristics and Obstetrics outcomes of GDMA2 patients

	SGA group - n=55	AGA group- n=167	p-value
Maternal age (years)	32.6±5.26	32.3±5.3	0.29
BMI (kg/m^2, SD)	27.3±3.4	28.2±2.2	0.02
Gestational age (weeks)	37.4±2	38.49±1.67	0.04
Metformin	72.7%	28.7%	<0.001
Insulin Levemir	35.3%	29%	0.08
Insulin Novorapid	5.1%	6.9%	0.7
Good glucose control	89.7%	86.5%	0.3
Hypertensive disorders	9%	6.6%	0.34
Neonatal Outcome			
Mode of delivery			
CS	34.1%	29.5%	0.49
CS urgent	73%	55.9%	<0.01
CS NRFHR	49%	35%	<0.01
VE	11.5%	9.7%	0.34
NVD	54.4%	60.8%	0.08
Birthweight ,mean(SD)	2469 (365)	2971 (269)	0.005
5 min Apgar score<=7	5%	2%	0.89
High Bilirubin level	89%	63%	0.03
Hypoglycemia	7.7%	8.2%	0.896
Meconial amniotic fluid	12%	81%	0.02
Gender- Male	42.9%	47.2%	0.3
Days of hospitalization mean(SD)	3.23 (1.97)	2.91 (0.89)	0.7

Data are presented as % or mean ± SD. BMI stands for Body Mass Index (kg/m²). CD refers to Cesarean Delivery. Hypertensive disorders include gestational and chronic hypertension, as well as preeclampsia. NICU stands for Neonatal Intensive Care Unit. Composite adverse neonatal outcome includes the presence of at least one of the following outcomes: NICU hospitalization, neonatal hypoglycemia, neonatal jaundice, phototherapy, or neonatal respiratory support. SGA refers to Small for Gestational Age, while AGA stands for Appropriate for Gestational Age. GDMA2 indicates Gestational Diabetes Mellitus requiring medication. CS refers to Cesarean Section, NRFHR stands for Non-Reassuring Fetal Heart Rate, VE refers to Vacuum Extraction, and NVD stands for Normal Vaginal Delivery.

1194 | MRI-Based Prediction of the Need for Surgical Intervention in Fetuses with Micrognathia

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4:00 PM - 6:00 PM

Objective: Diagnosis of fetal micrognathia, characterized by a small fetal mandible causing upper airway obstruction and immediate postnatal respiratory distress, has historically relied on subjective ultrasound assessments. More recent objective measurements including the inferior facial angle (IFA), jaw index (JI), mandibular width/maxillary ratio (MD/MX ratio), and oropharyngeal area (OP) aim to enhance diagnostic accuracy. This study aimed to evaluate the ability of fetal MRI measurements to predict the need for immediate postnatal surgical intervention.

Study Design: We conducted a retrospective query of our Radiology database for 'micrognathia' cases from 2007 to 2022. Radiologists, blinded to clinical details, independently assessed JI, IFA, MD/MX ratio, and OP area. Baseline demographics, comorbidities and clinical outcome metrics including the need for any Otolaryngologic surgical intervention were collected. Logistic regression models were fitted to examine the association

between each parameter and the need for surgery, using median radiologist-assessed values.

Results: Forty fetal MRI scans of 37 patients were analyzed at a median gestational age of 27 weeks. Median values of JI, IFA, MD/MX ratio, and OP area were lower in cases requiring surgical intervention compared to those not needing surgery, but these differences were not statistically significant ($p > 0.05$). Receiver operating characteristic (ROC) analysis revealed optimal cutoffs for predicting surgery. The more reliable predictors demonstrated modest performance: JI (sensitivity 65.4%, specificity 63%) and IFA (sensitivity 52.5%, specificity 52.8).

Conclusion: While not statistically significant, both JI and IFA showed modest performance as predictors of the need for the need for surgical intervention compared to MD/MX ratios and OP area when assessed via ROC curves. This suggests their potential utility in delivery planning and selection of surgical management strategies.

1195 | Effect of Intrapartum Antibiotic Prophylaxis on Systemic Maternal Inflammation During Labor Induction

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4:00 PM - 6:00 PM

Objective: Labor is an inflammatory process, but excessive inflammation may contribute to abnormal labor by causing myometrial dysfunction, leading to cesarean delivery. We explore whether serum pro-inflammatory cytokines during labor differ in women who receive intrapartum antibiotic prophylaxis (IAP) for group B streptococcus compared with those who do not.

Study Design: This prospective cohort study enrolled women age 18-45 years, term, and undergoing labor induction (IOL) with cervical Foley and oxytocin. Exclusion criteria were known fetal demise and multiple gestation. We drew blood samples prior to IOL and 6-12 and 18-24 hours (h) after IOL start and compared pro-inflammatory cytokine levels (IL-1α, IL-1β, IL-6, IL-8, GM-CSF, IFN-g, MCP-1, and TNF-α) in those who received IAP versus those who did not. We used linear mixed models to evaluate differences in labor cytokines between IAP groups over time, controlling for obesity, parity, race/ethnicity, chronic hypertension, preeclampsia and diabetes.

Results: 113 women (n = 59 did not receive IAP and n = 54 received IAP) were recruited. Cytokine concentrations significantly increased between pre-labor and 12-24h post-IOL measures with the exception of IFN-g, IL-1α and TNF-α (Figure). Overall, patients who received IAP had higher mean concentrations of IFN-g (unadjusted geometric mean ratio [GMR] 1.27 [95% CI 1.05, 1.55]) and lower levels of TNF- α (unadjusted GMR 0.87 [95% CI 0.76, 0.99]; Table). IL-1α levels did not differ by IAP status pre-labor but were 80% greater for those with IAP at 6-12h post-IOL. TNF-α concentrations at 6-12h were significantly lower in those who received IAP compared with those who did not (GMR 0.84 [95% CI 0.71, 0.99]).

Conclusion: Intrapartum TNF-α concentration was lower in those who received IAP for GBS compared with those who did not, while IFN-g, IL-1α concentrations were higher. Given the known effects of these cytokines on uterine contractility and labor, this could suggest a mechanism by which prophylactic antibiotics during labor induction may influence uterine activity and the risk of abnormal labor.

Figure 1a-h. Distribution of pro-inflammatory cytokine concentrations at three time points during labor.

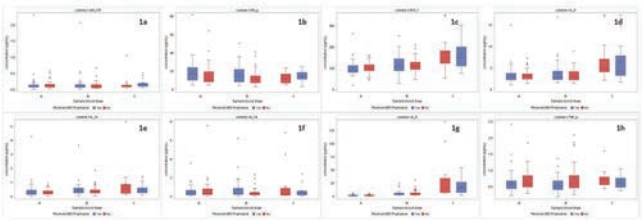

Table. Geometric mean ratios (GMR) and 95% confidence intervals to examine mean differences in cytokine concentrations among those who received IAP for GBS and those who did not across 3 time points during labor induction

Cytokine (pg/ml)	Pre-Labor		6-12 Hours Post LOI		18-24 Hours Post-LOI		Overall	
	Crude GMR (95% CI)	Adjusted GMR (95% CI)[a]	Crude GMR (95% CI)	Adjusted GMR (95% CI)[a]	Crude GMR (95% CI)	Adjusted GMR (95% CI)[a]	Crude GMR (95% CI)	Adjusted GMR (95% CI)[a]
GM-CSF	1.00 (0.76, 1.32)	1.06 (0.79, 1.44)	1.13 (0.84, 1.51)	1.16 (0.85, 1.58)	1.36 (0.92, 2.01)	1.45 (0.96, 2.19)	1.09 (0.85, 1.41)	1.15 (0.87, 1.51)
IFN-g	**1.31 (1.07, 1.61)**	**1.26 (1.01, 1.57)**	**1.29 (1.04, 1.59)**	1.21 (0.96, 1.52)	1.03 (0.79, 1.33)	0.98 (0.75, 1.29)	**1.27 (1.04, 1.55)**	1.21 (0.97, 1.50)
IL-1b	1.02 (0.74, 1.39)	1.19 (0.86, 1.65)	1.03 (0.74, 1.43)	1.17 (0.83, 1.64)	0.95 (0.58, 1.54)	1.23 (0.75, 2.03)	1.01 (0.77, 1.33)	1.19 (0.90, 1.57)
IL-1a	0.92 (0.57, 1.51)	0.99 (0.60, 1.64)	1.45 (0.90, 2.36)	**1.80 (1.09, 2.99)**	0.77 (0.37, 1.60)	0.87 (0.41, 1.87)	1.09 (0.76, 1.57)	1.25 (0.85, 1.84)
MCP-1	0.96 (0.85, 1.09)	0.96 (0.84, 1.10)	1.00 (0.88, 1.14)	1.00 (0.86, 1.15)	0.96 (0.79, 1.17)	1.01 (0.81, 1.25)	0.98 (0.88, 1.09)	0.98 (0.87, 1.10)
IL-6	0.92 (0.74, 1.15)	0.94 (0.75, 1.19)	0.96 (0.76, 1.22)	1.00 (0.78, 1.29)	0.79 (0.55, 1.16)	0.91 (0.61, 1.35)	0.92 (0.77, 1.09)	0.96 (0.80, 1.16)
IL-8	0.98 (0.84, 1.16)	0.99 (0.83, 1.17)	1.07 (0.90, 1.28)	1.09 (0.91, 1.30)	0.95 (0.73, 1.23)	1.06 (0.81, 1.38)	1.01 (0.87, 1.17)	1.03 (0.89, 1.20)
TNF-a	0.90 (0.78, 1.05)	0.91 (0.78, 1.07)	**0.82 (0.70, 0.96)**	**0.84 (0.70, 0.99)**	0.84 (0.67, 1.04)	0.86 (0.68, 1.08)	**0.87 (0.76, 0.99)**	0.88 (0.76, 1.02)

*Reference group = did not receive IAP for GBS

[a] Adjusted for bmi (obese/non-obese), parity (0/≥1), race/ethnicity (non-Hispanic white/other), chronic hypertension (yes/no), preeclampsia (yes/no), and diabetes (yes/no)

1196 | No Association Between Biological Therapeutics and Infections in Pregnant Patients with Autoimmune Disease

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4:00 PM - 6:00 PM

Objective: The incidence of autoimmune disease (AID) peaks during reproductive years. Active AID increases pregnancy risks, making disease control during pregnancy crucial for improving maternal and fetal outcomes. Biologic therapeutics (biologics) targeting the immune system have significantly improved AID management. Current clinical guidelines generally recommend continuation of biologics during pregnancy to maintain clinical remission, however, there is conflicting evidence regarding risk of infections. This study evaluates the association between the use of biologics during pregnancy and peripartum infections.

Study Design: We performed a retrospective cohort study including pregnant patients with autoimmune disease from a single institution during 2013-2023. Data on demographics, medical conditions, pregnancy, and therapeutics was abstracted from the medical record. The primary outcomes were rates of antepartum and postpartum infections between patients exposed to biologics during pregnancy versus unexposed. We hypothesized that the rate of antepartum and postpartum infections is higher in patients exposed to biologics during pregnancy compared to unexposed.

Results: We identified a total of 202 pregnancies in 131 individuals. 94 pregnancies (46.5%) were exposed to biologics, while 108 (53.5%) pregnancies were unexposed. Logistic regression adjusted for non-independent data was used to assess the association between biologic exposure and antepartum and postpartum infections. There was no significant difference in the rates of overall antepartum ($p = 0.66$) or postpartum ($p = 0.39$) infections between the biologics exposed and unexposed pregnancies as well as no difference in the rates of individual infections.

Conclusion: There was no significant association between the use of biologics during pregnancy and the incidence of peripartum infections. Studies in larger populations are needed to confirm safety of biologics during pregnancy as they may be useful for treatment of pregnancy complications related to inflammation.

Table 1. Characteristics

	Overall	Biologics	No Biologics
Total individuals	131	67 (51.2)	64 (48.8)
Total pregnancies	202	94 (46.5)	108 (53.5)
Maternal age	32.9 (5.1)	33.1 (5.2)	32.8 (5.1)
Gravidity	2.1 (1.3)	2.1 (1.4)	2.0 (1.2)
Parity			
0	114 (56.4)	53 (56.4)	61 (56.5)
1	64 (31.7)	28 (29.8)	36 (33.3)
2+	24 (11.9)	13 (13.8)	11 (10.2)
Race			
White	90 (68.7)	51 (76.1)	39 (60.9)
African American	10 (7.6)	1 (1.5)	9 (14.1)
American Indian	6 (4.6)	5 (7.5)	1 (1.6)
Asian	15 (11.5)	8 (11.9)	7 (10.9)
Pacific Islander	2 (1.5)	1 (1.5)	1 (1.6)
Other/Unknown	8 (6.1)	1 (1.5)	7 (10.9)
Hispanic ethnicity	8 (6.1)	1 (1.5)	7 (10.9)
BMI, kg/m^2	29.6 (5.7)	30.3 (6.0)	29.1 (5.3)
Any inflammatory bowel disease	102 (50.5)	41 (43.6)	61 (56.5)
Ulcerative colitis	41 (40.2)	3 (7.3)	38 (62.3)
Crohn's disease	61 (59.8)	38 (92.7)	23 (37.7)
Any autoimmune disease	102 (50.5)	60 (63.8)	42 (38.9)
Systemic lupus erythematosus	1 (0.1)	0 (0.0)	1 (2.4)
Sjogren's	3 (2.9)	2 (3.3)	1 (2.4)
Hashimoto's	3 (2.9)	1 (1.7)	2 (4.8)
Rheumatoid Arthritis	55 (53.9)	31 (51.7)	24 (57.1)
Multiple Sclerosis	4 (3.9)	0 (0.0)	4 (9.5)
Adult Onset Stills Disease	3 (2.9)	3 (5.0)	0 (0.0)
Antiphospholipid Syndrome	1 (1.0)	0 (0.0)	1 (2.4)
Inflammatory arthritis	15 (14.7)	11 (18.3)	4 (9.5)
Psoriasis	24 (23.5)	17 (28.3)	7 (16.7)
Ankylosing Spondylitis	4 (3.9)	3 (5.0)	1 (2.4)
Hidradenitis	2 (2.0)	1 (1.7)	1 (2.4)
On biologic prior to pregnancy	104 (51.5)	88 (93.6)	16 (14.8)
Class of Biologic			
Any TNF inhibitor		80 (85.1)	
Any IL-6 inhibitor		5 (5.3)	
Any integrin inhibitor		5 (5.3)	
Any IL-1 inhibitor		2 (2.1)	
Any IL-12/23		5 (5.3)	
Any IL-5/IL-13/IgE inhibitor		2 (2.1)	

Notes: denominator is total number of pregnancies except for race and ethnicity
TNF=Tumor necrosis factor, IL=Interleukin, CD=Cluster of differentiation

Table 2. Outcomes

	Overall N=202	Biologics N=94	No Biologics N=108	p-value
Antepartum infection	48 (33.3)	22 (31.4)	26 (35.1)	0.66
Cellulitis	2 (4.5)	2 (9.5)	-	NA
Chorioamnionitis	6 (3.0)	1 (1.1)	5 (4.6)	0.18
C. difficile	4 (9.1)	-	4 (17.4)	NA
Upper respiratory infection	17 (38.6)	6 (28.6)	11 (47.8)	0.20
Urinary tract infection	12 (27.3)	6 (28.6)	6 (26.1)	0.86
Yeast infection	1 (2.3)	1 (4.8)	-	NA
HSV or genital warts	5 (11.4)	3 (14.3)	2 (8.7)	0.56
Pneumonia	1 (2.3)	1 (4.8)	-	NA
Gastrointestinal infection	2 (4.5)	2 (9.5)	-	NA
Postpartum infection	28 (16.0)	15 (18.5)	13 (13.8)	0.39
Mastitis	11 (5.5)	6 (6.4)	5 (4.6)	0.61
Endometritis	5 (26.3)	4 (40.0)	1 (11.1)	0.20
Wound infection	1 (5.3)	1 (10.0)	-	NA
C. difficile	1 (5.3)	-	1 (11.1)	NA
Urinary tract infection	1 (5.3)	1 (10.0)	-	NA
OB Sepsis protocol	31 (15.4)	17 (18.1)	14 (13.0)	0.29
Antepartum admission	41 (20.3)	16 (17.0)	25 (23.0)	0.29
Postpartum readmission	19 (9.4)	10 (10.6)	9 (8.3)	0.55
Miscarriage or fetal demise	26 (12.9)	13 (13.8)	13 (12.0)	0.73
Preeclampsia/GHTN	38 (18.8)	16 (17.0)	22 (20.4)	0.58
Preterm birth	6 (3.0)	3 (3.3)	3 (2.8)	0.84

Notes: denominator is total number of pregnancies; p-values come from logistic regression model adjusting for non-independent observations
NA= not applicable, GHTN= gestational hypertension

1197 | Vasa Previa: Factors Associated with Inpatient vs. Outpatient Antepartum Management

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4:00 PM - 6:00 PM

Objective: When vasa previa is diagnosed, guidelines support recommendations about timing and route of delivery, as well as steroid administration. While elective admission to ensure proximity to care is common, evidence does not support a clear recommendation. Our objective was to compare patients with vasa previa managed as inpatients vs outpatients.

Study Design: This is a single institution cohort study of patients with a prenatal diagnosis of vasa previa from 2013-2023. Cases resolved in the third trimester were excluded. Decisions about inpatient vs. outpatient management and timing of planned delivery were made by physicians and patients. Demographic factors and outcomes were obtained through chart review. Cohorts managed with elective admission for the indication of vasa previa were compared with those managed as outpatients. Mann-Whitney U and Fisher's Exact test were used for statistical comparison.

Results: 89 patients were included, including 72 (80.9%) electively admitted vs. 17 (19.1%) managed as outpatients. The cohorts are compared in Table 1. The groups were of similar age and parity. A higher proportion of patients managed as outpatients had public insurance. There were no differences in the rate of a short cervical length or antepartum vaginal bleeding between the cohorts, and the rates of non-scheduled Cesarean Delivery were similar. Betamethasone was administered at a median gestational age of 32-33 weeks in both groups. Elective admission was associated with earlier gestational age at delivery overall, as well as earlier scheduled delivery. There were no stillbirths or neonatal deaths, and the rates of NICU admission were not significantly different between the groups.

Conclusion: Patients electively admitted for vasa previa do not appear to have been at higher risk for emergent delivery, though admission was associated with earlier delivery, including scheduled deliveries. The lower rate of admission in those with Medicaid could indicate a disparity in management, though

further study is necessary. While our data do not rule out a benefit to routine admission, the benefits remain unproven.

Table 1. Prenatal diagnosis of Vasa Previa with Inpatient vs Outpatient Management.

	Inpatient (N = 72)	Outpatient (N = 17)	p-Value
Maternal Age (years)	36 [33-40]	36 [32-40]	.89
Nulliparous	68.1%	58.8%	.57
Medicaid	5.6%	23.5%	.04
Vaginal Bleeding Episodes	28.1%	23.5%	1.0
Short Cervix	7.4%	5.9%	1.0
Gestational age at Betamethasone (Weeks)	32 2/7 [31 3/7-33 3/7]	32 6/7 [32.0-35.4]	.054
Unscheduled Delivery	46.5%	35.3%	.43
Gestational age at Delivery (Weeks)	35 1/7 [34 1/7-35 5/7]	36 0/7 [35 4/7-36 2/7]	<.001
Gestational age at Planned Delivery (Weeks)	35 3/7 [35 0/7–35 5/7]	36 1/7 [35 6/7–36 2/7]	.002
NICU Admission	67.8%	50.0%	.23
NICU Length of Stay (Days)	19 [10-31]	14 [0-31]	.28

Continuous Data compared with Mann-Whitney U
Categorical Data compared with Fisher's Exact test

1198 | A Comparison Between Provider Density and Severe Maternal Morbidity Rates: A Georgia State Review

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4:00 PM - 6:00 PM

Objective: Georgia's (GA) maternal morbidity & mortality rate is among the highest in the country. GA also has one of the highest rates of maternity deserts, defined as counties without obstetric care providers. Increasing the rates of non-physician providers, including certified nurse midwives (CNM), nurse practitioners (NP), advanced practice nurses (APRN), & physician assistants (PA) has been proposed to address the physician provider shortage. We analyzed the change in non-physician & physician provider density in relation to severe maternal morbidity (SMM) rates in GA from 2011 to 2020.

Study Design: We conducted a population-based cohort study utilizing GA Birth Certificate Data from 2011-2020 (n = 1,278,299). SMM included admission to intensive care, unplanned hysterectomy, eclampsia, & maternal blood transfusion. Changes in provider density for non-physician & physician providers were calculated & compared with changes in SMM rates overall & stratified by rural residence.

Results: Between 2011-2020, non-physician provider density increased significantly *[CNM (60.3%), NP (164.4%), APRN (151.1%), & PA (62.3%)] (Table 1)*. This increase of >50% in non-physician providers was seen in both rural and non-rural settings. While overall physician density increased by 12.8%, physician density in rural settings declined by 5% (Table 1). The SMM rate per 10,000 births increased from 42.2 in 2011 to 65.2 in 2020, indicating a 54.5% increase. There was no significant difference between changes in non-physician provider density & SMM rate *($p = 0.91$)* or changes in physician provider density & SMM rate *($p = 0.61$)*.

Conclusion: Our data demonstrate significant increases in CNM, NP, APRN, & PA rates across GA, including rural settings. While physician density in rural settings decreased, further efforts to provide directive education regarding maternal health in pregnancy to existing non-physician providers could help optimize care quality and access. Leveraging the opportunity to train non-physician providers in rural settings could help stratify care needs & facilitate transfer to higher level facilities when necessary.

Table 1: Provider Density and Percent Change in 2011 and 2020

	CNMD			NPD			APRND			PAD			PD		
	2011	2020	CNMD change (%)	2011	2020	NPD change (%)	2011	2020	APRND change (%)	2011	2020	PAD change (%)	2011	2020	PD change (%)
ALL	11.1	17.8	60.3	164.4	493.8	200	235.1	590.6	151.1	125.8	204.2	62.3	296.2	331.2	12.8
Rural	25	42	68	592	1769	198.8	798	2049	156.7	436	613	41.05	1035	983	-5.0
Non-Rural	206	344	66.9	2819	8937	217	4079	10754	153.6	2173	3813	75.4	5109	1093	21.3

ALL: All subjects in entire group
CNMD: Certified Nurse Midwife Density
NPD: Nurse Practitioner Density
APRND: Advanced Practitioner Nurse Density
PAD: Physician Assistant Density
PD: Physician Density

1199 | Second Trimester Placental Proteins are Associated with Maternal Vascular Malperfusion Among Patients with Adverse Outcomes

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4:00 PM - 6:00 PM

Objective: Adverse pregnancy outcomes (APO) are known to be heterogenous in etiology; many are linked to maternal vascular malperfusion (MVM) of the placenta. Second trimester placental proteins have poor prediction of APO. Placental proteins may have a greater association with APO related to a specific underlying mechanism such as MVM. The objective of this study is to evaluate levels of second trimester placental proteins and placental MVM among patients with an APO.

Study Design: This is a secondary analysis of a prospective cohort study of 9,289 low risk nulliparous patients with singleton gestation (nuMom2b). For this analysis, participants who met the following criteria were included: 1. APO defined as preterm birth (< 37 weeks), preeclampsia/eclampsia, small for gestational age infant, or stillbirth; 2. Maternal serum placental proteins (sFlt-1, Adam-1, VEGF, endoglin, bHcg, AFP, PlGF, Inhibin A, Papp-A, sFlt/PlGF) collected between 16 and 21 weeks gestational age; 3. Placental pathology data. A single perinatal pathologist (LE) manually reviewed all placental data (lesions and additional comments included in the publicly available data set) to categorize participants as MVM absent or present. Placental protein levels were compared by MVM category using Wilcoxon rank sum.

Results: Of the 9,289 participants in the parent study, 2,091 (24%) had APO. Of these, 510 patients were eligible for inclusion, of which 216 (42%) had any presence of MVM. There was a significantly higher level of inhibin-A and sFlt-1/PlGF ratio and lower levels of VEGF and PlGF among those with MVM compared to those without (Table). A trend towards increase in sFlt-1, ADAM-12, and endoglin was additionally seen in MVM related APO.

Conclusion: Among individuals with APO, MVM is associated with significant differences in second trimester maternal serum placental proteins, especially those related to angiogenesis. Over half of APO were unrelated to MVM in this cohort. Classifying APO by placental pathology may lead to improvement in use and development of predictive biomarkers, given the underlying heterogeneity of APO.

Table: Second trimester maternal serum placental proteins by presence/ absence of maternal vascular malperfusion (MVM) among patients with adverse pregnancy outcomes

Second-trimester maternal serum placental proteins	Maternal Vascular Malperfusion Absent (N=294)	Maternal Vascular Malperfusion Present (N=216)	*p- value*
sFlt-1 (pg/mL)	871 (572, 1189)	899 (655, 1229)	0.06
Adam-12 (ng/mL)	10.0 (7.5, 12.4)	10.4 (8.2, 12.9)	0.09
Endoglin (ng/mL)	5.4 (4.7, 6.3)	5.5 (4.9, 6.8)	0.09
VEGF (pg/mL)	1.2 (0.8, 1.7)	0.9 (0.7, 1.7)	0.007
BHcg (ng/mL)	3.9 (2.6, 6.1)	4.1 (2.6, 6.6)	0.62
AFP (IU/mL)	48.3 (37.2, 62.7)	48.5 (39.0, 69.1)	0.20
PlGF (pg/mL)	183 (117, 284)	169 (102, 256)	0.04
Inhibin A (pg/mL)	215 (168, 284)	236 (164, 335)	0.04
PAPP-A (mU/mL)	9095 (5168, 15801)	9376 (5435, 15132)	0.45
sFlt-1/ PlGF ratio	4.6 (2.7, 7.1)	5.1 (3.2, 9.3)	0.02

1200 | Neighborhood Socioeconomic Disadvantage and Antenatal Depressive Symptoms

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4:00 PM - 6:00 PM

Objective: To evaluate whether neighborhood-level socioeconomic disadvantage is associated with an increased risk of antenatal depressive symptoms.

Study Design: We conducted a secondary analysis of data from the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-To-Be, a prospective cohort of nulliparous pregnant individuals. Data were obtained throughout pregnancy by patient interviews and health record abstraction. Participant home addresses in the first trimester were geocoded at the census-tract level. The exposure was socioeconomic disadvantage (categorized by tertile, with the least deprived [T1] as the reference) by the Area Deprivation Index (ADI). The outcome was depressive symptoms in the early third trimester (median gestational age: 26.9 weeks) by the Edinburgh Postnatal Depression Scale (EPDS), assessed as a score $\geq$ 10, a cutoff which is commonly used for screening, and secondarily, $\geq$ 13, a higher more specific cutoff. Modified Poisson regression was used and adjusted for maternal age, individual-level social determinants (insurance, household income), and EPDS score in the first trimester.

Results: Of 8,678 assessed nulliparous individuals, the mean ADI was 44.4 (SD: 30.2), 16.1% had an EPDS score $\geq$ 10, and 6.5% had an EPDS score $\geq$ 13. In adjusted analyses, individuals who lived in a community with the highest tertile of ADI were nearly 40% more likely to screen positive for depressive symptoms in the third trimester compared with those in the lowest tertile (21.6% vs. 11.7%; aRR: 1.38; 95% CI: 1.16, 1.63). The association was similar at the higher EPDS screening threshold $\geq$ 13 (9.9% vs. 3.8%; aRR: 1.75; 95% CI: 1.29, 2.38).

Conclusion: Neighborhood-level socioeconomic disadvantage early in pregnancy was associated with an increased risk of screening positive for depressive symptoms in the third trimester, even after accounting for depressive symptoms in early pregnancy. These findings highlight the need for multilevel and structural interventions to address perinatal mental health.

TABLE. Association between first trimester area deprivation index (ADI) and antepartum depressive symptoms in the third trimester in nulliparous individuals

	EPDS n, % (Row Percentage)		Unadjusted and adjusted analysis	
			Unadjusted risk ratio (95% CI)	Adjusted risk ratio (95% CI)[1]
	≥10	<10		
ADI				
Tertile 1 (low)	337 (11.7)	2,550 (88.3)	Ref	Ref
Tertile 2	452 (15.3)	2,506 (84.7)	**1.31 (1.15, 1.49)**	1.15 (0.98, 1.35)
Tertile 3 (high)	611 (21.6)	2,222 (78.4)	**1.85 (1.63, 2.09)**	**1.38 (1.16, 1.63)**
	≥13	<13		
ADI				
Tertile 1 (low)	109 (3.8)	2,778 (96.2)	Ref	Ref
Tertile 2	171 (5.8)	2,787 (94.2)	**1.53 (1.21, 1.94)**	1.24 (0.92, 1.67)
Tertile 3 (high)	281 (9.9)	2,552 (90.1)	**2.63 (2.12, 3.26)**	**1.75 (1.29, 2.38)**

[1]Model adjusted for baseline age, insurance status, household income, and first-trimester EPDS score (continuous).
Bolded results reflect statistically significant findings (p<0.05).
EPDS, Edinburgh Postnatal Depression Scale; ADI, Area Deprivation Index

1201 | The Impact of Denying Abortion Access to Patients with Heart Failure: A Cost-Effectiveness Analysis

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4:00 PM - 6:00 PM

Objective: In June 2022, the *Dobbs v. Jackson Women's Health* Supreme Court decision eliminated constitutional protections for abortion access. This ruling has far-reaching impacts on long-term morbidity, mortality, and health-related expenses for individuals capable of pregnancy. This study investigates the influence of abortion access on outcomes for pregnant individuals with stage 1 or 2 heart failure (HF) seeking abortion care based on the presence of a statewide abortion ban.

Study Design: A decision-analytic model was developed to evaluate the outcomes and cost-effectiveness associated with providing in-state abortion services versus those incurred under a statewide abortion ban for individuals with HF seeking an abortion. Clinical outcomes included preeclampsia, preterm birth, pregnancy-related major adverse cardiac events (MACE), disease progression, and mortality. The likelihood and financial burden of traveling out of state for abortion care was considered. The cost-effectiveness threshold was set at $100,000/QALY. Model inputs were derived from the literature.

Results: In our theoretical cohort of 1,515 pregnant people with HF, access to abortion services led to 348 fewer cases of preeclampsia, 315 fewer preterm births, 218 fewer cases of pregnancy-related MACE, 233 fewer cases of HF stage progression, and 112 fewer deaths annually relative to no access to

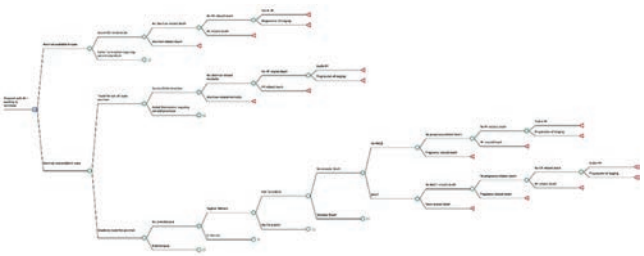
abortion services (Table 1). In-state abortion access was the dominant strategy, resulting in a $57,229,928 reduction in the costs and an increase in 3,182 QALYs.

Conclusion: Protecting in-state abortion access for pregnant individuals with HF is a cost-effective strategy, reducing adverse perinatal outcomes, enhancing resource allocation, and improving quality of life. These findings may inform policies to improves individual and societal outcomes for this vulnerable population in the context of restrictive abortion laws.

Table 1. Outcomes in a cohort of 1,515 pregnant people with heart failure

Outcome	In-State Abortion Access	No in-State Abortion Access	Difference (No IS access – IS access)*
Preeclampsia (cases)	0	348	+348
Preterm Birth (cases)	0	315	+315
Cesarean Delivery (cases)	0	870	+870
Neonatal Death (cases)	0	12	+12
Pregnancy-related MACE (cases)	0	218	+218
HF Progression (cases)	72	305	+233
Mortality (cases)	76	188	+112
Cost ($)	60,773,664	118,003,592	+57,229,928
Effectiveness (QALY)	16,180	12,999	-3,182

*IS = In-state



1202 | Assessing the Reliability of ChatGPT for Evaluation of Risk-of-Bias in Randomized Clinical Trials

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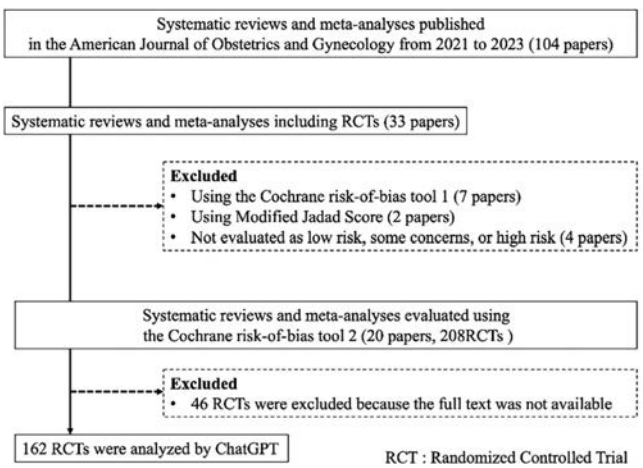
4:00 PM - 6:00 PM

Objective: To examine whether ChatGPT can be useful in the assessment of the risk-of-bias in Randomized Clinical Trials (RCTs) traditionally performed by reviewers performing systematic reviews.

Study Design: The study analyzed systematic reviews and meta-analyses published in the American Journal of Obstetrics and Gynecology from 2021 to 2023, focusing on the risk-of-bias assessments in RCTs using Version 2 of the Cochrane risk-of-bias tool for randomized trials (RoB 2). ChatGPT-4 was trained on RoB 2 guidelines and then tasked with evaluating each RCT across five domains: Randomization process, Deviations from intended interventions, Missing outcome data, Measurement of the outcome, and Selection of the reported result. Each domain, along with the overall bias, was rated as Low risk of bias, Some concerns, or High risk of bias. ChatGPT's evaluations were compared to those of human reviewers, as described in published papers, using Cohen's Kappa to determine agreement. Additionally, for each RCT, ChatGPT conducted three separate evaluations to calculate the intra-ChatGPT agreement rate using Fleiss' Kappa.

Results: The study included 161 RCTs. The Cohen's Kappa scores for agreement between ChatGPT's evaluations and those of the reviewers were as follows: Domain 1 (Randomization) 0.485, Domain 2 (Deviations) 0.489, Domain 3 (Missing) 0.596, Domain 4 (Measurement) 0.446, Domain 5 (Selection) 0.484, and Overall bias 0.262. For the three separate evaluations conducted by ChatGPT on the same RCTs, the Fleiss' Kappa scores were Domain 1 (Randomization) 0.245, Domain 2 (Deviations) 0.359, Domain 3 (Missing) 0.555, Domain 4 (Measurement) 0.493, Domain 5 (Selection) 0.351, and Overall bias 0.760.

Conclusion: ChatGPT's risk-of-bias assessments moderately agreed with human reviewers across five domains but showed only fair agreement in overall bias assessment. Intra-ChatGPT evaluations were inconsistent for certain domains (Randomization, Deviations, Selection), though the overall bias assessment showed substantial agreement.



	Cohen's Kappa (GPT vs reviewer)	Fleiss' Kappa (Three evaluations by Chat GPT)
Domain 1 (Randomization)	0.485	0.245
Domain 2 (Deviations)	0.489	0.359
Domain 3 (Missing)	0.596	0.555
Domain 4 (Measurement)	0.446	0.493
Domain 5 (Selection)	0.484	0.351
Overall bias	0.262	0.760

TABLE 1. Agreement between ChatGPT and human reviewers in risk-of-bias assessments and consistency of ChatGPT's own evaluations. Kappa categories for agreement: none for 0, slight for 0.10-0.20, fair for 0.21-0.40, moderate for 0.41-0.60, substantial for 0.61- 0.80, near perfect for 0.81-0.99, and perfect for 1.

1203 | The effect of One-Abnormal Glucose-Value of the 100-gram Oral-Glucose Tolerance-Test According to Carpenter-and-Coustan on Obstetrical-Outcomes

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4:00 PM - 6:00 PM

Objective: To examine the effect of one abnormal glucose value only according to C&C criteria in 100 g OGTT on pregnancy outcomes.

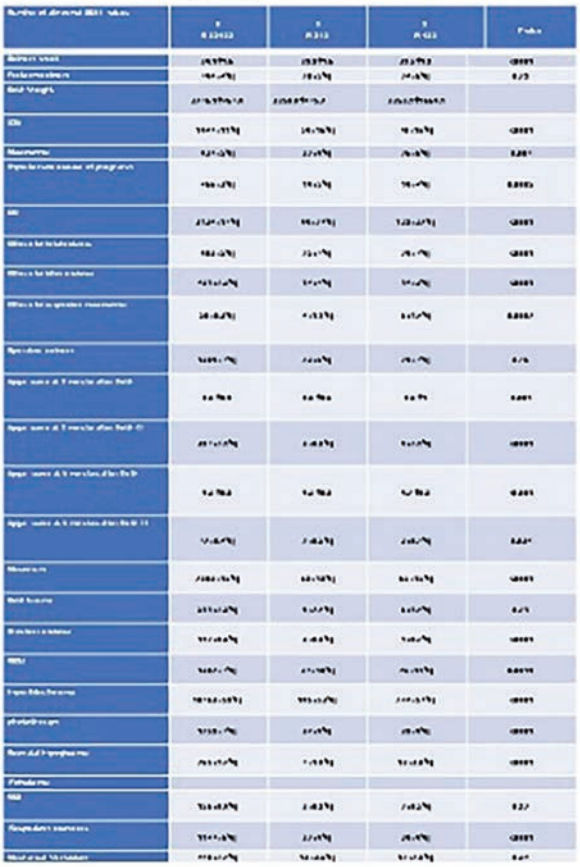
Study Design: A population-based retrospective cohort study was conducted involving women who delivered at Tzafon Medical Center in Israel between March 2012 and December 2022. The women were categorized into three groups: (1) those without GDM (either normal GCT or OGTT; N = 18,422), (2) those with one abnormal OGTT value according to C&C criteria (fasting glucose 95-104, one hour 180-189, two hours 155-164, and three hours 140-144 mg/dL; N = 371), and (3) those with GDM, defined as at least two abnormal OGTT values according to C&C (N = 431). Only the last group was officially diagnosed with GDM. The primary outcome measured was the rate of large for gestational age (LGA) neonates.

Results: Univariable and multivariable analyses are detailed in Tables 1 and 2. After adjusting for background characteristics, having one abnormal glucose value significantly increased the risk, compared to the control group, and similar to the values in the two pathologic values group, for the following outcomes: large for gestational age (LGA) neonates (adjusted OR 1.5, 95% CI [1.2-2.0]), macrosomia (2.0, 95% CI [1.3-2.8]), cesarean delivery (1.5, 95% CI [1.2-1.9]), and hypertensive disease of pregnancy (2.0, 95% CI [1.3-3.3]).

Univariable and multivariable analyses are detailed in Tables 1 and 2. After adjusting for background characteristics, having one abnormal glucose value significantly increased the risk, compared to the control group, and similar to the values in the two pathologic values group, for the following outcomes: large for gestational age (LGA) neonates (adjusted OR 1.5, 95% CI [1.2-2.0]), macrosomia (2.0, 95% CI [1.3-2.8]), cesarean delivery (1.5, 95% CI [1.2-1.9]), and hypertensive disease of pregnancy (2.0, 95% CI [1.3-3.3]).

Conclusion: Women with one abnormal OGTT value, according to the C&C criteria, had worse outcomes compared to normoglycemic women, and similar to those with GDM. Therefore, these women should be considered as having GDM.

Table 1. Pregnancy and neonatal outcomes



Values are presented as number (percent) or mean±SD.
Missing values: Birth number- 5218 missing values, Age- 3 missing values.
CD, cesarean delivery; LGA, large foe gestational age; NICU, neonatal intensive care unit; OGTT, oral glucose tolerance test; RDS, respiratory distress syndrome;

Table 2. Multivariable analysis

	Adjusted OR 95% CI*		
Number of abnormal OGTT values	1 vs 0	1 vs 2	2 vs 0
LGA	1.5 [1.2-2.0]	0.97 [0.7-1.4]	1.6 [1.2-2.1]
Macrosomia	2.0[1.3-2.8]	1.3[0.7-2.9]	1.5[1.0-2.3]
Cesarean delivery	1.5[1.2-1.9]	0.8[0.6-1.1]	1.8[1.5-2.3]
Cesarean Delivery for suspected macrosomia	4.2[1.5-11.9]	0.7[0.2-2.6]	5.8[2.4-13.8]
Hypertensive disease of pregnancy	2.0 [1.3-3.3]	1.4 [0.7-2.7]	1.5 [0.9-2.4]
Neonatal hypoglycemia	1.2[0.5-2.5]	0.7[0.3-1.9]	1.6[0.9-3.0]
NICU admission	1.3[0.9-1.9]	1.0[0.6-1.7]	1.3[0.9-1.8]
Respiratory distress	1.3[0.9-1.9]	1.1[0.6-1.8]	1.2[1.9-1.7]

*Adjusted for maternal age, chronic hypertension, and delivery Week
CI, confidence interval; NICU, neonatal intensive care unit; OGTT, oral glucose tolerance test; OR, odds ratio

1204 | Risk of HDP in Nulliparas with Treated Versus Untreated Mood and Anxiety Disorders

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4:00 PM - 6:00 PM

Objective: The impact of mood and anxiety disorders (MAD) on the risk of developing hypertensive disorders of pregnancy (HDP) remains unclear. This study aimed to explore the risk of HDP in nulliparas with either treated or untreated MAD.

Study Design: This was a secondary analysis of the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-Be (nuMoM2b). Nulliparas with singleton gestations ≥20 weeks without chronic hypertension were grouped as follows: no MAD, untreated MAD, and treated MAD. The diagnoses included in the MAD groups were depression, bipolar disorder, other mood disorders (dysthymia, seasonal affective disorder), and anxiety disorders (generalized anxiety disorder, panic disorder, obsessive-compulsive disorder). Treatment was defined as the use of a psychotropic medication for a psychiatric indication. The risk of HDP was compared between groups using univariate and multivariate analyses.

Results: Of the 8,492 patients included in the analysis, 6,877 (81.0%) had no MAD diagnosis, 1,014 (11.9%) had an untreated MAD, and 601 (7.1%) had a treated MAD. Patients with a treated MAD were more likely to be older (p< 0.001), white (p< 0.001), non-Hispanic (p< 0.001), college-educated (p = 0.01), privately insured (p< 0.001), have a higher pre-pregnancy BMI (p = 0.001), and score higher on the Edinburgh Postnatal Depression Scale (EPDS) in early pregnancy (p< 0.001). Compared to patients with no MAD, the risk of any HDP was similar across groups in both unadjusted and adjusted models (untreated MAD, aRR 0.96 [CI 0.85-1.08]; treated MAD, aRR 0.92 [CI 0.79-1.08]) (Table 1). The risk of preeclampsia was also not significantly different by MAD diagnosis or treatment exposure. To account for patients who may have undiagnosed or undertreated MAD, a multivariate model was created to examine the risk of any HDP or preeclampsia alone by EPDS score, which also showed no significant difference in risk (aRR 0.93 [CI 0.80-1.07]).

Conclusion: This large cohort analysis found no significant statistical difference in the risk of HDP by MAD diagnosis, psychotropic treatment, or worst mood symptoms during pregnancy.

Table. Relative risk of hypertensive disorder of pregnancy by mental health disorder and treatment status

	Cohort (N)	Any HDP n (%)	Unadjusted RR (95% CI)	Adjusted[a] RR (95% CI)	Preeclampsia n (%)	Unadjusted RR (95% CI)	Adjusted[b] RR (95% CI)
No mood and anxiety disorder[c]	6877	1604 (23.3)	Ref	Ref	580 (8.4)	Ref	Ref
Untreated mood and anxiety disorders	1014	241 (23.8)	1.02 (0.91-1.15)	0.96 (0.85-1.08)	89 (8.7)	1.00 (0.72-1.37)	0.93 (0.75-1.16)
Treated mood and anxiety disorders	601	138 (23.0)	0.98 (0.85-1.15)	0.92 (0.79-1.08)	53 (8.8)	0.96 (0.78-1.19)	0.92 (0.69-1.21)
EPDS Score < 13[d]	7636	1793 (23.5)	Ref	Ref	640 (8.4)	Ref	Ref
EPDS Score ≥ 13	615	145 (23.6)	1.00 (0.87-1.16)	0.93 (0.80-1.07)	67 (10.9)	1.26 (1.00-1.60)	1.07 (0.84-1.35)

Abbreviations: HDP, hypertensive disorder of pregnancy (defined as gestational hypertension or preeclampsia); RR, relative risk; CI, confidence interval; Ref, reference; EPDS, Edinburgh Postnatal Depression Scale.
[a]Adjusted for known risk factors for HDP, including race, pre-pregnancy BMI, diabetes, renal disease, autoimmune disease, family history of preeclampsia, and aspirin use.
[b]Adjusted for significantly different variables from univariate analysis, including age, race, ethnicity, education, insurance, BMI, diabetes, autoimmune disease, aspirin, EPDS score, and gestational age at delivery.
[c]Mood and anxiety disorders included depression, bipolar disorder, other mood disorders (dysthymia, seasonal affective disorder), and anxiety disorders (generalized anxiety disorder, panic disorder, obsessive compulsive disorder).
[d]EPDS score of ≥13 suggests diagnosis of depression.

1205 | More Frequent Emergency care Utilization, Prior to 20w0d, is Associated with Higher Preterm Birth Rates

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4:00 PM - 6:00 PM

Objective: Frequent emergency care (EC) utilization throughout pregnancy has been associated with adverse pregnancy outcomes, including preterm birth (PTB). Given that it has previously been shown that care coordination of at-risk populations in North Carolina (NC) is associated with a reduced PTB rate, identifying early EC utilization as a risk factor for PTB affords an opportunity for intervention with the potential for introduction of a care coordination program in EC settings. To that end, the objective of this study was to assess whether the frequency of early EC utilization, prior to 20w0d, is associated with higher rates of PTB.

Study Design: Retrospective cohort study of pregnant Medicaid recipients who had a live birth in NC between 01/01/2014–12/31/2019, using linked birth records and NC Medicaid hospital claims. Early pregnancy EC use was defined as an encounter in OB triage or the emergency department prior to 20w0d. We categorized frequency of EC visits before 20w0d as follows: 0, 1, 2, or 3 visits. We built a multivariable modified Poisson regression model to analyze the association between early EC visits and PTB, adjusted for potential confounders.

Results: With increasing EC utilization prior to 20w0d (Table 1), the % of patients with PTB increased. Among those with zero EC visits prior to 20w0d, 0.53% delivered < 28w0d, compared to 0.86%, 1.02%, and 1.43%, in those with 1, 2, and 3 ED visits, respectively. A similar trend was observed among those who delivered between 28w0d-33w6d and between 34w0d-36w6d. In a multivariable model adjusted for confounders, a higher number of early ED visit was associated with an increased risk of PTB < 28 weeks (adjusted relative risk (aRR) = 1.35, 95% CI: 1.28-1.42), 28w-33w6d (aRR = 1.18, 95% CI: 1.15-1.20), and >34 weeks (aRR = 1.13, 95% CI: 1.11-1.15).

Conclusion: More frequent, early EC utilization is associated with a higher rate of PTB in every gestational age category assessed. Clinically, the study reveals an area of opportunity to initiate a prenatal care coordination plan as an intervention in the EC setting, which may potentially reduce the rate of PTB.

Table 1: Gestational age at delivery, by frequency of early EC utilization

EC utilization visits <20 weeks	<28 weeks N=1,161 (0.76)	28-33w6d weeks N=5417 (3.57)	34-36w6d N=7937 (5.23)	≥37 weeks N=137,289 (90.44)
0	416 (0.53%)	2331 (2.95%)	3615 (4.57%)	72,743 (91.96%)
1	334 (0.86%)	1428 (3.69%)	2042 (5.27%)	34,908 (90.17%)
2	189 (1.02%)	815 (4.41%)	1141 (6.18%)	16,331 (88.39%)
≥3	222 (1.43%)	843 (5.43%)	1139 (7.34%)	13, 307 (85.79%)

p-values are all <0.05

1206 | Is First Trimester Hemorrhage with Concurrent Anemia Associated with Placenta Accreta Spectrum?

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4:00 PM - 6:00 PM

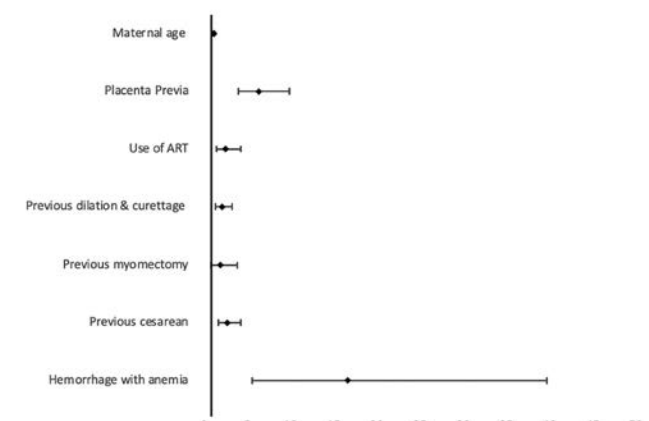
Objective: First trimester hemorrhage may contribute to abnormal placentation. These abnormalities can have devastating consequences in the form of placenta accreta spectrum (PAS), which is associated with significant maternal morbidity and mortality. Subchorionic hematoma, a leading cause of first trimester hemorrhage, and anemia may contribute to placental hypoxia and aberrant placentation. We sought to establish if an association exists between anemia, hemorrhage, and PAS.

Study Design: his is a secondary analysis of a retrospective case-control study using patient data from 2007 to 2022 at a large tertiary care center. Demographics and clinical characteristics of patients with and without PAS (diagnosed by histopathology or high index of clinical suspicion) were collected as well as complete blood count in early pregnancy. Bivariate analyses compared baseline case and control characteristics. Logistic regression was performed to assess risk of PAS according to the presence of first trimester hemorrhage with concurrent anemia (hemoglobin < 11 g/dL) while adjusting for relevant covariates.

Results: The final cohort included 88 patients with confirmed PAS and 27,126 controls. Rates of first trimester hemorrhage alone were not significantly different between groups (12.3% of those without PAS versus 17.0% of those with PAS, $p = 0.2$); however, those with PAS were more likely to have first trimester hemorrhage and concurrent anemia (0.4% of those without PAS versus 5.7% of those with PAS, $p < 0.001$). In multivariate logistic regression, first trimester hemorrhage and concurrent anemia was associated with higher odds of PAS than any other covariate, including prior cesarean or placenta previa (adjusted odds ratio = 16.6, 95% confidence interval 5.58 - 39.7).

Conclusion: Patients with a first trimester hemorrhage and concurrent anemia have 16-fold higher odds of PAS. This suggests that early pregnancy placental disruptions may significantly increase the risk for PAS. Further research into the pathophysiology of this process is warranted to fully understand this phenomenon.

Figure 1: Multivariate regression for placenta accreta spectrum



Adjusted odds ratio (OR) and 95% confidence interval for each covariate according to multivariate logistic regression. ART = assisted reproductive technologies. Dark vertical line represents OR = 1.

1207 | Use of Mean Arterial Blood Pressure to Predict Superimposed Preeclampsia with Severe Features

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4:00 PM - 6:00 PM

Objective: To examine whether longitudinal assessment of mean arterial pressure (MAP) could predict the development of superimposed preeclampsia (SIPE) with severe features.

Study Design: This was a secondary analysis of the Chronic Hypertension and Pregnancy (CHAP) trial. We excluded individuals with missing or invalid information regarding SIPE diagnosis. Our primary outcome was SIPE with severe features. We fitted Bayesian joint longitudinal and time-to-event models (linear and non-linear natural spline-based) using MAP from baseline and throughout pregnancy prior to the diagnosis of SIPE or censoring as repeated measures. A hazard ratio (HR) with a 95% credible interval was estimated. The fitted models were evaluated using the area under the receiver-operating curves (AUC) and Brier scores, estimated by 5-fold cross-validation 5 times.

Results: Of 2316 individuals with chronic hypertension, 600 (25.9%) developed SIPE with severe features. Compared to individuals without SIPE with severe features, those with SIPE with severe features had higher MAP, were more likely to be Black or smokers, and were more likely to have government insurance and diabetes (Table 1). Higher MAP was associated with an increased risk of SIPE with severe features (HR 1.15; 95% CI 1.12-1.19), indicating that each mmHg increase in MAP was associated with a 15% increase in the risk of SIPE with severe features. AUCs (Table 2) were low-to-moderate, with better performance for intervals later in pregnancy and shorter in duration (e.g., 0.60 at 20-40 weeks to 0.71 at 34-37 weeks). Similarly, Brier scores were low-to-moderate indicating poor performance. Estimated HRs and prediction performance were nearly indistinguishable between linear and spline-based models.

Conclusion: While repeated measures of MAP are associated with developing SIPE with severe features, the predictive ability of longitudinal MAP alone was fair to moderate. Future studies should consider longitudinal MAP in modeling the risk of SIPE with severe features, but additional predictors are necessary to improve predictive performances.

Table 1. Maternal characteristics

Variable	All (N = 2316) Mean/ Freq.	SD/%	SIPE with SF (N = 600) Mean/ Freq.	SD/%	No SIPE with SF (N = 1716) Mean/ Freq.	SD/%	p-value
Age (yr)	32.3	5.6	32.5	5.6	32.3	5.7	0.36
Gestational Age at Enrollment (wk)	15.5	4.3	15.6	4.3	15.4	4.3	0.29
BMI at Enrollment (kg/m^2)	37.6	9.8	38.3	9.8	37.4	9.8	0.06
Missing	40		5		35		
MAP at Enrollment (mmHg)	101.7	10.6	103.4	11.1	101.2	10.4	**<0.0001**
Mean Prenatal MAP	97.06	7.56	100.72	7.39	95.77	7.19	**<0.0001**
Missing	60		12		48		
Multiparas	1919	82.8	501	83.5	1418	82.6	0.63
Race							
Black	1099	47.5	302	50.3	797	46.5	**0.001**
Hispanic	474	20.5	140	23.3	334	19.5	
White	646	27.9	130	21.7	516	30.1	
Other	97	4.2	28	4.7	69	4.0	
Insurance							
Govt/Medicaid	1262	54.5	357	59.5	905	52.7	**<0.001**
Private	904	39.0	195	32.5	709	41.3	
None	119	5.1	40	6.7	79	4.6	
Missing	31	1.3	8	1.3	23	1.3	
Diabetes	357	15.4	117	19.5	240	14.0	**0.001**
Ever Smoker	162	7.0	51	8.5	111	6.5	0.09
Aspirin	1035	44.7	276	46.0	759	44.2	0.45
Type of CHTN							
New	497	21.5	116	19.3	381	22.2	0.11
Known (Meds)	1303	56.3	334	55.7	969	56.5	
Known (No Meds)	516	22.3	150	25.0	366	21.3	

Abbreviations: BMI (body mass index); CHTN (chronic hypertension); MAP (mean arterial pressure); SD (standard deviation); SF (severe features)

Table 2. Area under curves using 5x5 cross-validation

GA Interval (Weeks)	Linear AUC	Linear Brier score	Natural Splines (df = 3) AUC	Natural Splines (df = 3) Brier score
20-28	0.6605	0.0164	0.6469	0.0165
20-34	0.6171	0.0774	0.6137	0.0781
20-37	0.6205	0.1455	0.6176	0.1470
20-40	0.6012	0.1987	0.6072	0.2016
28-34	0.6838	0.0630	0.6869	0.0629
28-37	0.6691	0.1333	0.6705	0.1342
28-40	0.6459	0.1879	0.6449	0.1906
34-37	0.7071	0.0924	0.7072	0.0928
34-40	0.6812	0.1606	0.6690	0.1635
37-40	0.6615	0.1052	0.6683	0.1075

Abbreviations: AUC (area under the curve); GA (gestational age)

1208 | Association between Levels of Perceived Stress and Severity of Nausea and Vomiting in Pregnancy

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4:00 PM - 6:00 PM

Objective: The role of psychosocial factors such as perceived stress in the severity of Nausea and Vomiting of Pregnancy (NVP) is unclear. Our objective was to determine the association between perceived stress levels and NVP severity.

Study Design: This was a secondary analysis of data from the Nulliparous Outcomes Study: Mothers to be (nuMoM2b). Perceived stress was assessed in the first trimester using the Perceived Stress Scale, categorized into mild (0-14), moderate (15-27), and severe (28-40). NVP severity over the past 24 hours was assessed at 6-13 (visit 1), 16-21 (visit 2), and 22-29 weeks (visit 3) using the Pregnancy Unique Quantification of Emesis and Nausea tool, categorizing symptoms as no symptoms (0-3), mild (4-6), moderate (7-12), and severe (13-15). The primary outcome was the moderate or severe NVP in each trimester. Modified Poisson regression with robust variance was used to calculate adjusted relative risks (aRR) and 95% confidence intervals (CI), controlling for potential confounders (mild stress as the referent).

Results: Of 8,867 participants, 5,279 (59.5%) had mild stress, 3,298 (37.2%) had moderate stress, and 290 (3.3%) had severe stress. Maternal characteristics and socioeconomic factors varied across the groups (Table 1). The risk of moderate or severe NVP is presented in Table 2. Individuals with severe stress had a significantly increased risk of having moderate or severe NVP in visit 1 (aRR 1.65, 95% CI 1.25-2.13) and visit 2 (aRR 2.08, 95% CI 1.15-3.77) when compared to those with mild stress. Individuals with moderate stress had a significantly increased risk of having moderate or severe NVP in all visits when compared to those with mild stress (visit 1 aRR 1.24, 95% CI 1.09-1.40; visit 2 aRR 1.49, 95% CI 1.10-2.02: visit 3 aRR 1.59, 95% CI 1.06-2.41).

Conclusion: Elevated perceived stress levels show a significant association with increased severity of NVP throughout all trimesters, warranting the need for specific interventions in the management of NVP in high-stress pregnancies.

TABLE 1: Maternal characteristics and socioeconomic factors

	Mild stress (n=5279)	Moderate stress (n=3298)	Severe stress (n=290)	P-value
Age, year	28.0 (± 5.2)	25.9 (± 5.7)	23.0 (± 5.5)	<0.001
Body Mass Index, kg/m^2	26.0 (± 6.0)	26.6 (± 6.5)	28.3 (± 7.9)	<0.001
Gravida, median (IQR)	1.0 (1.0- 1.0)	1.0 (1.0- 2.0)	1.0 (1.0- 2.0)	0.02
Unmarried	3780 (71.6)	1608 (48.8)	64 (22.1)	<0.001
Government or self-insured	1147 (21.8)	1267 (38.7)	192 (66.9)	<0.001
Non-US origin	629 (12.0)	444 (13.5)	28 (9.7)	0.006
English not very well	197 (3.7)	190 (5.8)	15 (5.2)	<0.001
Less than high school	226 (4.3)	350 (10.6)	83 (28.6)	<0.001
Father less than high school	265 (5.1)	392 (12.5)	73 (27.8)	<0.001
Employment	4084 (83.9)	2125 (72.8)	109 (46.6)	<0.001
Less than $100,000	2544 (55.8)	1907 (74.5)	192 (90.6)	<0.001
Depression	56 (1.1)	575 (17.9)	198 (70.5)	<0.001
Anxiety	528 (11.0)	1493 (51.9)	197 (86.4)	<0.001
Connor-Davidson Resilience Scale	83.0 (76.0-90.0)	75.0 (67.0-83.0)	68.0 (58.0-79.0)	<0.001
Reading less than high school	700 (13.3)	751 (22.8)	96 (33.1)	<0.001
Smoking	656 (12.4)	773 (23.4)	119 (41.0)	<0.001
Alcohol use in the first trimester	187 (3.6)	136 (4.2)	13 (4.8)	0.562
Ever used drug	1691 (32.1)	1236 (37.5)	139 (47.9)	<0.001
Experience of discrimination	117 (2.3)	141 (4.5)	20 (7.4)	<0.001
Low social support	165 (3.4)	98 (3.4)	18 (7.7)	0.005

TABLE 2: Risk of moderate/severe NVP across levels of perceived stress

	Mild stress n = 5279	Moderate stress n = 3298	aRR (95%CI)	Severe stress n = 290	aRR (95%CI)
Moderate or severe NVP (visit 1)	712 (13.5)	626 (19.0)	1.24 (1.09-1.40)	87 (30.0)	1.63 (1.25-2.13)
Moderate or severe NVP (visit 2)	115 (2.2)	132 (4.0)	1.49 (1.10-2.02)	24 (8.3)	2.08 (1.15-3.77)
Moderate or severe NVP (visit 3)	68 (1.3)	78 (2.4)	1.59 (1.06-2.41)	16 (5.5)	1.91 (0.86-4.26)

Abbreviations: aRR (adjusted relative risk); CI (confidence interval)
aRRs were adjusted for age, BMI, insurance type, employment status, marital status, depression, and anxiety.

1209 | Hypertensive Control and Delivery Outcomes with Use of Oral Antihypertensives in Pregnancy for Non-severe Hypertension

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4:00 PM - 6:00 PM

Objective: This study aims to determine if there are differences in pregnancy outcomes and hypertension control for patients on single versus multiple antihypertensive maintenance drug regimens.

Study Design: Retrospective chart review of adult pregnant patients who received prenatal care and delivered at a single academic institution with a diagnosed hypertensive disorder requiring antenatal antihypertensive maintenance medications started by 34 weeks GA or for a minimum of 2 weeks. Exclusion criteria were pregnancies of known anomalous fetus and multifetal gestations. Patients were then stratified by type and number of medications prescribed. Chi-squared, Fischer's exact, and student's t-test analysis were performed.

Results: 112 patients met inclusion criteria. 96 (85.7%) were prescribed a single drug regimen: labetalol 71(63.4%), metoprolol 2(1.8%), nifedipine 11 (9.8%), other 12 (10.7%); 16 (14.3%) were taking a combination of medications. There were no differences in age, obesity, race/ethnicity, insurance status, hypertensive diagnosis, maternal co-morbidities, aspirin or tobacco use. More women requiring polytherapy had more history of preeclampsia versus those on monotherapy (89% vs 28%, p< 0.001), along with higher diastolic BP and MAP at first prenatal visit. Patients on multidrug regimens had higher rates of change in hypertensive diagnosis (i.e. chronic to preeclampsia) (p = 0.01), inpatient admission for blood pressure control (p = 0.002), higher BP and MAP at delivery (p< 0.001), earlier gestational age at delivery (p< 0.001), rates of medically indicated PTD (p< 0.001), cesarean delivery (p< 0.001), and longer maternal hospitalization (p = 0.02), as compared to the monotherapy group (Table 1).

Conclusion: Requiring multidrug antihypertensive regimens may be a proxy for pregnancies with poor hypertensive control, and furthermore a marker for poor maternal outcomes. Close supervision and attention to these patient populations may be warranted to optimize their pregnancy outcomes.

Table 1: Hypertension Control and Pregnancy Outcomes for Patient Requiring Antepartum Antihypertensive Maintenance Medications

	Single drug regimen (n=96)	Multiple drug regimen (n=16)	p
Antepartum			
Systolic blood pressure 1st prenatal visit (mmHg)	131.2 ± 15.9	142.3± 25.1	0.13
Diastolic blood pressure 1st prenatal visit (mmHg)	79.6 ± 11.4	86.6 ± 14.2	**0.04**
Mean Arterial Pressure 1st prenatal visit (mmHg)	96.8 ± 12.2	105.1 ± 17.7	**0.02**
Medication initiation during pregnancy	5 (13)	5 (56)	**0.01**
Inpatient admission for blood pressure control	22 (26)	11 (69)	**0.002**
Compliance issues with medication	9 (11)	3 (19)	0.41
Change in hypertension diagnosis antepartum	34 (39)	12 (75)	**0.01**
Delivery			
Gestational age at delivery (weeks)	36.8 ± 2.7	32.6 ± 3.7	**<0.001**
Systolic blood pressure: delivery admission (mmHg)	144.9 ± 2.6	161.7 ± 22.1	**0.004**
Diastolic blood pressure: delivery admission (mmHg)	84.9 ± 13.4	98.2 ± 20.1	**<0.001**
Mean Arterial Pressure: delivery admission (mmHg)	104.9 ± 14.4	119.4 ± 19.0	**<0.001**
Change in systolic BP (mmHg)	12.7 ± 22.7	19.4 ± 29.5	0.31
Change in diastolic BP (mmHg)	3.8 ± 13.3	11.6 ± 21.1	0.17
Fetal Placental Complications	8 (9)	4 (27)	0.06
FGR	3 (3)	2 (13)	0.15
Oligohydramnios	3 (3)	2 (13)	0.15
Medically Indicated preterm delivery <37 weeks	33 (34)	13 (81)	**<0.001**
Medically Indicated preterm delivery <35 weeks	16 (17)	12 (75)	**<0.001**
Cesarean Delivery	55 (57)	16 (100)	**<0.001**
Length of stay for mother (days)	3.3 ± 2.0	7.0 ± 5.7	**0.02**

*Data presented as n(%) or mean±SD

1210 | Maternal Delivery Outcomes at 35-37 Versus 34 weeks after PPROM <34 weeks in the US

Timothy Wen[1]; Brittany Arditi[2]; Nasim C. Sobhani[3]; Cynthia Gyamfi-Bannerman[4]; Adina R. Kern-Goldberger[5]; Teresa C. Logue[6]; Maria Andrikopoulou[2]; Lanbo Yang[7]; Milli Desai[8]; Alexander M. Friedman[2]; Kartik K. Venkatesh[9]
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4:00 PM - 6:00 PM

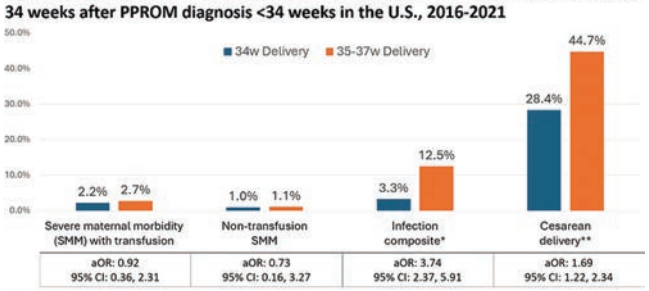
Objective: International data suggest that expectant management of preterm premature rupture of membranes (PPROM) up to 37 weeks is safe compared with 34-week delivery. U.S. data on this evolving practice is lacking. We examined maternal outcomes and healthcare utilization between delivery at 35-37 versus 34 weeks after a PPROM diagnosis < 34 weeks.

Study Design: This study included livebirth delivery hospitalizations in the Nationwide Inpatient Sample from 2016-2021 that had a diagnosis of PPROM < 34 weeks with consequent delivery between 34-37 weeks. The exposure was timing of delivery defined as 34+0 to 34+6 versus 35+0 to 37+6 weeks per best obstetrical estimate of gestational age in completed weeks at delivery per National Center for Health Statistics recommendations. Outcomes at delivery included a composite of maternal infection (chorioamnionitis, endometritis, sepsis, shock), severe maternal morbidity (SMM) with and without transfusion, and cesarean delivery. Secondary outcomes included postpartum length of stay (ppLOS) and total hospitalization costs. Logistic regression models adjusted for payer type, self-reported race as a social construct, obstetric comorbidity index, hospital characteristics, and birth year.

Results: Among 73,365 deliveries between 34-37 weeks with a PPROM diagnosis < 34 weeks, 920 (1.3%) delivered between 35-37 weeks. Delivery between 35-37 weeks was associated with a higher risk of maternal infection (3.3% vs. 12.5%, aOR: 3.74, 95% CI: 2.37, 5.91) and cesarean delivery (28.4% vs. 44.7%, aOR 1.69, 95% CI: 1.22, 2.34) versus delivery at 34 weeks. There were no differences in SMM by timing of delivery (Figure 1). Hospitalization costs were three-fold higher with delivery between 35-37 weeks ($22,487 vs. $6,669), but median ppLOS were similar between the two groups (Figure 2).

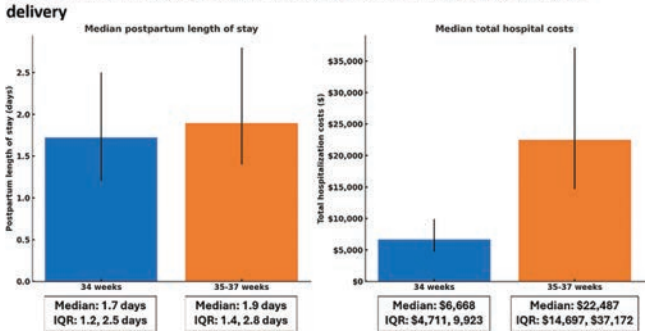
Conclusion: Later delivery between 35+0 to 37+6 weeks following PPROM < 34 weeks was associated with higher likelihood of infectious morbidity and cesarean delivery compared with delivery between 34+0 to 34+6 weeks. These national U.S. observational data contrast with recent international trials.

Figure 1. Prevalence and association of maternal outcomes with delivery at 35-37 vs. 34 weeks after PPROM diagnosis <34 weeks in the U.S., 2016-2021



*Includes chorioamnionitis, endometritis, shock, sepsis
**Among hospitalizations with no history of Cesarean delivery
***35-37w versus 34w delivery adjusting race, payer, obstetric comorbidity index composite, hospital location, hospital region, year

Figure 2. Health services outcomes following PPROM <34 weeks by timing of delivery



1211 | Firearm-Related Injuries and Severe Maternal Morbidity in the United States, 2017-2021

Timothy Wen[1]; Brittany Arditi[2]; Cynthia Gyamfi-Bannerman[3]; Adina R. Kern-Goldberger[4]; Nasim C. Sobhani[5]; Teresa C. Logue[6]; Maria Andrikopoulou[2]; Chia-Ling Nhan-Chang[3]; Alexander M. Friedman[2]; Kartik K. Venkatesh[7]

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4:00 PM - 6:00 PM

Objective: Firearm violence is a preventable public health crisis in the United States and a primary cause of maternal mortality, but its national impact on perinatal outcomes remains to be fully examined. We examined trends in firearm-related injuries (FRI) during pregnancy, and their association with severe maternal morbidity (SMM) and adverse pregnancy outcomes (APOs).

Study Design: We utilized all delivery hospitalizations in the Nationwide Inpatient Sample from 2017-2021. The exposure was any firearm-related injuries at delivery hospitalization. We analyzed trends of FRI overall. The primary outcome was non-transfusion severe maternal morbidity (ntSMM) and secondarily SMM with transfusion, inpatient mortality, stillbirth, critical care procedures, and preterm birth < 37 weeks. We evaluated the association between FRI and perinatal outcomes using survey-adjusted logistic regression models, adjusting for demographic factors, hospital factors, delivery year, and obstetric comorbidity score.

Results: Among 17.5 million deliveries, 6,365 were complicated by FRI at a rate of 3.6 per 10,000 delivery hospitalizations. Deliveries with FRI significantly increased from 2.7 to 3.6 per 10,000 delivery hospitalizations from 2017 to 2021 (p< 0.01), with a peak of 5.0 per 10,000 delivery hospitalizations in 2020 [Figure 1]. In adjusted analyses, FRI was associated with over a five-fold increased likelihood of ntSMM (5.1% vs 0.8%; aOR 5.21, 95% CI: 3.91, 6.95). In addition, FRI was associated with higher likelihood of adverse of all APOs, with the highest likelihood of needing critical care procedures (aOR 8.47, 95% CI: 4.64, 15.44) and inpatient mortality (aOR 19.19, 95% CI: 4.66, 79.07) [Figure 2].

Conclusion: Firearm-related injury at delivery hospitalization has increased across the US from 2017 to 2021 and is associated with an increased risk of SMM as well as APOs. Preventing gun violence has the potential reduce perinatal morbidity and mortality and should be an urgent public health priority.

Figure 1: Trends of firearm-related injuries complicating delivery hospitalizations, 2017-2021

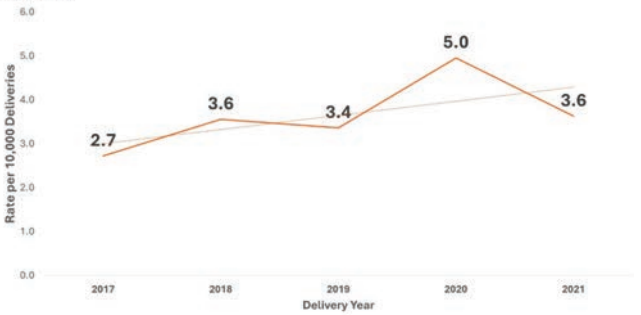
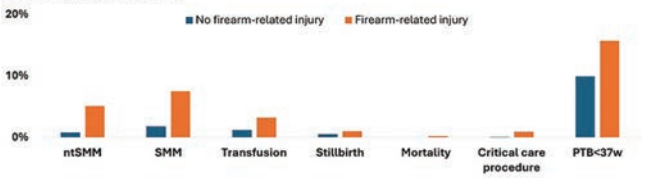


Figure 2: Prevalence and association of maternal outcomes with firearm related injuries (FRI), 2017-2021



	ntSMM	SMM	Transfusion	Stillbirth	Mortality	Critical care procedure	PTB<37w
No FRI	0.8% 131,975	1.8% 311,730	1.2% 205,150	0.5% 86,255	0.0% 935	0.1% 12,075	9.9% 112,620
FRI	5.1% 325	7.5% 475	3.2% 205	1.0% 65	0% DS	0.9% 60	15.7% 90
aOR 95% CI	5.21 (3.91-6.95)	3.49 (2.73-4.44)	2.21 (1.59-3.08)	1.80 (1.03-3.12)	19.19 (4.66-79.07)	8.47 (4.64-15.44)	1.70 (1.06-2.74)

aOR: adjusted odds ratio. *CI*: confidence interval, *ntSMM*: non-transfusion severe maternal morbidity. *PTB*: preterm birth
Analysis reference group was no firearm-related injury
Adjusted analysis accounted for: payer, maternal race, median income quartile by ZIP code, social vulnerability, obstetric comorbidity index score, hospital region, hospital teaching status, and year of delivery

1212 | Determining time Course of Complex Gastroschisis Development in Fetal Lambs with Standardized Abdominal Wall Defect

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4:00 PM - 6:00 PM

Objective: Complex gastroschisis is the severe type of gastroschisis, characterized by intestinal atresia, stenosis, volvulus, perforation, or necrosis. A systematic review (Arai, *Prenatal Diagnosis* 2024) demonstrated complex gastroschisis can be reliably surgically induced in fetal lambs using a 1.5 cm left lateral abdominal wall defect stabilized by a 1.5 cm silicone ring. It results in a 60% complex gastroschisis and a 40% fetal death rate *by term*. We aimed to identify from what time point after induction gastroschisis becomes complex.

Study Design: Gastroschisis was induced in 75-day (term = 145d) fetal lambs, which were harvested between 13 and 21d post-induction. Primary outcome was the occurrence of *complex* gastroschisis; secondary outcomes included *in-vivo* ultrasound characteristics of the bowel, *ex-vivo* bowel contractility, and

histology (Fig. 1). We first assessed 6 animals at 13-16d and 6 at 17-21d post-induction to sufficiently power the study.
Results: In the first 12 lambs, 0/6 developed *complex* gastroschisis at 13-16d, whereas this was present in 4/6 at 17-21d. Hypothesizing a complex gastroschisis rate of 10% at 13-16d and 65% at 17-21d, we added 6 lambs (total:18). Finally, 17-21d post-induction, *complex* gastroschisis was present in the vast (5/8 = 63%) majority, whereas it was simple at 13-16d (9/10 = 90%, p = 0.0265, 2-sided Fisher exact). Bowels from lambs with complex gastroschisis display inappropriate bowel relaxation on contractility testing and a thicker muscular layer on histology. Remarkably, lambs with complex gastroschisis presented with intra-abdominal bowel dilation on prenatal ultrasound at obduction; a 2.58mm cut-off could identify complex with 100% sensitivity and 60% specificity.
Conclusion: Gastroschisis can be reliably induced in fetal lambs. This leads to simple gastroschisis early on (13-16d), whereafter (17-21d) complex gastroschisis becomes very common. Complex gastroschisis coincided with intra-abdominal bowel dilation on ultrasound, which may be used as a non-invasive biomarker. This defines a time window of opportunity and signs to guide experiments for prenatal intervention.

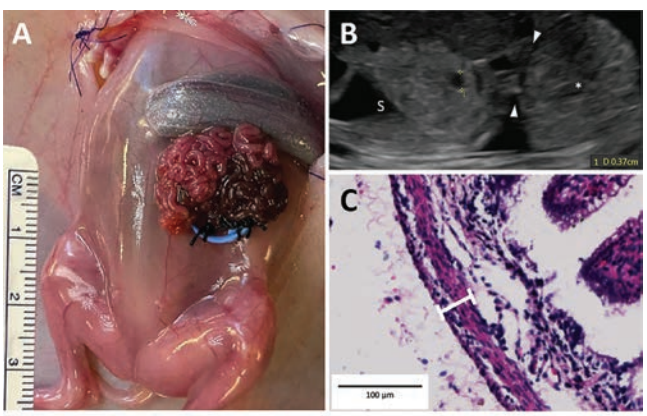

Fig 1: Gastroschisis induced at 75 d through creation of a 1.0 cm defect in the left lower abdominal quadrant, stabilized with a 1.0 cm ring (A). Ultrasound image of intra-abdominal bowel dilatation, measured at the most dilated part near the stalk (arrowhead) of the exteriorized bowel (*); S: stomach (B). Muscular layer thickness measured on hematoxylin-eosin staining of the bowel (C).

1213 | Neighborhood Socioeconomic Disadvantage and Severe Maternal Morbidity

Tracy Caroline Bank[1]; Janet Catov[2]; Jiqiang Wu[3]; Lynn M. Yee[4]; David M. Haas[5]; Rebecca B. McNeil[6]; Brian M. Mercer[7]; Hyagriv Simhan[8]; Uma M. Reddy[9]; Robert M. Silver[10]; Samuel Parry[11]; George R. Saade[12]; Judith H. Chung[13]; Courtney Denning-Johnson Lynch[14]; William A. Grobman[3]; Kartik K. Venkatesh[3]
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4:00 PM - 6:00 PM
Objective: To determine whether neighborhood socioeconomic disadvantage in early pregnancy was associated with severe maternal morbidity (SMM) at delivery hospitalization.
Study Design: This was a secondary analysis from the prospective cohort Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-To-Be study. Participant residential addresses in the first trimester were geocoded at the census-tract level. The exposure was neighborhood socioeconomic disadvantage, measured by the Area Deprivation Index (ADI) and modeled in quartiles from the least (quartile 1, Q1, reference) to most (Q4) disadvantage. The outcome was SMM, based on the Centers for Disease Control and Prevention definition. Secondarily, SMM without transfusion was assessed. Modified Poisson regression with robust error variance was used and adjusted for individual-level covariates: age, pre-pregnancy body mass index, chronic hypertension, and diabetes in pregnancy. We also evaluated whether any observed associations between ADI and SMM differed by race/ethnicity, understood as a social construct (effect modification).
Results: Among 9,588 nulliparous individuals, 2.3% (n = 221) experienced any SMM and 0.5% (n = 48) experienced non-transfusion SMM. Individuals who self-identified as non-Hispanic Black were more likely to experience SMM than non-Hispanic White individuals (3.9% vs. 2.1% p < 0.001). Individuals living in the most disadvantaged neighborhoods (Q4) were more likely to experience SMM compared with those in the least disadvantaged neighborhoods (Q1) (3.4% vs 2.1%; aRR 1.73; 95% CI 1.17, 2.58) (Table). In secondary analyses, the association was also significant for non-transfusion SMM (1.0% vs 0.3%; aRR 2.82; 95% CI 1.15, 6.93). There was no evidence of effect modification by self-reported race and ethnicity (interaction p >0.05).
Conclusion: Nulliparous individuals living in the most disadvantaged US neighborhoods were at increased risk of experiencing SMM. Known racial and ethnic disparities in SMM may be related to differential neighborhood-level social determinants.

Table. Association of neighborhood-level socioeconomic disadvantage in early pregnancy and severe maternal morbidity (SMM) at delivery hospitalization

	Frequency of SMM (row percentage)		Unadjusted Risk Ratio[1], RR (95% CI)	Adjusted Risk Ratio[1,2], aRR (95% CI)
	No, n (%)	Yes, n (%)		
Any SMM				
Area Deprivation Index				
Quartile 1 (least deprived)	2,468 (97.9)	52 (2.1)	1.00	1.00
Quartile 2	2,295 (98.2)	43 (1.8)	0.89 (0.60, 1.33)	0.91 (0.60, 1.37)
Quartile 3	2,330 (98.1)	45 (1.9)	0.92 (0.62, 1.36)	0.94 (0.62, 1.42)
Quartile 4 (most deprived)	2,274 (96.6)	81 (3.4)	**1.67 (1.18, 2.35)**	**1.73 (1.17, 2.58)**
Non-transfusion SMM				
Area Deprivation Index				
Quartile 1 (least deprived)	2,512 (99.7)	8 (0.3)	1.00	1.00
Quartile 2	2,328 (99.6)	10 (0.4)	1.35 (0.53, 3.41)	1.33 (0.52, 3.40)
Quartile 3	2,368 (99.7)	7 (0.3)	0.93 (0.34, 2.56)	0.88 (0.31, 2.48)
Quartile 4 (most deprived)	2,332 (99.0)	23 (1.0)	**3.08 (1.38, 6.86)**	**2.82 (1.15, 6.93)**

[1]Poisson regression with robust error variance with imputation for missing covariates was used to estimate relative risk (RR) and adjusted relative risk (aRR).
[2]Adjusted model included individual-level covariates: age, pre-pregnancy body mass index, chronic hypertension, and diabetes in pregnancy.
Bolded results signify statistically significant findings (p<0.05).

1214 | Antepartum Depressive Symptoms and Severe Maternal Morbidity

Tracy Caroline Bank[1]; Janet Catov[2]; Jiqiang Wu[3]; Lynn M. Yee[4]; David M. Haas[5]; Rebecca B. McNeil[6]; Brian M. Mercer[7]; Hyagriv Simhan[8]; Uma M. Reddy[9]; Robert M. Silver[10]; Samuel Parry[11]; George R. Saade[12]; Judith H. Chung[13]; Courtney

Denning-Johnson Lynch[14]; William A. Grobman[3]; Kartik K. Venkatesh[3]
[1]The Ohio State University Wexner Medical Center, Columbus, OH; [2]Magee-Womens Hospital, Pittsburgh, PA; [3]The Ohio State University, Columbus, OH; [4]Northwestern University Feinberg School of Medicine, Chicago, IL; [5]Indiana University School of Medicine, Indianapolis, IN; [6]Research Triangle International, Durham, NC; [7]Case Western Reserve University, Cleveland, OH; [8]University of Pittsburgh Medical Center, Pittsburgh, PA; [9]Columbia University, New York, NY; [10]University of Utah, Salt Lake City, UT; [11]University of Pennsylvania, Philadelphia, PA; [12]Macon & Joan Brock Virginia Health Sciences Eastern Virginia Medical School at Old Dominion University, Norfolk, VA; [13]University of California- Irvine, Irvine, CA; [14]The Ohio State University College of Medicine, Columbus, OH

4:00 PM - 6:00 PM

Objective: The relationship between maternal mental health during pregnancy and consequent severe maternal morbidity (SMM) remains to be investigated. Therefore, we examined whether antepartum depressive symptoms in early pregnancy were associated with SMM at delivery hospitalization.

Study Design: This was a secondary analysis from the prospective cohort Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-To-Be study. Nulliparous pregnant individuals were followed from the first trimester through delivery at 8 centers in the United States. The Edinburgh Postnatal Depression Scales (EPDS) was administered at 11-13 weeks' gestation. The EPDS was assessed categorically at ≥10 and ≥13, which are thresholds commonly used in clinical practice. The outcomes were SMM (including transfusion) and SMM (without transfusion) at delivery hospitalization. SMM was identified based on the Centers for Disease Control and Prevention definition. Modified Poisson regression with robust error variance was used and adjusted for age, insurance status, tobacco use, and Area Deprivation Index.

Results: Among 8,784 nulliparous individuals, 2.3% experienced any SMM and 0.5% had non-transfusion SMM. In early pregnancy (median gestational age: 12.0 weeks; IQR: 11.0,13.0), 17.2% of individuals had EPDS scores ≥10 and 7.1% ≥13. In univariable analysis, having an EPDS ≥10 was associated with a greater frequency of SMM (3.0% vs 2.1%; RR: 1.42; 95% CI: 1.02, 1.96), although this did not remain statistically significant after adjustment (Table). Individuals who met the higher EPDS threshold of ≥13 had a statistically significant increase in risk of SMM without transfusion in both univariable (1.1% vs. 0.4%, RR 2.53, 95% CI: 1.13, 5.67) and multivariable analyses (aRR: 3.12; 95% CI: 1.11, 8.81).

Conclusion: In a prospective cohort of nulliparous individuals from across the US, depressive symptoms in early pregnancy, defined by an EPDS score ≥13 was associated with an increased risk of SMM without transfusion.

Table. Association between antepartum depressive symptoms in early pregnancy and severe maternal morbidity (SMM) at delivery hospitalization in nulliparous individuals

	SMM n, % (Row Percentage)		Unadjusted and adjusted analyses	
			Unadjusted risk ratio (95% CI)	Adjusted risk ratio (95% CI)[1]
	No N=8,586	Yes N=198		
SMM				
EPDS ≥10				
No	7,120 (97.9)	153 (2.1)	1.00	1.00
Yes	1,466 (97.0)	45 (3.0)	**1.42 (1.02, 1.96)**	1.17 (0.77, 1.77)
EPDS ≥13				
No	7,981 (97.8)	177 (2.2)	1.00	1.00
Yes	605 (96.6)	21 (3.4)	1.55 (0.99, 2.41)	1.42 (0.81, 2.47)
SMM without transfusion	No N=8,741	Yes N=43		
EPDS ≥10				
No	7,242 (99.6)	31 (0.4)	1.00	1.00
Yes	1,499 (99.2)	12 (0.8)	1.86 (0.96, 3.62)	2.03 (0.91, 4.55)
EPDS ≥13				
No	8,122 (99.6)	36 (0.4)	1.00	1.00
Yes	619 (98.9)	7 (1.1)	**2.53 (1.13, 5.67)**	**3.12 (1.11, 8.81)**

[1]Model adjusted for baseline age, insurance status, tobacco use, and Area Deprivation Index.
Bolded results are statistically significant (p<0.05).

1215 | Association between Antenatal low-dose Aspirin use and de Novo Postpartum Hypertension Incidence

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4:00 PM - 6:00 PM

Objective: Low dose aspirin (LDA) mitigates antenatal preeclampsia risk. Data is scarce regarding LDA effectiveness in preventing de novo postpartum hypertension (dnPPHTN), a growing contributor to maternal morbidity and mortality. We investigated the association between antenatal LDA prescription and dnPPHTN in a diverse multicenter cohort.

Study Design: We conducted a retrospective cohort study of patient data extracted from a multicenter electronic medical record system, including patients delivering from 2017 to 2024 from 90 locations and ~320 providers. Patients who met ACOG criteria for LDA 81 mg once daily throughout pregnancy for preeclampsia risk reduction were included in the analysis. Exclusion criteria were: preexisting HTN, congenital heart disease, or pregnancy-related HTN in the index pregnancy. Patients were grouped by LDA exposure (based on provider completion of prescription/recommendation). The primary outcome was dnPPHTN incidence, defined as "postpartum HTN" recorded at the postpartum encounter or on the delivery outcome form. We fit logistic regression models for dnPPHTN with unadjusted and adjusted odds ratios (OR, aOR) presented as measures of association.

Results: A total of 15,899 patients met criteria for LDA for preeclampsia risk reduction and did not develop hypertension antenatally; of those 10209 (64%) had been appropriately prescribed LDA. The overall incidence of dnPPHTN was 2.9% (n = 466). (Table 1) LDA-exposed patients had an increased odds of dnPPHTN compared to LDA-unexposed patients (OR 1.4, 95% CI 1.2,1.7). After controlling for baseline differences in clinically-relevant risk factors and other clinical characteristics (Table 2), this association persisted (aOR 1.4, 95% CI 1.1,1.8).

Conclusion: Patients at increased risk of preeclampsia by ACOG criteria who are prescribed LDA remain at elevated risk for

HTN in the postpartum period. Given limitations in assessing adherence and unmeasured confounders, prospective trials may help elucidate whether aspirin serves any preventative role beyond delivery.

Table 1. Characteristics and outcomes of LDA-unexposed and LDA-exposed patients

	LDA-unexposed (N=5690)	LDA-exposed (N=10209)	P-value
dnPPHTN, n (%)	133 (2.3)	333 (3.3)	**<0.001**
Demographic characteristics, n (%)			
Age			**0.037**
0-19	94 (1.7)	126 (1.3)	
20-29	1805 (32.3)	3168 (31.7)	
30-34	2352 (42.1)	4130 (41.3)	
35-39	1187 (21.2)	2282 (22.8)	
>40	154 (2.8)	300 (3.0)	
Race			**<0.001**
American Indian/Alaska Native	26 (0.5)	37 (0.4)	
Asian	279 (4.9)	459 (4.5)	
Black/African American	361 (6.3)	716 (7.0)	
Nativa Hawaiian/Pacific Islander	7 (0.1)	16 (0.2)	
Other	447 (7.9)	690 (6.8)	
Unknown	1729 (30.4)	2850 (27.9)	
White	2841 (49.9)	5441 (53.3)	
Ethnicity			**<0.001**
Hispanic	798 (14.0)	1242 (12.2)	
Not Hispanic	3008 (52.9)	3893 (57.7)	
Unknown	1884 (33.1)	3074 (30.1)	
Clinical characteristics, n (%)			
BMI ≥30 kg/m^2	1036 (30.5)	2372 (33.3)	**0.005**
Primiparous[a]	2299 (44.8)	4228 (43.9)	0.273
Gestational diabetes mellitus	1002 (17.6)	1542 (15.1)	**<0.001**
Multiple gestation	78 (1.4)	174 (1.7)	**0.106**
Systemic lupus erythematosus	10 (0.2)	27 (0.3)	0.266
Renal disease	220 (3.9)	413 (4.0)	0.580
In vitro fertilization	213 (3.7)	454 (4.4)	**0.034**
Pregestational diabetes mellitus	64 (1.1)	191 (1.9)	**<0.001**
Preterm delivery	466 (8.2)	696 (6.8)	**<0.001**
Mode of delivery, cesarean	1932 (34.0)	3499 (34.3)	0.684
Neonate requiring NICU stay	434 (7.6)	738 (7.2)	0.357
Preeclampsia in prior pregnancy	53 (0.9)	165 (1.6)	**<0.001**

[a] Having just delivered their first child in this index pregnancy

Table 2: Univariable and multivariable regression of dnPPHTN rates by LDA exposure

	OR/aOR	95% CI	
LDA only	1.41	1.15	1.73
LDA + clinically relevant characteristics different at baseline [a]	1.39	1.07	1.81
LDA + all characteristics different at baseline [b]	1.37	1.05	1.78
LDA + all characteristics different at baseline + known risk factors [c]	1.39	1.06	1.82

[a] Model includes: age, BMI≥30kg/m^2, GDM, pregestational DM, multifetal gestation, IVF, preterm delivery, history of preeclampsia in prior pregnancy
[b] Model includes: age, ethnicity, race, BMI≥30kg/m^2, GDM, pregestational DM, multifetal gestation, IVF, preterm delivery, history of preeclampsia in prior pregnancy
[c] Model includes: age, ethnicity, race, BMI≥30kg/m^2, primiparity, GDM, pregestational DM, multifetal gestation, systemic lupus erythematosus, renal disease, IVF, preterm delivery, cesarean delivery history of preeclampsia in prior pregnancy

1216 | Comparing Perinatal Outcomes between Women with Subcapsular Liver Hematoma versus Preeclampsia - A Population-Based Study

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4:00 PM - 6:00 PM

Objective: Subcapsular Liver Hematoma (SLH) is a rare life-threatening complication of preeclampsia and the data regarding it is scarce. We aimed to compare pregnancy and perinatal outcomes in women with preeclampsia with and without an SLH.
Study Design: We conducted a retrospective cohort study using the Healthcare Cost and Utilization Project, Nationwide Inpatient Sample (HCUP-NIS). Included in the study were all pregnant women who delivered or had a maternal death in the US between 2004-2014 with an ICD-9 diagnosis of preeclampsia. We divided the cohort into women with a diagnosis of SLH (study group) and women without an SLH (control group). Pregnancy and perinatal outcomes were compared between the two groups using multivariate logistic regression models adjusting for potential confounders.
Results: Overall, 327,485 women met the inclusion criteria. Amongst them, 119 women had a diagnosis of SLH. Women with an SLH, compared to those without, were more likely to be older ($p = 0.002$); had a higher BMI (BMI >30kg/m^2) ($p = 0.004$); and suffered from chronic hypertension ($p = 0.007$). Patients in the SLH group, compared to those without, had a higher rate of eclampsia (aOR 15.23, 95% CI 4.82-48.16, p< 0.001); and placental abruption (aOR 8.87, 95% CI 5.62-14.01, p< 0.001). Additionally, they had a higher rate of cesarean delivery (aOR 3.02, 95% CI 1.95-4.68, p< 0.001), postpartum hemorrhage (aOR 3.5, 95% CI 2.24-5.48, p< 0.001), packed red blood cell transfusion (aOR 23.58, 95% CI 16.41-33.89), disseminated intravascular coagulation (DIC) (aOR 23.11, 95% CI 14.67-36.41, p< 0.001), and maternal death (aOR 98.48, 95% CI 36.4-266.45, p< 0.001). Regarding neonatal outcomes, patients with an SLH, compared to those without, had a higher rate of intrauterine fetal demise (IUFD) (aOR 30.69, 95% CI 19.36-48.67, p< 0.001).
Conclusion: Women diagnosed with an SLH had a higher incidence of myriad pregnancy and perinatal complications, including DIC, maternal death, and IUFD, as compared to women with preeclampsia alone, highlighting the severity of this condition.

Table – Pregnancy and perinatal outcomes

	SLH n=119	Preeclampsia n=327,366	Adjusted OR (95% CI)	Adjusted p-value
GDM[a]	<11	29,567 (9%)	0.6 (0.28-1.28)	0.186
Eclampsia[a]	<11	574 (0.2%)	15.23 (4.82-48.16)	**<0.001**
Preterm delivery[a]	26 (21.8%)	73,752 (22.5%)	0.88 (0.57-1.37)	0.572
Placental abruption[a]	23 (19.3%)	8,090 (2.5%)	8.87 (5.62-14.01)	**<0.001**
Cesarean delivery[a]	93 (78.2%)	174,205 (53.2%)	3.02 (1.95-4.68)	**<0.001**
Hysterectomy[a]	<11	375 (0.1%)	36.92 (15.82-86.15)	**<0.001**
PPH[a]	21,465 (6.6%)	24 (20.2%)	3.5 (2.24-5.48)	**<0.001**
Packed RBC transfusion[a]	12,705 (3.9%)	60 (50.4%)	23.58 (16.41-33.89)	**<0.001**
Maternal death[a]	<11	94 (0%)	98.48 (36.4-266.45)	**<0.001**
DIC[a]	25 (21%)	3,185 (1%)	23.11 (14.67-36.41)	**<0.001**
SGA[a]	<11	20,836 (6.4%)	0.75 (0.33-1.71)	0.493
IUFD[a]	23 (19.3%)	2,358 (0.7%)	30.69 (19.36-48.67)	**<0.001**
Congenital anomalies[a]	0 (0%)	2,025 (0.6%)	N/A	N/A

a- Pregnancy Outcomes: adjusted for age, obesity, and chronic hypertension.
Abbreviations and definitions: SLH – subcapsular liver hematoma GDM – gestational diabetes mellitus; PPH – post-partum hemorrhage; DIC – disseminated intravascular coagulation; SGA – small for gestational age; IUFD – intrauterine fetal death; N/A – not available.
Per convention of the HCUP database when N<11, absolute cell number of subjects was not provided to protect patient anonymity (zero subjects could be reported because it would not affect anonymity).
OR and CI cannot be calculated if zero cases occur in one group

1217 | Rare Inflammatory Arthritis and Obstetric and Neonatal Outcomes - A Population-Based Study

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4:00 PM - 6:00 PM

Objective: Inflammatory Arthritis (IA) is a common pathology among reproductive-aged women. While abundant data exists regarding pregnancy outcomes in the more common IA subtypes, data is scarce regarding these outcomes in rare IA subtypes. We aimed to compare pregnancy and perinatal outcomes between women who suffered from rare types of IA and those who did not.

Study Design: A retrospective cohort study using the Healthcare Cost and Utilization Project, Nationwide Inpatient Sample (HCUP-NIS). Included in the study were all pregnant women who delivered or had a maternal death in the US (2004-2014) with an ICD-9 diagnosis of any of the following rare IA subtypes: Arthritis Nodosa, Acute Febrile Mucocutaneous Lymph node, Hypersensitivity Angiitis, Wegner Granulomatosis, Giant Cell Arteritis, and Takayasu Arteritis. We divided the cohort into women with rare IA (study group) and women without (control group). Obstetric and perinatal outcomes were compared between the two groups using multivariate logistic regression adjusting for potential confounders.

Results: A total of 9,096,788 women met the inclusion criteria. Amongst them, 335 women (3.7/100,000) had a diagnosis of rare IA. Women with rare IA, compared to those without, were more likely to be older; Caucasian; in the highest income quartile; be insured by private insurance; and suffer from obesity, pregestational diabetes mellitus, thyroid disorders, and chronic hypertension ($p< 0.05$, all). Patients in the rare IA group, compared to those without, had a higher rate of hypertensive disorders of pregnancy (HDP) (aOR 1.89, 95% CI 1.4-2.56, $p< 0.001$); preterm delivery (aOR 1.76, 95% CI 1.28-2.42, $p< 0.001$); and blood products transfusion (aOR 3.68, 95% CI 2.14-6.34, $p< 0.001$); with lower rates of spontaneous vaginal delivery (SVD) (aOR 0.76, 95% CI 0.61-0.94, $p = 0.012$); and a higher rate of congenital anomalies (aOR 4.1, 95% CI 2.03-8.31, $p< 0.001$).

Conclusion: Women with rare IA had a higher incidence of maternal complications, including HDP and preterm delivery, as well as an increased risk of congenital anomalies.

Table – Pregnancy and perinatal outcomes

	IA n=335	No IA n=9,096,453	Adjusted OR (95% CI)	Adjusted p-value
HDP[a]	53 (15.8%)	673,696 (7.4%)	1.89 (1.4-2.56)	**<0.001**
GDM[a]	18 (5.4%)	523,174 (5.8%)	1.97 (0.73-5.29)	0.179
Preterm delivery[b]	48 (14.3%)	653,847 (7.2%)	1.76 (1.28-2.42)	**<0.001**
PPROM[b]	11 (3.3%)	103,608 (1.1%)	2.59 (1.38-4.86)	**0.003**
Placental abruption[b]	<11	97,477 (1.1%)	0.49 (0.12-1.95)	0.308
SVD[b]	171 (51%)	5,667,298 (62.3%)	0.76 (0.61-0.94)	**0.012**
Hysterectomy[b]	0	7,099 (0.1%)	N/A	N/A
PPH[b]	12 (3.6%)	263,953 (2.9%)	1.16 (0.65-2.06)	0.62
Blood Products transfusion[b]	14 (4.3%)	90,353 (1%)	3.68 (2.14-6.34)	**<0.001**
Maternal death[b]	0	638 (0%)	N/A	N/A
VTE[b]	0 (0%)	5,310 (0.1%)	N/A	N/A
SGA[b]	15 (4.5%)	198,055 (2.2%)	1.61 (0.95-2.72)	0.076
IUFD[b]	<11	38,256 (0.4%)	1.92 (0.61-5.99)	0.263
Congenital anomalies[b]	<11	38,236 (0.4%)	4.1 (2.03-8.31)	**<0.001**

a- Pregnancy outcomes adjusted for Age, Race, Plan type, Income quartiles, Chronic hypertension, Obesity, Thyroid disease, and pregestational diabetes mellitus.

b- Delivery Outcomes: Adjusted for Age, Race, Plan type, Income quartiles, Chronic hypertension, Obesity, Thyroid disease, Pregestational diabetes mellitus, and hypertensive disorders of pregnancy.

Abbreviations and definitions: IA – Inflammatory arthritis; HDP – hypertensive disorders of pregnancy; GDM – gestational diabetes mellitus; PPROM – preterm premature rupture of membranes; SVD – spontaneous vaginal delivery; N/A – not available; PPH – post-partum hemorrhage; VTE – venous thromboembolism; SGA – small for gestational age; IUFD – intrauterine fetal death.
Per convention of the HCUP database when N<11, absolute cell number of subjects was not provided to protect patient anonymity (zero subjects could be reported because it would not affect anonymity).
OR and CI cannot be calculated when zero cases occurred in one group.

1218 | The social Vulnerability (SV) Index is Related to Toxicology Testing During Pregnancy

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4:00 PM - 6:00 PM

Objective: To compare the demographic profiles and SV of pregnant patients who did and did not receive urine toxicology (uTox) testing. We also wished to determine if the declaration of the opioid epidemic as a National Public Health Emergency (PHE) on 10/27/17 led to increased testing rates. We hypothesized that patients receiving uTox testing were more likely to be SV than those who did not and that testing rates would increase post-PHE declaration.

Study Design: Patients receiving prenatal care and delivered within a multihospital academic healthcare system with urban, suburban, and rural hospitals from 8/23/2016-12/31/2018 were included. Patient addresses were matched to the CDC Social Vulnerability Index to obtain overall and domain-specific (Household Composition, Socioeconomic Status, Racial/Ethnic Minority Status, and Housing/Transportation) SV scores. Scores ≥ 0.75 indicate high SV. Chi-squared or Fisher's exact tests were used to compare categorical variables, and Mann-Whitney U tests were used to compare continuous variables.

Results: 3,938 were included; 3,405 (86%) did not receive uTox testing, and 533 (14%) did. Testing rates did not differ pre- and post-PHE (14% vs 13%; $p = 0.25$). Patients with uTox testing were

more likely to be non-Hispanic Black or Hispanic, older, unmarried, without private insurance (Table 1). Overall elevated SV scores were significantly higher among those who received uTox testing and individually in all domains except for racial/ethnic minority status (Table 1). Those who received testing were more likely to have inadequate prenatal care, fetal or neonatal demise, abruption, PPROM and poor pregnancy outcomes (Table 2).

Conclusion: The PHE declaration did not impact testing rates. Demographic and other clinical differences in uTox testing may highlight provider biases. A high SV score may be a helpful tool for investigating other ways to make substance use testing in pregnancy more reliable.

Table 1: Maternal Demographics and social vulnerability (SV) score

	Overall N=3,938	Did not receive uTox testing n=3,405	Received uTox testing n=533	p-value
Demographics				
Race/Ethnicity				
Non-Hispanic White	52.10%	52.90%	46.70%	**<0.01**
Non-Hispanic Black	11.40%	10.80%	15.30%	
Non-Hispanic Other	3.90%	14.50%	10.60%	
Hispanic	22.50%	21.80%	27.50%	
Married/Significant Other	74.90%	78.30%	53.10%	**<0.01**
Private Insurance at entry into care	55.50%	60.80%	22.10%	**<0.01**
Age at delivery (years; median (IQR))	30 (26-34)	20 (26-34)	27 (23-31)	**<0.01**
English Primary language	90.00%	89.20%	94.80%	**<0.01**
Elevated SV Score ≥ 0.75				
Overall SV score	22.80%	21.80%	29.40%	**<0.01**
Household Composition	22.60%	21.60%	29.40%	**<0.01**
Socioeconomic Status	20.40%	19.90%	24.00%	**0.03**
Racial/Ethnic Minority Status	23.70%	23.40%	25.70%	0.25
Housing/Transportation	19.10%	18.40%	23.60%	**<0.01**

Table 2: Pregnancy and delivery outcomes

	Overall N=3,938	Did not receive uTox testing n=3,405	Received uTox testing n=533	p-value
Adequacy of prenatal care				
Inadequate	25.60%	23.80%	36.80%	**<0.01**
Intermediate	9.20%	8.70%	12.60%	
Adequate	45.30%	48.70%	23.50%	
Adequate plus	20.00%	18.90%	27.20%	
Poor pregnancy outcomes				
Composite of outcomes below	26.10%	23.50%	43.00%	**<0.01**
Fetal or neonatal demise	1.50%	1.20%	3.20%	**<0.01**
Abruption	2.70%	2.40%	4.30%	**<0.01**
PPROM	5.90%	5.60%	8.30%	**0.01**
Preterm delivery (<37 weeks)	13.60%	11.50%	26.60%	**<0.01**
Fetal growth restriction	12.90%	11.90%	18.80%	**<0.01**

1219 | Factors Associated with Subsequent Diagnosis of T2DM Following an Initial Pregnancy with GDM

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4:00 PM - 6:00 PM

Objective: Gestational diabetes (GDM) affects more than 200,000 people annually in the US, with prevalence continuing to rise. GDM is associated with development of type 2 diabetes mellitus (T2DM) in the future, which can affect subsequent pregnancies. The purpose of this study was to identify factors that are associated with the development of T2DM in a subsequent pregnancy in patients who had GDM in their initial pregnancy.

Study Design: This was a retrospective cohort study of pregnant persons in California between 2008-2020 with two births that were both singleton, non-anomalous, gestational ages 23-42 weeks. Included persons had GDM in their index pregnancy. We assessed factors associated with development of T2DM in a subsequent pregnancy compared to those who did not develop T2DM. Statistical analyses were performed utilizing chi squared and multivariable logistic regression with a p-value of 0.05.

Results: There were 65,160 (6.9%) of patients who had GDM in their initial pregnancy, of which 3,904 (6.0%) developed T2DM in their second pregnancy. Factors associated with development of T2DM at second delivery included non-Hispanic black race (aOR 1.98, CI 95% 1.67-2.35), Hispanic ethnicity (aOR1.88, CI 95% 1.70-2.08), overweight or obese body mass index (BMI) (aOR 1.81, CI 95% 1.62-2.02; aOR 3.61, CI 95% 3.27-3.99), public insurance (aOR 1.26, CI 95% 1.17-1.36), and diagnosis of chronic hypertension (CHTN) (aOR 1.93, CI 95% 1.66-2.25). Patients that were less than 20 years of age were less likely to develop T2DM in their subsequent pregnancy (aOR 0.82, CI 95% 0.68-0.98).

Conclusion: We found that a new diagnosis of T2DM in a subsequent pregnancy after an initial pregnancy with GDM is associated with several factors, including non-Hispanic black race, Hispanic ethnicity, overweight or obese BMI, public insurance and diagnosis of CHTN during initial pregnancy. These findings can be used when counseling patients with a history of GDM to discuss the risk of development of T2DM in subsequent pregnancies. Future studies should assess structural and sociocultural factors that may contribute to these findings.

Table 1. Comparison of demographics of patients who did not develop T2DM vs. those who did in subsequent pregnancy.

	T2DM not present at second delivery N=61,256	T2DM present at second delivery N=3,904	p-value
Race and ethnicity			<0.001
Non-Hispanic white	26.1%	14.7%	
Non-Hispanic Black	3.9%	5.8%	
Hispanic	42.6%	57.5%	
Asian/Pacific Islanders	17.3%	11.8%	
AIAN	0.4%	0.5%	
Other/Multiracial	9.7%	9.7%	
Age at first delivery			0.004
<20	3.8%	3.6%	
20-34	80.3%	82.4%	
>=35	16.0%	14.0%	
Education at first delivery			<0.001
High school or less	33.7%	45.1%	
Some college	66.3%	54.9%	
Pre-pregnancy BMI at first delivery			<0.001
Underweight	2.7%	0.8%	
Normal weight	37.2%	16.3%	
Overweight	26.6%	22.8%	
Obese	33.5%	60.0%	
Insurance at first delivery			<0.001
Private	63.1%	50.9%	
Public	36.9%	49.1%	
Prenatal care at first delivery			0.093
≥5 visits	98.9%	98.6%	
<5 visits	1.1%	1.4%	
Chronic hypertension at first delivery	2.4%	5.7%	<0.001

Table 2: Multivariable logistic regression analysis showing odds ratios for factors associated with development of T2DM in subsequent pregnancy

T2DM N = 3,904	aOR (95% CI)	P-value
Race/Ethnicity		
Non-Hispanic Black	1.98 (1.67-2.35)	<.001
Hispanic	1.88 (1.70-2.08)	<.001
Asian/Pacific Islanders	1.78 (1.56-2.04)	<.001
AIAN	1.41 (0.85-2.46)	0.18
Other/multiracial	2.15 (1.87-2.46)	<.001
Age		
<20	0.82 (0.68-0.98)	<.05
>=35	.99 (0.90-1.09)	0.85
Education		
Some college	0.83 (0.77-0.89)	<.001
BMI		
Underweight	0.69 (0.47-0.99)	<.05
Overweight	1.81 (1.62-2.02)	<.001
Obese	3.61 (3.27-3.99)	<.001
Insurance		
Public	1.26 (1.17-1.36)	<.001
Medical co-morbidities		
Chronic Hypertension	1.93 (1.66-2.25)	<.001

1220 | Association of Active Antenatal Management before Periviable Birth and Birthing Parent race in the US

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4:00 PM - 6:00 PM

Objective: sMFM provides guidance on the use of antenatal corticosteroids, antibiotics, and cesarean delivery in the periviable period. Although differences exist in postnatal active management of periviable neonates by parent race, less is known about the receipt of antenatal interventions. The objective of this study is to describe differences in antenatal interventions before a periviable delivery by birthing parent race.

Study Design: This is a population-based cohort study of the National Center for Health Statistics database of periviable deliveries (20w0d-25w6d) from 2016-2021. Subjects were included if they delivered a non-anomalous live singleton gestation in a hospital. To minimize inaccurate dating, subjects were excluded for birthweight >97% for gestational age. The exposure was self-reported race; those of Black race were compared to those of non-Black race. Outcomes included receipt of antenatal steroids or antibiotics, and cesarean delivery. The relationship of race to antenatal interventions was assessed using multivariable logistic regression.

Results: Of 45339472 live births during the study period, 93686 met inclusion criteria for this study. 37626 (40.2%) periviable births occurred in Black subjects. Black subjects differed from non-Black subjects in baseline characteristics (Table 1). As seen in Table 2, Black subjects were less likely to receive antenatal steroids (33.5% v. 34.3%, aOR 0.93, 95% CI 0.90-0.96), receive antibiotics (36.8% v. 38.1%, aOR 0.96, 95% 0.93-0.99), or receive antibiotics in the presence of intraamniotic infection(64.7% v. 67.4%, aOR 0.87, 95% CI 0.78-0.97). There were no differences in mode of delivery in adjusted analyses.

Conclusion: Black birthing parents are less likely to receive antenatal steroids or antibiotics prior to a periviable delivery. Given the complexity of counseling and clinical-decision making required in those at risk of periviable birth, additional research is warranted to understand the root of these disparities with the goal of equitable, patient-centered care in the periviable period.

Table 1. Demographic and Clinical Characteristics by Race

	Non-Black (n=56060)	Black (n=37626)	P value
Age[1]	29 [24, 34]	28 [23, 33]	<0.001
BMI[1,2]	28.1 [22.3, 33.9]	29.9 [23.7, 36.1]	<0.001
Public insurance	30768 (55.5)	25852 (69.5)	<0.001
High School Education	44328 (83.1)	31614 (87.1)	<0.001
Married	26172 (52.6)	9614 (26.3)	<0.001
Tobacco Use	5564 (10.1)	2278 (6.2)	<0.001
DM[3]	2852 (5.1)	1782 (4.7)	0.015
cHTN[4]	2498 (4.5)	2976 (7.9)	<0.001
HDP[5]	4606 (8.2)	3414 (9.1)	<0.001
Nulliparous	28834 (51.4)	19516 (51.9)	0.19
History of preterm birth	5508 (9.8)	4590 (12.2)	<0.001

Data are n(%) unless otherwise specified.
[1]Median [Interquartile Range]
[2]Body mass index (kg/m^2)
[3]Includes preexisting and gestational diabetes
[4]Chronic hypertension
[5]Hypertensive disorders of pregnancy including preeclampsia and eclampsia

Table 2. Antenatal Interventions before Periviable Delivery by Birthing Parent Race

	Non-Black (n=56060)	Black (n=37626)	*p* value	Adjusted Odds Ratio (95% Confidence Interval)
Antenatal steroids[1]	19232 (34.3)	12584 (33.5)	0.006	0.93[2] (0.90-0.96)
20 weeks	44 (1.1)	34 (1.3)	0.37	
21 weeks	126 (2.3)	80 (2.2)	0.66	
22 weeks	1022 (14.3)	804 (16.5)	0.001	
23 weeks	4532 (42.4)	3166 (41.3)	0.17	
24 weeks	6496 (46.5)	4194 (44.5)	0.002	
25 weeks	7012 (47.8)	4306 (46.0)	0.005	
Antibiotics[1]	21336 (38.1)	13846 (36.8)	<0.001	0.96[3] (0.93-0.99)
20 weeks	772 (19.0)	456 (17.7)	0.21	
21 weeks	1152 (21.1)	716 (19.4)	0.05	
22 weeks	1910 (26.7)	1432 (29.4)	0.002	
23 weeks	4688 (43.8)	3346 (43.7)	0.87	
24 weeks	6244 (44.7)	4010 (42.5)	0.001	
25 weeks	6579 (44.8)	3886 (41.5)	<0.001	
Antibiotics with intraamniotic infection[1]	2466 (67.4)	1764 (64.7)	0.026	0.87[3] (0.78-0.97)
20 weeks	198 (63.9)	120 (58.3)	0.20	
21 weeks	250 (56.6)	202 (57.7)	0.75	
22 weeks	392 (64.1)	294 (66.5)	0.41	
23 weeks	530 (70.5)	370 (63.1)	0.005	
24 weeks	554 (69.3)	422 (68.5)	0.76	
25 weeks	542 (72.9)	356 (67.9)	0.046	
Cesarean delivery[1]	25624 (45.7)	17098 (45.5)	0.42	0.98[4] (0.95-1.01)
20 weeks	106 (2.6)	46 (1.8)	0.03	
21 weeks	162 (3.0)	100 (2.7)	0.49	
22 weeks	900 (12.6)	576 (11.8)	0.19	
23 weeks	5076 (47.4)	3710 (48.4)	0.17	
24 weeks	9176 (65.7)	6204 (65.8)	0.92	
25 weeks	10204 (69.7)	6462 (69.1)	0.31	
Cesarean with malpresentation[1]	12268 (63.7)	7988 (62.6)	0.03	1.02[4] (0.95-1.10)
20 weeks	34 (2.8)	14 (1.7)	0.11	
21 weeks	54 (3.4)	34 (2.9)	0.51	
22 weeks	456 (18.7)	284 (17.7)	0.40	
23 weeks	2626 (66.0)	2014 (68.4)	0.036	
24 weeks	4386 (87.8)	2918 (88.5)	0.37	
25 weeks	4712 (93.6)	2724 (92.6)	0.08	

Data are n (%)
[1]In overall cohort inclusive of all gestational ages
[2]Adjusted for parental age, marital status, birthing parent education, year of delivery, gestational age at delivery, insurance status, history of preterm delivery, tobacco use, chronic hypertension, hypertensive disorders of pregnancy, and intraamniotic infection
[3]Adjusted for body mass index, birthing parent education, year of delivery, gestational age at delivery, insurance status, history of preterm delivery, tobacco use, chronic hypertension, and diabetes
[4]Adjusted for parental age, marital status, body mass index, birthing parent education, year of delivery, gestational age at delivery, history of preterm delivery, tobacco use, chronic hypertension, and diabetes

1221 | Is Detectable Deleterious? Comparing Maternal and Neonatal Factors Stratified by Hepatitis C Viral Load Detection

William L. Riley[1]; Rebecca Purvis[2]; Alicia Mastronardi[3]; Jill M. Maples[4]; Molly Rigell Peek[1]; Elizabeth Kirby[5]; Zuha Khan[5]; Mary Herndon[1]; Emily Katz[6]; Lynlee M. Wolfe[1]; Kimberly B. Fortner[1]; Callie Reeder[1]
[1]University of Tennessee Graduate School of Medicine, Knoxville, TN; [2]University of Tennessee Medical Center Knoxville, Knoxville, TN; [3]University of Tennessee Graduate School of Medicine, Department of OB/Gyn, Knoxville, TN; [4]University of Tennessee Health Science Center, College of Medicine, Knoxville, TN;

[5]*University of Tennessee, Knoxville, TN;* [6]*High Risk Obstetrical Consultants of Knoxville, Knoxville, TN*

4:00 PM - 6:00 PM

Objective: To investigate maternal and neonatal risk factors and outcomes among pregnant individuals with positive hepatitis C virus (HCV) screening results stratified by undetectable or detectable HCV RNA or viral load (VL).

Study Design: This retrospective cohort study included all deliveries between January 2022 and June 2023 at our institution with positive HCV antibody screening results and quantitative HCV RNA testing. Data on demographics and maternal and neonatal outcomes were collected. Comparisons were performed on factors and outcomes stratified by undetectable or detectable VL. Pearson chi-square tests were used to compare populations and outcomes as appropriate and can be found in the table.

Results: Of the 6,337 births with HCV screening results, the prevalence of positive HCV screening serology was 3.6% (n = 228). HCV VL results were available for 206 patients. When stratified by undetectable or detectable VL, there were no statistically significant differences in preterm delivery, hypertensive disorders of pregnancy, late or limited prenatal care, delivery route, NICU admission, or neonatal abstinence syndrome diagnosis. There were no differences in the rate of self-reported current substance misuse or a history of IV substance misuse. A history of substance misuse was significantly higher in patients with a detectable viral load (92.4% vs. 83.2%, p = .043). Full outcome data is shown in the table.

Conclusion: Although obstetric complications have been reported among women with HCV, the frequency of these outcomes remained unchanged when stratified by detectable VL. The only factor associated with detectable VL was a self-reported history of substance misuse. HCV genotyping remains an important factor in determining treatment type and duration. Future research will focus on understanding factors related to HCV infection that drive delivery and neonatal outcomes, including the temporal association of last substance use, IV misuse, and VL in pregnancy.

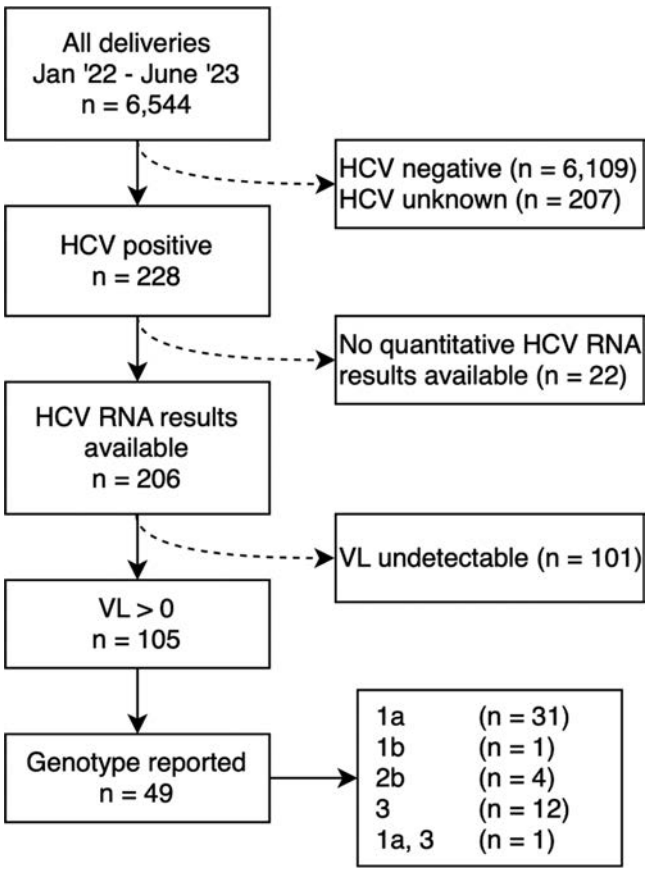

Table. Demographics and outcomes by VL

	Total	Undetectable VL n=101 (49.0%)	Detectable VL n = 105 (51.0%)	p-value
Age	30.6 +/- 4.9	30.4 +/- 4.7	30.8 +/- 5.2	0.532
Preterm delivery	46 (22.3)	27 (26.7)	19 (18.1)	0.137
HDP	42 (20.4)	18 (17.8)	24 (22.9)	0.618
Less than 7 prenatal visits	66 (32.0)	35 (34.7)	31 (29.5)	0.775
Prenatal care initiated after 4 months	65 (31.6)	25 (24.8)	40 (38.1)	0.19
Vaginal delivery	117 (56.8)	60 (59.4)	57 (54.3)	0.458
NICU admission	70 (34.0)	34 (33.7)	36 (34.3)	0.925
NAS diagnosis	41 (19.9)	16 (15.8)	25 (23.8)	0.201
Medication for opioid use disorder	93 (45.1)	43 (42.6)	50 (47.6)	0.467
History of substance misuse	181 (87.9)	84 (83.2)	97 (92.4)	**0.043**
History of IV substance misuse	94 (45.6)	44 (43.6)	50 (47.6)	0.813
Current Substance misuse	60 (29.1)	30 (29.7)	30 (28.6)	0.858
Current IV substance misuse	34 (16.5)	15 (14.9)	19 (18.1)	0.531

VL, viral load; HDP, hypertensive disorders of pregnancy; NAS, neonatal abstinence syndrome

1222 | Collagen's Critical Role in Uterine Structure and Function and Implications in Placenta Accreta Spectrum

Sohum Shah[1]; Lior Kashani Ligumsky[1]; Alex Kot[1]; Liwen Xu[1]; Anhyo Jeong[1]; Guadalupe Martinez[1]; Scott A. Shainker[2]; Deborah Krakow[1]; Yalda Afshar[1]

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4:00 PM - 6:00 PM

Objective: Properly synthesized and cross-linked collagen fibrils are the principal source of tensile strength in tissues and altered during pregnancy. We previously described changes in collagen at the decidual-stromal interface in placenta accreta spectrum (PAS). We aim to describe histoarchitectural variables of collagen organization in the uterus of wild type and mutant type I collagen mice to understand the role of collagen in pregnancy and repair as it related to PAS.

Study Design: We utilized two mutant type I collagen mice: *Col1a1*$^{Aga2/+}$ (*Aga2/+*) mice which express modified *Col1a1,* C-terminal frameshift mutation, and *Col1a1*$^{+/-}$ which express reduced levels of type I collagen. These mice, historically used in the study of skeletal dysplasias, allow us to interrogate the role of type I collagen. Uteri and placenta from wildtype (WT), *Col1a1*$^{+/-}$, and *Aga2/+* mice were harvested. Additionally, we utilized a surgical mouse model of PAS. We employed quantitative histomorphometry with standard histochemistry as well as label-free 3D spectroscopy to understand collagen fibril orientation and distribution.

Results: Type I (Col1a1) collagen was expressed in WT non-pregnant mice and at postpartum day (PP). In the WT, collagens were organized around smooth muscle and in the basement membranes of luminal and glandular epithelium (Fig 1). PP type I collagen staining was prominent within the endometrial stroma. *Aga2/+* mice demonstrated decreased type I collagen with a compensatory increase in type III collagen but no difference in type I and III collagen PP. *Aga2/+* stromal thickness was decreased. Utilizing the surgical PAS mouse, RNA and protein expression of COL1A1 was altered and there was an increase deposition of type III collagen at the decidual-placental interface in PAS (Fig 2).

Conclusion: Collagens are a main component of the dynamic architecture of the uterus. Type I collagen remodeling is a physiological component of pregnancy and birth and altered in PAS. The increased abundance and disorganization of collagen fibers at the site of adherence in PAS provide spatiotemporal clues to the mechanisms of PAS.

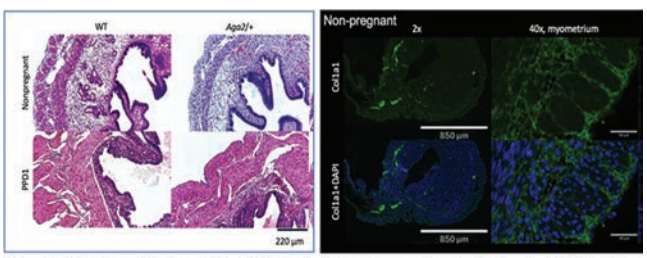

Figure 1. H&E staining of uteri from WT and Col1A1 mutant mice (non-pregnant and postpartum day 1 [PPD1]) without significant gross differences. Immunofluorescence demonstrates visualization of endometrial and myometrial Col1a1 protein (green) relative to nuclear staining (DAPI; blue) in non-pregnant WT mice.

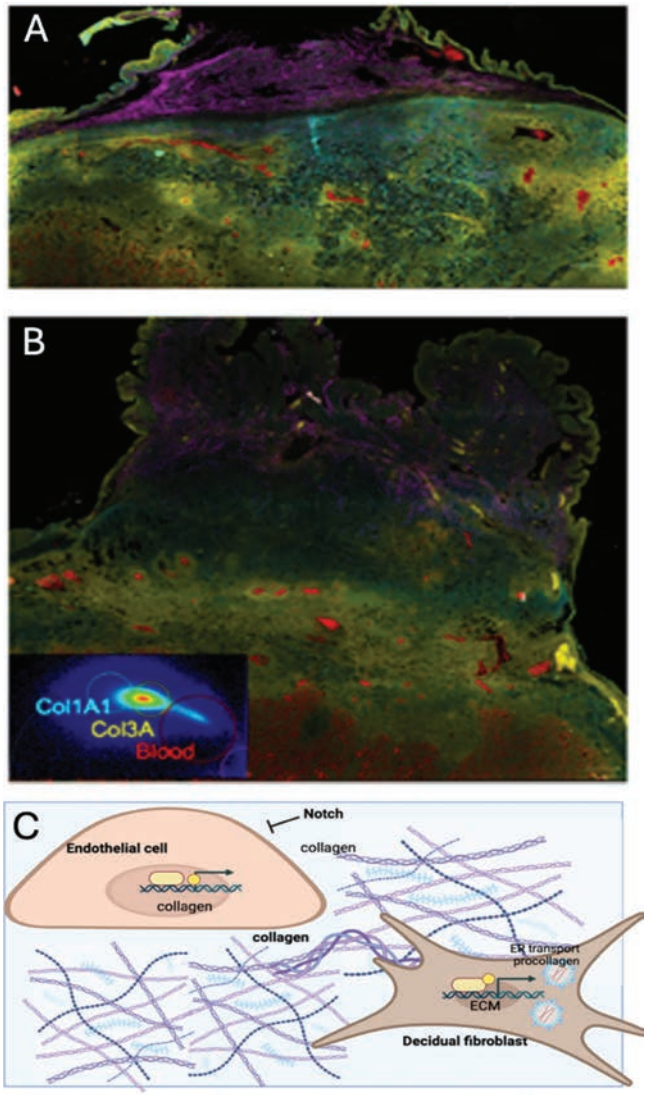

Figure 2. (A) Fluorescence lifetime imaging microscopy of uterine tissues from mouse pregnancies without PAS and without scarring compared to (B) PAS mice. (C) Collagen remodeling is a requirement for endothelial cell migration at the maternal-fetal interface and modulated by decidual fibroblast driven ECM production.

1223 | Cervicovaginal Microbiome in Pre vs Post Cerclage Placement

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4:00 PM - 6:00 PM

Objective: Though an association between changes in the cervicovaginal microbiome (CVM) and preterm birth has previously been demonstrated, the impact of cerclage placement on the CVM is poorly understood. Our objective was to assess significant changes in CVM due to cerclage placement, and association of CVM makeup with preterm delivery in patients with cervical insufficiency requiring cerclage placement.

Study Design: This was a prospective cohort study of singleton, non-anomalous pregnancies from 2022-2023 at two tertiary care centers. We enrolled 22 subjects receiving ultrasound or physical exam indicated cerclage, and 20 subjects with no prior preterm delivery and a normal cervical length as controls. Cervicovaginal fluid samples were collected prior to, and 1-2 wks post cerclage placement for the study group, and during routine anatomical surveys for the control group. Samples were analyzed using 16S rRNA gene sequencing.

Results: We detected no significant difference in Shannon diversity between study and control groups. However, a significant difference in distribution was observed in Shannon diversity between preterm and term deliveries (p = 0.01, Graph1). There were significant differences in differential abundance of 14 taxa in study vs control groups, and 4 taxa in preterm vs term deliveries (Table 1).

When comparing samples pre vs post cerclage placement, no significant difference was observed in Shannon diversity. However, a significant difference in distributions was observed in beta diversity between these samples (p =˙.04). There were no differences in specific taxon abundance between pre and post cerclage samples.

Conclusion: In a diverse patient population, differences in CVM distribution are associated with preterm delivery. The abundance of certain taxa may be associated with cervical insufficiency and preterm birth. Though cerclage placement did not implicate a difference in specific taxa present, it does appear to alter the distribution of the CMV.

Graph 1: Shannon Diversity in Preterm vs Term Deliveries

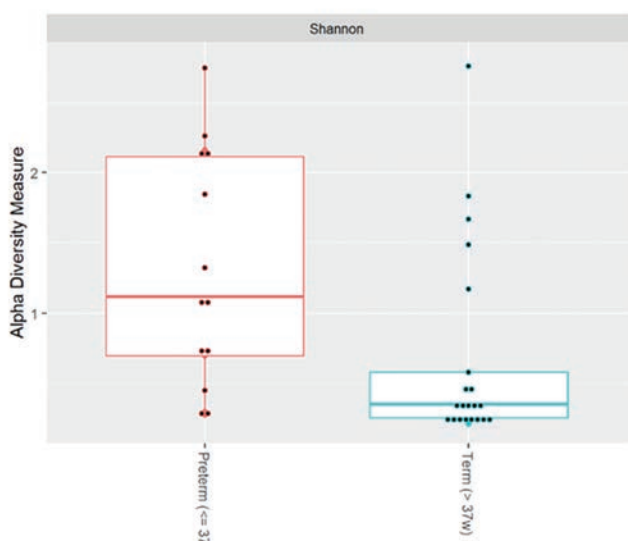

Table 1: Differential Abundance Results

Study vs Control Groups

taxonomiclevel	taxon	q_Cerclage	lfc_Cerclage
Phylum	Planctomycetes	0.0156	-1.5836
Class	Acidobacteria_Gp5	0.0077	1.3301
Order	Euzebyales	0.0324	-1.2599
Order	Solirubrobacterales	0.0016	-1.7806
Order	Chloroplast_Unclassified	0.0110	-1.4495
Family	Glycomycetaceae	0.0030	-1.4418
Family	Euzebyaceae	0.0357	-1.2828
Family	Chitinophagaceae	0.0446	-1.0688
Family	Chloroplast	0.0149	-1.4599
Family	Aurantimonadaceae	0.0222	-1.0986
Family	Sneathiellaceae	0.0333	-1.1470
Family	Oxalobacteraceae	0.0185	-1.6345
Family	Ectothiorhodospiraceae	0.0050	-1.4198
Family	Moraxellaceae	0.0012	-1.9690

Preterm vs Term

taxonomiclevel	taxon	q_val
Order	Desulfovibrionales	0.0001
Family	Bacillales_Incertae_Sedis_XI	0.0382
Family	Desulfovibrionaceae	0.0017
Family	Peptoniphilaceae	0.0357

1224 | Do Maternal Fetal Medicine Fellowship Websites Adequately Depict Training Opportunities?

Zenobia Gonsalves[1]; Rachel Lee[2]; Lama R. Noureddine[3]; Kimberly Herrera[4]; Cassandra Heiselman[1]

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4:00 PM - 6:00 PM

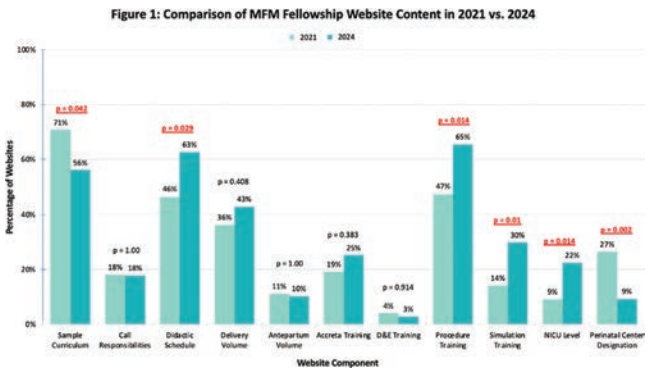
Objective: After the COVID-19 pandemic and with current virtual fellowship interviews, applicants rely heavily on programs' websites early in the application process to assess a program's unique training attributes and fit with their professional goals. We aimed to evaluate and compare the availability of information on education and training on MFM fellowship program websites between 2021 and 2024.

Study Design: This was a cross-sectional analysis of MFM fellowship websites for the 109 ACGME-accredited programs. Fellowship program websites had previously been reviewed in July 2021 and then again in July/August 2024 for the following information: delivery and antepartum volumes; level of neonatal intensive care units (NICU); regional perinatal center designation; sample curriculum with didactic schedule, simulation sessions, and call responsibilities; and training in placenta accreta spectrum (PAS) disorders, prenatal diagnostic procedures, and dilatation and evacuation (D&E). The percentage of websites that included each of these components was calculated and compared

across time points. Chi-square and Fisher's exact analyses were performed with a p-value < 0.05.

Results: 107 (98%) of the 109 ACGME-accredited MFM fellowship programs had an official website as of August 2024. Less websites were "up to date" for the current academic year in July 2024 (50%) compared to July 2021 (65%) [p = 0.04]. A larger proportion of programs in 2024 included information about the didactic schedule (p = 0.029), procedure training (p = 0.014), simulation training (p = 0.01), NICU level (p = 0.014), and perinatal center designation (p = 0.002) [Figure 1]. However, a smaller percentage of websites in 2024 included the rotation schedule as compared to 2021 (56% vs 71%, p = 0.03).

Conclusion: This study demonstrates continued gaps in the availability of desired information about education and training on MFM fellowship program websites. Programs should continue to improve information availability to enhance the application process, particularly as fellowship programs look to adopt signaling as AGCME residency applications have implemented.



1225 | Uterine Electrical Activity in Labor: EMMI Insights on Contraction "Pacemakers"

Zichao Wen[1]; Hui Wang[2]; Hansong Gao[2]; Yuelin Li[2]; Yuan Nan[2]; Josephine Lau[2]; Yong Wang[2]

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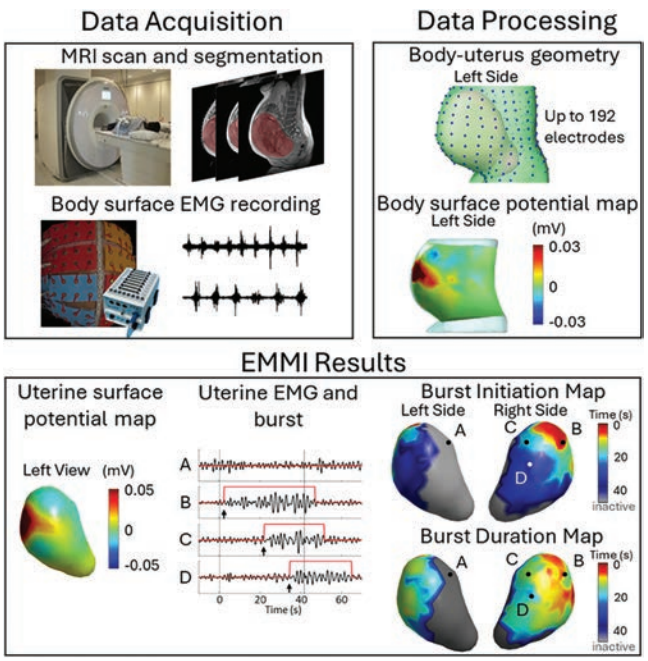
4:00 PM - 6:00 PM

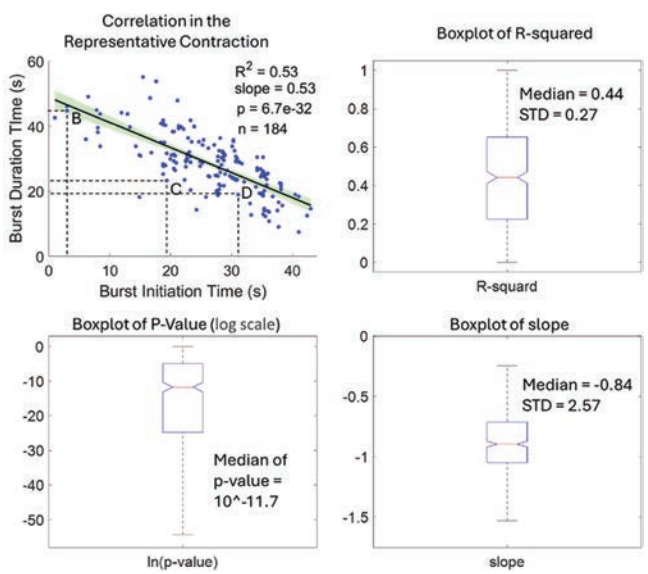
Objective: This study aims to analyze the correlation between initiation and duration of Electromyometrial Imaging (EMMI)-reconstructed electrical activity across the whole 3D uterine surface, which could provide new insights into electrophysiological "pacemakers" in human labor contractions.

Study Design: The Washington Institutional Review Board approved this prospective cohort study. Following informed consent, 38 subjects underwent MRI at ~37 weeks of gestation to capture subject-specific body-uterus geometry. Upon admission to Labor & Delivery Unit and during active labor (≥4 cm dilation with regular contractions), ≤192 electrodes were applied to the abdomen and back. Electrical potentials on the body were recorded for ~1 hour. EMMI generated uterine potential maps, electrogram bursts, and isochrone maps of burst initiation and duration (Fig. 1). Four representative uterine EMG (A-D) are shown.

Results: A strong negative correlation (Fig. 2) was observed between burst initiation time and duration, suggesting uterine regions with earlier activation had longer burst durations. Uterine locations B-D in Fig. 1 are depicted in the scatter plot. Statistics of R2, P-values, and slopes for 482 contractions from 38 subjects are also shown in Fig. 2. This finding aligns with the concept that the uterus does not have a single, dedicated, anatomical pacemaker, but instead shows variable initiation sites for each contraction, supporting the idea of multiple, widely dispersed, functional "pacemakers".

Conclusion: The inverse relationship between burst initiation time and duration highlights the importance of early-activating regions in maintaining normal uterine contractions. These findings challenge the traditional notion of an anatomically fixed uterine pacemaker like the heart's sinoatrial node. Instead, the data support the hypothesis that the uterus operates with multiple functional "pacemakers," likely coordinated through intrauterine pressure. Future studies should address potential bias from varying detected contractions per subject to refine these findings and explore uterine contraction coordination mechanisms.





1226 | Determining Potentially Avoidable Blood Transfusion after Cesarean Delivery: A Retrospective Cohort

Zoya Pervaiz Butt; Rebecca F. Hamm
University of Pennsylvania Perelman School of Medicine, Philadelphia, PA

4:00 PM - 6:00 PM

Objective: Prior work shows that actual blood loss is similar between vaginal (VD) and cesarean deliveries (CD). Yet, 12-hour complete blood counts (12hCBCs) are only routinely performed after CD, possibly contributing to a higher blood transfusion rate after CD as compared to VD. We sought to determine the proportion of blood transfusions after CD performed secondary to the routine post-CD 12hCBC alone, thus potentially avoidable.

Study Design: This retrospective cohort evaluated indications for packed red blood cell (pRBC) transfusion after CD in the postpartum (PP) period at a single institution from 2017-2022. Patients were evaluated for: pRBC transfusion before or after 12hCBC, high risk clinical criteria for PP anemia warranting a CBC (defined as ≥1 of the following: EBL≥1L, ≥3 CD, placental abnormalities, severe preeclampsia, multiple gestation, bleeding/clotting disorder, antepartum pRBC transfusion, admission Hb< 9.5g/dL, and surgical injury), and documented symptomatology (lightheadedness and/or fatigue) or abnormal vital signs (VS, defined as ≥1 of the following HR≥100; BP< 90/50; O2 sat < 95%) prior to transfusion. Those transfusions that occurred post-12hCBC, without high-risk clinical criteria, symptoms, or abnormal VS, were deemed potentially avoidable without a routine 12hCBC. Descriptive statistics were utilized.

Results: 421 patients were included; demographics are shown in the Table. Of those 421, 244 (58.0%) of post-CD transfusions occurred after the 12hCBC. Among those 244, 216 had at least one of the high-risk clinical criteria. Of the remaining 28 (6.6% of the initial cohort), 17 had either documented symptoms or abnormal VS. Thus, of 421 patients receiving pRBC transfusions post-CD after the 12hCBC, only 11 (2.6%), encompassing 19 pRBC units out of 984 transfused in the cohort (1.9%), were deemed potentially avoidable (Figure).

Conclusion: This study highlights that the majority (>97%) of patients who received pRBCs post CD would not have avoided the transfusion even in the absence of a routine 12hCBC. Alternative interventions to reduce unnecessary post-CD transfusion should be pursued.

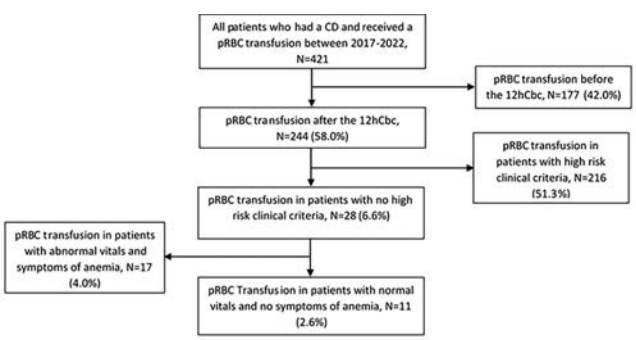


Figure: All percentages are out of the total patients transfused after CD

Table: Maternal Characteristics	n(%) n=421
Maternal Age [a]	33 (29-37)
Gestational Age at Delivery [a]	39 (36-40)
Race	
White	158 (37.5)
Black	169 (40.1)
Asian	34 (8.0)
Other/Unknown	60 (14.5)
Hispanic ethnicity	50 (11.8)
Insurance	
Private	255 (60.5)
Medicaid	166 (39.4)
Parity	
Nulliparous	205 (49.6)
BMI at Last Prenatal Care Visit (kg/m2) [a]	32 (28-37)
Gestation	
Singleton	374 (88.8)
Multiple	47 (11.1)

[a] Median [IQR]

1227 | Severe Early Post-Partum Hemorrhage: An Individualized Risk Assessment by Machine Learning Models

Ido Bachar[1]; Zvi Ehrlich[2]; Ari Weiss[3]; Rivka Farkash[4]; Tzuria Peled[3]; Sorina Grisaru Granovsky[5]
[1]Bnei Zion, Bnei Zion, Yerushalayim; [2]Shaare Zedek Medical Center, Jerusalem, Yerushalayim; [3]Shaare Zedek Medical Center, Shaare Zedek Medical Center, Yerushalayim; [4]SZMC, SZMC, Yerushalayim; [5]Hebrew University, Jerusalem, Yerushalayim

4:00 PM - 6:00 PM

Objective: Severe early post-partum hemorrhage (SEPPH) is a common, life-threatening obstetric challenge. The risk factors of early postpartum hemorrhage had been researched, however, early, upon admission for labor, recognition of high-risk parturients by machine learning models (ML) has not been attempted.

Study Design: Analysis of a multi-parameter dataset of 227,424 births at a tertiary medical center. SEPPH was defined as - Hemoglobin loss more than 4 g/dl or post-partum hemoglobin level less the 8 g/dl or treatment of 2 or more pRBC post-partum. For the ML analyses, the data set was divided into two groups: SEPPH and no SEPPH; analysis was conducted using a gradient boosting model (CatBoost) algorithm, to create a model predicting the risk score of SEPPH. Furthermore, this type of analysis categorized the study population high-risk and low-risk groups for SEPPH by using the Youden's Index.

Results: Study population is depicted in Figure 1. Using traditional statistical methods dissected into the individual risk factors for SEPPH. Notably, we revealed that the primiparity is a major risk factor for extreme postpartum hemorrhage (OR 4.5 [4.0-5.0] CI, p< 0.001). In addition, Multiple gestation (OR 2.5 [2.0-3.1]

CI p< 0.001), previous caesarean section (OR 3.0 [2.6-3.5] CI, p< 0.001), placentation anomaly (OR 4.0 [3.424-4.814] CI, p< 0.001), were significant risk factors.

The high-risk group identified by the ML model showed a significant higher risk for adverse maternal and neonatal outcomes including among the low and high risk for SEPPH: uterine rupture (OR-3.5), re-admission 42 and 90 days after delivery (OR -2.2, 2.2 respectively) and perinatal fever (OR-2.2), uterine scar dehiscence (OR-1.9). Newborn infection (OR-2.5), postnatal intensive care unit (NICU) stay >3 days (OR 2.4, 2.37 respectively) and low Apgar (1-7) at 1st and 5th min (OR 2.0, 1.26 respectively). Figure -2.

Conclusion: We built a machine learning model with defined measurable predictable factors to identify high risk for SEPPH. Prediction models for early PPH may allow appropriate risk reducing preventive care during and after delivery.

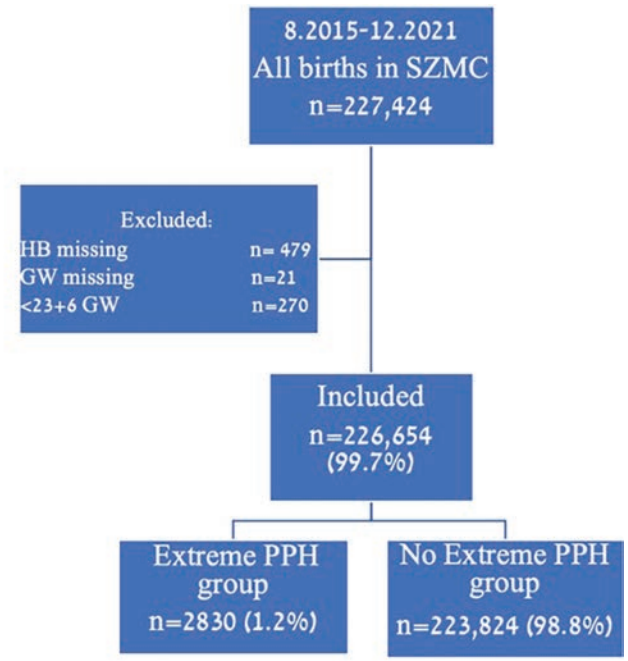


Figure 1 - study population

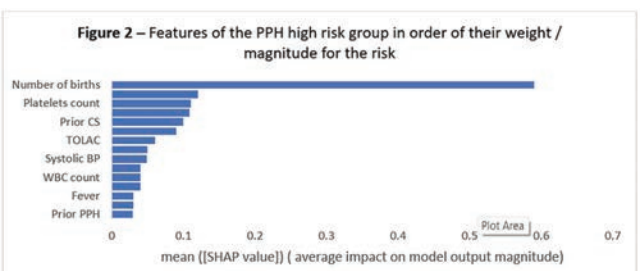


Figure 2 - Risk ranking using a gradient boosting model to identify the most important influencing features in order of relative importance. The top most influential features according to the GBM, by order of importance. As seen, the number of parity was the most influential feature. Values are measured by relative importance based on shapely additive explanation (SHAP). CS- cesarean section, TOLAC- trial of labor after cesarean, BP – blood pressure. RBC- red blood cell, WBC- white blood cell.

Late-Breaking Abstract Presentations

PREGNANCY

ABSTRACTS OPEN ACCESS

Late-Breaking Abstract Presentations

LB01 | CErebro Placental RAtio based Management in Reduced Fetal Movements; an International Cluster-Randomized Clinical Trial (CEPRA)

Laura A. Lens[1]; Selina Posthuma[2]; Stefanie E. Damhuis[3]; Renée J. Burger, N/A[1]; Henk Groen[4]; Ruben G. Duijnhoven[5]; Sailesh Kumar[6]; Alexander E.P Heazell[7]; Asma Khalil[8]; Wessel Ganzevoort[9]; Sanne J. Gordijn[10]

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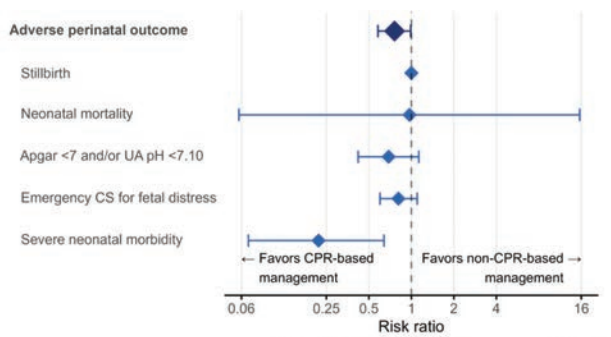
10:00 AM - 10:15 AM

Objective: Routine assessments in near-term pregnancies often fail to accurately detect fetal compromise due to placental insufficiency, especially in non-small for gestational age fetuses. The cerebroplacental ratio (CPR) serves as a potential indicator of placental insufficiency and adverse outcomes. This study aims to evaluate whether expedited birth in women with reduced fetal movements, potentially a sign of placental insufficiency, and low CPR improves neonatal outcomes.

Study Design: In this international, multicenter, cluster-randomized controlled trial, we randomly assigned 22 Dutch and 1 Australian hospitals to CPR-based management (i.e. expedited birth in case of CPR < 1.1) and concealed CPR measurement with routine clinical care in case of reduced fetal movements at term (37+0 to 40+6 weeks' gestation). Women were eligible to participate in the trial if the fetus was estimated to be above the 10th percentile, if cardiotocography was normal, and if there were no other reasons necessitating expedited birth within 4 days. Primary outcome was a composite of severe adverse perinatal outcomes: stillbirth, neonatal mortality, 5-minute Apgar score < 7, umbilical artery pH < 7.10, emergency birth for fetal distress and/or severe neonatal morbidity.

Results: From July 2020 to September 2024, 1816 women participated in the trial. 1676 Women with complete data were included in the intention to treat analysis. In preliminary data, the composite of severe adverse perinatal outcomes occurred in 99 (11.7%) of 849 participants who received CPR-based management versus in 127 (15.4%) of 827 participants in the concealed CPR group (relative risk 0.76; 95% confidence interval 0.58 to 0.99, Figure 1, Table 1). This was mainly driven by a reduction in severe neonatal morbidity, Apgar score < 7, umbilical artery pH < 7.10 and/or emergency birth for fetal distress.

Conclusion: In women presenting with perceived reduced fetal movements at term in non-small for gestational age fetuses, CPR-based management, i.e. expedited delivery if CPR < 1.1 and expectant management if CPR > 1.1, reduced severe adverse perinatal outcomes.



	Revealed CPR N=849	Concealed CPR N=827	RR (95% CI)
Intention-to-treat population			
Primary outcome			
Composite adverse perinatal outcome - no.	99 (11.7%)	127 (15.4%)	0.76 (0.58-0.99)
Stillbirth	0 (0.0%)	0 (0.0%)	-
Neonatal mortality	1 (0.1%)	1 (0.1%)	0.97 (0.06-15.57)
5-minute Apgar score <7 and/or umbilical artery pH <7.10	31 (3.7%)	44 (5.3%)	0.69 (0.42-1.13)
Emergency birth for fetal distress	76 (9.0%)	91 (11.0%)	0.81 (0.60-1.10)
Severe neonatal morbidity	4 (0.5%)	18 (2.2%)	0.21 (0.07-0.64)
Respiratory distress syndrome	2 (0.2%)	10 (1.2%)	0.19 (0.04-0.89)
Hypoxic ischemic encephalopathy	1 (0.1%)	1 (0.1%)	0.97 (0.06-15.57)
Sepsis	1 (0.1%)	7 (0.8%)	0.14 (0.02-1.13)
Necrotizing enterocolitis	0 (0.0%)	1 (0.1%)	-
Need for therapeutic cooling	0 (0.0%)	2 (0.2%)	-
Supplementary oxygen therapy (>4 days)	1 (0.1%)	1 (0.1%)	0.97 (0.06-15.56)

* CPR <1.1 considered abnormal.

Abbreviations: CPR, cerebroplacental ratio; RR, relative risk.

LB02 | iSEARCH RCT: Evaluating the Effectiveness of Maternal Sildenafil to Reduce Complications Related to Intrapartum Hypoxia

Sailesh Kumar[1]; Ben W. Mol[2]; William Tarnow-Mordi[3]; Jon Hyett[4]; Nadia Badawi[4]; Annalene Seidler[5]; Helen Liley[6]; Emily Callander[7]; Vicky Flenady[6]; Sue Walker[8]; Rachel O'Connell[4]
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10:15 AM - 10:30 AM

Objective: Sildenafil citrate (SC) has been proposed as a drug to reduce fetal distress during labour. We assessed its effectiveness in a large placebo controlled clinical trial.
Study Design: This was a double-blind multicentre randomised controlled trial (Trial Registration Number ACTRN12621000231842) funded by the Australian Medical Research Future Fund. We randomised women attempting vaginal birth at term to 50mg SC every 8 hours during labour (maximum of 3 doses) or placebo. Primary outcome was a composite of 10 adverse neonatal outcomes (intrapartum stillbirth, neonatal death, Apgar score < 4 at 5 minutes, cord artery pH < 7.0, neonatal encephalopathy, neonatal seizures, neonatal respiratory support >4 hours, neonatal unit admission > 48hours, persistent pulmonary hypertension of the newborn and meconium aspiration syndrome). Secondary outcomes were caesarean section (CS) or instrumental vaginal birth (IVB) for fetal distress. The sample size of 3200 women was predicated on a 35% reduction in the RR of the composite perinatal outcome by 35% (7% to 4.55%).
Results: Between 7 September 2021 and 30 June 2024 we randomized 3257 women (including 18 sets of twins) to SC (1626) and placebo (1631). Induction of labour occurred in 83.5% of the SC cohort and 82.9% of the placebo group. Electronic fetal heart rate monitoring rates were similar (97.4%) in both arms. The primary outcome occurred in 5.1% of women taking SC and 5.2% of those taking placebo [RR 1.02 (0.75-1.37)] with no differences in any of the components of the composite outcome. There was also no difference in rates of CS or IVB for fetal distress [21.1% vs. 18.8%, RR 1.12 (0.98-1.29)]. Blood loss >1000ml occurred in 10.1% in the SC group vs. 7.9% [RR1.29, (1.03-1.60)].
Conclusion: Maternal oral SC in women undergoing term labour did not result in a reduction of adverse neonatal outcomes potentially related to intrapartum hypoxia.

LB03 | Single-Dose Intravenous Iron Versus Oral Iron for Maternal Iron Deficiency Anemia: A Randomized Controlled Trial

Richard Derman[1]; Mrutyunjaya Bellad[2]; Manjunath Somannavar[2]; Sudhir Bhandari[3]; Sudhir Mehta[3]; Seema Mehta[3]; Dharmesh Sharma[3]; Yogesh Kumar[4]; Umesh Charantimath[4]; Amaresh Patil[5]; Ashalata Mallapur[6]; Umesh Ramdurg[6]; Radha Sangavi[7]; Praveen Patil[7]; Subarana Roy[8]; Phaniraj Vastrad[9]; Chander Shekhar[10]; Benjamin Leiby[10]; Rebecca Hartman[10]; Michael Georgieff[11]; Stephen Mennemeyer[10]; Zubair H. Aghai[12]; Simal Thind[10]; Rupsa C. Boelig[13]
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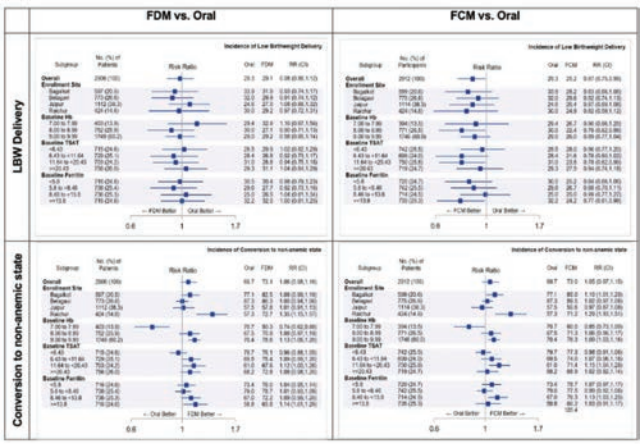
10:00 AM - 10:15 AM

Objective: Maternal iron deficiency anaemia (IDA) is a persistent global health challenge with increased risk of adverse perinatal outcomes. Obstetric guidelines recommend first line treatment with oral iron, however rates of maternal IDA remain above global targets. We aimed to determine whether single dose intravenous (IV) iron for maternal IDA in the 2nd trimester was superior to oral iron in reducing incidence of low birth weight (LBW) infants and maternal anemia at delivery.
Study Design: This is a parallel, three-arm superiority randomized controlled multi-center trial in India of pregnant singletons at 14-17 weeks with moderate IDA randomized to: (1) 60mg oral ferrous sulphate twice daily; or single dose infusion of (2) intravenous (IV) ferric derisomaltose (FDM) or (3) IV ferric carboxymaltose (FCM). The dual primary outcomes were: (1) LBW (< 2500 grams [g]) and (2) maternal non-anemic state (NAS) (Hb >11·0 g/dL at 30-34 weeks or delivery). Participants received rescue treatment per local clinical care guidelines (Hb< 7g/dL or < 1g/dL improvement in Hb). Sensitivity analysis performed defining NAS as Hb≥11.0 without additional non-study iron or blood transfusion.
Results: The oral iron, FDM, and FCM arms included 1450, 1456, and 1462 participants respectively. There was a reduced rate of LBW with IV FCM (25·2%, Relative Risk [RR] 0·87 [97·55% CI 0·75,0·99]), but not IV FDM (29·1%, RR 0·98 [97·55% CI 0·86,1·12]) vs oral iron (Fig1). Achievement of NAS was not improved: IV FCM (RR 1·05 [99·95% CI 0·97-1·15]) and IV FDM (RR 1·06 [99·95% CI 0·98, 1·16]) vs oral (Fig 1, 2A). In sensitivity analysis, there was increased rate of NAS in both IV FDM (RR 1.25 (1.13-1.396), p< 0.0001) and IV FCM (RR 1.24 (1.12-1.38), p< 0.0001) vs oral (Fig 2C).
Conclusion: First-line treatment of maternal IDA with single dose infusion of IV iron results in a reduced incidence of LBW infants (IV FCM) and higher incidence of maternal NAS without additional iron or blood transfusion (IV FCM and FDM).
Clinical guidelines should address the potential benefit of single dose IV iron as the primary treatment of IDA in pregnancy.

Figure 1: Overall and Subgroup Analyses for Primary Outcomes



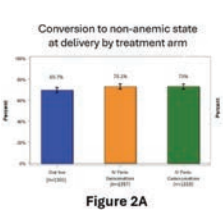


Figure 2A

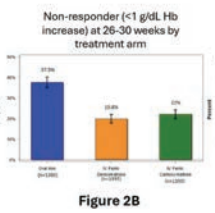


Figure 2B

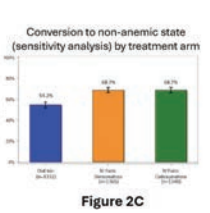


Figure 2C

LB04 | Neonatal Impact of Prematurity Risk Biomarker Screening with Targeted Interventions: A Multicenter Randomized Controlled Trial

Brian K. Iriye[1]; John O'Brien[2]; Christopher S. Ennen[3]; Perry Barrilleaux[4]; Jill Berkin[5]; Anna Palatnik[6]; Moeun Son[7]; Cynthia Gyamfi-Bannerman[8]; Mollie McDonald[9]; Glenn Markenson[10]; Anthony C. Sciscione[11]; Joseph R. Biggio, Jr[12]; Samuel Wolf[13]; Scott Sullivan[14]; Michael Walker[15]; Babak Shahbaba[16]; Stephen P. Pound[17]

[1]Hera Womens Health, Las Vegas, NV; [2]University of Kentucky, Lexington, KY; [3]University of Virginia School of Medicine, Charlottesville, VA; [4]Ochsner Louisiana State University Health Shreveport, Shreveport, LA; [5]Icahn School of Medicine at Mount Sinai, New York, NY; [6]Medical College of Wisconsin, Milwaukee, WI; [7]Weill Cornell Medicine, New York, NY; [8]University of California, San Diego, San Diego, CA; [9]Austin Maternal-Fetal Medicine, Austin, TX; [10]Boston Medical Center, Boston, MA; [11]Christiana Care Health System, Newark, DE; [12]Ochsner Health, New Orleans, LA; [13]Emerald Coast OBGYN Clinical Research, Panama City, FL; [14]Inova Fairfax Medical Campus, Fairfax, VA; [15]Walker Bioscience, Carlsbad, CA; [16]University of California, Irvine, Irvine, CA; [17]Virginia Physicians for Women, North Chesterfield, VA

10:15 AM - 10:30 AM

Objective: Obstetric advances have had limited impact on preterm birth (PTB) rates and neonatal outcomes. We assessed outcomes in a cohort of average risk singleton pregnancies using biomarker-based PTB risk stratification, followed by interventions for those identified at higher risk.

Study Design: This randomized controlled trial enrolled 5,018 singleton pregnancies at 19 U.S. centers from 2020-2023. Individuals with prior PTB, short cervix, severe maternal conditions, or known genetic/fetal anomalies were excluded. We measured the ratio of maternal circulating insulin-like growth factor-binding protein 4 to sex hormone-binding globulin between 18w0d and 20w6d, with participants randomized 1:1. The control arm, blinded to test results, received usual care, while the prevention arm received test results. Prevention arm participants identified as high-risk were offered a regimen of daily vaginal progesterone, low-dose aspirin, and weekly nursing calls. Lower-risk participants in the prevention arm received usual care. Follow-up continued through delivery and neonatal discharge. The prespecified modified intent-to-treat (mITT) analysis included the control group, prevention arm low-risk participants, and high-risk participants who consented to intervention by 24 weeks, while excluding those hospitalized with COVID-19. Primary outcomes included neonatal length of stay (NNLOS) and a composite morbidity index (NMI). A planned intent-to-treat (ITT) analysis assessed multiple neonatal outcomes.

Results: Baseline characteristics did not differ between arms. mITT analysis of co-primary outcomes (Table 1) showed significantly decreased NMI and NNLOS in the prevention arm. The ITT analysis displayed significant reductions in NMI (20%), NNLOS (8%), neonatal intensive care unit (NICU) length of stay (6%), and NICU admission (20%) (Table 2).

Conclusion: In an average risk singleton population, a mid-trimester blood test identified pregnancies at higher PTB risk, and implementing the treatment bundle significantly reduced neonatal morbidity and hospital stay compared to usual care.

Table 1. Modified intent-to-treat analysis of co-primary endpoints

Variable	Measure	N	Adjusted Rate*	95% CI	P†
NMI‡	Odds Ratio	4468	0.75	0.62 - 0.91	0.003
NNLOS¶	Hazard Ratio	437	0.82	0.68 - 0.99	0.044

NMI, neonatal morbidity index; NNLOS, neonatal hospital length of stay.

*Controlled for parity, pre-enrollment aspirin use, and COVID-19 positivity.

†Prespecified alpha reserved for final analysis was 0.0482 post-interim analysis.

‡Ordinal logistic regression analysis in entire mITT population; prevention versus control arm. An odds ratio <1 reflects lower NMI scores in the prevention arm.

¶Cox regression analysis in a prespecified quantile (~10%) of longest stays; control versus prevention arm. A hazard ratio <1 reflects shorter length of hospital stay in the prevention arm.

Table 2. Neonatal outcomes in the intent-to-treat population.

Full Analysis Set of the Intent-to-Treat Population*				
Variable	Measure	Adjusted Rate†	95% CI	P†
NMI‡	Odds ratio of increased NMI	0.80	0.66 - 0.96	0.015
NNLOS§	Ratio of average days in hospital	0.91	0.88 - 0.94	<0.001
NICULOS¶#	Ratio of average days in NICU	0.92	0.88 - 0.97	0.003
NICU Admission‡#	Odds ratio of NICU admission	0.78	0.65 - 0.93	0.006
Intent-to-Treat Population with Multiple Imputation (N = 5018)				
NMI‡	Odds ratio of increased NMI	0.80	0.67 - 0.96	0.019
NNLOS§	Ratio of average days in hospital	0.92	0.89 - 0.95	<0.001
NICULOS¶#	Ratio of average days in NICU	0.94	0.89 - 0.99	0.017
NICU Admission‡#	Odds ratio of NICU admission	0.80	0.67 - 0.96	0.018

*Full analysis set is the intent-to-treat population minus 4.9% with missing data.
†Prevention versus control; adjusted for parity, pre-enrollment aspirin use, and COVID-19 positivity.
‡Odds ratio; ordinal logistic regression (NMI), logistic regression (NICU admission).
§Incidence rate ratio; Poisson regression.
¶Incidence rate ratio; zero-inflated Poisson regression.
#Reductions in NICU admissions and NICULOS (time spent in the NICU) contribute independently to overall NICU day reductions across arms.

LB05 | Patient Navigation to Improve Postpartum Health Care Among Low-Income Birthing People: A Randomized Controlled Trial

Lynn M. Yee[1]; Joe M. Feinglass[1]; Brittney R. Williams[1]; Laura Diaz[1]; Viridiana Carmona-Barrera[1]; Ying Cheung[1]; Ka'Derricka Davis[1]; Chen Yeh[1]; Charlotte M. Niznik[1]; Michelle A. Kominiarek[2]; William A. Grobman[3]
[1]Northwestern University Feinberg School of Medicine, Chicago, IL; [2]Northwestern Feinberg School of Medicine, Northwestern Feinberg School of Medicine/ Chicago, IL; [3]Women & Infants Hospital of Rhode Island / Alpert Medical School of Brown University, Brown University/Providence, RI

10:15 AM - 10:30 AM

Objective: To evaluate whether postpartum (PP) patient navigation (PN) improves PP health care quality among birthing people with low income.

Study Design: In this single-center RCT, English- or Spanish-speaking pregnant people aged 16 or older with Medicaid were randomly assigned between 30 weeks of gestation and PP discharge to one year of PN versus usual care. Participants assigned to PN were partnered with a trained lay navigator who provided individualized, intensive PN services designed around PP-specific barrier ascertainment and reduction. PN services included social needs assessments and support, healthcare appointment and insurance assistance, health education, and support for engagement in shared decision making. Data were collected via patient report and medical record abstraction at enrollment, 4-12 weeks PP, and 11-13 months PP. The primary outcome was achievement of a six-component composite measure representing receipt of optimal PP care by 12 weeks PP (Table 1). Secondary outcomes included a PP care score (% of components achieved), each component of optimal PP care, and 11-13 month health services outcomes.

Results: From January 2020 to June 2023, 405 people were randomized (203 PN, 202 usual care) of whom 50% identified as non-Hispanic Black and 41% as Hispanic. The primary outcome of optimal PP care was similar between groups (9.4% PN vs. 7.9% usual care, p = 0.6); however, the mean PP care score was significantly higher among PN recipients (72% ±17% vs. 64% ±23%, p = 0.001). Three components drove this difference: PP visit completion (96% vs. 80%, p< 0.001), receipt of all indicated anticipatory guidance (65% vs. 51%, p = 0.008), and PP depression screening/care (86% vs. 72%, p< 0.001). At 11-13 months, PN recipients were significantly more likely to be using their desired family planning method and have attended a primary care appointment (Table 2).

Conclusion: The primary outcome, a composite measure of optimal PP care, was not different between groups but was achieved infrequently. However, PN improved several aspects of PP care quality and increases frequency of transition to primary care.

Table 1. Postpartum care outcomes at 4-12 weeks in participants receiving patient navigation versus usual care

	Usual care N=202	Navigated N=203	p-value
Primary Composite Outcome			
Optimal postpartum care[1]	7.9%	9.4%	0.6
Postpartum Care Score			
Mean (± standard deviation) percent of total number of postpartum care components achieved	64% ± 23%	72% ± 17%	0.001
Components of Primary Outcome			
Completed comprehensive postpartum visit[2]	80%	96%	<0.001
Received all indicated anticipatory guidance[3]	51%	65%	0.008
Received desired family planning method[4]	89%	94%	0.08
Screening for postpartum depression and linkage to care, if indicated[5]	72%	86%	<0.001
Initiated and maintained breast/chestfeeding[6]	60%	63%	0.5
Received all indicated vaccinations (influenza, Tdap, measles-mumps-rubella, human papillomavirus)[7]	32%	27%	0.3

1. Optimal postpartum care was defined as all six components of the primary outcome achieved. A sample size of 400 (90% power, assuming 30% attrition) was needed to detect a 20% difference in the primary outcome.
2. Defined as a present when a visit with an obstetric clinician occurred that addressed physical health, mental health, and other postpartum needs within 4-12 weeks postpartum. Visits solely for wound care, blood pressure checks, or other single-issue topics were not considered comprehensive postpartum visits.
3. Domains included: 1) Mental health (mood, smoking cessation, substance use, mental health disorders); 2) Infant feeding; 3) Social needs (family/child material needs, social services resources); 4) Sexuality (resumption of sexual activity); 5) Reproductive life planning (pregnancy spacing, reproductive life planning); 6) Prevention of future pregnancy complications; 7) Family planning (family planning preferences, options); 8) Sleep management (sleep, fatigue, social support); 9) Physical recovery (physical activity, recovery from birth); 10) Chronic disease management (management of chronic diseases, prevention of morbidity); and 11) Health maintenance (health maintenance, vaccinations).
4. Participants were considered to have received their desired family planning method if they had been given a prescription for a method, had a device inserted/implanted, had received male or female permanent contraception, chose a barrier method, or declined a method by 12 weeks postpartum. Participants were ineligible for this outcome if they had undergone a hysterectomy or had a monogamous same-sex partnership (N=2).
5. Participants were considered to have been screened if they completed a Patient Health Questionnaire-9 (PHQ-9) by 12 weeks postpartum; among those with PHQ-9 score >9, linkage was considered to have occurred if they received further mental health care.
6. Breast/chestfeeding: participants who were exclusively or partially feeding their own milk within the 4-12 week postpartum period were considered to be breast/chestfeeding. Participants who did not have custody of their infant or whose infant was deceased were ineligible for this outcome (N=2).
7. All participants were considered eligible for Tdap or influenza. Participants were considered eligible for MMR if they were measles or rubella non-immune. Participants were considered eligible for HPV vaccination if they had never initiated or completed the series. Vaccinations were considered received if they occurred during pregnancy or until 12 weeks postpartum.

Table 2. Outcomes at 11-13 months postpartum in participants receiving patient navigation versus usual care

	Usual care N=202	Navigated N=203	p-value
Received or continued use of desired family planning method	43%	65%	<0.001
Maintained breast/chestfeeding[1]	26%	26%	>0.9
Attended primary care visit	30%	57%	<0.001
Diabetes testing among patients with history of GDM (N=31)			
OGTT completion at 4-12 weeks postpartum	43%	75%	0.2
Any other diabetes testing after 12 weeks postpartum	20%	38%	0.4

GDM, gestational diabetes mellitus; OGTT, oral glucose tolerance test
1. Included participants who self-reported or medical record review indicated sustained breastfeeding during the 11-13 month postpartum period.

LB06 | Comparing 162mg vs. 81mg Aspirin for Prevention of Preeclampsia (ASAPP): A Randomized Control Trial

Amrin Khander[1]; Kathy Matthews[2]; Charlene Thomas[3]; Paul Christos[4]; Stephen T. Chasen[5]; Daniel W. Skupski[3]; Laura E. Riley[3]; Phyllis August[6]; Line Malha[3]

[1]*Weill Cornell Medicine-New York Presbyterian Hospital, New York, NY, NY;* [2]*New Jersey Perinatal Associates, Livingston, NJ;* [3]*Weill Cornell Medicine, New York, NY;* [4]*Weill Cornell Medical College, New York, NY;* [5]*Weill-Cornell Medical College, New York, NY;* [6]*New York Presbyterian Weill Cornell Medicine, New York, NY*

10:15 AM - 10:30 AM

Objective: Low dose aspirin (ASA) < 100 mg vs placebo reduces the incidence of preterm preeclampsia (PE) by 20-30% for those at high risk. Doses 100-150mg may further reduce the incidence by 60% compared to placebo. We compared 162mg to 81mg of ASA per day in the prevention of PE in high-risk pregnancies.

Study Design: We conducted a pragmatic prospective randomized open label blinded-endpoint (PROBE) clinical trial. Pregnant persons at high risk for PE (as defined by ACOG) with one or more of the following criteria: chronic hypertension, history of PE, diabetes mellitus, autoimmune disease, multifetal gestation or kidney disease were randomized (< 16weeks) to either 81mg or 162mg ASA daily and monitored throughout pregnancy (20±2 weeks, 26±2 weeks, and 36±2 weeks) until 6 weeks postpartum. The primary outcome was a composite of developing preterm PE (< 37 weeks) or PE with severe features. Outcomes were adjudicated by independent investigators blinded to treatment group and clinical diagnosis. Secondary outcomes were adherence to therapy (determined by a validated Simplified Medication Adherence Questionnaire), maternal and fetal complications. Based on a prespecified interim analysis of the first 100 participants, we estimated that 400 participants would be required to detect a 7.1% difference in the primary outcome between the groups.

Results: Of 400 participants randomized, 369 had delivery data and were included in the intention to treat analysis (17 lost to follow up/withdrew, 14 elective terminations) with 186 participants in the 162mg and 183 in the 81mg group. Baseline characteristics were similar. The incidence of preterm PE or PE with severe features was 25/183 (13%) in the 162mg group vs. 28/180 (14%) in the 81mg group (p = 0.7). Adherence rates ranged from 88%-91% vs 89%-92% for the 162mg vs 81mg groups respectively across study visits. Infant birthweight was slightly lower in the 162 mg group (2.9 kg vs 3.2 kg; p = 0.002).

Conclusion: Our data show that the rates of preterm PE or PE with severe features were similar in pregnant people at high risk for PE taking either 81mg or 162mg ASA.

Table 1. Demographics

Characteristic	162mg (Arm 2) N = 186	81mg (Arm 1) N = 183
Age (years)	35 [32, 37]	35 [32, 38]
Race		
American Indian/Alaska Native	0 (0%)	2 (1%)
Asian	30 (16%)	40 (22%)
Black or African American	37 (20%)	42 (23%)
More Than One Race	37 (20%)	25 (14%)
Unknown / Not Reported	7 (4.1%)	15 (8.5%)
White	74 (40%)	58 (32%)
Ethnicity		
Hispanic or Latino	46 (25%)	31 (17%)
NOT Hispanic or Latino or Unknown	140 (75%)	152 (83%)
Insurance Payor		
Commercial	125 (70%)	116 (63%)
Medicaid	54 (28%)	56 (30%)
Unknown	7	11
Parity	1 [1, 1]	1 [1, 1]
Pre-Gravid BMI (kg/m^2)	29 [24, 34]	26 [23, 33]
Gestational Age at Randomization	13.00 [12.14, 14.29]	13.14 [12.43, 14.43]
Eligibility Criteria		
Chronic Hypertension	76 (38%)	60 (30%)
History of preeclampsia	69 (35%)	62 (31%)
Type 1 or Type 2 Diabetes	37 (19%)	37 (19%)
Autoimmune Disease	33 (17%)	17 (8.5%)
Multifetal Gestation	25 (13%)	38 (19%)
Kidney Disease	9 (4.5%)	9 (4.5%)
Number of prior pregnancies with PE	1 [1, 1]	1 [1, 1]

All data presented as median [IQR] or n (%).

Table 2. Outcomes by Treatment Group

Outcome	162mg (Arm 2) N = 186	81mg (Arm 1) N = 183	p-value
Primary Composite Outcome: Preterm PE or PE with Severe Features	25 (13%)	28 (14%)	0.7
Primary Outcome by Subgroup^			
Chronic Hypertension	13/76 (17%)	10/60 (17%)	>0.9
Type 1 or Type 2 Diabetes	6/37 (16%)	7/37 (19%)	0.8
Autoimmune Disease	1/33 (3.0%)	1/17 (5.9%)	>0.9
Multifetal Gestation	1/25 (4.0%)	8/38 (21%)	0.08
History of Preeclampsia	13/69 (19%)	4/62 (6.5%)	0.04
Kidney Disease	3/9 (33%)	3/9 (33%)	>0.9
Adherence*			
At 18-22 weeks GA†	127/144 (88%)	109/123 (89%)	
At 24-28 weeks GA	128/142 (90%)	126/140 (90%)	
At 34-38 weeks GA	102/112 (91%)	108/117 (92%)	
Spontaneous Pregnancy Loss			
<20 weeks GA	5 (2.7%)	4 (2.2%)	>0.9
≥20 weeks GA	3 (1.6%)	2 (1.1%)	>0.9
Quantitative Blood Loss at Delivery (mL)	705 [350, 872]	552 [300, 1,000]	0.5
GA (weeks) at Delivery (singleton)	37.57 [36.71, 38.71]	38.00 [37.00, 39.00]	0.04
Birthweight (grams) (singleton)	2,943 [2,525, 3,290]	3,210 [2,776, 3,511]	0.002
NICU Admission (singleton)	27 (16%)	14 (9.3%)	0.06

† GA = gestational age
All data presented as median [IQR] or n (%).
^ Presented as number of respondents with composite outcome over total participants with criterion (percentage).
* Adherence defined on SMAQ score. Presented as number of respondents who qualified as 'adherent' over total respondents (percentage).

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