CENTRAL ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS (FOUNDED 1929)

2018 ANNUAL MEETING

OCTOBER 17 – 20, 2018

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MEETING OBJECTIVES

The Central Association of Obstetricians and Gynecologists is one of the oldest and most prestigious specialty organizations in the United States. Since its founding in 1929, the CAOG has actively encouraged and promoted the study of obstetrics and gynecology and women’s health care. In support of its mission, the national program this year is designed to address important advances in clinical care and practice management, as well as fundamental research. The program is integrated to promote open discussion between attendees, who are leaders in obstetrics, gynecology, genetics, reproductive endocrinology, gynecologic oncology and women’s health care. The program format of hot topics, sunrise lectures, keynote speaker and scientific research presentations will promote a better understanding of each subject by filling gaps in knowledge.

Specific learning objectives for each presentation are listed on the speaker evaluation forms.

DISCLOSURE OF FACULTY AND INDUSTRY RELATIONSHIPS

In accordance with ACCME policy, all faculty members have signed a conflict of interest statement in which they have disclosed any relevant financial interests or other relationships with industry relative to topics they will discuss at this program. At the beginning of the program, faculty members are expected to disclose any such information to participants. Such disclosure allows you to evaluate better the objectivity of the information presented in lectures. Please report on your evaluation form any undisclosed conflict of interest you perceive.

MEETING EVALUATION FORMS

Speaker evaluation forms for each session will be distributed to all attendees. Please complete these promptly. A signed, completed evaluation is required by our CME provider in order to receive credit. This also assists with CAOG’s future needs assessment.
ACCME ACCREDITATION STATEMENT
This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the University of North Dakota School of Medicine and Health Sciences and the Central Association of Obstetricians and Gynecologists. The University of North Dakota School of Medicine and Health Sciences is accredited by the ACCME to provide continuing medical education for physicians.

AMA/PRA CREDIT Designation Statement for Category 1
The University of North Dakota School of Medicine and Health Sciences designates this live activity for a maximum of 16.75 AMA PRA Category 1 Credit(s)™. Physicians should only claim the credit commensurate with the extent of their participation in the activity.

Category 1 Credit Certificates
Award Certificates will be mailed to each attendee after the meeting and will include only those credits for presentations which you have attended and for which a completed and signed evaluation form has been returned.

ACOG Cognates
The American College of Obstetricians and Gynecologists has assigned up to 16.75 cognate credits to this program.

Sign-In Protocol
The only recognized “official record” of member attendance is your signature on the green card arranged alphabetically in the historic membership books. These have all been updated to begin with 2015, but show meeting attendance since 2005. Consecutive attendance records come from the green card signatures only.

Daily signature sheets are also required for credit documentation. Your attention to this is appreciated.
GENERAL INFORMATION

REGISTRATION (Lakes Ballroom)
Registration for all attendees will take place during the following hours:

Wednesday, October 17 1:00 p.m. – 9:00 p.m.
Thursday, October 18 6:00 a.m. – 1:00 p.m.
Friday, October 19 6:00 a.m. – 1:00 p.m.
Saturday, October 20 6:00 a.m. – 1:00 p.m.

NAME BADGES (two different colors)
Please wear your name badge to all CAOG events. This is your identification for admission to CAOG activities. Attendees registered for educational credits will receive a white badge. Spouses and guests will receive a tan badge. All badges will be in CAOG “green” holders with adjustable neck cords. Ribbons denote state and other information (officers, speakers, new members).

WELCOME RECEPTION (Wednesday, October 17)
The traditional CAOG Welcome Reception will be held in the Lakes Ballroom on Wednesday, October 17 from 6:00 p.m. – 9:00 p.m. in the Exhibit Hall, which also opens this evening. Admission is by name badge so please register on arrival.

SPOUSES/GUESTS PROGRAM (Thursday, October 18)
The traditional spouse/guest program will start with a continental breakfast at 8:30 a.m. Following breakfast, hosted by CAOG President’s wife, Laura Shulman, the renowned Guthrie Theater in Minneapolis will have a Teaching Artist present “Personal Storytelling.” Learn the art and skill of transforming good storytelling into great storytelling.

CHILD CARE
The CAOG will not provide child care at this meeting. The Radisson Blu can provide recommendations for child care. Please contact the hotel if interested in assistance arranging child care.
**SUNRISE LECTURES (white badge holders only)**

Sunrise scientific lectures will be held each morning in the Lakes Ballroom. These will begin at 6:30 a.m. on Thursday, October 18, Friday, October 19 and Saturday, October 20. A buffet breakfast will precede each lecture at 6:00 a.m. Speakers and other audience members always appreciate your promptness. Sunrise lecture topics include how a neonatologist can reduce professional liability in OB, changing landscapes in cervical cancer testing and prevention of extreme prematurity.

**SCIENTIFIC SESSIONS**

All general scientific sessions will be held in the Lakes Ballroom. The sessions will begin at 7:30 a.m. on Thursday, Friday and Saturday. Hot topic lectures will be part of each general session.

**HOT TOPIC LECTURES AND KEYNOTE ADDRESS**

Five “hot topic” lectures will be presented, with three on Thursday, one on Friday and one on Saturday. Each emphasizes the most up-to-date information on:
1. disorders of sexual differentiation,
2. MACRA, MIPS and HIPAA slips,
3. ARRIVE trial results,
4. pelvic surgery update,
5. integrative health and functional medicine in America.

These topics will complement all 22 original research oral presentations.

The Keynote Address will be delivered on Friday, October 19th by Dr. Joe Leigh Simpson who has long been preeminent in the subspecialty of clinical genetics. The intriguing title of his talk is “50 Years of Progress in Ob-Gyn Genetic Testing.”
PRESIDENTIAL ADDRESS (Friday, October 19)

CAOG President Lee P. Shulman, from Chicago, Illinois will be escorted to the podium by the Past Presidents of CAOG who are in attendance. He will deliver his Presidential Address at 12:15 p.m. on Friday in the Lakes Ballroom. All registrants and guests are invited to attend his thought provoking presentation titled “Genomics in Obstetrics and Gynecology: The Time is Now to Knock Down the Temple and Rebuild It.”

The 85th incoming CAOG President, Vanessa M. Barnabei, M.D. will be installed in a brief ceremony immediately following the Presidential Address.

ANNUAL BUSINESS MEETING (Friday, October 19)

The CAOG Annual Business Meeting will be held following the Presidential Address at 1:00 p.m. on Friday, October 19, in the Lakes Ballroom. New members elected in 2017 will be introduced at this time and membership certificates will be presented.

GALA RECEPTION/DINNER (Fri., October 19)

The traditional Friday Evening CAOG Gala Banquet is always the highlight of the Annual Meeting. This year is no exception. The reception will begin at 6:00 p.m. in the Lakes Ballroom with dinner to follow at 7:00 p.m. Awards for the best papers and posters will be presented along with other special acknowledgements by Dr. Lee Shulman, President.

Business casual attire is acceptable for this evening as well as for the meeting events throughout the week.
INDUSTRY EXHIBITS

The Industry Exhibits will be located in the Lakes Ballroom. The Scientific Posters will also be displayed in the same area. Hours are:

Exhibit Set-Up
Wednesday, October 17  1:00 p.m. – 5:00 p.m.

Exhibit Hall Hours
Wednesday, October 17  6:00 p.m. – 9:00 p.m.
Thursday, October 18  6:00 a.m. – 12:00 p.m.
Friday, October 19  6:00 a.m. – 11:00 a.m.

Exhibit Dismantle
Friday, October 19  11:00 a.m.

SCIENTIFIC POSTER DISPLAYS

The Scientific Poster session will be located in the Lakes Ballroom with the Exhibit Hall. Poster judging will be:

Thursday, October 18  10:00 – 10:45 a.m.
Friday, October 19  9:45 – 10:30 a.m.

Poster Set-Up
Wednesday, October 17  1:00 p.m. – 5:00 p.m.

Poster Hours
Thursday, October 18  6:00 a.m. – 12:00 p.m.
Friday, October 19  6:00 a.m. – 11:00 a.m.

Poster Dismantle
Friday, October 19  11:00 a.m.

CAOG ANNUAL MEETING POLICY

Absolutely no refunds after 5:00 pm (CDT) Friday, September 14, 2018
PROGRAM SCHEDULE
85th Annual Meeting Central Association of Obstetricians and Gynecologists
Radisson Blu Mall of America
October 17 – 20, 2018

WEDNESDAY, OCTOBER 17, 2018

10 a.m. – 5 p.m.  CAOG Officers and Trustees
                  Annual Meeting
                  Calhoun Board Room

1:00 – 9:00 p.m. General Registration (Lakes Ballroom)
6:00 – 9:00 p.m. Welcome Reception (Lakes Ballroom)

THURSDAY, OCTOBER 18, 2018

6:00 a.m.  General Registration (Lakes Ballroom)

6 a.m. – 12 noon  Industry Exhibits Open

6 a.m. – 12 noon  Scientific Poster Session Open

6:00 – 7:00 a.m.  Breakfast (Lakes Ballroom)

6:30 – 7:30 a.m.  Sunrise Lecture  (Lakes Ballroom)
                  “How a Neonatologist Can Reduce Professional Liability in OB”
                  Jonathan K. Muraskas, M.D.
                  Loyola University
                  Maywood, Illinois

FIRST SCIENTIFIC SESSION
(Lakes Ballroom)

Moderators:
  Lee P. Shulman, M.D. – CAOG President
  Suneet P. Chauhan, M.D. – CAOG President Elect II

7:30 a.m.  Opening Remarks
7:30 – 8:00 a.m. **Paper #1 Central Prize Award**
“A Comparison of Vaginal Versus Buccal Misoprostol for Term Cervical Ripening in Women for Labor Induction at Term (the IMPROVE Trial): A Triple Masked Randomized Controlled Trial”
**David M. Haas, M.D.**
Indiana University School of Medicine
Indianapolis, Indiana
Discussant: Sharon T. Phelan, M.D.
Albuquerque, New Mexico

8:00 – 9:00 a.m. **Hot Topic #1**
“Disorders of Sexual Differentiation”
**Amy B. Wisniewski, Ph.D.**
Cook Children’s Hospital
Forth Worth, Texas

9:00 – 9:30 a.m. **Paper #2 President’s Certificate of Merit Award**
“Intention to Treat: Obstetrical Management at the Threshold of Viability”
**Tiffany R. Tonismae, M.D.**
Indiana University School of Medicine
Indianapolis, Indiana
Discussant: Stephen Entman, M.D.
Nashville, Tennessee

9:30 – 10:00 a.m. **Paper #3 Young Investigator Award**
“Hypertension Among Women of Reproductive Age: Impact of 2017 American College of Cardiology/American Heart Association High Blood Pressure Guideline”
**Suneet P. Chauhan, M.D.**
Univ. of Texas Health Science Center
Houston, Texas
Discussant: Michelle Y. Owens, M.D.
Jackson, Mississippi

10:00 – 10:45 a.m. **Break/Refreshments/Exhibits/Posters**
(Lakes Ballroom)
SECOND SCIENTIFIC SESSION
(Lakes Ballroom)

Moderators:
Andrew F. Wagner, M.D. – CAOG Secretary/Treasurer
Michelle Y. Owens, M.D. – CAOG Trustee

10:45 – 11:30 a.m. **Hot Topic #2**
“MACRA, MIPS and HIPAA Slips”
*Kyle J. Haubrich, J.D.*
Sandberg, Phoenix & Von Gontard, P.C.
St. Louis, Missouri

and

*Dennis Harms, J.D.*
Sandberg, Phoenix & Von Gontard, P.C.
St. Louis, Missouri

11:30 – 12:00 pm **Paper #4**
Dr. Kermit E. Krantz
Memorial Paper
“How Long is Too Long? Intraoperative Time Intervals and Umbilical Artery pH Depression at Scheduled Cesarean”
*Rebecca R. Rimsza, M.D.*
Saint Louis Univ. School of Medicine
St. Louis, Missouri

Discussant: Paul G. Tomich, M.D.
Downers Grove, Illinois

12:00 – 12:30 pm **Paper #5**
“The Association of HBB-Related Structural Hemoglobinopathies and Low Fetal Fraction on Single Nucleotide Polymorphism-Based Non-Invasive Prenatal Screening (NIPS) for Fetal Aneuploidy”
*Manesha Putra, M.D.*
Detroit Medical Center/Wayne State Univ
Detroit, Michigan

Discussant: Barbara V. Parilla, M.D.
Park Ridge, Illinois

12:30 – 1:30 p.m. **Hot Topic #3**
“ARRIVE Trial Update”
*William B. Grobman, M.D.*
Northwestern Univ.
Chicago, Illinois
FRIDAY, OCTOBER 19, 2018

6:00 a.m.  General Registration (Lakes Ballroom)
6 a.m. – 11 a.m.  Industry Exhibits Open
6 a.m. – 11 a.m.  Scientific Poster Session Open
6:00 – 7:00 a.m.  Breakfast (Lakes Ballroom)
6:30 – 7:30 a.m.  Sunrise Lecture (Lakes Ballroom)
   “Changing Landscape in Cervical Cancer Testing”
   Dennis J. Lutz, M.D.
   UND School of Med. & Health Sciences
   Minot, North Dakota

THIRD SCIENTIFIC SESSION
(Lakes Ballroom)

Moderators:
James F. Kirby, M.D. – CAOG Vice President
William J. Todia, M.D. – CAOG Trustee

7:30 a.m.  Announcements

7:30 – 8:00 a.m.  Paper #6  Dr. Jack A. Pritchard
   Memorial Paper
   “Persistence and Extent of Neonatal Brachial Plexus Palsy: Association with Number of Maneuvers and Duration of Shoulder Dystocia”
   Morgen S. Doty, D.O.
   Univ. of Texas Health Science Center
   Houston, Texas
   Discussant:  Jean R. Goodman, M.D.
   Maywood, Illinois

8:00 – 8:30 a.m.  Paper #7
   Manesha Putra, M.D.
   Detroit Medical Center/Wayne State Univ
   Detroit, Michigan
   Discussant:  Robert P. Kauffman, M.D.
   Amarillo, Texas

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8:30 – 9:00 a.m. **Paper #8**
“Fetomaternal Bleeding and Neonatal Hematocrit Following Cesarean Delivery: Routine Versus Transplacental Transection”  
**Emily J. Gregory, M.D.**  
Univ. of Tennessee  
Knoxville, Texas

Discussant: Emmet Hirsch, M.D.  
Evanston, Illinois

9:00 – 9:45 a.m. **Hot Topic #4**
“Pelvic Surgery Update”  
**Angela Chaudhari, M.D.**  
Northwestern Univ.  
Chicago, Illinois

9:45 – 10:30 a.m. **Break/Refreshments/Exhibits/Posters**
(Lakes Ballroom)
FOURTH SCIENTIFIC SESSION  
(Lakes Ballroom)

Moderators:  
David F. Lewis, M.D. – CAOG Past President  
Pamela R. Midboe-Penn, M.D. – CAOG Trustee

10:30 – 11:00 a.m. Paper #9  
“Neuroradiological Perspective of Preeclampsia and Eclampsia Spectrum: A Correlation From Posterior Reversible Encephalopathy Syndrome (PRES)”  
Darshan Hosapatna Basavarajappa, MD  
Postgraduate Institute of Medical Education and Research  
Chandigarh, India  
Discussant: Katherine W. McHugh, M.D.  
Indianapolis, Indiana

11:00 – 11:30 a.m. Paper #10  
“Comparison of Neonatal Outcomes Following TOLC and Scheduled Repeat Cesarean in a High-Risk Population”  
William M. Perez, M.D.  
Saint Louis Univ. School of Medicine  
St. Louis, Missouri  
Discussant: Roger P. Smith, M.D.  
Boca Raton, Florida

11:30 – 12:15 Keynote Address  
“50 Years of Progress in Ob-Gyn Genetic Testing”  
Joe Leigh Simpson, M.D.  
Florida International Univ. College Med.  
Miami, Florida

12:15 – 1:00 p.m. Presidential Address  
“Genomics in Obstetrics and Gynecology: The Time is Now to Knock Down the Temple and Rebuild It”  
Lee P. Shulman, M.D.  
Northwestern Univ.  
Chicago, Illinois

1:00 p.m. Installation of New President &  
1:00 – 1:30 p.m. Annual Business Meeting CAOG  
6:00 – 9:30 p.m. Annual Gala Reception/Dinner  
(Cypress Court)

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SATURDAY, OCTOBER 20, 2018

6:00 a.m. General Registration (Lakes Ballroom)

6:00 – 6:30 a.m. Breakfast (Lakes Ballroom)

6:30 – 7:30 a.m. **Sunrise Lecture** (Lakes Ballroom)
   “Prevention of Extreme Prematurity”
   James E. Sumners, M.D.
   St. Vincent Women’s Hospital
   Indianapolis, Indiana

FIFTH SCIENTIFIC SESSION
(Lakes Ballroom)

Moderators:
Vanessa M. Barnabei, M.D. – CAOG President Elect I
James W. Van Hook, M.D. – CAOG Trustee

7:30 a.m. Announcements

7:30 – 7:45 a.m. **Paper #11**  Dr. George W. Morley
   Memorial Paper
   “Chronic Diseases, Self-Reported
   Health Status and Prescription
   Opioid Analgesic Use Among
   Women of Reproductive Age”
   Suneet P. Chauhan, M.D.
   Univ. of Texas Health Science Center
   Houston, Texas

7:45 – 8:00 a.m. **Paper #12**
   “Protein S Functional Activity and Total
   Protein S Levels in Normal Pregnancy”
   Elizabeth A. Richardson, M.D.
   Univ. of Tennessee
   Knoxville, Tennessee

8:00 – 8:15 a.m. **Paper #13** Community Hospital
   Award
   “Newborn Birth Weight or Body Mass
   Index: Predictors of the Duration of
   Neonatal Brachial Plexus Palsy”
   Leen Al-Hafez, M.D.
   Houston Methodist Hospital
   Houston, Texas
8:15 – 8:30 a.m.  **Paper #14**
“Cord and Infant Blood Angiogenic Marker Concentrations are Affected by Race, Gestational Age, and Tobacco Use”
_Tiffany R. Tonismae, M.D._
Indiana Univ. School of Medicine
Indianapolis, Indiana

8:30 – 8:45 a.m.  **Paper #15**
“Tumor Associated Expression of Glucose Regulated Protein 78 Represents A Potential Marker for Early Detection of Ovarian Cancer by Molecular-Targeted Ultrasound Imaging”
_Animesh Barua, Ph.D._
Rush Univ. Medical Center
Chicago, Illinois

8:45 – 9:00 a.m.  **Paper #16**
“Closing the Loop Between Obstetric Providers and the Peer Review Committee: A Preferred Paradigm for Hospital-Based Perinatal Quality Assurance”
_Yonatan Hirsch, B.A._
NorthShore Univ. HealthSystem
Evanston, Illinois

9:00 – 9:30 a.m.  **Break/Refreshments**
(Lakes Ballroom)
SIXTH SCIENTIFIC SESSION
(Lakes Ballroom)

Moderators:
Emily A. DeFranco, D.O. – CAOG Trustee
Craig V. Towers, M.D. – CAOG Trustee

9:30 – 10:30 a.m. Hot Topic #5
“Integrative Health and Functional Medicine in America”
Stephen H. Cruikshank, MD, MBA, JD
Integrative and Functional Medicine
Mooresville, North Carolina

10:30 – 10:45 a.m. Paper #17
“Vaccine Preventable Illnesses and Immune Status in a Cross Sectional Analysis of Pregnant Women”
Brent W. Bost, M.D., MBA
Southeast Texas Ob/Gyn Associates, PA
Beaumont, Texas

10:45 – 11:00 a.m. Paper #18
“Uterine Tachysystole: A Survey of CAOG Members Suggests Persistent Ambiguity”
Leen Al-Hafez, M.D.
Houston Methodist Hospital
Houston, Texas

11:00 – 11:15 a.m. Paper #19
“Preventing the First C-Section: The Challenge in a Tertiary Level Medical Center”
Sereen K. Nashif, M.D.
Loyola Univ. Medical Center
Maywood, Illinois

11:15 – 11:30 a.m. Paper #20
“Disseminated Intravascular Coagulopathy with Dilation and Evacuation for Fetal Demise”
Jessica W. Kiley, M.D.
Northwestern Univ.
Chicago, Illinois
11:30 – 11:45 a.m. **Paper #21**
“Psychological Consequences Among Survivors of Amniotic Fluid Embolism”
**Alexandra L. Berra, MD**
Baylor College of Medicine/
Texas Childrens Hospital
Houston, Texas

11:45 – 12:00 **Paper #22**
“The Use of Newborn Liver Functions in Timing of Newborn Hypoxic Ischemic Encephalopathy”
**Jonathan K. Muraskas, M.D.**
Loyola Univ. Medical Center
Maywood, Illinois

**ADJOURN**

**PLEASE COMPLETE, SIGN AND RETURN ALL SPEAKER EVALUATION FORMS AS THESE ARE REQUIRED IN ORDER TO RECEIVE CME !!**

**THANK YOU FOR ATTENDING**
SCIENTIFIC PRESENTATIONS
THURSDAY, OCTOBER 18, 2018

6 a.m. – 12 noon  INDUSTRY EXHIBITS OPEN

6 a.m. – 12 noon  SCIENTIFIC POSTER SESSION OPEN

6:00 – 6:30 a.m.  Breakfast (Lakes Ballroom)

6:30 – 7:30 a.m.  Sunrise Lecture  (Lakes Ballroom)
“How a Neonatologist Can Reduce Professional Liability in OB”
Jonathan K. Muraskas, M.D.
Loyola Univ.
Maywood, Illinois

Learning Objectives:

- Identify the most frequent causes of professional liability in OB.
- Explain how a neonatologist can help reduce OB professional liability

FIRST SCIENTIFIC SESSION
(Lakes Ballroom)

Moderators:
Lee P. Shulman, M.D. – CAOG President
Suneet P. Chauhan, M.D. – CAOG President Elect II
A Comparison of Vaginal Versus Buccal Misoprostol for Term Cervical Ripening in Women for Labor Induction at Term (the IMPROVE Trial): A Triple Masked Randomized Controlled Trial

David M. Haas, MD/MS¹, Kathleen Flannery, BS¹, Meredith Dorr, MD¹, Joanne Daggy, PhD¹, Carrie Bonsack, CNM/MSN¹, Rebecca C. Pierson, MD¹, Anthony Lathrop, CNM¹, Rachel Towns, MD¹, Nicole Ngo, PharmD², Annette Head, PharmD¹, Sara Morgan, MD¹, Sara K Quinney, PharmD/PhD¹

Indiana University School of Medicine, Indianapolis, IN¹, Eskenazi Health, Indianapolis, IN²

Purpose: More than 25% of pregnant women undergo induction of labor in the United States, with the overall rate doubling over the last 25 years. Often when labor is induced, the cervix requires ripening to facilitate successful induction of labor. Prostaglandins such as misoprostol are commonly used for this process. Misoprostol is currently given in practice via many routes of administration. While vaginal administration is the most common, buccal dosing has recently gained popularity. The objective of this trial was to compare the efficacy and safety of vaginal and buccal misoprostol for women undergoing labor induction at term.

Methods: The IMPROVE trial was an IRB-approved, placebo controlled randomized trial (NCT02408315). All women underwent informed consent in either English or Spanish before beginning labor induction. Women were at least 14 years old, ≥ 37 weeks gestation with a singleton gestation in cephalic presentation, and a Bishop score ≤ 6. Women were excluded if they had a known prior uterine scar, untreated cervical infection, known major fetal congenital anomaly, or evidence of fetal compromise before the start of the induction. Misoprostol (100mcg) tablets (Novel Laboratories) and identical placebo tablets (University of Iowa Pharmaceuticals) were cut in half (50mcg) or quarters (25mcg) and dispensed by the research pharmacy following a computer-generated 1:1 randomization scheme. Providers, participants, and research assistants who collected data were all blinded to group assignment. Women received 25 mcg of misoprostol by assigned route (vaginal [VM] or buccal [BM]) and a matching quartered placebo tablet by the opposite route for the first dose. Subsequent doses of 50mcg misoprostol and matching placebo were administered every 4 hours for up to 7 doses (24 hours). Study drug was stopped for adverse effects,
active labor, or reaching 24 hours without sufficient cervical ripening. The primary efficacy outcome of the trial was time to delivery after placement of the first dose of study drug. The primary safety outcome was the rate of cesarean delivery performed urgently for fetal non-reassurance as the primary indication. A sample size of 300 women, with 260 expected vaginal deliveries, was calculated based on a non-inferiority of time to delivery of buccal misoprostol with a null hypothesis that the Hazard Ratio would be \( \leq 0.74 \) with women censored at the time of cesarean. Participant and delivery characteristics were compared between treatment groups using appropriate tests (T-test, Wilcoxon rank sum test, Chi-square test, or Fisher’s exact test). For the primary outcome of time to delivery, Cox proportional hazards regression was used to estimate the hazard ratio and associated 95% confidence interval for route of delivery with non-inferiority being concluded if the lower limit of the 95% CI for the HR is above 0.74.

**Results:** 300 women were recruited, 152 receiving VM and 148 receiving BM. Randomization achieved balanced groups as treatment groups did not significantly differ on any baseline characteristics. The most common indications for induction were post-dates (27%), hypertensive disorder (21%), and diabetes (12%). Hispanic women comprised 29% of the cohort and 31% of women were African-American. 59% of the women were nulliparous. 242 women (80.7%) had a successful induction and delivered vaginally. The rate of vaginal delivery in <24 hours from start of induction was higher in the VM group (58.6% vs. 39.2%, \( p=0.001 \)). Additionally, the time to vaginal delivery was lower for the VM group (median [95% confidence interval] in hours: 20.1 [18.2, 22.8] for vaginal dosing vs. 28.1 [24.1, 31.4] for buccal, Logrank test \( p=0.006 \)). The number of doses of misoprostol required to get into active labor was significantly less with the VM group (median [range]: 2 [1-5] vs. 3 [1-7], \( p<0.001 \)) and the need for oxytocin augmentation was less in the VM group, although it did not quite reach significance (65.1% vs. 75.0%, \( p=0.062 \)). The hazard ratio for delivery for BM vs. VM dosing was 0.70 (95% CI 0.54, 0.90). Thus we cannot conclude that BM is non-inferior to VM. The rate of cesarean deliveries for fetal nonreassurance was only 3.3% for the VM group and 9.5% for the BM group (\( p=0.03 \)). There were no differences between groups in the rates of any other adverse outcomes. When asked if both medication routes were equivalent, which dosing location would they prefer, overall 41.7% preferred “in my cheek”, 31.3% preferred “in my vagina”, and 21.7% said they weren’t sure.
Conclusions: The IMPROVE trial found that vaginal dosing of misoprostol, compared to buccal administration, led to a higher rate of vaginal deliveries, more rapid vaginal delivery, and fewer doses of misoprostol needed to get into active labor. The buccal misoprostol group had significantly more cesarean deliveries for fetal nonreassurance. There were no differences in other adverse safety events. Vaginal misoprostol may be superior to buccal misoprostol for cervical ripening at term.

Discussant: Sharon T. Phelan, M.D.
Albuquerque, New Mexico

8:00 – 9:00 a.m. Hot Topic #1
“Disorders of Sexual Differentiation”
Amy B. Wisniewski, Ph.D.
Cook Children’s Hospital
Forth Worth, Texas

Learning Objectives:
- List the most common major disorders of sexual differentiation.
- Provide fertility treatment prognosis for each disorder of sexual differentiation.
**Background:** While less than 1% of all births occur before the onset of the third trimester, these early deliveries account for a large amount of neonatal deaths. There remains debate on what interventions should be used in patients presenting with pregnancies at the threshold of viability, often defined at deliveries occurring between 20 0/7 weeks and 25 6/7 weeks. Survival rates remain dismal for these extremely early pregnancies and data has not yet shown that increased interventions improve overall survival rates at lower gestational ages.

**Objective:**
1. To review obstetrical management of patients presenting with imminent delivery at the threshold of viability in comparison to their desire for neonatal resuscitation following delivery
2. To compare survival rates to NICU discharge with level of interventions

**Methods:** This is a retrospective study of the 6 INDEED study group centers reviewing patients admitted between 22 0/7 to 24 6/7 weeks with living fetuses facing delivery from 2011 to 2015. Patients with known congenital or genetic anomalies or missing data were excluded. Charts were reviewed for basic demographics, plan for resuscitation as well receipt of antenatal steroids, magnesium sulfate for neuroprotection, tocolytics of any kind, and antibiotics for Group Beta Streptococcus (GBS) prophylaxis. Mode of delivery, delivery room care, and final disposition (NICU discharge, transfer, or death) discharge were recorded. We determined if planed resuscitation was associated with antenatal intervention with chi square test, and used multivariable logistic regression analysis to explore the association of each intervention with death.
Results: A total of 479 mothers met initial criteria. The average gestational age at admission was 23 3/7 weeks and the average age at delivery was 23 5/7 weeks. Overall, when resuscitation was planned by either mothers or the treatment team, mothers were more likely to receive antenatal steroids, tocolytics, magnesium sulfate, and GBS prophylaxis regardless of gestational age at time of admission (p<0.05). They were also more likely to be delivered by cesarean section (p<0.001).

There were 143 pregnancies between 22 0/6 - 22 6/7 at admission with 33% (47/143) receiving at least a single dose of steroids, 27% (38/143) receiving magnesium sulfate, 24% (34/143) receiving antibiotics for GBS prophylaxis, and 18% (26/143) receiving tocolytics prior to delivery. Patients planning neonatal resuscitation were more likely to receive steroids (p<0.0001), magnesium sulfate (p<0.0001), and GBS prophylaxis (p<0.05). While 90% of these pregnancies were delivered vaginally, cesarean section was only performed in cases in which neonatal resuscitation was planned at delivery (p<0.0001).

There were 198 pregnancies between 23 0/7 - 23 6/7 at admission with 72% (142/198) receiving steroids, 60% (118/198) receiving magnesium sulfate, 42% (84/198) receiving antibiotics for GBS prophylaxis, and 34% (68/198) receiving tocolytics prior to delivery. Patients planning neonatal resuscitation were more likely to receive steroids (p<0.0001), magnesium sulfate (p<0.0001), tocolytics (p<0.05) and GBS prophylaxis (p<0.0001). Sixty one percent of these pregnancies were delivered by vaginal delivery with an increase in cesarean sections when neonatal resuscitation was planned (p<0.0001).

There were 138 pregnancies between 24 0/7 and 24 6/7 at admission with 81% (112/138) receiving at least one dose of steroids, 77% (106/138) receiving magnesium sulfate, 44% (61/138) receiving antibiotics for GBS prophylaxis, and 33% (46/138) receiving tocolytics prior to delivery. Patients planning neonatal resuscitation were more likely to receive steroids (p<0.005). No difference was in other interventions. Only 38% of these pregnancies were delivered vaginally, though no difference was noted between vaginal delivery versus cesarean section when neonatal resuscitation was planned.

Increased survival to discharge from NICU was noted for all gestational ages as a whole group when antenatal steroids (p<0.0001), magnesium sulfate (p<0.005), and GBS prophylaxis (p<0.05) were given. Overall, there were no statistically significant improvements in survival for use of tocolytics or delivery via cesarean section. Interventions were also reviewed at each gestational week at birth. At 22 and 23 weeks, antenatal steroids (p<0.05) and magnesium sulfate...
(p<0.05) showed increased chances of survival, while at 24 weeks, only use of GBS prophylaxis improved survival (p<0.05).

**Conclusion:** The American College of Obstetricians and Gynecologists recommends initiation of antenatal steroids, magnesium sulfate, tocolytics and antibiotics at 24 weeks in pregnancies at risk of preterm delivery with consideration for administration beginning at 23 weeks. While there is no clear evidence in current literature to support administration less than 23 weeks, our study shows these patients were more likely to receive antenatal steroids, magnesium sulfate, and antibiotics at both 22 and 23 weeks when resuscitation was planned (p<0.005). Our study notes increased survival for all gestational ages following administration of antenatal steroids and magnesium sulfate in infants between 22 0/7 and 23 6/7 weeks gestational age, and may be used to shift consideration of use of these two interventions at lower gestational ages when neonatal resuscitation is planned. Notably, cesarean delivery did not improve survival.

**Discussant:** Stephen Entman, M.D.
Nashville, Tennessee
Objective: In 2017, the American College of Cardiology/American Heart Association (ACC/AHA) published the Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. The new guideline supplants the prior guideline—JNC7—published in 2003.

Compared to the JNC7, the 2017 ACC/AHA guideline defines hypertension using a lower threshold of systolic blood pressure (SBP) and diastolic blood pressure (DBP) levels. The 2017 ACC/AHA guideline also proposes an extended criteria for pharmacological treatment relative to prior guidelines. There is, however, a lack of reports which focus on the characteristics, prevalence of hypertension and potential need for antihypertensive medications for reproductive-aged women based on the 2017 ACC/AHA guideline.

The primary objective was to estimate the prevalence of hypertension and recommended for antihypertensive medication among U.S. adult women of reproductive age according to the 2017 ACC/AHA vs the JNC7 guideline. The secondary objective was to identify factors associated with newly classified hypertension and not currently taking antihypertensive medication under the new guideline among this population.

Methods: Data from the National Health and Nutrition Examination Survey (NHANES) were used for this investigation. NHANES data were combined and analyzed from 5 survey periods collected from 2005-2006 to 2013-2014. Our study population included women aged 20 to 44 years who had home interviews and a medical examination. We excluded women who were pregnant at the time of examination, who did not have three SBP and DBP measurements obtained during their study visit or were missing data on self-reported antihypertensive medication used, and those without data for determining recommended antihypertensive medication.

The criteria for hypertension and recommending antihypertensive medication based on the 2017 ACC/AHA and the JNC7 guidelines were used. Hypertension was
defined using blood pressure measurements and/or self-reported antihypertensive medication use. The mean of the three measurements, obtained during medical exam, was used to determine SBP and DBP. Participants were considered to be taking antihypertensive medication if they responded “yes” to both of the questions: “Have you ever been told by a doctor or other healthcare professional that you had hypertension, also called high blood pressure?” and “Are you now taking prescribed medication for high blood pressure?” Several criteria for defining recommended antihypertensive medication were also assessed.

Sample characteristics were described using frequency and percentage. The prevalence of hypertension and recommended antihypertensive medication according to the 2017 ACC/AHA guideline as compared with the JNC7 guideline were determined. Multivariable Poisson regression models with robust error variance were conducted to identify factors associated with newly classified hypertension (i.e., if a woman was non-hypertensive using JNC7 guideline, but was classified as hypertensive using 2017 ACC/AHA guideline) and not currently taking recommended antihypertensive medication (i.e., if a woman would be recommended for antihypertensive medication using 2017 ACC/AHA guideline, but was not on such a medication currently).

The factors examined in the multivariable analyses included age, race/ Hispanic, non-Hispanic other), education, household income, body mass index, insurance status, current cigarette use, high risk of cardiovascular diseases, diabetes, chronic kidney disease, and survey cycle. We estimated adjusted relative risk (aRR) and 95% confidence intervals (CIs). Our results were reported with unweighted numbers from the original sample and weighted values after accounting for sample weights to reflect the U.S. nationally representative estimates.

**Results:** The study sample consisted of 4,575 (weighted n=40,194,602) non-pregnant women aged 20 to 44 years in the U.S. The overall prevalence of hypertension was 16.5% according to the 2017 ACC/AHA guideline, and 7.8% when estimated based on the JNC7 guideline, which indicates 8.7% of reproductive-aged women would be newly classified hypertension using the new guideline. The prevalence of hypertension increased by 112%, when using the 2017 ACC/AHA rather than the JNC7 guideline.

Following the 2017 ACC/AHA guideline, 8.6% were recommended for antihypertensive medication, but only 5.7% reported currently taking it, which suggested that among women recommended for antihypertensive medication, about one-third were not taking it currently.
After multivariable regression adjustment, women with older age of 35-39 years (aRR=2.07, 95% CI=1.37-3.14) or 40-44 years (aRR=2.47, 95% CI=1.59-3.86) and obesity (aRR=2.16, 95% CI=1.59-2.94) were more likely to be newly classified hypertension following the implementation of the new guideline, while women with older age of 30-34 years (aRR=3.15, 95% CI=1.10-9.05), 35-39 years (aRR=4.61, 95% CI=1.67-12.70), or 40-44 years (aRR=6.73, 95% CI=2.40-18.82), being non-Hispanic black (aRR=1.84, 95% CI=1.15-2.94) and had diabetes (aRR=5.88, 95% CI=3.73-9.25) were more likely to not currently taking antihypertensive medication recommended by the new guideline.

**Conclusions:** Among women of reproductive age, compared to the JNC7 guidelines, the prevalence of hypertension increased over 100% following the 2017 ACC/AHA guideline. Among women who were recommended for antihypertensive medications, 1 in 3 were not on them. Factors associated with newly classified hypertension and not on antihypertensive medication were identified, which should assist with the development of innovative, patient-centered, intervention strategies to improve outcomes.

**Discussant:** Michelle Y. Owens, M.D.
Jackson, Mississippi

10:00 – 10:45 a.m. **Break/Refreshments/Exhibits/Posters**
Moderators:
Andrew F. Wagner, M.D. – CAOG Secretary/Treasurer
Michelle Y. Owens, M.D. – CAOG Trustee

10:45 – 11:30 a.m. **Hot Topic #2**
“MACRA, MIPS, & HIPAA SLIPS”
of Noncompliance”
**Kyle J. Haubrich, J.D.**
Sandberg, Phoenix & Von Gontard, P.C.
St. Louis, Missouri

and

**Dennis Harms, J.D.**
Sandberg, Phoenix & Von Gontard, P.C.
St. Louis, Missouri

**Learning Objectives:**

- Identify and explain the fundamental requirements for HIPPA, OSHA and MACRA compliance.
- Assess your practice policies to prevent breeches in HIPPA, OSHA and MACRA compliance.
Introduction: Unanticipated neonatal depression at scheduled cesarean delivery is distressing for both patient and provider. A decreased umbilical artery pH measured via cord gas analysis can serve as an indicator of abnormal fetal acid-base status prior to delivery. Contributors to uterine hypoperfusion, such as neuraxial block-related hypotension and maternal obesity, have been proposed as contributors to neonatal depression and decreased umbilical artery pH. Operative time intervals objectively reflect the duration of fetal exposure to potential insults associated with neonatal acidemia. If these time intervals function as surrogate markers of exposure to risk factors for neonatal acidemia, minimizing exposure time may decrease the incidence of unanticipated neonatal depression. As such, we sought to correlate specific operative time intervals with umbilical artery pH and identify predictors of unanticipated umbilical artery pH depression.

Materials and Methods: We performed a retrospective cohort study of cesarean deliveries at our academic tertiary care center between September 2014 and February 2017. Subjects included women with non-anomalous singleton gestations undergoing scheduled cesarean delivery under spinal anesthesia between 37-41 weeks with a reassuring preoperative non-stress test. Demographic and obstetric variables, operative times, and neonatal outcomes were collected via individual chart review. Operative and anesthetic time intervals were defined as follows in minutes: total operative room (OR) time defined as OR entry to OR exit, OR to delivery defined as OR entry to neonatal delivery, spinal placement to delivery defined as start of neuraxial block to neonatal delivery, skin incision to delivery, and uterine incision to delivery times. The primary outcome was umbilical artery pH. Comparison groups were categorized using umbilical artery pH intervals of >7.30, 7.21-7.30, 7.11-7.20, 7.01-7.10, and < 7.0. Subsequent interval data are presented according to these intervals. ANOVA and X2 analyses were used to compare continuous and categorical variables. Stepwise linear regression was performed analyzing
umbilical artery pH as a continuous variable, controlling for associations identified in univariate analyses. A p value < .05 was considered significant.

Results: We analyzed 554 participants who met study criteria. Median umbilical artery pH was 7.27 [IQR 7.23-7.29] with minimum value of 6.61. The cohort consisted of gravidas with median BMI 35.4 [IQR 30.7-41.3] and was 61% black, 71% government insurance, 11% chronic hypertensive, 16% diabetic, and 39% with 2 or more prior cesareans. Black ethnicity and diabetes were more frequent with decreasing umbilical artery pH (.04, <.001, respectively), but groups had similar parity (p = .2) and chronic hypertension (p = .8). Delivery BMI significantly increased with decreasing umbilical artery pH (34.9±6.8, 36.3±8.6, 41.1±9.5, 42.4±7.9, 46.0±9.6 for respective groups, p<.001). Delivery from non-cephalic lie occurred in 14% of cases and was more frequent with decreasing umbilical artery pH (p<.001). Minimum intraoperative mean arterial pressure (MAP) was lower (p = .02) and maximum decline in MAP was greater (p = .001) with decreasing umbilical artery pH. Median birthweight was 3330 gm [IQR 3010-3675] and birthweight increased with decreasing umbilical artery pH (p=.002). 5 minute APGAR scores decreased (9±1, 9±1, 8±1, 8±1, 6±3 p <.001) and NICU admission was more frequent (15%, 11%, 25%, 33%, 67%, p<.001) with decreasing umbilical artery pH. Two instances of hypoxic ischemic encephalopathy occurred, and both were noted to have umbilical artery pH <7.00.

Total OR, OR to delivery, spinal placement to delivery, uterine incision to delivery, and skin incision to skin closure time intervals all increased with decreasing umbilical artery pH interval (p<.001 for all). With decreasing umbilical artery pH, uterine incision to delivery time increased (1.3±1.4, 1.3±1.0, 2.0±1.5, 2.8±2.4, 2.7±1.5 minutes, p <.001). Spinal placement to delivery time also increased with decreasing umbilical artery pH (35±11, 35±10, 39±14, 41±7, 54±23 minutes, p <.001). Stepwise linear regression using significant variables from univariate analyses produced a significant model [F(5,499) = 16.865, p =.0001], with R2 of 0.145. In the final model, maternal BMI, non-cephalic presentation, spinal placement to delivery interval, uterine incision to delivery interval, and maximum decrease in maternal MAP were predictive of umbilical artery pH depression. Non-cephalic lie was associated with a decline in umbilical artery pH of 0.027. Umbilical artery pH decreased by 0.008 and 0.001 for each minute for uterine incision to delivery and spinal to delivery time intervals, respectively. Each unit increase in maternal BMI and decline in MAP (mmHg) resulted in an umbilical artery pH decrease of 0.001. A receiver operating
characteristic curve demonstrated that a spinal to delivery time greater than 27.5 minutes was associated with an umbilical artery pH < 7.1 (AUC 0.74, 100% sensitivity, 79% specificity).

**Discussion:** We found that spinal to delivery and uterine incision to delivery time intervals predicted a decreasing umbilical artery pH during scheduled cesarean delivery. Increased pre-delivery time intervals can prolong the duration of fetal exposure an environment of uterine hypoperfusion. Our findings suggest that efforts to minimize pre-delivery time intervals could reduce the frequency of unanticipated neonatal acidemia.

**Discussant:** Paul G. Tomich, M.D.
Downers Grove, Illinois
12:00 p.m. – 12:30 p.m.

**Paper #5**

The Association of HBB-Related Structural Hemoglobinopathies and Low Fetal Fraction on Single Nucleotide Polymorphism-Based Non-Invasive Prenatal Screening (NIPS) for Fetal Aneuploidy

Manesha Putra, MD¹, Jay Idler, MD¹, Kara Patek, MD¹, Jessica Chaperon, MS², Robert Sokol, MD¹, Sanjay Patwardhan, MD¹

Wayne State University, Detroit, MI¹ and Natera, Inc, San Carlos, CA²

**Background:** Sickle-cell disease (SCD) is a part of a heritable group of disorders caused by altered amino acid on the HBB-gene sequences resulting in structural hemoglobinopathies, such as SCD, hemoglobin SC disease, sickle-beta thalassemia and many other variants. It has been anecdotally associated with an increased incidence of low fetal fraction on single nucleotide polymorphism-based NIPS, but this hypothesis has not been tested.

**Objectives:** Our objective in this study was to compare the difference between fetal fraction of single nucleotide polymorphism (SNP)-based NIPS of women with HBB-related structural hemoglobinopathies (HSH) and women with structurally normal hemoglobin. We also sought to compare the difference in "no-calls" due to low fetal fraction rate in these two groups.

**Method:** This was a retrospective case-control study. Our study cohort was obtained from pooled sample of pregnant women with SNP-based NIPS from the Natera laboratory database of Detroit Medical Center patients with clinically diagnosed HSH or women who were expected to be affected with a HSH based on carrier-screening. The control population with SNP-based NIPS and clinically proven structurally normal hemoglobin was obtained from the Detroit Medical Center. We tested for case-control differences in median fetal fraction using quantile regression analysis, adjusting for weight and gestational age. Fisher's Exact test was used to examine the association between HSH status and no-call rate. We report the fold difference as relative risk.

**Results:** This study includes 35 women with clinically significant HSH and 636 women with hemoglobin AA as controls. The median fetal fraction was lower among women who had HSH than in the control group [5.8% (inter-quartile range [IQR] 3.8 - 7.4) vs. 9.4% (IQR 6.3-14)]. Adjusting for
gestational age and body weight, there was no significant influence on the median fetal fraction difference between the HSH and control groups (β -4.1; 95% -5.7 to -2.5). Adjusting for weight and gestational age, the risk of no-call report was significantly higher in the HSH group than in the control group [HSH: n=6/32, 19% vs. control: n=32/626, 5.1% (Fishers Exact p = 0.007), RR 3.7; 95% CI 1.7-8.1].

The risk of no-call report differed between the HSH and control groups depending on lowest quartile body weight (p=0.045), largely because women in control group whose weight was < 144 lbs. (lowest quartile in this sample) were at tenfold lower risk of no-call test determination than their heavier control peers. Importantly, clinically significant HSH was no longer associated with increased risk of no-call report determination when compared to control group whose body weight was not in the bottom quartile [HSH group with low body weight: RR 0.4; 95%CI 0.1 - 1.5 versus control group without low body weight: RR 1.0; 95%CI 0.1-8.0].

**Conclusion:** In our study, women with HSH were more likely to have a lower fetal fraction and ultimately a threefold higher no-call rate. Explanations as to why women with HBB-related structural hemoglobinopathies may have a lower fetal fraction may include a reported increase in circulating maternally-derived cell free DNA due to vasooclusive crisis and/or dilution due to frequent red blood cell transfusion. Further our findings confirm the previously reported association between higher body weight and higher no-call rate. More interestingly, we report that the relationship of body weight and no-call rate appears to work differently in women with HSH, as higher weight results in lower no-call rate. We hypothesize that this difference might be a reflection of disease status as women with worse disease status tend to have lower weight. However, further research is needed to study this relationship.

Our results highlight the importance of considering clinically significant HSH during counseling for prenatal aneuploidy screening. It might be prudent to consider a later time frame to order NIPS in women with HSH or in some cases or, perhaps, a different modality, such as combined first trimester screening as a better option for these patients.

**Discussant:** Barbara V. Parilla, M.D.
Park Ridge, Illinois
12:30 – 1:30 p.m.  **Hot Topic #3**
“ARRIVE Trial Update”
**William B. Grobman, M.D.**
Northwestern Univ.
Chicago, Illinois

**Learning Objectives:**
- Outline the basic components of the ARRIVE Trial.
- Explain how the ARRIVE trial results will impact your obstetrical practice
SCIENTIFIC PRESENTATIONS
FRIDAY, OCTOBER 19, 2018

6:00 a.m.  General Registration (Lakes Ballroom)

6 a.m. – 11 a.m.  Industry Exhibits Open

6 a.m. – 11 a.m.  Scientific Poster Session Open

6:00 – 6:30 a.m.  Breakfast (Lakes Ballroom)

6:30 – 7:30 a.m.  Sunrise Lecture (Lakes Ballroom)
“Changing Landscape in Cervical Cancer Testing”
Dennis J. Lutz, M.D.
UND School of Med. & Health Sciences
Minot, North Dakota

Learning Objectives:
• Explain how the landscape is once again changing in cervical cancer testing.
• Contrast the value of future pap smears and cotesting components of HPV.

THIRD SCIENTIFIC SESSION
(Lakes Ballroom)

Moderators:
James F. Kirby, M.D. – CAOG Vice President
William J. Todia, M.D. – CAOG Trustee
Objective: Neonatal brachial plexus palsy (NBPP) occurs in about 1 per 1,000 births and is defined as flaccid paresis of an upper extremity, with passive range of motion greater than active. Persistent NBPP occurs in about 1-2 per 10,000 births and is characterized by the presence of musculoskeletal contractures or the deviation of a joint's active range of motion from normal by > 10 degrees (Chang et al. Am J Perinatol. 2016;33:765-9). Though shoulder dystocia (SD) is inexorably linked with NBPP, there is a paucity of information on the number of maneuvers utilized and the time interval to resolution of SD and persistence and extent of nerve roots injured.

Among children with NBPP and documented SD, we hypothesized that persistence of NBPP and higher Narakas grade (number of nerve roots injured) are dependent on a) > 3 vs. ≤ 3 maneuvers utilized in SD and b) duration of SD > 120 vs. ≤ 120 sec.

Material and Methods: We conducted a retrospective cohort study of children managed at the University of Michigan Interdisciplinary Brachial Plexus Program (UM-BPP) from 2004 to 2016. The inclusion criteria were non-anomalous, singletons, for whom maternal and perinatal records documented maneuvers used to resolve SD and its duration. We excluded cases with cesarean delivery. Demographics were noted, as were Apgar scores, fractures and bruising at delivery, NBPP persistence at 1 and/or 2 years of age, and extent of NBPP by Narakas score (grade III-IV defined as injury to all 5 nerve roots). Clinicians evaluating the status of NBPP in the children were unaware of the management of SD. The obstetric charts of the cohorts were reviewed by a MFM attending, a MFM fellow and an OB/GYN resident-all unaware of the status of NBPP at 1 and 2 years of age. Chi-square analysis and calculation of relative risk with 95%
confidence intervals (CI) were performed. P <0.05 or CI not crossing integer 1 was significant.

Results: Of 106 cases during the study period, 47 (44%) children with NBPP had data regarding number of maneuvers used. SD resolved with ≤ 3 maneuvers in 85% (40/47) of cases. Among those with resolution of SD ≤ 3 vs. > 3 maneuvers, there were no differences in maternal age, ethnicity, body mass index (BMI) < vs. ≥ 30 kg/m² at delivery, diabetes (pre-gestational or gestational), induction, operative vaginal delivery, gender, and birth weight < vs. ≥ 4,000 g. The rate of persistent NBPP at 1 year was significantly higher when SD was resolved using > 3 (100%) vs. ≤ 3 maneuvers (69%; RR 1.4, 95% CI 1.1-1.9). Persistent NBPP was also significantly higher at 2 years if > 3 maneuvers were utilized (100%) compared to ≤ 3 maneuvers (62%; RR 1.6, 95% CI 1.2-2.2). No significant difference was found with Apgar score ≤ 5 at 5 min, number or location of fractures and bruising, or Narakas grade.

Of the cases with NBPP and SD, the time interval to resolution of the impaction was documented in 43 (41%). The median time to resolution of SD was 60 sec (range of 15 to 600 sec) with 81% (35/43) being resolved in ≤ 120 sec. There were no significant differences among children with NBPP whose SD resolved ≤ vs. > 120 sec in regards to demographics. The rate of persistent NBPP at 1 year was significantly higher when SD resolved > 120 sec (100%) vs. ≤ 120 sec (73%; RR 1.4, 95% CI 1.1-1.8). Among children with persistent NBPP at 2 years of age, the rate of resolution of SD > 120 sec was significantly higher (100%) than ≤ 120 sec (63%; RR 1.6, 95% CI 1.1-2.2). No significant difference was found between Apgar score ≤ 5 at 5 min and number or location of fractures and bruising in regards to duration. The relative risk of injury to all 5 nerve roots (Narakas grade III and IV) was significantly higher among those with SD lasting > 120 sec (63%) vs. ≤ 120 sec (29%; RR 2.2, 95% CI 1.03-4.6).

Conclusions: This is the largest known study on children with 1-2 year follow up for NBPP and documented shoulder dystocia at delivery. Our data suggests that SD resolved with > 3 maneuvers has increased rates of persistence of NBPP in children at both 1 and 2 years of age. SD with duration of > 120 sec also has higher rates of NBPP persistence at both 1 and 2 years of age. The risk of injuring all 5 nerve roots (Narakas grade III and IV) of the brachial plexus is higher when SD duration is > 120 sec vs. ≤ 120 sec.

Discussant: Jean R. Goodman, M.D.
Maywood, Illinois
The Impact of the New Hypertension Guidelines to Low-Dose Aspirin Prophylaxis Eligibility for the Prevention of Preeclampsia: A Cost-Benefit Analysis

Manesha Putra, MD\(^1\), Madagedara M Balasooriya, MS\(^2\), Alexander L Boscia, MS\(^1\), Khrystyna Levytska, MS\(^3\), Dalkiran Evrim, PhD\(^2\), Robert J Sokol, MD\(^1\)

Wayne State University School of Medicine, Detroit, MI\(^1\), Wayne State University College of Engineering, Detroit, MI\(^2\), Case Western Reserve University School of Medicine, Cleveland, OH\(^3\)

Background: In November 2017 American College of Cardiology (ACC) and American Heart Association (AHA) along with other professional societies published new guidelines which redefine the cut-off for hypertension. With thin new guidelines, blood pressure (BP) of 130-139/80-89 mmHg will now be classified as a stage I hypertension. This change was made based on studies which showed significantly poorer long term outcomes of these group of population compared to people with optimally controlled BP. Although these guidelines do not redefine BP cut-off for gestational hypertension or preeclampsia, they do impact obstetrical practice by increasing the prevalence of pre-existing chronic hypertension in reproductive age women. Based on ACC/AHA publication, the prevalence of chronic hypertension in reproductive age women is expected to increase by 90%.

Multiple studies have shown the benefits of low-dose aspirin prophylaxis for the prevention of preeclampsia in high risk women. There are several prescribing schemes that are currently being used, most commonly based on the United States Preventative Service Task Force (USPSTF). According to USPSTF recommendation, women with one or more high risk factors, including chronic hypertension, would benefit from low-dose aspirin prophylaxis. There has been no study that evaluate the cost-benefit of expanding the eligibility of aspirin with a lower cut-off for the definition of chronic hypertension.

Objective: Our objective in this study was to develop a decision model to evaluate the impact of new ACC/AHA hypertension guidelines to the risks, benefits and costs of several low-dose aspirin prophylaxis approaches for preeclampsia prevention.
Study Design: We created a decision tree analysis using R statistical software to evaluate four approaches to aspirin prophylaxis in the United States: no aspirin, USPSTF with old ACC/AHA hypertension guidelines, USPSTF with new ACC/AHA hypertension guidelines as well as universal aspirin prophylaxis. In order to build this model PubMed literature review was performed to find a range for various clinical parameters pertinent to the model. We accounted for cost of aspirin, cost of medication side effects, adverse events and hypersensitivity reaction. Benefits were derived from aspirin-related obstetrical complications risks reduction, including preeclampsia, preterm birth as well as perinatal and neonatal death. Our model takes into account recent studies which showed increased risks of preeclampsia and adverse obstetrical outcomes in women with stage 1 hypertension. This model was executed to simulate a hypothetical cohort of 4 million pregnant women in the United States.

Results: Based on our simulation model, the new ACC/AHA hypertension guidelines would expand the aspirin eligibility by 8% (76,953 women) in the USPSTF guidelines. We also showed that even with this increased eligibility, USPSTF guidelines continues to be the approach with the most cost savings ($386.5 million) when compared to no aspirin and universal aspirin approaches ($373.2 million). The new hypertension guidelines are projected to increase the cost savings of the USPSTF approach by $9.4 million. Subsequently, we constructed a polynomial trend based on all approaches cost saving values to model the relationship between cost-saving and number of women treated with aspirin.

Conclusions: The increased prevalence of chronic hypertension due to the change in hypertension cut-off is expected to increase the eligibility of aspirin prophylaxis for preeclampsia by 8%. This number is rather small because we anticipated most of women with stage 1 hypertension, would have been eligible for aspirin prophylaxis based on other criteria. Despite this, such small change in aspirin prophylaxis still results in an annual cost-saving of $9.4 million in the United States. Based on this, it might be prudent to continue to follow USPSTF guidelines even with the increased prevalence of chronic hypertension based on the new hypertension guideline. When we analyze the polynomial trend, it is possible that the optimal number of women needs to be treated to yield a maximum cost saving is still unknown. The actual impact of the new hypertension guidelines may not be clearly defined yet. Beyond the cost-benefit of preeclampsia prophylaxis, we anticipate that surveillance cost may change how the new hypertension guidelines impact
obstetrical care. Further study will be needed to simulate the impact of these new guidelines to obstetrical care of women with chronic hypertension.

**Discussant:** Robert P. Kauffman, M.D.
Amarillo, Texas
8:30 – 9:00 a.m.

Paper #8

Fetomaternal Bleeding and Neonatal Hematocrit Following Cesarean Delivery: Routine Versus Transplacental Transection

Emily Gregory, MD, Craig V Towers, MD, Jaclyn Van Nes, MD, Beth Weitz, RN, Kristina Shumard, MD, Kimberly B Fortner, MD

University of Tennessee Medical Center, Knoxville, TN

Objective: Fetomaternal hemorrhage has been documented following both vaginal and cesarean delivery. Some studies have suggested that a fetomaternal bleed is increased with cesarean delivery while others have not found this association. One possible difference in these studies may lie in whether or not the placenta is transected during the cesarean delivery process. To our knowledge, no prior study has evaluated this question. In addition, data are also limited regarding neonatal hematocrit post cesarean delivery in routine surgeries versus those where the placenta was transected. If fetomaternal bleeding is greater in transplacental transection cesarean deliveries, then Rh-negative mothers who deliver Rh-positive newborns may need supplemental Rh hyperimmune globulin. Therefore, the primary study objective was to evaluate the rate of fetomaternal bleeding following routine cesarean delivery compared with cesarean delivery where transplacental transection was needed to accomplish delivery. The secondary study objective was to evaluate the neonatal hematocrit post-delivery for each group.

Study Design: Our study was a prospective evaluation of cesarean delivery controls (the placenta was not transected to accomplish delivery) and cases (transplacental transection occurred in the delivery process). All pregnant English-speaking patients who entered labor and delivery from January 2016 through April 2018 were eligible. The Kleihauer-Betke (KB) test, collected within 24 hours of delivery, was used to determine the rate and amount of fetomaternal bleeding. The neonatal hematocrit was also obtained on the first day of life. A power analysis was performed based on data from the few published studies to date that evaluated the rate of a positive KB following cesarean delivery. Because transplacental transection cesarean delivery is not common, a 2 to 1 ratio of routine cesarean versus transplacental transection cesarean was incorporated. For a power of 80 using an alpha of .05 and a beta of .20 and an expected rate of a positive KB to be 3 times higher in the transplacental transection cases, a minimum of 90 patients
was required (60 routine cesarean controls and 30 transplacental transection cases). Once consented, primary data collection included demographics, gestational age at delivery, indication for cesarean, type of cesarean incision, those in labor prior to cesarean, manual removal of the placenta, and the newborn hematocrit post-delivery. A large fetomaternal bleed was considered at 15 mL. Statistics involved the student t-test, chi square, and fisher exact where appropriate and a P value < .05 was considered significant with all tests considered against a two-sided alternative hypothesis. The study was reviewed and approved by the institutional review board.

Results: A total of 94 patients were evaluated with 63 routine cesarean controls compared with 31 transplacental transection cases. There were no differences in the demographics, gestational age at delivery, the indication for cesarean delivery, the type of incision, labor preceding the cesarean, and manual removal of the placenta. There were 9 (14%, 95% CI 7-25%) positive KB's in the routine cesarean deliveries compared with 6 (19%, 95% CI 7-31%) in the 31 cases (not significant, p = .74). There were 3 large bleeds as defined, 2 in the controls and 1 in the cases (both at 3%, p = 1.00). The mean neonatal hematocrits were also not different at 50.4% (+/- 5.9%) in the controls compared with 48.3% (+/- 8.7%) in the cases. However, for neonatal hematocrits < 40%, there were 7 in the transplacental transection cases (23%, 95% CI 10-41%) compared with only 2 in the controls (3%, 95% CI 0.4-11%), which was significant, p = .005.

Conclusions: These data demonstrate that a cesarean delivery that requires transplacental transection to accomplish delivery does not significantly increase the rate of fetomaternal bleeding. A type 2 error is always possible; however, if the respective rates were to remain unchanged, more than 10 times the number of cases and controls would be needed to reach significance. Additionally, though mean neonatal hematocrits were not different, a hematocrit less than 40% at delivery was higher among cases. Therefore, consideration should be given to inform pediatrics in clinical settings where the placenta is transected at the time of cesarean delivery, so the newborns can be evaluated.

Discussant: Emmet Hirsch, M.D.
Evanston, Illinois
9:00 – 9:45 a.m. **Hot Topic #4**
“Pelvic Surgery Update”
**Angela Chaudhari, M.D.**
Northwestern Univ.
Chicago, Illinois

**Learning Objectives:**
- Explain ways to improve perioperative patient care following ob-gyn surgery.
- Define the value of simulation training in ob-gyn resident education.

9:45 – 10:30 a.m. **Break/Refreshments/Exhibits/Posters**
Neuroradiological Perspective of Preeclampsia and Eclampsia Spectrum: A Correlation from Posterior Reversible Encephalopathy Syndrome (PRES).

Darshan Hosapatna Basavarajappa, MD, Pradip Kumar Saha, Rashmi Bagga, MD, N Khandelwal, MD, Manish Modi, MD

Postgraduate Institute & Medical Education & Research, Chandigarh, India

Background: Posterior reversible encephalopathy syndrome (PRES) is known to be the neuroradiological appearance of eclampsia. This study was conducted to recognize the occurrence of PRES and to understand the neuroradiological aspects of severe preeclampsia patients. Many studies have elicited PRES in eclampsia patients retrospectively. Lacunae still exist in severe preeclampsia patients and those with cerebral symptoms probably, clinical conditions that presage eclampsia.

Materials & Methods: It was a prospective and observational study conducted in a tertiary referral centre of northern India. A total of 75 women were recruited, 30 of them with cerebral symptoms of preeclampsia i.e, headache, visual disturbances and depressed level of consciousness and 30 patients of severe preeclampsia who were asymptomatic in terms of neurological manifestations and 15 of eclampsia patients were enrolled consecutively in the immediate postpartum period within 48 hours of delivery. Magnetic resonance imaging of the brain was performed within that period. The main outcome was to correlate the MRI brain picture with the neurological disease status of preeclampsia and to correlate these symptoms of cerebral involvement with the clinical and biochemical parameters. True cerebral involvement in symptomatic patients with the elucidation of PRES radiologically was anticipated.

Results: PRES was identified in 86.7% of patients in eclampsia group (p-value - .001) and in 20% and 26.6% of symptomatic and asymptomatic severe preeclampsia patients
respectively (p-value - 0.06 and 0.195). True cerebral involvement of preeclampsia was witnessed even in severe preeclampsia patients those without any clinical demonstration of cerebral signs and symptoms. Headache was the most consistent symptom of severe preeclampsia that patients presented with. 53% of patients with both headache and visual symptoms had PRES. There was a shorter mean duration of high blood pressure records in those who developed PRES. There was no statistically significant difference seen with other parameters evaluated.

Conclusions: Severe preeclampsia patients had the changes of PRES already set in before being symptomatic or have seizures. This was of high neuroradiological evidence further supporting the existing practice of prompt termination of pregnancy with the onset of cerebral symptoms itself and institute methods for early reversibility of PRES. In addition to the vast emergence of metabolic syndrome in the present day population, preeclampsia-eclampsia associated PRES and subsequent persistence of these white matter lesions is a definite risk factor for the long-term neurological sequel.

Discussant: Katherine W. McHugh, M.D.  
Indianapolis, Indiana
Comparison of Neonatal Outcomes Following TOLAC and Scheduled Repeat Cesarean in a High-Risk Population

William M Perez, MD, Rebecca R Rimsza, MD, Laura K Vricella, MD

Saint Louis University School of Medicine, Saint Louis, MO

Introduction: Previous research has associated successful vaginal birth after cesarean (VBAC) with more favorable maternal and neonatal outcomes than both RCS and failed VBAC ending in repeat cesarean section (RCS). In a contemporary gravid population with high incidences of obesity, diabetes, and hypertension, VBAC failure is associated with lower success rates, but also higher incidence of infectious and operative complications. As such, providers and patients are often hesitant to pursue trial of labor after cesarean (TOLAC).

In efforts to reduce cesarean delivery rates, VBAC is more often encouraged. Simultaneously, newer labor standards encourage providers to allow longer labors. As much of our understanding of maternal and neonatal risks of VBAC originates from outdated labor protocols, the relative neonatal risk of VBAC in high risk women who may require longer labors should be better understood in light of more contemporary management. As such, we sought to evaluate neonatal outcomes following VBAC attempts in a high risk population experiencing longer labors.

Materials and Methods: We performed a retrospective cohort study of candidates for trial of labor after cesarean (TOLAC) at our academic tertiary care center between September 2014 and February 2017. Subjects included women with non-anomalous singleton gestations between 37-41 weeks gestation undergoing scheduled repeat cesarean or TOLAC after 1 or 2 prior low transverse cesarean deliveries who otherwise were appropriate candidates for TOLAC as recommended by the American College of Obstetrics and Gynecology (ACOG). Demographic and obstetric variables, delivery outcomes, maternal outcomes, and neonatal outcomes data were collected via individual chart review. The primary outcome was neonatal intensive care unit (NICU) admission. Secondary outcomes included umbilical artery analytes, 5 minute APGAR score <7, reason for NICU admission, hypoxic ischemic encephalopathy (HIE), and neonatal death. For the primary analysis, an intention-to-treat analysis was performed comparing TOLAC versus scheduled
RCS. Mann-Whitney U test was used to analyze non-normally distributed continuous data and ordinal data. A post-hoc analysis was also performed using an as treated comparison of successful VBAC, failed VBAC, and scheduled RCS. In this analysis, Kruskal Wallis test was used to compare ordinal and non-normally distributed continuous data. X2 analysis was used to compare categorical data.

Results: We identified 825 deliveries meeting criteria for inclusion. In our cohort, 429 (52%) subjects underwent TOLAC while 396 (48%) underwent scheduled RCS. 315 of 429 (73.4%) of the TOLAC group ended in successful VBAC. In the intention to treat analysis, women who underwent TOLAC as compared to scheduled RCS were similar in respect to age (p=.120), black race (p=.077), number of prior cesareans (p=.211) and birthweight (p=.052). Median parity [2(1-3) vs. 1 (1-2), p<.001] was higher in the TOLAC group. Incidence of obesity (BMI ≥30) was 73.7% and was similar in groups (71.3 vs. 76.8% p=.075) with super-obesity (BMI ≥ 50) being more common in women undergoing scheduled RCS (4.2 vs. 8.3%, p=.014). Hypertension was more common in the TOLAC group (22.1% vs. 14.1%, p=.003) while diabetes mellitus was more common in women undergoing scheduled RCS (10.7% vs. 15.9%, p=.028)

The primary outcome, NICU admission, was similar among TOLAC and scheduled RCS [38 (8.9%) vs. 43 (10.9%), p=.355]. Neonatal respiratory distress (RDS) and hypoglycemia were less common in the TOLAC group (6.3% vs. 10.9%, p=.019 and 0.9% vs. 4%, p=.004). Median umbilical artery pH was statistically lower in the TOLAC group as compared to the RCS group [7.24 (IQR 7.20-7.27) vs 7.27 (IQR 7.23-7.29), p<.001]. Incidence of umbilical artery pH <7.1 and <7 was similar among groups [(6.1% vs. 4%), p=.187, and [2.1% vs .7%], p=.108]. 5 minute APGAR < 7 occurred similarly in TOLAC and RCS groups (3.5% vs. 1.77%, p=.124). Neonatal HIE was similar following TOLAC (0.4%) and scheduled RCS (0.7%), p=.675. There were no neonatal deaths identified. There was one uterine rupture.

An as treated analysis showed that NICU admission was 7.30% for successful VBAC, 13.16% for failed VBAC and 10.86% for scheduled RCS, p=.124. Umbilical artery pH <7.1 occurred in 2.86% of successful VBAC attempts, 14.91% of failed TOLAC attempts, and 4.04% of scheduled RCS, p<.001. Umbilical artery pH <7 occurred in 0% of successful VBAC attempts, 6.25% of failed TOLAC, and 0.76% of scheduled RCS, p<.001.

Discussion: In a large cohort of women with a high incidence of co-morbidities known to negatively affect TOLAC success,
we found that NICU admission was similar following TOLAC and scheduled RCS. Neonatal RDS and hypoglycemia, were much more common following scheduled RCS. The incidence of lower pH was similar among groups in both comparisons. An as-treated analysis demonstrated favorable neonatal outcomes for the successful VBAC group. Catastrophic outcomes including HIE and uterine rupture were rare. Our data suggest that in a high risk population, neonatal outcomes did not differ significantly following TOLAC and scheduled RCS. These data should encourage high-risk providers and patients to consider TOLAC a safe option in otherwise appropriate candidates.

**Discussant:** Roger P. Smith, M.D.
Boca Raton, Florida
11:30 – 12:15 Keynote Address
“50 Years of Progress in Ob-Gyn Genetic Testing”
Joe Leigh Simpson, M.D.
Florida International Univ. College Med.
Miami, Florida

Learning Objectives:
- Outline the relevant advances in ob-gyn genetic testing in your own ob-gyn practice.
- Predict the future of ob-gyn genetic testing using telemedicine.

12:15 – 1:00 p.m. Presidential Address
“Genomics in Obstetrics and Gynecology: The Time is Now to Knock Down the Temple and Rebuild It”
Lee P. Shulman, M.D.
Northwestern Univ.
Chicago, Illinois

Learning Objectives:
- Provide examples of obstetrical “best practices” in current genetic testing.
- Identify and discuss which prenatal genetic tests are absolutely essential for all populations.

1:00 p.m. Installation of New President

1:00 – 1:30 p.m. Annual Business Meeting CAOG
6:00 a.m. General Registration (Lakes Ballroom)

6:00 – 6:30 a.m. Breakfast (Lakes Ballroom)

6:30 – 7:30 a.m. **Sunrise Lecture** (Lakes Ballroom)
“Prevention of Extreme Prematurity”
*James E. Sumners, M.D.*
St. Vincent Women’s Hospital
Indianapolis, Indiana

**Learning Objectives:**
- Describe the current prevalence of extreme prematurity in the United States.
- Provide a plan to reduce extreme prematurity in your own practice.

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**FIFTH SCIENTIFIC SESSION**

(Lakes Ballroom)

**Moderators:**
Vanessa M. Barnabei, M.D. – CAOG President Elect I
James W. Van Hook, M.D. – CAOG Trustee
Objective: Adults living with chronic diseases have increased, with a concomitant upsurge in use of opioid analgesia. Despite the increase in both, there is a lack of data on the association between chronic diseases, self-reported health status and prescription opioid analgesic use among women of reproductive age.

The objectives of this study were 1) to estimate the prevalence of chronic diseases, self-reported health status, and prescription opioid analgesic use, and 2) to examine the association between chronic diseases, self-reported health status, and prescription opioid analgesic use among women of reproductive age.

Methods: Data from the National Health and Nutrition Examination Survey (NHANES) were used for this investigation. NHANES data were combined and analyzed from 5 survey periods collected from 2005-2006 to 2013-2014. Our study population included women aged 20 to 44 years who had home interviews and a medical examination, and had information on prescription drug use.

The study outcomes were self-reported health status (poor/fair health) and prescription opioid analgesic use. Participants were asked “Would you say health in general is excellent, very good, good, fair, or poor? “Poor/fair health” was defined as respondents who rate their health “poor” or “fair.” For prescription medication use, participants were asked “In the past 30 days, have you used or taken medication for which a prescription is needed?” Opioid analgesics were identified using the Multum ingredient category codes. We excluded opioid-containing medications with non-analgesic indications, typically used for cough and colds rather than pain, or primarily used to treat opioid addiction. We defined prescription opioid analgesic use as participants reported at least one medication of opioid analgesics use over the prior 30 days.

We examined participants by 16 selected chronic diseases: angina, arthritis, asthma, cancer, chronic bronchitis, congestive heart failure [CHF], coronary heart disease [CHD],
depression, diabetes, emphysema, heart attack, hypertension, liver condition, obesity, stroke, and thyroid disease.

Sample characteristics and prevalence estimates were calculated with frequency and percentages. To examine the association between chronic diseases and poor/fair health, we conducted a multivariable Poisson regression model with robust error variance while adjusting for potential confounders, including age, race/ethnicity, marital status, household income, insurance status, cigarette use, hospitalization last year, pregnancy status at the time of medical examination, and survey cycle. We conducted the same regression analyses to examine the association between chronic diseases and prescription opioid analgesic use in the past 30 days.

We estimated adjusted relative risk (aRR) and 95% confidence intervals (CIs). Our results were reported with unweighted numbers from the original sample and weighted values after accounting for sample weights to reflect the U.S. nationally representative estimates.

**Results:** The study sample consisted of 6,238 (weighted n=52,004,664) women aged 20 to 44 years in the U.S. Among cohorts, 53.9% reported having at least one chronic disease, with the 5 most common being obesity (33.8%), hypertension (12.8%), asthma (10.0%), arthritis (9.3%) and depression (8.4%).

Overall, 12.0% reported having poor/fair health, and 5.4% reported prescription opioid analgesic use in the past 30 days. The prevalence of poor/fair health and prescription opioid analgesic use in the past 30 days increased as the number of chronic diseases increased. The 5 diseases with the most prevalent poor/fair health were angina (60.2%), CHD (56.5%), CHF (49.1%), emphysema (48.1%) and heart attack (47.0%). The 5 diseases with the most prevalent use of prescription opioid analgesic in the past 30 days were CHD (37.3%), angina (33.1%), liver condition (28.5%), emphysema (28.0%) and heart attack (26.8%).

After multivariable regression adjustment, compared to women with no chronic disease (referent group), every chronic disease was significantly associated with an increased risk of poor/fair health; the 5 highest aRR of poor/fair health according to specific diseases were angina (aRR=9.8, 95% CI=5.9-16.5), CHD (7.6, 4.5-12.7), chronic bronchitis (6.1, 4.6-7.9), emphysema (5.7, 3.0-10.7), and CHF (5.4, 3.8-7.7). Similarly, compared to referent group, every chronic disease was significantly associated with an increased risk of prescription opioid analgesic use in the past 30 days; the 5 highest aRR of prescription opioid analgesic use in the past 30 days according to specific diseases were CHD (8.1, 4.1-15.7), angina (6.7, 3.6-12.2), liver condition (6.6, 3.8-11.2), arthritis
(6.3, 4.4-9.0), and cancer (5.2, 3.5-7.9). As the number of chronic diseases increased, the risk of having poor/fair health and prescription opioid analgesic use in the past 30 days also increased.

**Conclusions:** More than half of the reproductive-aged women have chronic diseases, with 1 in 8 being in poor/fair health and 1 in 20 being prescribed opioid analgesic within the past month. Such burden is an impetus for additional research to guide the development of effective treatment modalities for managing chronic disorders and reducing prescription opioid analgesic use among reproductive-aged women.
Objective: Inherited thrombophilias in pregnancy are associated with several complications including a risk for venous thrombosis. One of these inherited thrombophilias is Protein S deficiency; however, it is known that pregnancy can affect normal Protein S values. Per the ACOG Practice Bulletin (No. 138, September 2013, Reaffirmed 2017) on Inherited Thrombophilias in Pregnancy, testing for Protein S is more reliable in the nonpregnant patient. If testing during pregnancy is performed, then the recommended cutoff values for Free Protein S are listed as < 30% for the second trimester and < 24% for the third trimester. No cutoff values are supplied for Protein S Functional Activity or Total Protein S levels in pregnancy. Therefore, the objective of this study was to evaluate Protein S Functional Activity and Total Protein S levels in normal pregnancy.

Study Design: Our study was a prospective longitudinal evaluation of 50 pregnant women. Following informed consent, testing for Protein S Functional Activity and Total Protein S levels were performed in the first trimester (up to 12 weeks gestation), in the second trimester (between 23 and 27 weeks gestation) and at the end of the third trimester prior to delivery. The study duration was 26 months (March 2016 through April 2018) from first enrollment to the final delivery. Patients were eligible if they were considered low risk at the initiation of prenatal care. Patients were excluded if they had a prior history of thrombosis, a strong family history of thrombosis (especially at a young age), or prior pregnancies with complications (including placental abruption, hypertension, 2 or more spontaneous abortions prior to 10 weeks gestation, or 1 intrauterine fetal demise after 10 weeks gestation). Patients were also excluded if they were taking medications that might influence coagulation (such as NSAID’s). Statistics involved the student t-test where appropriate and a P value < .05 was considered significant with all tests considered against a two-sided alternative hypothesis. The study was reviewed and approved by the institutional review board.
Results: Of the 50 patients enrolled, 44 had second trimester labs drawn (6 did not --- 3 moved, 1 missed abortion at 9 weeks, 1 fetal demise at 13 weeks, and 1 preterm delivery at 25 weeks), and 36 had third trimester labs drawn (8 additional did not ---- 1 preterm delivery at 29 weeks, 1 preterm delivery at 32 weeks, and 6 cases where labs were missed). The mean Protein S Functional Activity level for the first trimester was 60% (+/- 21%); for the second trimester was 51% (+/- 15%); and for the third trimester was 47% (+/- 10%). The mean Functional Activity significantly decreased between the first and second trimester (p = .024) but was not different between the second and third trimester (p = .26). The mean Total Protein S level for the first trimester was 55% (+/- 17%); for the second trimester was 47% (+/- 12%); and for the third trimester was 42% (+/- 12%). Again, the Total Protein S level significantly decreased between the first and second trimester (p = .009) but was not different between the second and third trimester (p = .06). Medians (with interquartile levels) were also evaluated and these also decreased from the first to the second trimester and from the second to the third trimester for both Functional Activity and Total Protein S level. If the normal nonpregnant laboratory values for Protein S Functional Activity were used, then 34%, 89% and 90% of these patients (first, second, and third trimesters respectively) would be classified as Protein S deficient. Likewise, if the normal nonpregnant laboratory values for Total Protein S were used, then 54%, 77% and 90% of these patients (first, second, and third trimesters respectively) would be classified as Protein S deficient. Including the 3 cases that moved, 45 pregnancies had uncomplicated term deliveries. For the 5 nonterm deliveries (2 early losses and 3 preterm deliveries), laboratory values were at or above the means and medians for both tests.

Conclusions: These data demonstrate that the normal laboratory values for Protein S Functional Activity and for Total Protein S level should not be used for making a diagnosis of Protein S deficiency during pregnancy. In addition, they confirm other studies that have demonstrated that Protein S laboratory values significantly drop during pregnancy starting early in the first trimester. Lastly, our suggested cutoff values based on two Standard Deviations of our data (and other limited literature) for both Protein S Functional Activity and Total Protein S level be set at 20% for all trimesters when making a diagnosis of Protein S deficiency during pregnancy.
Objective: Neonatal brachial plexus palsy (NBPP), defined as weakness or paralysis of an upper extremity with passive range of motion greater than active range of motion, occurs in about 1 per 1,000 births. While most resolve within a year of delivery, about 1 per 10,000 births persist for over a year. Persistence is characterized by the presence of musculoskeletal contractures or the deviation of a joint's active range of motion from normal by > 10 degrees (Chang et al. Am J Perinatol. 2016;33:765-9).

It is acknowledged that with vaginal deliveries, macrosomic newborns (birth weight \[BW\] ≥ 4,000 g) is a risk factor for NBPP (Ecker JL et al Obstet Gynecol 1997). However, there is a paucity of data on macrosomia as risk factor for persistent NBPP at one or two years. Additionally, it is unknown if the neonatal body mass index (BMI) - defined as BW (g) / length of newborn (m2) - correlates with duration of NBPP. We hypothesized that 1) persistent of NBPP is more common among macrosomic vs. non-macrosomic newborns; and 2) neonatal BMI ≥ 90th percentile (15 kg/m2) may be a better predictor of duration of injury.

Material and Methods: We conducted a retrospective cohort study of children managed at the University of Michigan Interdisciplinary Brachial Plexus Program (UM-BPP) from 2004 to 2018. The inclusion criteria were non-anomalous, singletons, who had known BW and BMI, and evaluation regarding persistence of NBPP at either 1 or 2 years.

The obstetric charts of the cohorts were reviewed by a MFM attending, a MFM fellow and an OB/GYN resident-all unaware of the status of NBPP at 1 and 2 years of age. Chi-square analysis and calculation of relative risk with 95% confidence intervals (CI) were performed. P <0.05 or CI not crossing integer 1 was significant. Receiver-operating characteristic (ROC) curves were constructed for BW and
BMI to differentiate between NBPP that persisted at either 1 or 2 years.

**Results:** Of the 106 children with NBPP that were managed at UM-BPP, 72 (68%) had information on BW and 61 (57%) had information on BMI. Among those with BW < 4000 g vs ≥ 4000 g, there were no differences in maternal age, ethnicity, BMI at delivery, diabetes (pre-gestational or gestational), documented history of prior shoulder dystocia or NBPP. In the index pregnancies, the rate of shoulder dystocia differed significantly: 94% for the macrosomic group, and 76% for non-macrosomic group (OR 5.4 95% CI 1.02 - 28.46). Female newborns were significantly less prominent in the BW < 4000 g group (68%) than the BW ≥ 4000 g (30%; OR 0.19; 95% CI 0.07-0.52). There were no differences in the rates of fractures (clavicular, humeral or both) or bruising (face, chest, arms) between the two cohorts. The area under the ROC curves were also similar between both groups.

ROC indicates that BW (range 2840 - 5310 g) of newborn is not predictive of persistence of injury at 1 or 2 years. Area under the ROC curves for BW were 0.40 ± 0.07 for 1 year and 0.42 ± 0.08 for the second year (P>0.05 for both comparisons).

Thirty-eight percent of cohorts had BMI ≥ 90th percentile. The rate of persistent NBPP at 1 year was similar among those with BMI < vs. ≥ 90th percentile (75% vs. 74%; OR 0.91, 95% CI 0.27-3.01). Moreover, for persistence at 2 years the rate was similar (58% vs. 56%; OR 0.94, 95% CI 0.26-3.31). Lastly, ROC indicates that BMI (range 9.8 to 19.7) of newborns is not predictive of persistence of injury at 1 or 2 years. Area under the ROC curves were 0.52 ± 0.09 for 1 year and 0.50 ± 0.09 for the 2nd year (P > 0.05 for both comparisons)

**Conclusions:** This is the first report on persistence of NBPP vis-a-vis BW, which indicates that neither macrosomia nor any other threshold of birth weight is predictive of persistence at 1 or 2 years. Additionally, BMI of a newborn does not differentiate if NBPP will remain at 1 or 2 years.
Cord and Infant Blood Angiogenic Marker Concentrations are Affected by Race, Gestational Age, and Tobacco Use

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Background: Angiogenesis is critical for fetal lung development. Previous studies using animal models demonstrate that decreased angiogenic factors lead to reduced alveolarization. Additionally, animals with bronchopulmonary dysplasia have an inhibition of pro-angiogenic factors, resulting in an overall anti-angiogenic environment. While many studies describe these markers in animal studies, no human studies have evaluated multiple angiogenic markers in fetal and infant blood. Moreover, no associations have been examined between fetal and infant angiogenic marker levels and basic maternal and neonatal characteristics.

Objective: To examine for correlations between angiogenic marker concentrations and maternal and neonatal characteristics.

Methods: IRB approval was obtained for this prospective cohort study. Mothers were consented either pre- or postnatally for participation. Those consented prior to delivery had cord blood obtained at delivery and infant blood at 4-6 months adjusted for gestational age. Inclusion criteria included delivery >26 weeks gestational age and delivery at a study hospital. Exclusion criteria included pregnancies complicated by maternal hypertensive disorders, diabetes mellitus, known cardiopulmonary or chromosomal disorders of the fetus, multiple gestation and non-English speaking mothers. Blood samples were tested for 15 angiogenic markers using ELISA analysis as well as a Human Angiogenesis and Growth Factor Magnetic Bead Panel from Bio-Rad. Statistical analysis was performed to determine bivariate associations.

Results: Thirty pregnancies met inclusion criteria. A total of 38 samples were obtained; 13 cord blood and 25 infant blood samples. Eighty-three percent of the infants were delivered vaginally. The average gestational age at birth was 37.2 weeks (26.8 to 41.3 weeks) with 57% male, and 57% African American infants. Angiogenic markers were analyzed to
establish average concentrations in both cord and infant blood samples. Interestingly, Angiopoetin-2 was higher in cord blood compared to infant blood (p<0.05). No other significant differences were noted between cord and infant blood samples.

Initially, cord blood angiogenic factor concentrations were analyzed by race, gender, and gestational age. Several markers were higher in African American subjects compared to Caucasian including placental growth factor (PIGF), soluble endoglin (sEng), bone morphogenetic protein 9, fibroblast growth factor 1, and vascular endothelial growth factor C (p<0.05). No statistical difference was detected between genders. Seven subjects received antenatal steroids prior to delivery (average gestational age 33.4 weeks, range 26.9 to 38.9 weeks), and in those subjects epidermal growth factor was 7 times lower (p<0.05).

Next, angiogenic markers were analyzed in infant blood samples for associations with maternal and neonatal characteristics. Similar to cord blood samples, sEng was elevated in African American infants (p<0.05). Leptin was also higher in African American infants. No gender difference was noted. In pregnancies with smoke exposure, PIGF was almost 2 times higher (p<0.05).

**Conclusion/Discussion:** This pilot study is significant compared to previous studies due to the large panel of factors used as well as the ability to compare cord and infant blood samples to maternal and infant demographics. These results serve to provide a descriptive sample analysis of angiogenic markers within a pregnancy cohort. While the sample size is small, to our knowledge it is the first study to provide a baseline description of these markers in overall healthy neonates. Although this study excluded maternal factors previously associated with anti-angiogenic states (hypertensive disorders, diabetes mellitus), these pregnancies may have other risk factors for angiogenic factor disturbances. As recruitment continues, additional analysis is planned for a larger cohort as well as comparing this group to those born to women with hypertensive disorders.
8:30 a.m. – 8:45 a.m.

**Paper #15**

Tumor Associated Expression of Glucose Regulated Protein 78 Represents a Potential Marker for Early Detection of Ovarian Cancer by Molecular-Targeted Ultrasound Imaging

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Rush University Medical Center, Chicago, IL\(^1\), University of Chicago, Chicago, IL\(^2\), University of Illinois at Urbana-Champaign, Urbana, IL\(^3\), University of Illinois at Chicago, Chicago, IL\(^4\)

**Background:** Ovarian cancer (OVCA) is a fatal malignancy of women with high incidence-to-death ratio among gynecological cancers. Although early detection of OVCA improves the survival rate of patients significantly, heterogeneity of origin, non-specificity of symptoms at early stage and the lack of an effective early detection test, OVCA in most cases being detected at late stages. The 5-year survival rate is <20% when detected at late stages compared with >90% when detected at early stages. OVCA recurs frequently when detected at late stages. Therefore, an early detection test for OVCA is urgently needed. Serum levels of CA-125 together with or without transvaginal ultrasound imaging (TVUS) are the currently available test for OVCA diagnosis. Although CA-125 is a better prognostic marker, it is not specific for early stage OVCA as its level also increases in association with several benign conditions. As the resolution of traditional TVUS has limits, it cannot detect early changes relative to OVCA. Moreover, an imaging target in the ovary diagnostic of early OVCA has not yet been established. Thus, an imaging target in the ovary and an imaging agent with its corresponding serum marker detective of early OVCA needs to be established. Chronic unresolved oxidative stress has been suggested as a hallmark for malignancy, and ovarian and fimbria of the fallopian tube are exposed to chronic stress. Glucose regulatory protein 78 (GRP78) is a marker of endoplasmic reticular (ER) stress and it is expressed on cell surface and secreted in serum making it a potential marker for early detection.

**Objectives:** The goals of this study were to examine (1) whether expression of GRP78 increases in ovarian malignant tumors at early and late stages; (2) whether serum levels of GRP78 increases in serum of OVCA patients; and (3) whether GRP78 can be targeted for contrast enhanced ultrasound
imaging. Because it is difficult to identify patients at early-stage OVCA, access to patients remains a significant barrier to study changes associated with ovarian tumor development. Thus, archived human specimens were used for exploratory studies while in vivo studies with laying hens, a preclinical model of spontaneous OVCA, were used for imaging studies.

Methods: Experiment 1: Immunohistochemical (IHC) and proteomic expression of GRP78 in normal (40-70 years old, n=10), subjects with BRCA1 (n=5), benign (n=5) and malignant ovarian tumors (n=5 early and n=10 late stages) were examined. Serum GRP78 concentrations were determined by immunoassay. Experiment-2: Tissue expression and serum levels of GRP78 were determined in normal (n=10) and ovarian tumors at early (n=10) and late stages (n=10) of OVCA in laying hens by IHC and ELISA, proteomic and gene expression studies. Experiment-3: To examine the enhancement of resolution of ultrasound imaging, molecular imaging agent targeting GRP78 was developed and its feasibility in detecting early stage OVCA was tested using laying hens. The clinical impression from targeted imaging for the presence of ovarian tumors were confirmed at euthanasia. Tissue expression and serum levels of GRP78 were examined and compared with imaging predictions. Significant differences in the intensity of GRP78 expression and serum levels among normal, early and late stage OVCA were examined using ANOVA and t-tests. Enhancement in the signal intensity of molecular targeted TVUS imaging detective of early OVCA was determined. Significance was taken when P<0.05.

Results: Expression of GRP78 was detected in the surface epithelial cells in normal ovaries, in benign and malignant tumors. Immunoblotting detected a protein band of approximately 78kDa. Compared with normal ovaries, the intensity of GRP78 expression and its serum levels were significantly higher (P<0.01) in malignant ovarian tumors in patients and hens at early and late stages. GRP78-targeted imaging agents bound with their target in normal and malignant ovaries in laying hens. Compared with pre-targeted, signal intensities of ultrasound imaging were significantly (P<0.01) higher in GRP78-targeted imaging in all groups. The enhancement in imaging signals were significantly higher in hens with OVCA than normal hens and in late stage OVCA than early stage OVCA (P<0.05). Signal intensity of targeted imaging was positively correlated with immunohistochemical intensity and serum levels of GRP78.

Conclusion: Results of the present study showed that intensity of GRP78 expression and its serum levels increase in
association with OVCA development and progression. GRP78-targeted imaging agents bound with their targets in the ovary and enhanced ultrasound signals remarkably. Taken together, increased expression by malignant cells, increased serum levels, ability to improve ultrasound signals makes GRP78 imaging, a feasible target for early detection of OVCA.

Support: R01CA210370
8:45 a.m. – 9:00 a.m.

Paper #16
Closing the Loop between Obstetric Providers and the Peer Review Committee: A Preferred Paradigm for Hospital-Based Perinatal Quality Assurance

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Purpose: To analyze an innovative system of perinatal quality assurance that employs: 1) formal clinical indicators for case selection; 2) primary and secondary multidisciplinary review; 3) personalized educational feedback to the provider; and, 4) detailed follow-up back to committee membership.

Methods: Perinatal quality assurance meetings are conducted quarterly within a state-based network composed of nine hospitals, each designated by the state's Perinatal Code based upon obstetric and neonatal resources required to care for high risk women and their preterm infants. Committee membership at two of the nine hospitals is multidisciplinary and includes obstetricians, family medicine physicians, neonatologists, MFM specialists, certified nurse midwives, obstetric and neonatal nurses, pathologists, risk managers and quality improvement staff. Cases at all sites are selected for review according to pre-specified indicators and all final determinations are developed after a primary review by an obstetrical or neonatal peer followed by full committee discussion and adjudication. Case disposition is based upon a 5-point scale (0=system issue; 1=variation predictable; 2=variation unusual; 3=variation unexpected; 4=variation unacceptable). For cases assigned a 3 or 4 classification, hospitals can, but are not required to refer the cases to the relevant clinical chairperson who can then meet with the provider to review findings; thereby "closing the loop” by providing peer feedback and relevant education. The chair can "close the loop” a second time by documenting the interaction in a memorandum sent back to the committee that summarizes the provider response to the case review process. For this analysis, between-hospital comparisons were made as to the indications for case review, case dispositions as determined by the committees and the frequencies with which cases were referred to the clinical chairs. Separately, a qualitative survey was conducted among committee membership from the two hospitals in which referral to the chair occurs followed by education of the provider and...
subsequent feedback to the committee, to determine their impression as to the perceived value of closing the loop.

Results: A total of 1,457 obstetric and neonatal de-identified cases derived from 278,757 deliveries that occurred in the nine network hospitals from 2002-2016 were studied. Institutional rates of case review as a function of annual delivery volume (i.e., maternal and neonatal cases/total delivered women) varied with a hospital's perinatal designation. Level III hospitals had more than twice the rate of case review when compared to Level II facilities (1.8% versus 0.8%, p<.001); perhaps explained in part, by the fact that more complex patients were either primarily cared for or secondarily transferred to the Level III sites. Delivery volume was not directly related to rates of case review across the 9 facilities. Distribution of the review indicators (maternal mortality, n=28; fetal death, n=1505; neonatal death, n=838; maternal transfusion >4 units, n=298; unanticipated maternal ICU admission, n=425) were similar across centers. Other indications for review included low Apgar scores and concerns with either obstetric or neonatal management, but these categories were not consistently documented across time or between hospitals. In the two centers that were inclined to refer cases out of committee, 5% - 8% of reviewed cases required referral to the chair for discussion, which represented only 4 cases on average per each year studied, for a total of 129 referrals during the 15-year timeframe. Of 25 potential committee respondents who had experienced case referral and return communication from the chair, 22 individuals completed an anonymous on-line questionnaire. When asked about the role of their committee, 82% believed that the providers whose cases were reviewed would potentially benefit from additional training, education or remediation and 100% were convinced that the multidisciplinary membership was highly important to the committees' success. Further, 95.5% of committee members considered closing the loop between the clinical chair and the committee to be either most important or somewhat important, even though 24% did not specifically recall being notified of the outcomes corresponding to referred cases.

Conclusions: All of our perinatal network hospitals performed perinatal quality assurance using committee review, but only a minority had multidisciplinary membership. Furthermore, only two committees referred cases back to the chair for discussion with the original care provider. When asked, closing the loop in this manner was perceived to be very important by committee members as was learning the outcome of the actual meeting between chair and provider. A review process that does not loop back to
providers potentially misses opportunities to modify individual practice patterns and provide focused quality improvement. The annual burden of additional meetings that closing the loop entails does not appear to be excessive and committee members perceive that their efforts are supported when the loop is closed a second time.

9:00 – 9:30 a.m. Break/Refreshments

SIXTH SCIENTIFIC SESSION
(Lakes Ballroom)

Moderators:
Emily A. DeFranco, D.O. – CAOG Trustee
Craig V. Towers, M.D. – CAOG Trustee

9:30 – 10:30 a.m. Hot Topic #5
“Integrative Health and Functional Medicine in America”
Stephen H. Cruikshank, MD, MBA, JD
Integrative and Functional Medicine
Mooresville, North Carolina

Learning Objectives:
• Define the relationship between integrative health and functional medicine.
• List vital components of integrative health and functional care.
Background: Measles, mumps, rubella and pertussis represent vaccine-preventable illnesses (VPI) that contributed significantly to overall morbidity and mortality in the United States prior to the availability and widespread use of effective vaccines against these illnesses. Much of the burden of these diseases was borne by children, but also by women of childbearing age and their babies. A disturbing trend toward decreasing participation in recommended vaccinations (vaccine hesitancy), as well as recent revelations about the decreased longevity of protection obtained through vaccination against pertussis, have prompted questions about the longevity of other vaccines and the overall immune status of the population at risk, particularly in relation to pregnancy. Short-term vaccine efficacy data are available, but cross-sectional population data on the immune status of women of childbearing age, years after childhood and adolescent vaccinations have been completed, are currently lacking.

Objective: We aimed to assess the immune status of a cross section of our obstetrical patients against measles, mumps, rubella and pertussis, as well as patient awareness of that status, and the source of their immunity, or lack thereof.

Study Design: Pregnant women in our suburban medical practice appearing for their initial obstetrical visit were invited to participate in additional laboratory screening for measles, mumps, and pertussis antibodies in addition to the routine rubella screening protocol already in place. Patients were administered a series of standard questions about their perceptions of immunity to these vaccine preventable illnesses and the source of their immune status.

Results: Of the 224 randomly-selected women who were invited to participate, 196 completed questionnaires and had at least one VPI with antibody titers available for analysis. The average age of participants was 28.75 years (range, 19-41 years). Results of antibody titers were reported as immune or susceptible. The overall proportion of women who were susceptible to measles was 12.2% (n=24/196); mumps, 19.4%
(n=38/196); rubella, 19.6% (n=39/196); and pertussis, 48.2%, (n=93/193).

Women who reported that they were immune to measles were confirmed to have protective antibody levels in 86.8% of cases while 13.2% did not. Mumps immunity among those claiming to be immune was only 79.6% while rubella susceptibility among those who stated that they were immune was 20.4%. Pertussis susceptibility among those women who stated that they were immune was much higher, at 42.2%. This level of susceptibility to pertussis was mirrored in the overall study group; 48.2% of women lacked protective antibody levels. Virtually all women in the study presumed that their immunity was achieved through immunization, although about 20% of women were unaware of their immune status for measles mumps and rubella, while more than 1:3 were unaware of their immune status to pertussis. There were no significant associations between age, ethnicity, education, or income and immune status. However, our study population was affluent, educated, predominately Caucasian, and less than 1% had spent their early childhood outside of the United States.

**Conclusion:** Immunizations obtained in childhood and adolescence are successful in achieving protective levels of antibodies in the short-run, but appear to wane over time, allowing for significant levels of susceptibility in women of childbearing age. This is particularly true of pertussis, giving much weight to the current CDC recommendations, endorsed by ACOG, for universal immunization with Tdap during pregnancy. Additionally, the findings in our study that 1:5 women were not immune to both mumps and rubella, support universal post-partum screening for these diseases immediately after delivery and (re)vaccination for those found susceptible. Further studies are needed to identify risk factors for potential interventions in this area.

**Conflict of Interest:** Dr. Brent Bost is married to an employee of GlaxoSmithKline, Vaccines Division. However, NO support or participation from GSK or Mrs. Bost was allowed.
Uterine Tachysystole: A Survey of CAOG Members Suggests Persistent Ambiguity

Leen Al-Hafez, MD\textsuperscript{1} and Suneet P Chauhan, MD\textsuperscript{2}

Houston Methodist Hospital, Houston, TX\textsuperscript{1}, McGovern Medical School at the University of Texas, Houston, TX\textsuperscript{2}

Objective: In 2008, American College of Obstetricians and Gynecologists, the Eunice Kennedy Shriver National Institute of Child Health and Human Development, and the Society for Maternal-Fetal-Medicine convened to sponsor a workshop on intrapartum electronic FHR monitoring. Prior to this, excessive uterine activity / hyperstimulation was "ambiguous." To clarify, they revised the terminology and promulgated the term uterine tachysystole (TS), defined as "more than five contractions in 10 minutes, averaged over a 30-minute window" (Macones GA Obstet Gynecol 2008). However, in our practice, we noticed variations in how the term TS was being used and managed. A PubMed search (initially in March 2017 and updated on May 14, 2018) using combinations of the terms "uterine tachysystole," "survey," or "hyperstimulation," indicated that there are no prior publications on this topic. Thus, we sought to survey Central Association of Obstetricians and Gynecologists (CAOG) members to see if TS and its management is consistent among other centers.

Study Design: The survey listed 16 questions consisting of demographics, definitions of TS, management of 5 hypothetical clinical cases (HCC), their personal experience, and adverse outcomes. After obtaining IRB approval, we obtained a list of active members of CAOG and emailed them our survey. At the 2017 annual national meeting in Phoenix, Arizona, we solicited the response from remaining CAOG members that did not reply electronically.

A priori, we considered the terminology and management to be consistent if at least 75% of the respondents were concordant in their answers.

Results: The survey was given to 299 members, of which our response rate was 41% (122/299).

The majority of who answered the survey were generalists (57%), had ≥16 years of experience (77%), are associated with at least 100 deliveries per year (54%), and are male (56%).

Regarding the ACOG definition of TS, the majority answered that the explanation is somewhat ambiguous (52%).
While 44% answered that a minimum of 15 contractions in 30 min is needed to qualify for tachysystole, 33% thought 16, and 31% stated that there should be at least 18 contractions. Almost 40% of the respondents stated that in their practice, the frequency of TS is 1 in 20 women. About 7 out of 10 clinicians stated that labor and delivery nurses were the first to diagnose TS.

For HCC #1 ("If there were six contractions in 10 min and the fetal heart rate tracing (FHR) was category I, what is the next step in management?"), the majority (53%) would decrease oxytocin. For HCC #2 (If there is uterine tachysystole in conjunction with recurrent variable decelerations, moderate variability and accelerations, what is the next step in management?"), almost half (47%) will discontinue oxytocin. For HCC #3 ("If oxytocin was discontinued, how long would you wait before restarting it?"), almost half (48%) of the respondent would wait at least 30 min of category I FHR tracing. For HCC #4 ("At what dose would you restart oxytocin?"), two-thirds (65%) opined they would start it at half of the original dose. For HCC#5 ("If the uterine tachysystole reoccurs and is associated with recurrent late decelerations, what is the next step in management?"), 35% of the respondents will resuscitate with only discontinuing oxytocin.

More than one-third (37%) of the surveyors consider that resuscitation for TS is important to mainly avoid neonatal injury such as hypoxic ischemic encephalopathy (HIE). Over three-quarters (77%) of the CAOG members who answered the survey have never encountered any adverse maternal or neonatal morbidity with TS. Ten percent of the respondents had an adverse outcome with tachysystole: 6% with uterine rupture and 4% had either HIE or intrapartum fetal demise. Only 3% responded that they had medical litigation which focused on tachysystole.

**Conclusion:** This is the first survey publication on uterine tachysystole and is notable for inconsistency in the definition, frequency with which it is encountered, and hypothetical management of TS. The divergent response suggests that ambiguity regarding tachysystole persists, despite ACOG attempts to rectify it. Adverse outcomes, however, associated with TS are infrequent.
Purpose: Safely reducing the first cesarean section is considered an important goal. Establishing systemic interventions may represent an important strategic opportunity for reducing cesarean delivery rates. The most common reported indications for a primary singleton cesarean delivery are labor dystocia and an abnormal or indeterminate fetal heart rate tracing (FHT). Based on an internal quality improvement review, we identified opportunities to reduce the first cesarean delivery in our tertiary level academic medical center. An audit and education process as well as a system-wide second stage initiative were subsequently begun. Here we present the outcome of that initiative for singleton primary cesarean sections (C-section).

Methods: Loyola University Medical Center (LUMC) is a tertiary level facility, and the only academic center within Trinity Health. In January of 2016 we conducted an internal six-month review of all primary C-sections at our facility between July 1, 2015 and December 31, 2015 (Cohort 1). Demographics, indications and labor course were summarized. Feedback and education at the individual and department level, with comparison to National reported rates and indications were provided. In March of 2016, a system-wide second-stage management policy was initiated, applied to all women during the second stage of labor without contraindication for pushing or vaginal birth. This follows the ACOG and SMFM Obstetrics Consensus published recommendations with regard to length of the second-stage, and includes advocacy of labor support and frequent position changes. Between October 1, 2016 and September 30, 2017 we again reviewed all primary C-sections at our facility, with demographics, indications and labor course summarized (Cohort 2). Comparisons between the two cohorts for singleton live born deliveries were then made utilizing appropriate statistical methodology for qualitative and quantitative data via SPSS and Epistat. Data is reported as mean or percent, with 95% confidence intervals and Odds Ratios, with p< .05 considered significant.
Results: Between July 1, 2015 and December 31, 2015 (Cohort 1), the total singleton primary C-section rate was 20.4% (133/652 singleton live born deliveries), with 41% of those performed in non-laboring patients. Malpresentation accounted for 36% of the cesarean deliveries who did not labor. Of those who labored (58.6%), indications in order of frequency were arrest of labor (28.2%), arrest of descent (21.8%), and abnormal FHT (23.1%). The term primiparous singleton C-section rate for those who labored was 27.3%. The post-initiative singleton primary C-section rate (Cohort 2) was 17.4% (223/1275), with 42% of those performed in non-laboring patients. Although a 15% reduction in this C-section rate was observed, it was not statistically significant (p=0.14, OR 0.98, 95CI 0.67,1.42). In comparison to Cohort 1, the term primiparous singleton C-section rate for those who labored in Cohort 2 was essentially unchanged at 26.8% (p=0.92, OR 0.98,95CI 0.67,1.42). When evaluating indications for cesarean delivery among those who labored arrest of labor was surprisingly higher in Cohort 2 at 43.4% (p=0.04, OR 1.95, 95CI 1.07, 3.57), followed in frequency of indication by abnormal FHT (26.4%) (p=0.72, OR 1.19, 95CI 0.62, 2.30), and arrest of descent (14%) (p=0.20, OR 0.56, 95CI 0.28,1.21).

Conclusions: Although audit and feedback, as well as a regimented approach to labor management have been relayed by others to be successful in reducing primary C-section rates, we did not confirm the same in our center. Indications for a singleton primary C-section in our tertiary level facility are multi-faceted, with nearly half performed without labor due to obstetric, fetal or maternal reasons. As such, the challenge of reducing the first singleton C-section continues and will require each indication be addressed.
Objectives: To measure the rates of disseminated intravascular coagulopathy (DIC) and hemorrhage during second-trimester dilation and evacuation (D&E) procedures for fetal demise, to compare rates of DIC at 14-20 weeks versus 21-26 weeks of gestation, and to evaluate clinical factors that might predict the occurrence of DIC.

Methods: We conducted a retrospective cohort study, comparing the rates of DIC in two groups of women with fetal demise who underwent D&E at: 1) 14 weeks to 20 weeks 6 days of gestation, and 2) 21 weeks to 26 weeks 6 days of gestation. Experienced gynecologic surgeons performed procedures at an urban tertiary care center in the Midwest from January 2003 through December 2016. We obtained data from the electronic medical record on patient demographics and medical history, laboratory values, length of time between fetal demise and uterine evacuation, surgical blood loss, and operative complications. Hemorrhage was defined as estimated blood loss of > 200 mL, and diagnosis of DIC was based on prothrombin time (PT), partial thromboplastin time (PTT), and fibrinogen values, and on review of surgeon documentation.

The primary outcome was the rate of DIC in the two gestational age groups. We generated descriptive statistics and used chi-square or Fisher’s exact test for comparisons of categorical variables. We computed logistic regression models to evaluate independent predictors of DIC and hemorrhage.

Results: We identified 442 women who underwent D&E for fetal demise: 365 women (82.6%) at 14 weeks to 20 weeks 6 days, and 77 women (17.4%) at 21 weeks to 26 weeks 6 days of gestation. Age, parity, and medical history did not differ between the two groups.

DIC occurred in 1.6% of women at 14-20 weeks of gestation, and 9.1% of women at 21-26 weeks (p = 0.0017). There were 6 cases of DIC in the earlier gestational age group, and 7 cases in the later group, corresponding to an overall rate of 29 per 1000 cases. The rate of DIC at 21-26 weeks of gestation was 91 per 1000 cases, compared to 16 per 1000 cases in the earlier group.
1000 cases at 14-20 weeks (odds ratio = 5.99; 95% confidence interval, 1.95-18.34).

Surgical blood loss of > 200 mL occurred in 37 of 365 cases (10.1%) at 14-20 weeks and in 16 of 77 cases (20.8%) at 21-26 weeks (p = 0.009). Hemorrhage occurred in 12 of 13 women (92.3%) with DIC and 41 of 429 (9.6%) without DIC (p < 0.0001). Seven women in each gestational age group (1.9% of the earlier group and 9.1% of the later group) received blood transfusions (p = 0.0046). The rates of other complications, including uterine atony, cervical laceration, uterine perforation, and retained products, were similar between groups.

The median length of time between fetal demise and the D&E procedure was 15 days for the entire cohort (range, 0-46 days). The interval between fetal demise and surgery was \( \leq \) 28 days in 375 women (85.2%) and > 28 days in 65 women (14.8%). DIC occurred in 9 and 4 of these cases, respectively. An interval of > 28 days was not associated with DIC (p = 0.11). Preoperative PT, PTT, and fibrinogen were drawn in 276 women and normal in all except one.

**Conclusions:** To date, our research is the largest study reporting on DIC during D&E for second-trimester fetal demise. DIC is a rare event, and these data suggest that the rate of DIC is higher in the later second trimester. D&E for fetal demise at 21-26 weeks of gestation was associated with a nearly six-fold increased odds of DIC, compared with cases at 14-20 weeks. Preoperative coagulation laboratory values are typically normal and unnecessary, as they do not affect management or outcome.
Introduction: Amniotic fluid embolism (AFE) is a rare obstetric complication that remains a leading cause of maternal and neonatal morbidity and mortality. Due to its low incidence and high fatality, the medical and psychological sequelae remain largely under-investigated. Similar to other perceived or otherwise life threatening events, post-traumatic stress disorder (PTSD) is a condition that may permeate the lives of women who have suffered from an AFE. Using the international AFE registry in collaboration between Baylor College of Medicine and the AFE Foundation, we evaluated the prevalence of PTSD symptoms among AFE survivors.

Methods: Charts of patients enrolled in the registry between 2013 and 2017 were reviewed. Women classified as having an AFE and survived were contacted and interviewed regarding PTSD symptoms between 2 to 19 years post-AFE.

Results: Of the 145 patients enrolled in the registry, 115 charts were available for review. Sixty-eight (59%) were categorized as having suffered an AFE using previously published diagnostic criteria (Clark 2016 AJOG). Twenty-nine (43%) of women were available for interview. Among them, 16 (55%) endorsed symptoms consistent with PTSD, including anger outbursts, self-destructive behavior and flashbacks. Only 1 case (3%) of PTSD was associated with fetal or neonatal demise.

Conclusion/Implications: This is the first study to explore the psychological ramifications among AFE survivors. The majority (55%) of women with AFE, based upon meticulous chart review and strict diagnostic criteria, experienced PTSD symptoms. Although AFE is an uncommon complication and often medical implications take the forefront, focus and attention must be paid to the psychological after-effects as well.
The Use of Newborn Liver Functions in Timing of Newborn Hypoxic Ischemic Encephalopathy

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Body of Abstract: Asphyxia is a condition of impaired gas exchange leading to progressive hypoxia, hypercarbia, and acidosis depending on the extent and duration of insult before, during, or after birth. Three common patterns of neonatal Hypoxic-Ischemic Encephalopathy (HIE) are: Acute Profound (AP) (i.e. uterine rupture, cord prolapse), remote and/or intrapartum Partial Prolonged (PP) (i.e. cord compression, placental insufficiency) or Both (B) (i.e. preexisting injury, limited fetal reserves, terminal near collapse). During HIE, the fetus compensates by redistributing blood flow to the non-negotiable circulations of the brain, heart and adrenal gland at the expense of the bone marrow, kidneys and liver. Nucleated Red Blood Cells (NRBC) demonstrate distinct patterns with normal to minimally elevated values with rapid clearance in acute HIE and elevated values with delayed clearance in PP. Alanine Aminotransferase (ALT) (nl: 10-40 IU/L) and Aspartate Aminotransferase (AST) (nl: 20-70 IU/L) are common liver function test (LFT) not routinely drawn in a serial manner. ALT is more liver specific while AST is an acute phase reactant.

Rise and clearance trends of LFT would be similar to NRBC based on duration and extent of HIE.

IRB approved this observational study of 84 late preterm and term newborns, 51% male, from a pool of 204 closed medicolegal cases of alleged intrapartum asphyxia gathered between 1987 and 2017 reviewed by causation expert (JKM). Average GA and average birthweight were 39 weeks and 3.3 kg, respectively. Of 204 cases, 120 were excluded due to absence of LFT and/or death prior to imaging. We collected AST, ALT, NRBC, Apgar scores, cord gases, and initial blood gas of all encephalopathic newborns with an asphyxial pattern confirmed by neuroimaging. A total of 215 AST, 220 ALT and 204 NRBC values were collected.

Newborns with AP tend to report lower 5 and 10 minutes apgar compared to newborns with PP and B. Higher newborn blood gas pH (p = .02) and lower newborn blood gas base
deficit (BD) (p = .04) was seen in neonates with AP and PP compared to newborns with B. LFT appear to have a distinct pattern in differentiating three injurious patterns of HIE. With AP, the LFT demonstrate mild elevation in the first 12 hours of life followed by rapid normalization. With PP, elevation of ALT is noted at 12 hours while both LFT are elevated at 24 and 48 hours with delayed clearance. With B, the AST is elevated at 12 and 24 hours while the ALT is elevated at 24 and 48 hours with delayed clearance (Fig. 1 & 2).

Similar to NRBC, LFT demonstrated distinct rise and clearance with different patterns of asphyxia. No single proven biomarker is diagnostic of neonatal encephalopathy but LFT with NRBC measured at birth and daily for 3 days can provide evidence based data to confirm or refute allegations of acute intrapartum asphyxia which accounts for <15% of cerebral palsy.

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POSTER SESSIONS

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OCTOBER 18, 2018
6:00 A.M. – 12:00 NOON

FRIDAY
OCTOBER 19, 2018
6:00 A.M. – 11:00 A.M.
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C. David Adair, M.D.
Univ. of Tennessee
Chattanooga, Tennessee

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Identification and Isolation of Placenta-Specific Circulating Microparticles from Maternal Blood
David M. Haas, M.D.
Indiana Univ. School of Medicine
Indianapolis, Indiana

Poster #3
Impact of Progestin Therapy on Circulating Microparticle Proteins in Women Being Treated to Prevent Preterm Birth
David M. Haas, M.D.
Indiana Univ. School of Medicine
Indianapolis, Indiana

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Exploring the Screening, Perceptions, and Prevalence of Electronic Cigarettes in Pregnancy and Postpartum Women
Danny T. Dang, M.D.
Indiana Univ. School of Medicine
Indianapolis, Indiana

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Exploring Perceptions of Woman Health Care Providers and Screening of Electronic Cigarettes in Pregnant Population
Danny T. Dang, M.D.
Indiana Univ. School of Medicine
Indianapolis, Indiana

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Activity Tracking Devices in Group Prenatal Care: A Feasibility Study
Michelle A. Kominiarek, M.D.
Northwestern Univ.
Chicago, Illinois
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Morgen S. Doty, D.O.
The Univ. of Texas Health Science Center at Houston
Houston, Texas

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Kate Wan-Chu Chang, M.A./M.S.
Univ. of Michigan
Ann Arbor, Michigan

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Kristen M. Turner, M.D.
Loyola Univ. Medical Center
Maywood, Illinois

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Raanan Y. Alter, M.D.
Loyola Univ.
Maywood, Illinois

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Elliot M. Levine, M.D.
Advocate Illinois Masonic Medical Center
Chicago, Illinois

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**Ectopic Pregnancy: Consideration of Vascularity Index as a Novel Diagnostic Criterion**

Carlos M. Fernandez, M.D.
Advocate Illinois Masonic Medical Center
Chicago, Illinois
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Leah N. Delfinado, M.D.  
Advocate Illinois Masonic Medical Center  
Chicago, Illinois  

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Carlos M. Fernandez, M.D.  
Advocate Illinois Masonic Medical Center  
Chicago, Illinois  

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Fran Popper, M.D.  
Advocate Illinois Masonic Medical Center  
Chicago, Illinois  

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Maggie C. Pham, D.O.  
Advocate Illinois Masonic Medical Center  
Chicago, Illinois  

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Kathryn C. Renner, M.D.  
Saint Louis Univ.  
Saint Louis, Missouri  

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Katelin E. Sisler, M.D.  
Saint Louis Univ.  
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Charles W. Schaubeger, M.D.
Gundersen Health System
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Dana M. Benden, M.D.
Gundersen Health System
La Crosse, Wisconsin

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Joseph S. Fixler, M.D.
Univ. of Cincinnati
Cincinnati, Ohio

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Christopher G. Smith, M.D.
Univ. of Kentucky
Lexington, Kentucky

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Haleema Saeed, M.D.
Henry Ford Health System
Detroit, Michigan

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Lauren W. Knapp, M.D.
Louisiana State Univ. Health Sciences Center in New Orleans
New Orleans, Louisiana
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Samantha G. Prats, M.D.
Louisiana State Univ. School of Medicine
New Orleans, Louisiana

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Zack E. Bryant, M.D.
Louisiana State Univ. School of Medicine
New Orleans, Louisiana

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Nichole L. Adami, M.D.
St. Vincent
Indianapolis, Indiana

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Jennifer E. Roberts Merriman, D.O.
Aultman Hospital
Canton, Ohio

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Bryant L. Johnson, D.O.
Aultman Hospital
Canton, Ohio

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Keary L. Johnson, M.D.
Aultman Hospital
Canton, Ohio
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Daris C. Rice, D.O.
Aultman Hospital
Canton, Ohio

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Erin N. Ferrigni, B.S.
Froedtert Hospital and the Medical College of Wisconsin
Milwaukee, Wisconsin

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Kristen N. Crittle, M.D.
Univ. of Illinois Health and Sciences Center
Chicago, Illinois

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Danielle M. Greer, Ph.D.
Aurora Health Care
Milwaukee, Wisconsin

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Dennis J. Lutz, M.D.
UND School of Medicine and Health Sciences
Minot, North Dakota

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An Interesting Case of Transitional Cell Carcinoma of the Endometrium

Tra V. Pham, M.D.
Henry Ford Health System
Detroit, Michigan
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Examining the Relationship Between Differing Institution-Based Prenatal Diabetes Treatment Algorithms, Glucose Management and Perceived Patient Self-Efficacy
Liliana M. Palencia, M.D.
Southern Illinois Univ. School of Medicine
Springfield, Illinois

Poster #38
Six Kids, Three Cervices, Two Uteri, Who Knew?
Alyssa M. Erb, D.O.
Jersey Shore Univ. Medical Center
Neptune, New Jersey

Poster #39
The Disease of Kings Made a Surprising Appearance in the Obstetrics Clinic: Gout in Pregnancy
Camille C. Ricciardi, D.O.
Jersey Shore Univ. Medical Center
Neptune, New Jersey
Body of Abstract: High acuity areas, such as emergency rooms, follow simple supply and demand curves. They have high resource value but limited availability, thus an imbalance occurs creating a high demand state. Availability can be maximized by simulation modeling to ascertain and identify potential obstacles to efficient resource utilization. Specialty specific emergency departments are a recent concept, which have evolved over the past two decades. Obstetrical emergency department (OB ED) dedicated units are such an example. These units facilitate rapid evaluation and subsequent patient placement for correct specialized care. The medical literature data support improved healthcare quality and patient outcomes in specialty specific units. Like its larger counterpart, these fractal units can also be fraught with overcrowding, which can hinder and adversely impact care delivery. There have been several efforts to provide simulation analysis in the macrocosm of the Emergency department and other specialty units, to our knowledge none have been done to specifically examine this microcosm of an OB ED. We decided to investigate the use of a computer simulation of patient flow analysis in such a setting. Using a Monte Carlo simulation based modeling program we prospectively collected clinical data, relative time inputs for patient flow and overall outcomes. The collection period was the first two complete fiscal years for our OB ED unit, July 1, 2015 to June 30, 2017 at the Baroness Erlanger Hospital in Chattanooga, TN. The OB ED is serviced by front line advanced practice providers with consultation available via the University of Tennessee College of Medicine faculty, residents from our obstetrics and gynecology residency, maternal fetal medicine sub-specialists, and additional sub-
specialists. The clinically determined key inputs for construction of a query-based model were outlined. We used an illustrative computer simulated model to simulate our patient care path for presentation to the obstetrical emergency department. We selected patient acuity level, means of arrival, and time from initial presentation to transfer or discharge from the specialized unit. Key outcomes were total patient care wait times. We analyzed 10,092 consecutive patient visits during the two-year analysis period. This analysis identifies and supports the contention that an obstetrical specialty specific emergency department has several "bottleneck" areas despite being a lower volume, highly specialized unit. These included an increase in patient demand starting predominately in the early afternoon and continuing until midnight with a regression to lower numbers in the early morning. This mirrors practice availability and suggests this unit serves as an extension of the community obstetric providers, predominately as an afterhours service hub. These constraints project poorly to the patient and serve for frustration to care providers. This simulation also highlighted inadequacies in lab performance as evidenced by the long lab turnarounds. This loss time leader could be accounted for by the addition of an additional one to two bays or more simply and elegantly, by the purchase of an I-stat point of care technology to ascertain lab values and enrich the patient experience and provider satisfaction. In order to achieve the magnitude of effect for the one or two bays, lab turnaround would have to be reduced by 90%. This data set served as the basis for budgetary planning and ultimately the I-stat purchase approval. Out data set also suggested that one in five patients suffered from time block during their visit, on average when it occurred, of about 30 minutes irrespective of acuity level. By identifying and better managing these impediments, improved outcomes, better morale, and satisfaction by all can be expected. Specifically patient wait times can be minimized and quality perception improved. Moreover, the adaption fully conforms with all emergency medicine, trauma, labor act, (EMTLA) regulations and improves care provision. On an economic note, the unit adaption resulted in a net operating margin of 4 million dollars annually, whereas before the unit accounted for an annual loss of 2 million dollars. With further refinements simulation modeling may improve patient care delivery, economic margins, and subsequently enhanced interactions. Quantum leadership of the 21st century necessitates value as our certain piece, which is patient centered and facilitated by the provider. This departure from the traditional Newtonian approach of the 20th century is served exemplified in our effort and can serve as a template to others in the quest for excellent outcomes with economic rationing.
Poster #2
Identification and Isolation of Placenta-Specific Circulating Microparticles from Maternal Blood

David M Haas, MD1, Kevin P Rosenblatt, MD2, Robert C Doss, PhD2, Shelley Dowden, MS1, Brian Brohman, BA2

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Purpose: Predicting adverse pregnancy outcomes using blood-borne biomarkers is an active area of research. Utilizing circulating microparticles (CMP) isolated from maternal blood can provide insights into communication between the maternal and placental environments. However, CMPs increase throughout pregnancy and not all CMPs in maternal circulation are derived from the placenta. The purpose of this project was to isolate CMPs from the maternal circulation and identify those expressing placenta-specific markers for studying placental development and pathology and obstetrical complications.

Methods: This study is an analysis of samples from the IRB-approved, prospective, longitudinal Building Blocks of Pregnancy Biobank. Women are recruited early in pregnancy and samples obtained at various times during pregnancy and at delivery. All subjects signed informed consent for unspecified research use for plasma and other specimens. Thirty plasma samples were randomly selected from early in pregnancy. These women had healthy pregnancies without adverse pregnancy outcomes. Briefly, CMPs were enriched by size exclusion chromatography using NeXosome columns. This process allows for separation of CMPs from high abundant proteins. Placental alkaline phosphatase (PLAP) was used as a confirmatory test of placental origin of the CMPs. The PLAP was measured using absolute quantification, proteomic methods-liquid chromatography-mass spectrometry and a multiple reaction monitoring technique that uses internal controls for marker identification and quantification. A group of 10 non-pregnant women were selected as controls as they should not express CMPs expressing PLAP.

Results: CMPs were isolated successfully from all specimens. PLAP peaks were confirmed using the internal standard. PLAP was expressed with an average peak area of 7000 in the specimens isolated from pregnant women but not from non-pregnant controls.
Conclusions: Using this quantification technique, we can identify placenta-specific CMPs in maternal plasma. This is a viable methodology for future biomarker research. The next step using the targeted proteomics approach to placental analytes is likely separating the PLAP-associated CMPs from other circulating CMPs through other methods, such as coupling anti-PLAP antibodies to magnetic beads or other capture technologies, and removing the non-placental CMPs. This would allow for study of biomarkers specific to maternal-placental communication. In conclusion, we have demonstrated that these CMP isolation methods lend themselves to the study of subpopulations of CMPs during pregnancy.
Impact of Progestin Therapy on Circulating Microparticle Proteins in Women Being Treated to Prevent Preterm Birth

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Purpose: Progestin therapy has been established to reduce recurrent preterm birth. However, this preventive therapy does not carry the same benefit for all women and many still deliver preterm babies. Research into prediction of response to progestin therapy has failed to reliably identify predictors of response. The objective of this study was to utilize novel circulating microparticle (CMP) extraction techniques to detect proteomic signatures that elucidate the differences in women receiving progestin therapy and matched controls to detect signature differences before and after treatment.

Methods: The study was a case-control analysis of samples from the IRB-approved, prospective, longitudinal Building Blocks of Pregnancy Biobank. Women are recruited early in pregnancy and samples obtained at various times during pregnancy and at delivery. All subjects signed informed consent for unspecified research use for plasma and other specimens. For the current analysis, women were identified from the biobank who had received progestin therapy for prevention of recurrent preterm birth; plasma specimens must have been obtained both before they began the therapy and during therapy. Control women without a history of preterm birth and not taking progestin were identified and matched by gestational week and clinical characteristics. Plasma specimens were blindly analyzed using CMPs followed by liquid chromatography-mass spectrometry analysis for 132 proteins. Briefly, CMPs were enriched by size exclusion chromatography using NeXosome columns. This process allows for separation of CMPs from high abundant proteins. Targeted, quantitative proteomic measurements were performed using processed protein from CMP isolates. The quantification protein concentrations was carried out using internal peptide standards and control CMP samples for comparisons. Quantified proteins from women on progestin therapy were compared control subjects using ANOV; measurements from pre-treatment samples were additionally compared those obtained during treatment.
Results: CMP measurements from six women taking progestins and six control women were analyzed. Of the women taking progestins, 2 (33%) went on to deliver at term, with two delivering at 36 weeks. Women treated with progestins had significant changes in AACT, PGPR2, CHLE, and LG3BP protein expression compared to control women (p<0.05). There were no statistically significant differences in the protein expression in the women on progestin therapy who delivered preterm compared to those on progestin therapy who went on to deliver at term.

Conclusions: In the current study, women who were given progestins to reduce preterm birth had significant changes in several proteins during the course of their treatment compared to women not on progestins. These results need to be confirmed in a larger sample of women receiving progestin treatment to prevent preterm birth if a CMP protein signature for predicting response to progestin therapy is to be developed. Such a clinical tool could lead to a more effective strategy at personalizing progestins therapy to prevent preterm birth.
Poster #4
Exploring the Screening, Perceptions, and Prevalence of Electronic Cigarettes in Pregnancy and Postpartum Women

Danny T Dang, MD and David M Haas, MD

Indiana University School of Medicine, Indianapolis, IN

Objectives: Since the introduction of electronic cigarettes (EC) in the United States in 2007, the use of EC has increased dramatically. Despite the drastic increase in popularity of EC, it has been scarcely studied in the pregnant population. The health risk and impact of exposure to the ingredients in "e-juice" (the substance that is vaporized in EC) remain unclear. Nicotine use during pregnancy can be problematic. Nicotine readily cross the placenta and has been correlated with health issues such as low birth weight, prematurity, and congenital heart defects. This includes all nicotine products including nicotine gum and nicotine patches. The purpose of this study was to evaluate the prevalence, screening, and perceptions of a population of pregnant and post-partum women regarding EC.

Methods: Pregnant and postpartum women were recruited to participate in a cross-sectional survey from August 2017 to December 2017. A voluntary, anonymous survey was distributed to women that presented to a university-based outpatient clinic for their obstetric related care. The survey included demographics and EC related questions. Women were asked if they were ever or current users of various tobacco/nicotine products. They were also asked about opinions they had about risks of those products for women, pregnant women, and the developing fetus, as well as discussions they have had about those risks with providers. Opinions about risk were reported on a Likert scale from 0-10 with 0 representing "no risk at all" and 10 representing "high risk". The data was analyzed using SPSS Statistics Software® 24 to compare responses between women who used tobacco and EC to those who had never used those products.

Results: Of the 130 surveys distributed, 115 were completed (88%). Of the 115 participants, 13 (11%) reported having ever used electronic cigarettes (EUEC). 7 of the 13 (54%) self-reported as Non-Caucasian/ Non-White. Those that have ever used had mean age of 26.2; never used electronic cigarettes (NUEC) had a mean of 27.3. EUEC first heard about EC through social media and friends/family (46% and 69% respectively). Women in both the EUEC and NUEC groups rated tobacco cigarettes and EC as harmful for pregnant
women (Likert score mean (standard deviation): cigarettes: 9.9 (0.2) vs. 9.55 (1.8), p=0.47; EC: 8.8 (2.0) vs. 9.0 (2.3), p=0.69, respectively). There were no clear differences in the risk ratings between women who were EUEC compared to those who had not used EC. More women in the EUEC group believed that EC vapors were less harmful than cigarette smoke (85% vs. 63%) and no EUEC respondents felt they were more harmful (0% vs. 30.2% for NUEC respondents), although the difference was not clear (p=0.057). There were also no differences in the rates of women believing that ECs were helpful in reducing tobacco use between the groups (p=0.60). Of those EUEC, only 1 (7.7%) was screened by a provider during pregnancy for EC and none (0%) reported screening for tobacco use. 16 of 102 (15.7%) NUEC were screened for EC and 62 (60.8%) were screened for tobacco.

Conclusion: This study found that few pregnant women surveyed were screened for EC use. Additionally, women who used ECs reported perceiving that they had less risk for pregnant women, fetuses, and nonpregnant women than women who never used ECs. With so little risk data regarding EC and pregnancy and the rapid increase in popularity, providers need information to counsel their patients. Women need clear information and guidance and should be screened and educated during their prenatal care. Effects on pregnancy outcomes need to be further examined and researched.
Poster #5
Exploring Perceptions of Woman Health Care Providers and Screening of Electronic Cigarettes in Pregnant Population

Danny T Dang, MD and David M Haas, MD
Indiana University School of Medicine, Indianapolis, IN

Objectives: Since the introduction of electronic cigarettes (EC) in the United States in 2007, the use of EC has increased dramatically. Despite the increase in popularity of EC, research on its impact or effects on pregnancy is lacking. The health risk and impact of exposure to the ingredients in "e-juice" (the substance that is vaporized in EC) remain unclear. Nicotine use during pregnancy can be problematic. Nicotine readily crosses the placenta and has been correlated with health issues such as low birth weight, prematurity, and congenital heart defects. This includes all nicotine products such as nicotine gum and nicotine patches. The purpose of this study was to evaluate the perceptions of healthcare providers regarding EC screening and risk in pregnant women.

Methods: Women's health care providers were recruited to participate in a cross sectional survey from December 2017 and January 2017. A voluntary, anonymous online survey was sent to the email list of members of the Indiana Section of the American College of Obstetricians and Gynecologists (ACOG) by email. The participants completed a survey that contained demographics and e-cigarette related questions. Providers were asked if they were ever or current users of various tobacco/nicotine products. They were also asked about opinions they had about risks of those products for nonpregnant women, pregnant women, and the developing fetus, as well as how often they screen for nicotine product use for their patients. Opinions about risk were reported on a Likert scale from 0-4 with 0 representing "no risk at all" and 4 representing "high risk". The completed surveys were directly imported into REDCap. Descriptive results were compiled and comparisons of responses between providers who "always" counsel pregnant women about EC use and those who did not report "always" counseling were made in their perceptions of risk. The data was analyzed using SPSS Statistics Software® 24.

Results: There were 62 participants that completed survey. 28 of the participants categorized their practice as urban, 23 suburban, and 12 as rural. Of the 62 participants, 17 (27%) marked that they "always" screened their patients for EC use.
Among providers who report always screening, 50% were 51-60 years old, most have been in practice for over 10 years (72%), and practice in suburban setting (50%). Providers who did not "always" screen tended to be younger, in practice fewer years, and had a trend towards more urban practice (53%) (p=0.03, p=0.08, p=0.08, respectively). Overall, those that always and do not always screened felt that EC are less harmful than tobacco cigarettes to pregnant women, non-pregnant women, and fetus (Likert scale means: 3.56 vs.3.04 [p=0.02], 3.39 vs. 3.00 [p=0.09], 3.56 v. 3.14 [p=0.03], respectively). However, nearly all providers rated the risk in the 3 or 4 range, similar to ratings for other nicotine/tobacco products.

**Conclusion:** This study demonstrated that the majority of providers regard ECs to generally be high risk for pregnant women and the developing fetus. Providers who note that they always screen patients for EC use tended to rate this risk slightly lower than those who do not. The study demonstrated that providers may not adequately screen for EC and provide clear guidance. With so little risk data regarding EC and pregnancy and the rapid increase in popularity, providers need information to counsel their patients. The impact of ECs on pregnancy outcomes needs to be further studied.
Objective: Due to the potential for group prenatal care to have salutary effects on health behaviors and the importance of meeting physical activity goals for a woman's long term health, the primary objective of this study was to evaluate the feasibility (adherence to the study protocol and satisfaction) of using an activity tracking device (ATD) in group prenatal care, where the embedded social support could motivate women to meet their pregnancy goals including physical activity.

Study Design: Women were recruited to participate if they were in group prenatal care, owned a smartphone, and had no activity restrictions. Women were instructed to wear and sync the ATD daily. Steps, active minutes, and sedentary hours were wirelessly transmitted via cellular and Bluetooth technology and plotted on a graph in the ATD app that participants could view on their personal dashboard. Protocol adherence and satisfaction were assessed via surveys. Adherence to the ATD intervention was evaluated by the median and interquartile (IQR) number of days the ATD was worn from the day of study entry until delivery for each participant, defined by a minimum step count of >1000/day. The proportion of active days out of potential days, the longest number of consecutive days worn, and number of participants wearing the ATD for at least seven consecutive days were reported. Mixed models were used to assess the trajectory of steps, active minutes, and sedentary hours over gestational age. Self-reported energy expenditure from the Pregnancy Physical Activity Questionnaire (PPAQ) was compared to ATD-calculated energy expenditure via Wilcoxon signed rank tests.

Results: The baseline characteristics of the 49 enrolled women were: 24 years old (mean), pre-pregnancy body mass index 28 (mean), 80% Hispanic, 86% nulliparas, and 21 weeks gestation (mean). Of the 30 women who completed the follow-up survey, 47% self-reported wearing the ATD daily, 27% reported a lost or broken ATD, and 22% reported technical problems; however, 97% enjoyed wearing it, 100%
would recommend it to a pregnant friend, and 77% thought it helped them reach activity goals. According to ATD data, the median active days was 47 (IQR 21-79) and the median proportion of active days of potential days was 43.7% (IQR 15.4-77.1). For the 25 women who wore the ATD for the first 7 days, mean steps/day were 7574 (range 3076-15828), active minutes/day were 277 (range 145-475), and sedentary hours/day were 12 (range 7.8-16.2). Twenty percent had <5000 mean steps, 48% had 5000-7499 mean steps, and 32% had ≥ 7500 mean steps/day in the first 7 days. As gestational age increased, mean log steps (β = -0.02, P-value<0.001) decreased, mean active minutes decreased (β = -4.37, P-value<0.001), and mean sedentary hours increased (β = 0.17, P-value <0.001). These differences persisted after adjusting for age, ethnicity, pre-pregnancy BMI category, and education. There were no differences in mean energy expenditure (MET-h/week) by PPAQ or ATD data at 28 weeks gestation [231 (62-927 range) vs. 238 (212-290 range), P-value=0.74] and at 36 weeks gestation [145 (35-581 range) vs. 222 (196-272 range), P-value=0.27].

**Conclusion:** Most women reported high satisfaction with an ATD in group prenatal care, yet adherence to the study protocol was low and ATD technical problems were common. Given that pregnancy is viewed as a window of opportunity to influence current and future health behaviors, finding newer ways to engage women in physical activity and reduce sedentary behaviors in pregnancy is a research priority.
Poster #7
Vaginal versus Primary Cesarean Delivery During Labor Among Late Preterm Births: Risk Factors and Neonatal Outcomes

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Objective: Among women delivered in the late preterm period (34.0-36.6 wks), limited data exists on neonatal outcomes with vaginal vs primary cesarean during labor (PCDL). The objectives were to (1) determine risk factors for PCDL and (2) examine the association between route of delivery and neonatal outcomes.

Study Design: This was a secondary analysis of a multicenter trial of late preterm antenatal corticosteroids (ALPS) for the prevention of neonatal morbidity (Gyamfi-Bannerman C et al, NEJM 2016). Inclusions for our analysis were singleton pregnancies, who labored, and delivered at 34-36 wks. Major fetal anomalies and planned cesarean deliveries were excluded.

Primary outcomes included composite respiratory morbidity (CRM), Apgar < 5 at 5 minutes, hypothermia, proven sepsis, neonatal intensive care unit (NICU) length of stay > 3 days, and neonatal death < 72 hours. CRM was defined as 1) continuous positive airway pressure (CPAP) or high-flow nasal cannula for > 2 continuous hours, 2) fraction of inspired oxygen of > 0.30 for > 4 continuous hours, 3) mechanical ventilation, 4) extracorporeal membrane oxygenation (ECMO), or 5) stillbirth or neonatal death < 72 hours after birth (as defined by the original study).

Differences in demographics, intrapartum characteristics, and neonatal outcomes between delivery methods were examined using the chi-square test or Fisher's exact test for categorical variables. Multivariable Poisson regression models with robust error variance were used to determine the association between delivery method (vaginal vs primary cesarean) and neonatal outcomes, while adjusting for maternal age, race/ethnicity, education level, marital status, nulliparity, body mass index, smoking or alcohol during pregnancy, medical complications [hypertensive disorders, gestational diabetes (GDM), preterm premature rupture of membranes (PPROM), asthma], labor type, and gestational age (34, 35, 36 weeks). Adjusted relative risk (aRR) with 95% confidence intervals (CI) were calculated.
Results: Of 2,831 women in the parent trial, 65% (N=1852) met the inclusion criteria for our analysis. Among our study population, the majority were 20-34 years old (75.8%), non-Hispanic White (38.2%), had education more than 12 years (45.8%) and were married (62.7%). Hypertensive disorders were the most common medical complication (39.8%) among women in this cohort, followed by gestational diabetes (10.5%). Most women were inductions of labor (58.8%), and 22.4% had spontaneous labor. The two most common reasons for induction of labor were oligohydramnios (8.4%) and non-reassuring fetal status (5.2%). Women having PCDL were more likely to be obese (45.1%), whereas those having vaginal delivery were most likely to be normal weight (42.4%).

The rate of PCDL was 17% with the most common indication being non-reassuring fetal status (54%), followed by labor dystocia (48.6%). Women who were nulliparous were significantly more likely to have PCDL (56%) than vaginal delivery (35%; aRR 1.9, 95% CI 1.5-2.3), as were obese women (45% PCDL versus 25% vaginal delivery; aRR 1.5, 95% CI 1.2-1.9). Women with hypertensive disease had higher rate of PCDL (66%) versus vaginal delivery (34%; aRR 1.6, 95% CI 1.3-2.0). PCDL was also higher among women with induction (aRR 3.68, 95% CI 2.3-6.0) or augmentation of labor (aRR 1.8, 95% CI 1.03-3.3). Factors including maternal age, race/ethnicity, smoking or alcohol use during pregnancy, GDM, PPROM, and gestational age were not significantly associated with delivery method.

Composite respiratory morbidity was similar between vaginal (16%) and PCDL (22%; aRR 1.2, 95% CI 0.9-1.5), as was Apgar < 5 at 5 minutes, hypothermia, proven sepsis and neonatal death < 72 hours. NICU length of stay ≥ 3 days was significantly increased among PCDL (51%) compared to vaginal (37%; aRR 1.3, 95% CI 1.2-1.5).

Conclusions: For women at 34-36 weeks who labor, the rate of primary cesarean in labor is 1 in 5. While there are some discernable risks of primary cesarean, most factors, except perhaps obesity, are not modifiable. Over half of these cesareans are for non-reassuring fetal status and yet neonatal morbidities are similar between vaginal versus primary cesarean delivery during labor.
Preference for Cesarean Delivery Among Mothers of Children With and Without Neonatal Brachial Plexus Palsy

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Purpose: Neonatal brachial plexus palsy (NBPP) may result from stretching of the nerves of the brachial plexus during vaginal delivery. NBPP manifests as weakness or paralysis of the arm and impacts around 1.5-4 per 1,000 live births in the United States, with potential for life-long sequelae. To avert NBPP, clinicians advocate for elective cesarean delivery (CD) in subsequent pregnancies, though there is a paucity of data on mother's preference of CD to minimize likelihood of NBPP.

We report the first study on preference (health utility) for CD among mothers who had children with and without NBPP.

Methods: This cross-sectional survey study used a standard gamble method for CD preference (health utility) given a list of published complications with cesarean. We recruited women who were ≥18 years of age and had at least one live birth. Women who were non-English speaking or had children with neurological injuries (e.g. cerebral palsy) were excluded. We recruited mothers of children with NBPP from our interdisciplinary NBPP clinic (NBPP group, N=49), and mothers of children, without any known anomalies, were recruited via families or friends of subjects (general group, N=21).

Participants completed a standard demographics survey regarding children's and mothers' age, ethnicity, gender, family structure, mother's educational level, family health insurance status, and family income. Assumed health utility for full health was 1 and death was 0: participants in both groups were presented with a hypothetical scenario that CD can totally prevent NBPP but the procedure might come with complications to mother, and participants had to choose between an X probability of cesarean complications and 1-X probability of immediate death of mother. The probability of death decreased in each scenario until the participant chose a point of indifference between complication and death. The health utility was the X probability at the point of indifference. For example, if the woman chose 70% complication and 30% of immediate death, her health utility to have CD with complication was 0.70. The scenarios
included the following complications associated with CD: no complication, postpartum depression, urinary incontinence, placental issue/hysterectomy, amniotic fluid embolism, and severe peripartum illness (genital tract injury, wound disruption, wound infection, and systemic infection).

NBPP-related factors such as NBPP-involved side and the extent of NBPP (number of nerve roots affected classified by the Narakas scale: Narakas I-II: less extensive injury; Narkas III-IV: more extensive injury) were recorded at first clinic visit. One of two certified occupational therapists evaluated NBPP children's active range of motion in shoulder abduction, elbow flexion, and forearm supination. We categorized the active range of motion into functional outcomes in each joint for analysis. We compared the participant demographics and health utility differences between the NBPP group and the general group. Under the NBPP group, sub-group analyses were conducted for Narakas I-II vs. Narakas III-IV and AROM functional vs. non-functional group in each joint. Continuous variables were compared using student T-test and categorical variables were compared using Chi-square test.

**Results:** Participant demographics were similar except for child's age (NBPP: 55 months; general: 83 months, P=0.0001), mother's age at interview (NBPP: 33yrs; general: 36yrs, P=0.001), and family income (< vs. ≥$50,000; P=0.01). Given no CD complication, the NBPP mothers reported a health utility of 0.70 and the general group reported 0.79 with no significant difference. For all CD complications, the NBPP mothers reported health utility of 0.70-0.75 while the general group reported 0.75-0.82 (P > 0.05). Additionally, no significant CD preference exists between NBPP and general mothers for any CD complication, including severe peripartum illness (P>0.05 for all comparisons).

Regarding subgroup analyses within the NBPP group, no significant differences was noted for mothers' CD preference for Narakas grade, elbow flexion, or forearm function. However, decreased shoulder function was associated with increased tolerance of the risk of death with CD with complications of placental issue/hysterectomy (P=0.01), amniotic fluid embolism (P=0.002), and severe peripartum illness (P=0.009).

**Conclusions:** Our novel finding demonstrates there is no preference for CD (healthy utility) among mothers of children with and without NBPP. Within NBPP group, there is a CD preference difference when child has shoulder dysfunction. Our analysis suggests that women who take care of child with NBPP do not prefer cesarean to potentially avoid reoccurrence and the premise of offering CD may be
unwarranted. We encourage obstetricians to review all the possible delivery options and potential complications with expectant women who previously delivered a child with NBPP.
Poster #9
Getting Physical: The Role of Self-Reported Pain and Physical Activity in Pregnancy

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Introduction: Exercise during pregnancy has been associated with several benefits including decreased risks of gestational diabetes and hypertensive disorders. ACOG recommends at least 150 minutes per week of moderate-intensity aerobic activity for uncomplicated pregnancies. However, less than 20% of pregnant women engage in exercise. We hypothesized that maternal pain, a common activity-limiting symptom of pregnancy that affects up to 57% of patients, could be a contributor to reduced physical activity.

Objective: To assess the frequency of moderate to severe self-reported pain during pregnancy and to determine if maternal pain is correlated to physical activity level.

Methods: This was a prospective observational cohort study of pregnant women recruited at outpatient clinics visits or on labor and delivery in the late second through third trimester. Women with multifetal gestations or medical contraindications to exercise were excluded. Participants completed the Pregnancy Physical Activity Questionnaire (PPAQ) and a questionnaire related to current pain symptoms. The PPAQ is a validated survey of physical activity that quantifies time spent performing activities including: household tasks, occupation-related tasks, and sports or exercise-specific tasks. Results of the PPAQ estimated average weekly energy expenditure per week (METs/week) and were stratified by intensity of activities (including sedentary, light, moderate, vigorous, and sports). The pain questionnaire estimated current and weekly pain using a visual analog scale for pain of 0-10 as well as a body map to identify the location of pain. Results of the pain assessment categorized women into two groups: pain that inhibited their activity never/sometimes or usually always. Maternal demographic characteristics in addition to outcomes of assessment of maternal activity levels were compared between groups. Activity levels were also assessed by other factors including age, BMI, weight gain and parity. A p-value of <0.05 was considered significant. As a cross-sectional cohort study, we chose to recruit 130 patients as a
representative sample of our approximate 1300 deliveries annually.

Results: Among the 130 participants the mean age was 30 years old (± 6 years), 38.5% were obese with a mean gestational weight gain of 27.5 lbs (±13.3 lbs), 42.3% of participants were nulliparous with most women being Caucasian (37%) or Hispanic (37%). 58% of patients never had pain inhibit their activity, while 33% said that pain sometimes inhibited their activity, and 7.6% reported pain that usually (n=6) or always (n=4) inhibited their activity. Maternal characteristics including age, race, pre-pregnancy BMI, excessive weight gain, and gestational age at time of survey were not different by self-reported pain. Moderate/severe pain was more frequent for parous versus nulliparous women (12% vs 2%, p=0.04). We found no difference in total weekly METs or other levels of activity by self-reported pain. We also did not identify differences in activity by age, race, pre-pregnancy BMI or excessive weight gain. However lower levels of total activity were noted for nulliparous versus multiparous women (283 vs. 409 total weekly METS, p=0.001). Other assessments of activity including light activity, moderate activity, and house activity were also lower for nulliparous women (p<0.05).

Conclusions: Unlike our hypothesis, pain was not found to inhibit activity in pregnant women. Surprisingly, there was no difference in activity level based upon pre-pregnancy BMI or by maternal weight gain. We also observed a decreased level of activity in nulliparous patients, which we hypothesize is secondary to multiparous patients having a higher level of activity related to childcare.
Poster #10
Patient Characteristics and Perioperative Factors Related to Satisfaction with Gynecologic Surgery

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Introduction: Enhanced surgical recovery protocols have sought to maximize perioperative efficiency to improve patient outcomes. However, patient satisfaction of their surgical experience has not been well studied.

Aim: To assess whether patient characteristics and identifiable perioperative factors are associated with a positive or negative surgical experience in women undergoing gynecologic surgery using a satisfaction survey in addition to assessments of both mental and physical health postoperatively.

Methods: We recruited women undergoing gynecologic surgery with an expected hospitalization for at least 1 night. Patients were excluded if they had an expected same day surgery or an unscheduled surgery, were <18 years old or non-English speaking. Eligible participants completed a 5 item questionnaire regarding current subjective pain levels and overall satisfaction of their surgical care on a scale of 1-5. Subjects also completed the SF12 survey, which estimated patients perception of their overall health with both a mental composite score (MCS) and a physical composite score (PCS). Patient demographics, type of surgery, length of hospital stay, duration of foley catheter, narcotic use, use of bowel preparation, in addition to other surgical outcomes were collected. Associations between patient characteristics/surgical outcomes and satisfaction with surgery were assessed. Results of the SF-12 survey (MCS and PCS scores) were also compared by patient characteristics and surgical outcomes. Chi-square tests, Fisher's exact tests or parametric and non-parametric tests were used where appropriate. A p value of <0.05 was considered significant.

Results: 92/110 (84\%) of women who were approached for participation completed both surveys. The mean age of participants was 54.6 years (+/- 12 years), with the majority being Caucasian (73\%) undergoing laparoscopic surgery (51\%) with the GYN/ONC service (48\%). The median Morphine milligram equivalent (MME) used for pain control was 20 (IQR 10-30), and the median estimated blood loss
(EBL) was 50cc (IQR 33-200). Diet was most frequently advanced on postop day 0 or 1, with only 2% of patients having diet advanced after day 1. The readmission rate was 3%. 65% of patients gave a 5/5 score in their experience during surgery. On univariate analysis, there were no clinical characteristics that were associated with a 5/5 patient satisfaction. However, more positive results of both the SF12 MCS and PCS were found to be associated with decreased postoperative narcotic use (p=0.007), and shorter length of stay (p=0.043). In addition, positive scores of the PCS were found to correlate with the surgery type (p=0.014), earlier day of advancing diet (p=0.045), and earlier time of IV fluid discontinuation (p=0.025).

Conclusions: Patients undergoing gynecologic surgery reported positive experiences with their surgery regardless of their age, health score, or type of surgery. Patients who report higher composite health scores tend to have shorter hospitalizations with more rapid advancements in their postoperative courses (i.e. diet advancement, IV fluid discontinuation), and require less narcotics. This could be further studied after the implementation of enhanced recovery protocols.
Introduction: The condition of Adnexal Torsion (AT) typically presents on an emergency basis with unilateral pelvic/abdominal pain, often described as severe, intermittent, positional, throbbing and often radiating to the flank or groin. This can also be associated with a low-grade fever, nausea and vomiting. It can affect adolescent girls and reproductive-age women, including pregnant women. It typically results from rotation of the ovary and/or fallopian tube on the axis created between the infundibulo-pelvic ligament and the utero-ovarian ligament. This disruption of the primary ovarian blood supply causes venous and arterial compression (sequentially), edema and ultimately ovarian ischemia and necrosis, if untreated. Physical examination often reveals lower abdominal tenderness (both localized and diffuse) and a possibly enlarged tender ovary. Pelvic ultrasound (either abdominal or transvaginal) may reveal ovarian enlargement and a disturbance of vascular flow (with power doppler angiography), which can indicate the possible diagnosis.

When the diagnosis is convincingly made, and laparoscopy is then promptly performed, the diagnosis can be confirmed. Treatment with laparoscopic de-torsion (DT) may then be possibly performed, and if successful, the ovary/adnexa can be preserved, rather than removing it if it is irreversibly necrotic in appearance. This potential for optimal treatment of AT caused the authors to look back at the history of being faced with this scenario in our institution, as well as prospectively analyzing possible diagnostic criteria which can be applied.

Methods: Clinical data from the past five years (2012-2016) were reviewed, regarding the diagnosis of AT, presenting to our Emergency Department (ED). The authors present this case series from our institution, looking at the frequency such cases presented, and what had occurred. The group of patients who had an ovarian de-torsion (Group A) was compared to those with the AT diagnosis, but who did not have the de-torsion procedure (Group B). Specifically, the difference between the time of admission to the ED and the Operating Room (OR) start time were compared between those groups, using a student's t-test for a statistical comparison, with p < 0.05 to indicate statistical significance.

Prospectively, the team analyzed the impact of a multi-disciplinary approach to the detection and treatment of adnexal torsion. The Departments of Obstetrics and Gyne-
cology, Radiology, and Emergency Medicine worked in tandem to determine whether sonographically looking for the "whirlpool sign" with three-dimensional transvaginal sonography (3D TVS) evaluation of a patient with suspected adnexal torsion will improve detection and decrease the time from ED to OR, in order that DT can be successfully performed.

Results: Out of 68 patients admitted for adnexal torsion in the past 5 years (2012 - 2016), 50 were confirmed as ovarian or adnexal torsion (via laparoscopy), and of those, 17 successfully underwent DT, or 34%. In that same time period, 34 patients were admitted with findings suggestive of AT and who underwent diagnostic laparoscopy confirming that diagnosis, but who could not have a de-torsion adequately performed because of the observed adnexal discoloration that was noted, which could not be reversed with such manipulation (68%). Those patients then underwent either an oophorectomy or salpingo-oophorectomy. AT was correctly identified in the Emergency Department approximately ten times per year in our hospital (< 0.02 % of all ED admissions). The difference between Group A and Group B (ED Admission Time to the O.R. Start Time) was statistically significant (p = 0.014).

During the prospective phase of this investigation (January 1, 2018 through April 30, 2018), the finding of the "whirlpool sign", utilizing 3D TVS, sometimes enabled the diagnosis of AT to be made, which was subsequently confirmed with laparoscopy. DT was successfully performed in all of those six identified cases in this 4-month period of time.

Conclusion: Given that ovarian perfusion is impacted by the spontaneous torsion or twisting of an ovary, the resulting difference of the venous and arterial flow can sometimes be seen with sonography. It seems that the use of 3D TVS may be used to even better demonstrate this, rather than relying on two-dimensional ultrasound alone. Naturally, these perfusion changes correlate with the symptomatology which sometimes classically presents. Though the classic Whirlpool sign was only seen in 3 of the 6 AT prospective cases, the vascular flow attention paid to the sonographic analyses of these cases, probably contributed to the prompt diagnosis of the presenting AT condition.

The authors demonstrated that the earlier a diagnosis can be sonographically made via 3D TVS, an operative procedure (i.e. DT) can be more likely to be successfully performed. This can then lead to possibly preventing the sometimes otherwise required adnexectomy.
Ectopic Pregnancy: Consideration of Vascularity Index as a Novel Diagnostic Criterion

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Introduction: Since the medical management of ectopic pregnancy was introduced by Dr. Steven Ory at CAOG (and published in 1986 in the American Journal of Obstetrics and Gynecology), diagnostic criteria have been established to predict its successful medical treatment, which includes its sonographic dimensions, its associated hCG level, and whether there was identifiable fetal cardiac motion. With the advanced sonographic techniques that have become available, there is yet another feature warranting its inclusion in the diagnostic criteria that we currently use when embarking on the medical treatment with methotrexate of a known ectopically implanted tubal pregnancy. Specifically, it is the Vascularity Index (VI), which indicates the color density of associated vasculature at the ectopic implantation site. Since tubal rupture is a finite possibility with a tubal ectopic pregnancy (EP) that is medically treated, there may be significant consequences should rupture occur, and this may be potentially avoidable with the use of diagnostic 3D transvaginal sonography (3D TVS) with power doppler angiography (PDA), as this investigation reports.

Methods: An investigation has begun in which all patients presenting to the Emergency Department of Illinois Masonic Medical Center diagnosed with an EP, beginning May 1, 2016, will undergo a diagnostic 3D Ultrasound, using a GE Voluson E8 system (in the clinic) or the GE Logiq 9 (in the Department of Radiology), using the virtual organ computer-aided analysis (VOCAL) and histogram with the 4D view (GE Healthcare). This report describes all cases performed until April 30, 2018, although this investigation is still ongoing. Findings with the use of 3D TVS PDA included fetal heart rate detection, maximum ectopic diameter, ectopic volume, vascularity index and class. In addition, the associated serum hCG was included in this analysis.

The VI was automatically system-calculated from the histogram created with the sonographic volume capture. It represents the ratio of voxels displaying color (i.e. perfusion) divided by the total number of voxels contained in the volume obtained with the VOCAL software. The calculated VI class was assessed as A (VI < 10), B (VI ≥ 10 to < 20), and C (VI > 20). Medical treatment consisted of a single administration of
methotrexate (50 mg/m² body surface area). Patient outcomes after medical or surgical treatment were either I (resolved) or II (requiring surgical intervention).

**Results:** Of the 34 cases of EP in this current data set, 4 had a very elevated VI (class C). Each underwent surgery, and two of those cases had methotrexate administered prior to the required surgery. One patient was found unconscious 7 days after the administration of methotrexate (and had surgical intervention for a ruptured tubal pregnancy), and one case was taken for surgical intervention after a rising hCG was noted after methotrexate administration. Seven cases had an elevated VI (Class B). Each of those went for surgical treatment without administration of methotrexate. One had an hCG of over 13,000, with detectable fetal heart motion, four cases had an hCG over 5,000, and two cases had a maximum diameter over 4 cm. Of the 35 cases, the maximum diameters ranged from 1.1 to 8.1 cm, and the volume measurements ranged from 0.4 cm³ to 80 cm³. It can be noted that the VI was elevated (Class B or C) in one case for which the hCG was less than 5,000 and the maximum diameter was less than 4 cm, suggesting that VI may constitute an additional diagnostic factor to supplement the hCG and maximum ectopic diameter as prognostic risk factors.

**Conclusion:** We describe a series of consecutive cases of ectopic pregnancy presenting to our Emergency Department, with 3D TVS performed prior to surgical or medical treatment. One case of tubal rupture occurred 7 days subsequent to IM methotrexate, which was associated with having had a Class C VI. Since mortality is known to occur from EP resulting from tubal rupture, the authors wish to describe this advanced sonographic feature to illustrate its potential clinical value. Such significantly increased vascularity, described by a highly elevated Vascularity Index of Class C, which identifies the vasculature that surrounds the tube at the ectopic implantation site, was seen in 12% of our data set of 34 cases of ectopic pregnancy. This vasculature surrounding the fallopian tube is often referred to as "a ring of fire", and the VI is its numerical representation. Since we now have the capability of possibly predicting such serious morbidity from tubal rupture after medical therapy for this is given. We wish to show these examples, in order that the gynecologic community (and their patients treated) can benefit from this information.

We have begun to systematically study the phenomenon of which we speak, but believe it valuable to present the information at this time, even before all of our clinical data are completely collected.
Poster #13
Gender Dysphoria: Hysterectomy as a Step to Female-Male Transition

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Purpose: Transgender is a broad term used for gender nonconforming persons whose gender identity or gender expression differs from their assigned sex at birth. Transgender individuals face significant barriers to health care within the medical community, despite evidence that shows these treatments are safe and effective in affirming gender identity. Many generalist obstetrics and gynecology residency programs have little to no education specifically focused on transgender care. This is despite ACOG's recommendation that obstetrician/gynecologists, who are without specialized expertise, should be comfortable providing age-appropriate screening, and who may be asked to perform hysterectomy with or without salpingo-oophorectomy. If one is not comfortable managing hormonal therapy, an appropriate referral needs to be made. The authors will show that the considerable increase in the number of transgender patients seeking gender-affirming hysterectomy at a community hospital, demonstrates the need for basic education and training to appropriately care for this vulnerable population.

Methods: Retrospective chart review of patients transitioning from female to male and undergoing hysterectomy were recognized through our SQL database (PGWorks), by query for the diagnosis of "gender dysphoria" at Advocate Illinois Masonic Medical Center. Retrospective review of charts from 2015-2017 were analyzed for the following characteristics: age, gravidity, parity, BMI, ethnicity, hysterectomy indication/diagnoses, comorbidities, length of hormone therapy (12 months recommended by World Professional Association for Transgender Health (WPATH), whether evaluated by 2 separate mental health professionals supporting patient's decision (also WPATH criteria), and whether breast surgery was performed. In addition, the type of procedure, concurrent adnexal surgery, procedure time, Estimated Blood Loss (EBL), Operative or postoperative complications, surgical pathology, and uterine weight were examined.

Results: Hysterectomy performed for gender dysphoria on female to male transgendered men were 0 in 2015, 3 in 2016,
and 18 in 2017. The details of the specific factors mentioned above are reported in an associated table.

Conclusions: A considerable increase in the number of female to male transgender men seeking gender-affirming hysterectomy at a community hospital demonstrates the necessity of appropriate education and training to care for transgendered patients in a generalist obstetrics and gynecology residency program.
Poster #14
Clinical Relevance of the Height of Fundal Indentation of the Arcuate Uterus

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Introduction: The most commonly used and accepted classification for the Arcuate Uterus is that of the American Fertility Society (AFS). The AFS has defined the arcuate uterus separately from the partial and total septate uterus, on the basis that the arcuate uterus is a benign form with no or minimal influence on reproductive potential. Per the European Society of Human Reproduction and Embryology / European Society for Gynecological Endoscopy (ESHRE–ESGE) consensus in 2013, all cases of normal uterus are classified as Class U0. A normal uterus is defined as any uterus having a straight or curved interstitial line, with an internal indentation at the fundal midline not exceeding 50% of the uterine wall thickness. All cases of septate uterus are classified as Class U2. A septate uterus is defined as a uterus with a normal outline and an internal indentation at the fundal midline exceeding 50% of the uterine wall thickness.

Congenital uterine malformations, particularly with a uterine septum, are commonly reported as one of the main factors causing pregnancy loss or premature delivery, with the poorest infant viability. Several studies have confirmed a direct correlation between a septate uterus and an increased spontaneous miscarriage rate. However, the relationship of the Arcuate uterus with reproductive failure has been debated.

Primary recurrent pregnancy loss (RPL) is also referred to as recurrent miscarriage or habitual abortion, and is historically defined as 3 consecutive pregnancy losses prior to 20 weeks from the last menstrual period, and having no live births. However, the American Society of Reproductive Medicine (ASRM) has recently redefined recurrent pregnancy loss as 2 or more failed clinical pregnancies as documented by ultrasound or histopathologic examination, which was used in this study.

Categorization of the Arcuate uterus may offer a more precise diagnosis and perhaps a more accurate associated prognosis. The use of 3-Dimensional transvaginal sonography (3D TVS), and obtaining a mid-coronal uterine view, may serve to provide greater insight into the role of uterine morphology in reproductive potential. The authors performed an investigation with this imaging tool to improve the counseling provided to patients with this uterine anomaly.
Methods: All patients referred to our clinic for sonographic evaluation to determine the source of reproductive failure or abnormal uterine bleeding, from January 1, 2014 to December 31, 2017 were considered for this investigation. Those patients identified with features of an arcuate uterus were included in this data set. Measurements were taken for each patient undergoing this sonographic analysis, to determine the depth of the fundal depression from the interostial line (measured in millimeters). This Arcuate Measure (degree of “arcuateness”) was recorded, classified as > 0 and < 0.5 cm = Minimal; ≥ 0.5 < 1.0 cm = Moderate; ≥ 1.0 < 1.5 cm = Severe; ≥1.5 cm = Septated. Information was collected from each subject, to determine past reproductive history, and going forward, the reproductive outcomes following the ultrasound scan were recorded.

Results: There was a total of 140 patients in this data set who had an arcuate uterus. Five patients had a history of two or more pregnancy losses. One of those patients had an indentation depth of 15.7 mm (septate uterus) and two patients had an indentation depth ≥ 11 mm and < 15 mm (severe indentation).

When the definition of RPL of two or more consecutive pregnancy losses was used, the following results were demonstrated. There was 1 case of an indentation ≥ 15 mm, in which there was 1 RPL (100%). There were 6 cases of an indentation between 10 and 15 mm, in which there were 2 cases of RPL (33%). There were 54 cases of an indentation between 5 and 10 mm, in which 1 case had an RPL (1.9%). There were 68 cases of an indentation < 5 mm, in which 1 case had an RPL (1.5%).

Conclusions: Even though these numbers are too small to draw any clinical conclusions yet, it appears that the increased depth of fundal indentation may have a direct correlation with the incidence of recurrent pregnancy loss. When counseling patients with an Arcuate uterus, it is important to know exactly the depth of the endometrial cavity fundal indentation in millimeters, before we can honestly tell patients “not to worry” about having an Arcuate uterus. However, not all Arcuate uteruses are the same, as was demonstrated in this study. 3D US and volume manipulation continues to play an important role in the evaluation of uterine anomalies.
Introduction: Extrauterine pregnancies are a rare finding in obstetrics, occurring approximately once per 10,000 pregnancies. Intraligamentous pregnancies are an even more rare occurrence, and are generally reported only as case reports. Understandably, fetal mortality is extremely high in extrauterine pregnancy, estimated to be between 40-95%. Here is a case of an intraligamentous pregnancy that reached 36 weeks gestation and resulted in the live birth of a healthy infant.

Case Description: A 36 y/o Gravida 3 Para 2 woman was transferred from an outside hospital with a new diagnosis of placenta accreta. She established care at 32 weeks and had an obstetric ultrasound which showed a left lateral placenta previa with placentomegaly. She had a history of two prior cesareans, and her cesarean was scheduled and performed electively. A repeat ultrasound at 35 weeks 6 days had shown a left lateral placenta previa with concern for accreta. The patient was transferred to our institution for delivery the following day.

Upon arrival, the patient was comfortable and without complaint. She denied contractions and reported active fetal movement. Her blood pressure was 122/62, pulse 77 beats/minute and respiratory rate 16 breaths/minute. Her hemoglobin upon arrival was 8.7 g/dL. The patient received 2 units of packed red blood cells overnight and an additional 4 units were held for surgery. The neonatology and anesthesiology teams were consulted. The Gynecologic Oncology service was also consulted for anticipated assistance in performing the hysterectomy.

At surgery, upon entering the abdominal cavity, the anterior uterine wall was notably thin and semitransparent. The active fetus could be clearly visualized through this thin wall. A vertical incision was carefully made and the infant delivered. Upon removal of the infant, the anatomy became clearer. The incision made for delivery was made through the right anterior broad ligament. The uterus had been levo-rotated and posterior to the fetus and the placenta was adherent to the posterior leaf of the right broad ligament.

Given the suspicion for uterine invasion, the placenta was left in place and hysterectomy performed. The left adnexa was inspected and not found to be involved, so it was not
removed. Massive transfusion protocol was initiated due to anticipated blood loss. The right ovary could not be immediately identified. After the right ureter was identified, the right adnexa was removed at the level of the infundibulo-pelvic ligament. After hysterectomy was completed, additional bleeding was noted from the pelvic side wall and was controlled with bilateral hypogastric artery ligation. Estimated blood loss was 3,500ml. The patient was admitted to the ICU overnight with extubation the following morning. She was transferred to the postpartum unit on postoperative day one. She recovered well and was discharged home on postoperative day four. The infant was admitted to the NICU, moved to postpartum on postoperative day two and discharged home with mother.

Pathology revealed an enlarged placenta attached to the external aspect of the uterus in the region of the right adnexa, without communication into the endometrial cavity. Histologic sections of the placenta showed attachment to bands of smooth muscle consistent with the broad ligament.

Discussion: Intraligamentous pregnancies are a rare form of abdominal pregnancy and most often identified at the time of surgery. They arise when the conceptus implants in the tube and the trophoblasts penetrate through the tube into the mesosalpinx. Another etiology is the migration of the conceptus through a defect in the uterine wall - either an old surgical scar or fistula. A history of pelvic surgery, such as a myomectomy, tubal ligation or surgical dilation and curettage, would contribute to this risk. However, in our patient, her only risk factor was a history of two cesarean sections, a relatively common occurrence in the United States.

In this case, suspicion for of a placenta accreta resulted in performing an elective repeat cesarean. A multidisciplinary team had been organized, in preparation for a possibly complex cesarean hysterectomy. Broad ligament pregnancies are most often identified only at the time of surgery (5) and in this case, even the diagnosis during surgery was not obvious until after the delivery of the infant. The hysterectomy was completed without major complication. However, the outcome could have been different, had the subspeciality consultants not been immediately available. It is an important reminder to providers that even something as routine as a third repeat cesarean can pose significant and unanticipated complications.
Poster #16
Management of an Interstitial Ectopic Pregnancy: A Case Series

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Objective: Management of a relatively uncommon condition of interstitial ectopic pregnancy is discussed.

Introduction: Interstitial ectopic pregnancy (IEP) is defined as a tubal pregnancy within the portion of the tube that traverses the uterine wall. This may account for 2-4% of tubal pregnancies. Mortality rate can be as high as 2.5%, which is 7 times higher than that of ectopic pregnancy in general. IEP tends to be diagnosed later in gestation than other types of ectopic pregnancy, and if rupture occurs, hemorrhage is often profound. Treatment of IEP can include medical and surgical options. The widespread use of ultrasound allows for early diagnosis for ectopic pregnancies, and the emerging use of 3D ultrasound technology provides even greater image clarity than 2D ultrasound used in the past, and hence gynecologists are better able to diagnose an IEP today.

Case Series: In the span of a 6-week period of time, four interstitial ectopic pregnancies presented to our institution. All women were of reproductive age. One woman had a right interstitial ectopic pregnancy, s/p a previous right salpingostomy. Two of the four underwent in vitro fertilization. Three of the four were diagnosed sonographically using 3D ultrasound, and one was diagnosed laparoscopically at an outpatient surgery center (and referred to our center). All four women underwent uncomplicated laparoscopic resection of an interstitial ectopic pregnancy, which was pathologically confirmed. None of the cases required blood transfusions. Three of the four women received post-operative methotrexate (50mg/m2 IM), for prophylaxis against any residual disease, and all four women had serial beta-hCG determinations for approximately one month until undetectable.

Conclusion: All four cases were diagnosed early in the first trimester and were hemodynamically stable, without suspicion for rupture. The decision was therefore made to proceed with a laparoscopic approach to resect the IEP, which is often technically more challenging than an ectopic pregnancy of the fallopian tube infundibulum, ampulla, or
isthmus, because of the increased vascularity of the cornual region of the uterus. The use of diluted vasopressin injected around the cornual aspect of the uterus aided in decreasing blood loss during resection of the ectopic. Advanced laparoscopic skill appears to be required, to allow for a minimally invasive gynecologic procedure to be accomplished.

Current literature often describes methotrexate (IM or locally injected) as a medical treatment option for IEPs. Surgical options include laparoscopic or open cornual resection, with mode of surgery guided by the clinical scenario or preference of the surgeon. In three of the four cases, decision was made to give additional methotrexate 50mg/m2 IM after surgical resection of interstitial ectopic pregnancy to eliminate any potential trophoblastic tissue that was not completely surgically resected. No established protocol seems to exist, to guide the decision of adding methotrexate after surgical resection of ectopic pregnancy. If future fertility is no longer desired, uterine artery embolization or hysterectomy are also appropriate surgical options.
Poster #17
Resident Wellness Program Initiative: Yoga Classes During Didactics

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Purpose: Surgical residency programs are well known for rigorous training and increasing rates of physician burnout. Over the last few years, the ACGME has turned its focus to determining ways in which resident burnout and depression can be ameliorated, most recently, by looking toward system-level interventions to improve the training experience. Our objective was to determine the feasibility of introducing yoga classes during a scheduled didactic block and the impact of a wellness program on stress, anxiety, depression, burnout and sleep.

Methods: We conducted a QI initiative consisting of an 8-week wellness program for 24 Ob-gyn residents and 5 Maternal- Fetal Medicine (MFM) fellows in our academic institution. The program consisted of weekly yoga classes, nutritional and physical challenges. The 1-hour yoga classes were conducted during the weekly scheduled 4-hour didactic block. Winners were awarded weekly for participating the most in either or both of the challenges. All participants received a free Polar A370 fitness wrist device for participation that recorded their physical activity. Prior to the start of the program, baseline data were collected including the Maslach’s burnout inventory, the Five Faceted Mindfulness Scale (FFMS), the Pittsburgh Sleep Quality Index (PSQI), and the Depression Anxiety Stress Scale (DASS-21). The same inventories were repeated at the end of the program. Objective improvement in physical well-being was assessed by blood pressure, heart rate, weight, and BMI (baseline to post-program). Paired t tests and Wilcoxon signed rank tests were used for analysis. A one-tailed P-value of <0.05 was considered significant for this exploratory study.

Results:
Over an 8-week period, between October and December 2017, 89.6% (n=26) participated in at least 1 yoga class. One MFM fellow was on maternity leave and three residents declined to participate in the program beyond attending yoga class. None of the participants completed all 8 sessions. Seventy percent (n=20) participated in at least 1 nutritional
challenge and 51.7% (n=15) in at least 1 physical activity challenge.

There was a statistically significant decrease in systolic (122, 116 mmHg; p=0.001) and diastolic blood pressure (82, 76 mmHg; p=0.008) after the completion of the program. A statistically significant increase in weight was noted, albeit an average of a 2.2 pounds (p= 0.032). There was no significant change in heart rate and BMI after the program.

The Maslach burnout scale demonstrated a significant reduction in depersonalization (p= 0.043), however, emotional exhaustion and personal accomplishments were unchanged. According to the DASS-21 scale, there was a statistically significant reduction in anxiety (p= 0.019). Stress and depression scores also improved but did not attain statistical significance (p = 0.083 and 0.471, respectively). The total FFMS score remained unchanged, however, evaluation of subscale categories revealed a significant improvement in mindfulness observation (p=0.019). Overall sleep quality assessed by the PSQI score did not differ after the program.

There was a positive correlation between attending yoga classes and completing nutritional challenges (r=0.50, r2 =0.25, p=0.011), participating in nutritional and physical challenges (r=0.623, r2 =0.39, p=0.001), but not between yoga classes and physical challenges. Outcomes of frequent yoga class attendees, defined as those who attended 50% or more classes (4 or more classes out of 8), were compared to those who inconsistently participated (attended 0-3 classes). Frequent attendees were significantly more likely to participate in the nutritional challenges (p=0.008) but not the physical challenges (p=0.60). There was no significant difference in survey results when comparing these two groups.

**Conclusions:** Implementing a wellness program during protected didactic time is feasible. Despite limitations in attending classes regularly, participants experienced a decrease in depersonalization and anxiety, with, additionally, some improvement in certain aspects of mindfulness. A resident wellness initiative that emphasizes active participation during didactic sessions with the autonomy to implement wellness into daily activities has the potential to reduce physician burnout and improve well-being.
Poster #18
A Survey Assessment of Patient Understanding and Knowledge About HPV Vaccination in a High Risk Population

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Purpose: The first HPV targeted vaccination that was released in 2006. Despite being on the market for 12 years and heavy marketing through the media, recent studies have shown that only 60% of teens have received one vaccination and only 43% have completed the series. While there has been a reported 4% increase in vaccination rate since 2015, these numbers are still markedly lower than other childhood vaccination rates. The goal of our study is to enhance provider and patient knowledge of HPV and to increase the rates of completed HPV vaccination series, which will be planned through a two part process: The first part of our study will assess the understanding of the HPV vaccination, risk factors, and immunization rates in our patient population through a patient survey. The second and subsequent part of our study will be to implement a program of both resident education and of patient and physician reminders with the aim to improve HPV immunization rates in our clinic.

Methods: An anonymous patient survey was conducted, which was approved by the IRB at Saint Louis University. It assessed patient demographics, general knowledge of HPV, screening for known risk factors associated with HPV, personal vaccination history with a HPV vaccine, and personal history of abnormal pap smears and treatment. It was offered to all patients 18 and older who were attending the Resident clinics at Saint Louis University and appropriate statistical analyses performed.

Results: A total of 53 patients completed the survey. The majority of survey participants was 18 to 26 years old. 77% of those surveyed identified as African American and 21% as Caucasian. Only 45.3% of women indicated they had a primary care doctor aside from their Ob/Gyn. 45.3% of patients indicated that they had a history of a sexually transmitted infection and 13.2% of patients reported tobacco use. 35.8% had a history of an abnormal pap smear. Despite these risk factors, only 60.4% of respondents indicated that they thought HPV could cause cervical cancer, while 92.5% believed that throat and oral cancer were not caused by HPV. Only 11.3% of those surveyed indicated they had received an
HPV vaccination in the past and only 56% of respondents responded that Gardasil protected against HPV.

**Conclusion:** Our survey indicated that our HPV vaccination rate was very low despite being a high risk population for the acquisition of HPV and for the development of cervical cancer.

This initial part of our study demonstrates the lack of knowledge and understanding of HPV and the HPV vaccination in our patient population, and stresses the importance of both patient education and the importance of the role of the OB/GYN to implement the HPV vaccination series. The second part of our study will focus on the impact of providing HPV education training and screening reminders to the residents. The study will then implement text reminders to patients who have started the series about their upcoming HPV immunization appointments, with the aim to show that such a program will increase HPV immunization and series completion rates in our high risk population.

**Citation:**
Purpose: Pregnancy is a very stressful time for women with opioid use disorder (OUD). However, the postpartum interval may be even more so. Unfortunately, no research has been done looking at outcomes after delivery.

Methods: This is a retrospective review clinical outcomes during the first 6 months after delivery for 107 women with OUD who received comprehensive care through our pregnancy addiction clinic. The majority of the women were on methadone or buprenorphine through the pregnancy.

Results:
- There were no maternal deaths during this interval. There were 2 babies that died of SIDS.
- 63.6% returned for a postpartum visit. 39.7% were breastfeeding at time of their postpartum visit (4-8 weeks).
- 14 had sterilization procedures, 5 partners underwent vasectomy and 43.9% had started on LARCs (26 IUD, 7 Nexplanon, 14 Depo-Provera). No repeat pregnancies occurred in this 6-month interval.
- Only 39.3% scored greater than 8 on the EPDS scale at a pp visit.
- Maintenance of custody within the first 6 months after delivery was 87.4%.
- 86.8% remained in treatment for the first 6 months after delivery. Maintenance of custody and continuation in treatment are highly correlated (p = 0.0001).

Conclusions: Women with opioid use disorder require more than the traditional six weeks to navigate through the postpartum period. Obstetricians may represent a unique source of health care support and assistance for the postpartum period. We believe that comprehensive and linked services- obstetrics, addiction, and pediatrics, may also be responsible for our high rates of continuous treatment and custody.
Cervical Cancer Screening Training Pilot in Nicaragua

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Background: Cervical cancer is the leading cause of cancer-related deaths in Nicaraguan women. The Papanicolaou (Pap) test is standard of care, but barriers to optimal screening include limited supplies, improper screening technique, lack of access to results, and distance to a screening site. An alternative screening method developed for low-resource countries is visual inspection with acetic acid (VIA), which allows for immediate treatment with cryotherapy if a positive cervical lesion is identified. Pairing screening and treatment has been tested successfully in such countries as Thailand and Zimbabwe. Adopting this type of single-visit testing and treatment would address some of the access and resource challenges Nicaraguan women face.

Objective: In a small pilot program, determine baseline knowledge about cervical health among Nicaraguan nurses and other healthcare workers, teach them about cervical cancer prevention and treatment, and train them to perform VIA screening and cryotherapy treatment.

Methods: Global Partners is a not-for-profit program of Gundersen Health System, which is headquartered in La Crosse, Wisconsin. It was created in 2008 to develop long-term, sustainable relationships and community-to-community partnerships that expand beyond Gundersen Health System's typical borders, including Nicaragua. Over 3 days in March 2018, Global Partners collaborated with the Nicaraguan Ministry of Health (MINSA) in Matagalpa, Nicaragua, to train local nurses and healthcare providers. Trainees' baseline knowledge of cervical cancer screening, treatment, and prevention was assessed using the Precourse and Midcourse questionnaires available from JHPIEGO (a program originally called the Johns Hopkins Program for International Education in Gynecology and Obstetrics). Owing to time constraints, the questionnaires were administered together prior to training. Training was conducted by 3 Global Partners volunteers—2 medical doctors and a medical student—and by a doctor from the Fara Clinic in Matagalpa. Trainees observed the trainers in clinic performing Pap tests, VIA, colposcopy and biopsy, and cryotherapy, and then performed procedures under a trainer's direct supervision. The curriculum was guided by JHPIEGO's downloadable Cervical Cancer Prevention Learning Resource.
Package, which includes the Cervical Cancer Prevention: Guidelines for Low-Resource Settings reference manual, PowerPoint slides, and other useful training tools. The package focuses on the single-visit approach to cervical cancer screening and treatment—VIA and cryotherapy—and is available in English, Spanish, and French. Time constraints required trainers to select the most salient materials regarding prevention, screening, and treatment.

**Results:** Four municipal health nurses from separate rural areas surrounding Matagalpa were identified for training. All had acquired early baseline skill for performing Pap test collection in their respective health posts. In addition, a second group of clinicians from a Nicaraguan nonprofit organization dedicated to cervical cancer screening and treatment were assessed for their baseline knowledge. This group of trainees included 1 medical doctor, 2 cervical technicians, and 3 nurses. Overall, trainees scored a mean of 61% ± 10% correct (range, 45%-80%) on the combined questionnaires. Scores for the 4 municipal health nurses ranged from 45% to 63%, and scores for the nonprofit organization trainees ranged from 55% to 80%. The trainee who is a medical doctor and plans to specialize in gynecology earned the highest score.

The 4 municipal health nurses observed 25 colposcopy procedures, 30 biopsies, 11 loop electrosurgical excision procedures (LEEPs), 20 Pap tests, 8 VIA tests, and 1 cystoscopy. Each of the trainees performed 1 cryotherapy. Overall, 90 women underwent screening. The nonprofit organization conducted its own training in which its 6 trainees observed 56 VIA tests and 56 Pap tests.

**Conclusion:** At baseline, trainee knowledge of cervical health varied widely. In the next Global Partners mission, the test will be administered to the same group of trainees again to determine any change in knowledge. The impact of the pilot project was limited by the small number of participants—4 trainers and 10 trainees; however, in future Global Partners trips we will continue to train healthcare workers—both by educating them about cervical health and by teaching them to correctly perform screening tests and treatment. We will administer the two 20-item questionnaires to new trainees as "pre" and "post" assessments, which will provide immediate feedback regarding change in knowledge about cervical cancer prevention, screening, and treatment. Our long-term aim is that a sustainable train-the-trainer system will take root—with nurses who have completed training sharing their knowledge and new skills with their fellow nurses within Nicaragua, thus exponentially improving cervical cancer prevention and treatment in the country over time.
Poster #21
Racial and Ethnic Differences in Pregnancy Outcomes in Women Diagnosed with Gestational Diabetes Mellitus, Type A2

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Objective: Previous studies have demonstrated racial/ethnic differences in perinatal outcome among women diagnosed with gestational diabetes. However, no studies to date have stratified subjects in order to evaluate whether these differences are present only in those with gestational diabetes, type A1 (GDMA1); gestational diabetes, type A2 (GDMA2); or both groups. The purpose of this study is to determine whether maternal and fetal outcomes differ based on race/ethnicity in women diagnosed with GDMA2.

Methods: This was a retrospective cohort of women treated for GDMA2 who delivered between 12/2012 and 06/2015 at the University of Cincinnati Medical Center, an academic tertiary medical center located in Cincinnati, OH. All women were treated in the Diabetes and Pregnancy Program (DAPP), a multidisciplinary clinic at the University of Cincinnati Medical Center that provides comprehensive nutrition, education, and medical services to women with pregnancies complicated by pregestational and gestational diabetes. All women were treated with glyburide, acarbose, a combination of acarbose and glyburide, or insulin. Oral agents were the preferred first line treatment modality for women diagnosed with GDMA2 during the study period, and decision to transition to insulin was guided by standardized protocol for all patients. Institutional review board approval was obtained from the University of Cincinnati Human Research Program.

All demographic, medical, and pregnancy outcome data were available in the preexisting Treatment of Gestational Diabetes with Acarbose dataset. These data were collected from the maternal electronic medical record and the associated inpatient neonatal electronic medical record and entered onto a standardized data collection form. The women were grouped into four races/ethnicities: Non-Hispanic White (NH White), Non-Hispanic Black (NH Black), Hispanic, and Asian. Those whose race was defined as other or who did not have a listed race were not included. Baseline demographic and pregnancy factors of interest included maternal age, parity, obesity, chronic hypertension, smoking status, and 1 hour GCT value. Outcomes of interest included treatment modality (oral medication vs. insulin), primary cesarean
section, preeclampsia/eclampsia, macrosomia, neonatal hypoglycemia, NICU admission, hyperbilirubinemia, preterm birth <37 weeks gestation, and stillbirth. We used chi-square and ANOVA mean comparison in order to compare pretreatment/demographic factors of interest and outcomes. A p-value < 0.05 was considered significant. Effect estimates were expressed using relative risk and 95% confidence intervals. These calculations were performed using the NH White population as the reference population. Statistical analysis was performed with STATA v12.1 (StataCorp, College Station, TX).

Results: Of 198 women in our study cohort, 19 were categorized as "other" or had missing information on maternal race and were excluded, leaving a cohort of 179 women for analysis. Among the study population, 78 (44%) were NH Black, 68 (38%) were NH White, 22 (12%) were Hispanic, and 11 (6%) were Asian.

With regard to baseline characteristics, obesity was prevalent, but differed among racial/ethnic groups: 77% of NH Black, 63% of NH White, 63% of Hispanic, and 27% of Asian parturients were obese (p = 0.008). A higher proportion of NH White women smoked compared to NH Black, Hispanic, and Asian women (31.8%, 19.2%, 4.5%, and 9.1% respectively, p = 0.019). Chronic hypertension was more prevalent among Caucasian and African American women than among Hispanic and Asian women (21%, 27%, 0%, and 0% respectively, p = 0.019). No statistically significant differences were noted with regards to prevalence of advanced maternal age or multiparity.

With regards to perinatal outcomes, compared to Caucasians, NH Black women with GDMA2 had increased risk of non-compliance [RR 1.44, 95% CI (1.04-1.99)]. There were no statistically significant differences in delivery via primary cesarean section, preeclampsia/eclampsia, macrosomia, neonatal hypoglycemia, NICU admission, hyperbilirubinemia, preterm birth, or IUFD. Although not statistically significant, differences among races in rate of insulin treatment were noted: 19% of NH White, 26% of NH Black, 5% of Hispanic, and 0% of Asian patients were treated with insulin (p = 0.05).

Discussion: Despite significant differences in baseline health status, major perinatal outcomes in women diagnosed with and treated for GDMA2 at an academic tertiary care institution did not differ significantly by racial/ethnic group. Although these outcomes are derived from a small cohort at single academic tertiary institution, these data suggest that the approach used at a single large academic medical center is equally effective among Caucasian, African American, Hispanic, and Asian women with GDMA2.
Correlation of Internet Search Trends and the Incidence and Mortality Rates of Human Papillomavirus (HPV)-Related Cancers, and HPV Vaccination Coverage in the United States

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Objectives: The aim of this study was to determine whether state-specific internet search data correlates with the incidence and mortality of HPV-related cancer, as well as HPV vaccination coverage, in the United States.

Methods: This study examined the association between search volume index (SVI) and age-adjusted incidence and mortality rates for HPV related cancers, as well as the association between SVI for HPV vaccine, vaccine side effects, and state HPV vaccination coverage. SVI is a normalized quantity reflecting the relative search interest in a term within a defined time period. SVI is obtained from Google public data from Google Trends (https://trends.google.com/trends/). Random real time data is collected, categorized and connected with a topic. Non-real time data can be searched from 2004 and onward. Incidence and mortality data were obtained from the National Program of Cancer Registries, National Cancer Institute, and National Vital Statistics System, in the United States during 2009 to 2013 (oropharyngeal, n=58335, 12927; anorectal, n=19665, 2562; cervix, n=61711, 20231; vulva, n= 23716, 4947; vagina & other, n=16369, 4643). Vaccination data for adolescent girls aged 13-17 years were obtained from the Centers for Disease and Control, Prevention Morbidity and Mortality Weekly Report, and Healthy People 2020 for 2009 to 2013 (n = 47399). We examined the correlations between SVI, HPV-related cancer incidence and mortality, and HPV vaccination coverage data at the state level, and analyzed SVI-time patterns using national data. Pearson's correlation and the corresponding p-value were calculated to examine the strength and significance of the association between SVI, incidence and mortality, HPV vaccine, HPV vaccine side effects, and state HPV vaccination coverage. A time series plot is used to present the SVI-time relationship. P-value less than 0.05 was considered statistically significant.
Results: SVI at the state-level and age-adjusted incidence rates were statistically significant and correlated for three of five cancers in the United States in 2009-2013 (cervix, r= 0.488, p < 0.05; oropharyngeal, r= 0.174, p < 0.05; vulvar r= 0.501, p < 0.05). Similar associations were found for cervical (r= 0.556, p < 0.05), anorectal (r= -0.142, p < 0.05), and vulvar (r= 0.261, p <0.05) cancer mortality rates. Finally, there were statistically significant correlations between HPV vaccine SVI and vaccination coverage (1 Dose, r= 0.349, p < 0.05; 2 Doses, r= 0.259, p < 0.05; 3 Doses, r= 0.219, p < 0.05).

Conclusions: Population-based internet search data is weakly-to-moderately correlated with: the incidence rates of cervical, oropharyngeal and vulvar cancers; cervical, anorectal and vulvar cancer mortality rates; and HPV vaccination coverage. Internet search data can serve as an innovative surveillance tool to estimate the incidence and mortality rates of common HPV-related malignancies, as well as HPV vaccination coverage in the United States.
Poster #23
Quality of Life Improvement in Pregnant Women with Iron Deficiency Anemia Using Intravenous Iron

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Background: Iron deficiency anemia is seen commonly in women of reproductive age and particularly during pregnancy. Current treatment practice with oral iron supplementation is associated with gastrointestinal side effects leading to poor compliance. Intravenous dextran is an effective alternative that is underutilized which can lead to better clinical outcomes, reduced risk of blood transfusion as well as improved quality of life.

Methods: A pilot prospective study was performed involving 29 patients with a hemoglobin levels between 8 and 10 g/dL and/or a low ferritin <200 µg/L, referred by their obstetric provider for inability to tolerate oral iron. Patients received intravenous iron dextran, at a fixed dose of 1000mg. Hematologic (response defined by hemoglobin normalization) and quality-of-life [Health-Related Quality of Life (HRQOL) and 36-Item Short Form Survey (SF-36) questionnaire] evaluations were performed at baseline and at 3 and 6 months.

Exclusion criteria included hypersensitivity of parental iron, severe hepatic impairment, malignancy, and pre-existing cardiovascular disease.

Results: Of 33 patients recruited, 29 received intravenous iron dextran. In 2 patients, the medication had to discontinued due to adverse effect; hypotension and urticaria. Mean basal hemoglobin levels were 8.8 g/dL (range, 7.0-10.3). Hemoglobin normalization (improvement of Hgb > 11g/dL) was achieved in 55.5% of the patients. Improvement of more than 1 g/dL was noted in 88% of the patients. The quality-of-life scores correlated with improvement in hemoglobin and were increased in patients who normalized their hemoglobin in 3 months and 6 months.

Conclusion: Intravenous iron is an effective and safe alternative for iron deficiency anemia in intolerant patient. Our study aims to analyze the anemia correction with iron treatment is associated with a relevant improvement in the patients' quality of life.
Poster #24
Postpartum Pre-Eclampsia: Understanding Risk Factors

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Purpose: Our study aims to determine if there are any identifiable demographic or medical differences between patients with pre-eclampsia who are diagnosed antepartum or intrapartum vs. those diagnosed and readmitted postpartum.

Methods: A case control study was performed on all patients who were readmitted to Touro Infirmary in New Orleans, LA in the postpartum period for administration of magnesium sulfate for pre-eclampsia with severe features from July 1, 2011 and December 31, 2016. These cases were matched with two control patients who were treated with magnesium sulfate for pre-eclampsia with severe features during their admission for delivery. Variables collected included age, race, parity, gestational age at delivery, singleton vs. multiple gestation, BMI, weight gain in pregnancy, history of pre-eclampsia, pre-existing hypertensive disorders, other medical comorbidities, fetal growth restriction, tobacco use, and mode of delivery. Odds ratios (OR) were calculated for each of these variables, with a p-value of <0.05 considered statistically significant.

Results: During the study period, there were 32 cases of postpartum readmission for pre-eclampsia with severe features, with readmission occurring between 4-18 days post-delivery (average 7.8 days). Among these cases, delivery was less likely to have occurred at <34 weeks gestational age (OR 0.21, p=0.0229), and more likely to have occurred at 39 weeks or later (OR 5.44, p=0.0003) compared to the control group. Maternal age, race, parity, singleton or multiple gestation, obesity, weight gain, history of pre-eclampsia, pre-existing hypertension, maternal diabetes, fetal growth restriction, tobacco use, and mode of delivery were not associated with any difference in the timing of development of pre-eclampsia with severe features.

Conclusion: Patients who develop pre-eclampsia in the postpartum period are more likely to have had a full-term delivery, compared to women with antepartum or intrapartum disease who are more likely to have delivered preterm. Otherwise, no differences in patient demographics or medical comorbidities were detected. Thus, women identified as being at high for pre-eclampsia who do not develop the disease prior
to delivery remain at increased risk postpartum, highlighting the importance of patient counseling and continued blood pressure monitoring despite having already been "cured" with delivery.
Poster #25  
The Higher Prevalence of Hypoplastic Umbilical Artery in Caucasians Compared to African Americans

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Background: A hypoplastic umbilical artery (HUA) is an uncommon finding. It is most often characterized as a 2 vessel cord, but occasionally there is a tiny 3rd artery. Associations with fetal malformation, chromosomal disorders, and growth restriction have been identified. However, ethnicity in relation to HUA has not been evaluated.

Objective: To evaluate the prevalence of African American (AA) and Caucasian (C) fetuses/newborns with a HUA confirmed by two observers or a pathology report.

Study Design: Retrospective patient review of women seen for sonography within the hospitals served by members of the LSUHSC New Orleans Maternal- Fetal Medicine Program between 02/2007 thru 04/2018 with known pregnancy outcomes. Only singleton gestations with a fetus without chromosomal or structural disorder (isolated HUA) were included in this study.

Results: 208 singleton newborns were identified with SUA along with 3 newborns containing a tiny third vessel. HUA was found in 153 Caucasian infants and 58 African American infants. The distribution of HUA was compared to the expected distribution of ethnicity for the 5 parishes served by the Hospitals where located. 2010 and 2016 census data were used which included the number of African American (AA) and Caucasian (C) for the general population. Data regarding newborn ethnicity for the same parishes was also obtained from the year 2014.

Five parishes within the state of Louisiana were utilized for data collection. The five identified parishes included Orleans, St. Charles, Jefferson, Plaquemines, and St. Bernard. Only (C) and (AA) populations were included for this study. 52.3\% were (C) whereas 47.7\% were (AA). Based on sample size, we would have expected 108 (C) and 103 (AA). The expected versus identified prevalence of HUA within the Caucasian versus African American population was statistically significant with p value <.0001 (X\textsuperscript{2}=25.42). Based on birth data alone, we would have expected the number of Caucasian newborns to be 47.5\% (101) versus 52.5\% (110) of African
American newborns with HUA. Comparison of expected versus identified newborns with HUA was also statistically significant with p-value of less than .0001. (X²=32.47)

**Conclusion:** Isolated hypoplastic umbilical artery was found to be more prevalent with (C) population in comparison to (AA) population.
Poster #26
Update of the Literature of Pregnancy Outcomes in Cases of Placental Mesenchymal Dysplasia

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Introduction: Placental mesenchymal dysplasia (PMD) is a rare (0.02%) condition of placental development with a cystic appearing, enlarged placenta, first described in 1991. PMD is associated with poor pregnancy outcomes, genetic defects, and Beckwith-Wiedemann (BW) syndrome. Over the past several years, new predatory journals have appeared which often collect fees for publication, often omitting a strong peer review and careful editing.

Purpose: To conduct a systematic review of literature of newly reported recent cases of PMD.

Methods: Cases concerning PMD published between January 2016 thru March 2018 were identified searching both PubMed and Google. Only articles in English were used. Papers included in the report all provided a description of the placenta consistent with PMD: single abnormal placenta, confirming cystic changes and placentomegaly with histologic confirmation. Statistical analysis with SPSS was performed to compare PubMed to open access journals.

Results: 20 cases were identified thru PubMed and 8 thru open access. Elective termination (10.7%) and IUFD (21.4%) were documented. Preterm delivery (57.1%) and term delivery with AGA infant in 10.7%. There were 3 term deliveries, and 3 were AGA. One case of Di-Di twins had both placentas involved, and 2 other set of Di-Di twins had only 1 abnormal placenta. Abnormalities included 5 BW, 1 T-21, 1 Klinefelter, and 1 XXX syndrome. No difference in the mean number of cases presented was found when journal types were compared. Differences between pregnancy outcomes, genetic disorders, developments disorders or fetal growth restriction were absent between compare journal types.

Conclusion: PMD is associated with PTD, IUGR and genetic defects. Differences between journal types as to content were not identified.
Introduction: Obstetricians are instrumental to improving the health and well-being of their patients' during a point of time where access to healthcare is guaranteed. At the St. Vincent Health Joshua Max Simon Primary Care Center (PCC) upward of 30% of patients are immigrants to the United States, which per the CDC Advisory Council for the Elimination of Tuberculosis, increases the risk for Tuberculosis (TB) 13-fold. Tuberculosis remains a leading public health concern across the globe with those infected deemed highly contagious and require expedited treatment to prevent transmission. Pregnancy is the first point of contact to healthcare for many women and is an ideal time to obtain a full patient history and screen for high-risk diseases.

Methodology: This study was a prospective cohort study looking at women seeking care at the St. Vincent Health Joshua Max Simon Care Center in the Obstetric (OB) department, a resident run clinic with the average patient between 12-45 years old, with Medicaid or no insurance, of Caucasian (Hispanic and non-Hispanic), or African ethnicity. Screening for TB at the PCC currently consists of a single question. From December 1, 2017 through February 28, 2018 an expanded questionnaire for TB risk factors was given to all women initiating obstetrical care at the PCC. The survey included: prior positive skin test, prior positive chest x-ray, close contact with someone with TB, immigration from a high-risk county, time since immigration, immuno-suppression, pre-existing diabetes, HIV, etc., history of IV drug use, prior employment or residence at a prison, homeless shelter, or health care setting. Women who answered any question "yes" were considered to have a positive screen. The electronic medical record (Athena) was reviewed for the current screening method "Have you ever been exposed with someone with TB". Those living in the United States for greater than ten years were given a designation of "negative screening" based upon the average latency period of TB. The questionnaire was provided in both English and Spanish. Women with a positive screen were designated as requiring further follow-up completed by the primary research author and included a more detailed history or recommendations for
a purified protein derivative (PPD), quantiferon gold, or chest x-ray.

**Results:** A total of 109 patients were included, with one patient excluded due to not being currently pregnant at time of the survey. Chart review in Athena of the current screening methodology revealed only 2 patients (1.8%) reporting prior exposure to TB. In this same cohort of women, the expanded questionnaire found at total of 37 women (33.9%) had a positive screen. Thirty-four subjects (30.9%) had immigrated from a high-risk country. Eleven women (10.1%) screened positive due to prior IV drug use or prior residence in or employment at a prison, homeless shelter, or hospital. Seventeen patients (15.6%) reported recent TB screening through either skin test, blood test, or chest x-ray with 10 (58.8%) subjects who meet criteria for a positive TB screen.

**Discussion:** Through the expanded screening questionnaire an additional 35 women were identified as high-risk for TB exposure missed through the current screening method. The most common risk factors were immigration from a high-risk country and history of IV drug use or prior residence/employment at a prison, homeless shelter, or hospital. By expanding the current screening to include these additional questions, more women could be identified as at risk for TB and directed towards additional screening or follow-up.
Poster #28
Analysis of Post-Partum Compliance to Diabetic Testing

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Purpose: Increase provider and support staff knowledge of Gestational Diabetes Mellitus (GDM) and long term sequelae with the goal of increasing patient and physician adherence to the American College of Obstetrics and Gynecology (ACOG) guidelines via increasing patient education.

Methods: Electronic chart review was utilized to identify patients of My Community Health Clinic OB/GYN and family practice patients who were diagnosed as GDM and delivered at Aultman Hospital. Charts were reviewed to verify GDM diagnosis and determine if post-partum testing was ordered and completed, as well as the result. This occurred in two stages, in 2015 prior to any interventions and then again after a series of interventions, from November 1st 2016-October 31st 2017. Educational handouts were also tracked to verify patients received them.

Interventions were conducted throughout the studies entirety. Several provider educational sessions were held to understand the physiology, differential diagnosis, interventions and management of GDM in accordance to ACOG guidelines. An additional educational session was held after creation of the electronic medical record power plan to ensure accurate usage. The power plan included the automatic ordering of the 2 hour glucose tolerance test, and a letter to be mailed to the patient's primary provider notifying them of the GDM diagnosis. An educational session was held to educate nursing staff in the clinic, this was geared specifically towards introducing patient educational materials that were given to the patients at a clinic visit after diagnosis and answering patient questions. In addition to one on one sessions, several group meetings, learning modules and emails were conducted with the labor/delivery and post-partum nurses. These educational sessions were focused on introducing the patient handouts that were to be given upon discharge with recommendations on clear and concise communication with patients. Patients were given educational brochures with magnets after being diagnosed with GDM in addition to the diabetic education already in place. Patients were scheduled by 36 weeks gestational age for the post-partum visit. The goal of these interventions were both to increase patient understanding of their disease and provider involvement,
thereby expanding patient resources and opportunities for successful compliance with GDM guidelines.

**Results:** 530 patients delivered during 2015 and 48 of these patients were affected by GDM. Of these, 1 patient completed post-partum testing for diabetes mellitus (DM) via two hour glucose tolerance test (GTT). 14 patients were not ordered the recommended screening test by their physician. 20 patients did not complete the test as ordered. 13 patients did not appear for the post-partum visit. The same data was then collected after the patient and provider educational interventions. During the next study year, from November 2016- October 2017 there were 545 deliveries and 34 were affected by GDM. Of these, 5 patients completed post-partum testing for DM via two hour GTT. 16 patients were not ordered the recommended screening test by their physician. 16 patients did not complete the test as ordered. 9 patients did not appear for the post-partum visit. The primary impact occurred amongst the physicians. Physician non-adherence to guidelines decreased from 29% to 11.7%. There was an increase of completion of the two hour GTT from 2.1% to 14.7%; 50% of these were elevated and will require additional follow up. There was no significant difference in the patient completion of recommended screening, nor in the percentage of postpartum visit attendance from the pre to post intervention years.

**Conclusion:** Physician educational intervention yielded the most significant improvement in patient compliance. However, patient attendance to postpartum visits, as well as completion of postpartum testing remains an obstacle to optimal adherence to GMD treatment guidelines.
Poster #29
Obstetric Model of Induction of Labor: Does Time of Labor Induction Affect Patient Satisfaction?

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Introduction: Induction of labor accounts for nearly 23.3% of all pregnancies in the United States. The prevalence more than doubled (9.5 to 23.3%) due to medically indicated and elective inductions between the years 1990 and 2012. The increasing trend of elective inductions accounted for the majority. Induction of labor is defined as initiation of uterine contractions by medical means for the purpose of delivery before the spontaneous onset of labor.

Currently there is no national standard of onset of induction. Some organizations have available appointments for inpatient induction of labor, while others plan as needed and accommodate to physician and patient preference. Some institutions and providers prefer morning inductions while others prefer evening.

The purpose of the study is to compare the impact of evening versus morning inductions on patient satisfaction. Secondary objectives, will evaluate initial cervical dilation, time to delivery, time of delivery, cesarean section rate, and total length of hospital stay.

Methods: A prospective pilot study was performed. We collected data from a non-profit, community hospital, which consists of approximately 2,600 deliveries per year. Inductions contribute approximately 27% of the total deliveries, for approximately 700 induction per year. Data consisted of electronic medical records, and a standardized satisfaction survey given to all pregnant women who were scheduled inductions of labor. Exclusion criteria consisted of mentally impaired patients, multi-gestational pregnancy, history of prior cesarean section, preterm premature rupture of membranes (PPROM) diagnosis, or any patient deemed to be in active labor at the beginning of induction.

All pregnant patients who were scheduled for induction of labor were automatically enrolled in the study. Patients were given the option to not complete the survey; therefore, removing their opinion from the study. There was no predetermination made in whether a patient would be a morning (AM) induction versus an evening (PM) induction. The physician would determine based on his/her preference and/or available time slots offered at the hospital. There was no standard in method of induction or management of labor.
Data was collected primarily by a standardized satisfaction survey provided to each patient in the postpartum period by a non-healthcare employee of the hospital to reduce bias. Identifying induction patients were done through review of 143 charts. Data points were obtained about the time of start of induction, time of delivery, discharge time, mode of delivery, and beginning cervical dilation. Data was collected from March 1, 2017 to August 1, 2017. All patient identifiers were removed and each patient was given a unique numerical code, which was matched to the satisfaction survey.

The PM group consisted of 29 inductions in which 26 completed the satisfaction survey. The AM group consisted of 114 induction in which 87 completed the survey. A comparison analysis was conducted on the survey results for "Overall Satisfaction" and "Quality of Rest/Sleep". Secondary focus of comparison of admission to delivery time, total days spent in hospital, time of delivery, cesarean section rate, and time of desired induction were also completed.

Results: The overall satisfaction was statically significant in favor for AM inductions. The overall satisfaction of AM was 3.57 (out of 4) while PM was 3.04 (p-value = 0.037). The quality of rest/sleep also favored AM inductions with AM obtaining 2.97 (out of 4) while PM obtained 2.38 (p-value = 0.011).

Secondary analysis of admission to delivery time was in favor of AM inductions, which delivered on average 7 hours faster, with the AM induction group averaging 15.46 hours compared to the PM with 22.44 hours (p-value = 0.002). The AM induction group had shorter hospital stays, 2.62 days compared to 3.15 (p-value = 0.003). Time of desired induction survey question indicated that the AM inductions preferred morning inductions by a 54% majority while the PM induction group had no preference with 38%, followed by 30.8% desiring evening inductions.

A significant finding of the study was that the cesarean section rate of the AM induction group was 11.4% compared to 27.6% in the PM group (p-value = 0.028).

Conclusions: Patient satisfaction depicts the quality level and value of the overall healthcare experience. Any controllable method to increase patient satisfaction should be evaluated, especially the process of labor induction. This pilot study demonstrates that AM inductions have significantly higher scores in patient satisfaction as well as quality of rest/sleep compared to PM inductions. When comparing the two options, AM inductions provide a shorter duration of admission to delivery time, a shorter total hospital stay, and lower cesarean section rates. Overall one can argue that AM inductions are superior in many aspects compared to PM inductions.
inductions. While future research is needed to further explore the implications of AM versus PM inductions, this study provides valuable information and direction of establishing scheduled induction protocols.
Poster #30
Resident Wellness: Effects of a Structured Curriculum

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Purpose: To determine if a structured wellness curriculum improves resident wellness.

Location: Community Hospital OB/GYN Residency Program

Methods: This project was six weeks in length and included an initial wellness survey, six weeks of wellness, and a follow up survey. The survey used to measure overall resident wellness was the Stanford Physician Wellness Survey. This survey was used with permission and is a validated survey that encompasses all aspects of wellness. This survey evaluates Professional Fulfillment by assessing Culture of Wellness, Efficiency of Practice and Personal Resilience. Sixteen of the domains in the survey were found to be applicable to this research project. For this project 14 wellness options were chosen that would incorporate physical, emotional and psychological wellness. Time involvement and ease of implementing the choices into the daily life of the residents was also considered when determining the wellness options. The residents first completed an initial survey and chose three of the 14 wellness options to complete for 6 weeks. The residents tracked their progress on wellness compliance forms given to them on day 1 of the study. Upon the completion of the 6 weeks period, residents turned in the wellness compliance forms and completed a final survey. For data analysis each of the survey domains had a set of questions with response options of 1 to 5. The sum of each domain was calculated for each resident on the initial and follow up surveys. The domain totals from all residents were then summed and divided by the number of residents to give a mean score for each domain on the initial and follow up surveys. These results were then run for statistical significance.

Results: Thirteen of the fifteen residents in the program completed all aspects of the research project. The demographics of the residents included 3 PGY 1, 4 PGY 2, 3 PGY 3 and 3 PGY 4, 7 males, 6 females, 6 single and 7 married residents. All 14 wellness options were chosen at least once, and most were completed with greater than 80% compliance. After analyzing the data from the initial and follow up surveys, statistically significant results were found.
in four of the 16 areas in the survey. Professional Fulfillment had an initial mean score of 19.4 and a follow up mean score of 21.3 a mean increase of 1.9 $p = 0.045$. Burnout had an initial mean score of 28.8 and a follow up mean score of 23.6 a mean decrease of 5.2 $p = 0.017$. Self-Defined Burnout had an initial mean score of 3.0 and a follow up mean score of 2.4 a mean decrease of 0.6 $p = 0.028$. Negative Impact of Work on Professional Relationships had an initial mean score of 14.3 and a follow up mean score of 11.7 a mean decrease of 2.6 $p = 0.027$. The other 12 areas of the survey did not show a statistically significant change.

**Conclusion:** The four domains that showed a statistically significant change are major factors in resident wellness. This study shows that a structured wellness curriculum can improve resident wellness. It also shows that when implementing a wellness curriculum care must be taken to include all aspects of wellness including physical, emotional and psychological wellness. Further research on this topic needs to be done to find the best wellness options to make a well rounded curriculum.
Effectiveness of Postpartum Education in the ICU Setting

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Objective: To determine whether the current education model in the ICU setting at Aultman Hospital is effective for management of routine postpartum care.

Setting: Community Hospital

Background: The obstetric population has continued to become more high risk with consistent transfers to ICU postpartum. The incidence of ICU admission related to pregnancy is 0.1-0.8% with 75% being postpartum admissions. A total 1-3% of all pregnancies require critical care treatment including those admitted to ICU. When ICU admission is required in the obstetric population, the mortality rate increases and ranges from 2-11%. There is an increase in the development of obstetric intensive care units or special delivery units across the country, but in many community hospitals such development is not possible. At Aultman Hospital the current model of education was tested to see if it is sufficient to manage routine postpartum care performed in the ICU setting where there are regular admissions to warrant the need of education, but admissions are not close enough together to become part of the routine.

Methods: The nursing education in the ICU at Aultman Hospital is nontraditional in the sense that it is not classroom based, but instead is taught online through the Learning Management System (LMS). The trainings typically consist of a learning module or slide presentation followed by a test, which generally allows multiple attempts.

In this study, the SICU (Surgical Intensive Care Unit) nurses were given a pre-test to establish a baseline of knowledge relating to normal postpartum care as well as warning signs and to assess a potential knowledge deficit when performing routine postpartum care. The test was given consistent with current education practices at Aultman Hospital. The ICU nursing staff was supplied with a PowerPoint presentation online followed by a post-test, which was identical to the pre-test. The test questions consisted of routine postpartum care; including fundal height exams, lochia assessment, perineum assessment, breast assessment, signs of infection, when to notify the provider, and steps to...
follow when an abnormal amount of lochia or frank vaginal bleeding is encountered.

In the SICU there are full-time, part-time and casual nurses on staff. There are also traveling nurses and nurse practitioners. The exclusion criteria included any traveling nurses as there was a possibility that they would be unable to complete the entire training and testing. The nurse practitioners were excluded as they would not be performing the routine postpartum care, and mainly only respond to problems that arise. Also, anyone who did not complete the entire study was also excluded from the study. Of the remaining available nurses, 31 could have completed the study, 11 were excluded as 5 did not complete the pre-test, 2 did not complete the post-test, and 4 were not able to complete any part of the study.

To assure the nurses privacy, each test was graded automatically by the LMS and each nurse was assigned an identification number, which remained unchanged on the pre-test and post-test. All involved in the calculation of scores and outcome of the study were blinded to the individual's scores.

**Results:** Of the 31 RNs that could have completed the study, 11 were excluded; 5 nurses did not complete the pre-test, 2 nurses did not complete the post-test, and 4 nurses did not make an attempt at the education or testing. The overall score for the pre-test was 72.05% (15.85/22). The post-test results showed an overall improvement for the group of 16.36% (19.45/22) for average score of 88.41%. There were two scores that did not change, and one that decreased by 4.55%. Of those nurses that improved, their scores increased by an average of 19.52%.

The questions with the most significant improvement were questions regarding routine postpartum exam, breast assessment, fundal height exam, and signs of infection. There were 3 questions that had a significant improvement from pre-test to post-test, but still only had 50% of the nurses answer correctly on the post-test. All three questions were regarding postpartum bleeding including, when to notify the provider, signs of cervical laceration, and possible causes of uterine atony.

**Conclusion:** In a community hospital where obstetric ICU is not available, ICU nursing education online with post-education testing has demonstrated to be effective by increasing the overall scores from pre-test to post-test. A follow-up exam, without the online education, comparing the original pre-test scores could demonstrate knowledge retention and give further insight, including how frequent the education material should be review to demonstrate better knowledge retention. The education could also be improved
upon and retested to assure better understanding and overall improvement in nursing knowledge of postpartum care.
Poster #32
First Cesarean On Time

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Purpose: Within one year, via Plan-Do-Study-Act cycles, we aimed to improve on-time performance of each day's first scheduled cesarean to 80%. Our birth center's increasing volume created the need to perform more procedures. When the first scheduled cesarean of a given day starts late, this delays other patients' care, impacting both patient safety and satisfaction. Even though this has been a chronic frustration for personnel and providers, previous efforts have not succeeded as each stakeholder group expects the others to change their workflows.

Methods: We defined "on-time" as the skin incision performed no later than the scheduled time. Our Labor and Delivery Collaborative Practice team, comprised of providers and personnel, first established baseline data. We then developed expectations for and an audit tool to measure each key step in the process, including: labs completed and orders in place prior to patient arrival, patient arrival two hours before scheduled incision, arrival of the obstetrician at bedside at least 30 minutes prior to incision, patient entry into the operating room 30 minutes prior to planned incision to place anesthesia, and incision time. Baseline data and performance goals were communicated to all providers and personnel via presentations at key meetings and an e-mail. Strong support for the performance goals was voiced by all stakeholders. Performance on on-time surgery starts and process steps was disseminated monthly via presentations and e-mails. When, after three months, this did not generate improvement we began sending e-mails within 7 days after each case, often same day, to the anesthesiologist, obstetrician, and charge nurse, requesting that they share their perspectives on the reasons for delay. The reasons for the delays were then adjudicated and disseminated in aggregate, without identifying individuals or individual cases, within the monthly performance updates. When a cesarean began on time, a celebratory e-mail was sent to the involved anesthesiologist, obstetrician, and charge nurse. Beginning in month five, for all on-time cases, the three received public recognition in the monthly notifications. During month nine of the effort, nursing leadership withdrew the resources enabling the audit of many of the process measures. Patient arrival time, operating room roll-in time, and incision time
could still be extracted from the electronic medical record. The project continued for 15 months.

Results: Overall performance for on-time surgery starts and starts within 15 minutes of scheduled time improved (p=0.036 and p=0.004, respectively). When the baseline data and final quarter data are compared, performance improved from a baseline of 8% on-time and 15% within 15 minutes of the scheduled time to 17% (p=0.045) and 59% (p=0.001), respectively. Our median delay in scheduled roll-in into the operating room improved from 34 minutes late to 10 minutes late (p=0.01). Comparing performance at first quarter with the last quarter of the intervention showed improvement of the operating room roll-in time from a mean of 45 minutes late to 19 minutes late (p=0.001). During the first nine months, nurses began audits for an average of 64% of cases. The audits included four process measures that could not be subsequently obtained once the audit tool was no longer utilized. When comparing baseline performance with that at the end of the audit period, only physician time at bedside improved, from 50% to 79% (p=0.01). The rates at which preoperative labs were completed and providers placed orders prior to arrival remained unchanged. Patients were no more likely to arrive on time. The reasons for delays remained multifactorial. Nursing leadership's frustration with others' unwillingness to change their workflows led to withdrawal of the audit resources. Because of this, in combination with continued resistance to formal workflow changes from all stakeholder groups, no targeted process measure interventions were deemed possible. In response to our data, and overall patient volume data, beginning in month 10 of the study, anesthesiology doubled their resources and now provide two full weekday teams. This did not improve our overall performance.

Conclusions: Although we did not reach our goal of 80% on-time performance, we significantly improved the rate of on-time cesareans and reduced the mean delay in the start of the first daily cesarean, improving patient flow and care within our birth center. Improved patient flow was accomplished via an e-mail: an educational tool, as our culture did not support a stronger intervention. While educational interventions are usually weak and short-lived, the use of a timely e-mail, targeted to key individuals, combined with monthly group report-outs proved effective. This approach enabled each patient’s care team to pursue the target on behalf of their patient while their larger stakeholder groups publicly awaited the other groups’ changes. This technique may help others facilitate important process improvements when key stakeholders cannot reach consensus on whose workflows should change.
Cesarean Section Surgical Site Complication Rates Following Adhesive Strips or Topical Skin Glue for Skin Coverage

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Purpose: To investigate whether the use of adhesive strips or topical skin glue for skin coverage after subcuticular skin closure during cesarean section is associated with the rates of surgical site complications, specifically wound infection and wound separation.

Methods: We carried out a retrospective study of women who underwent cesarean section with subcuticular skin closure followed by either adhesive strips or adhesive skin glue at University of Illinois Hospital and Health Sciences System in the first 6 months of 2014 and 2015. Outcomes were assessed in the thirty-day postpartum period. We included patients over the age of 18 who underwent a cesarean section with documented subcuticular skin closure with clearly documented skin coverage.

Results: Of the 500 women who met inclusion criteria, 15 (3.0%) were diagnosed with wound infection and 32 (6.4%) were diagnosed with a wound separation in the thirty days following cesarean section. Five (2.8%) of the 177 patients who received adhesive strips and 10 (3.0%) of the 323 patients who received topical skin glue were diagnosed with wound infection. There was no statistical difference in the rate of wound infection between the groups (p=0.865). Wound infection rates in the two groups were not associated with patient race, smoking status, diagnosis of diabetes, preeclampsia or chorioamnionitis or whether or not the patient labored or received antibiotics. Patients with higher body mass index had a statistically significant higher rate of wound infection (M= [-6.15], SD = [2.255]) than the total group, t(498)= [-2.73], p= [.007].

A total of 15 (8.4%) of those who received adhesive strips and 17 (5.2%) of those who received topical skin glue were diagnosed with wound separation postoperatively. There was no statistical difference in the rate of wound separation between the two groups (p= 0.163).

Conclusion: Overall, we found a low wound infection rate of 3% in our diverse, urban population, in concordance with national rates for surgical site infection. There is no
significant association between coverage, with either skin adhesive strips or topical skin glue on surgical site infection or wound separation in this review. There is, however, a higher incidence of wound infection with increasing body mass index, which is not unexpected. Future research may consider collecting a larger sample to address low base rates of infection and separation.
Poster #34
Application of Porcine Urinary Bladder Matrix to the Vaginal Cuff: Does it Reduce Post-Hysterectomy Infections and Complications?

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Purpose: Urinary bladder matrix (UBM) is a porcine-derived extracellular matrix, containing collagens and other proteins that promote tissue regeneration and wound healing. Functioning as a biological scaffold, UBM is gradually absorbed by the body following implantation and has shown promise for minimizing postoperative erosions and infections. To date, few studies have evaluated UBM application to the lower abdominal cavity and none have focused on the site of vaginal closure following hysterectomy. In this study, we evaluated the utility of UBM for reinforcement and healing of the vaginal cuff.

Methods: We retrospectively studied the postoperative infection and complication outcomes of all women who underwent hysterectomy performed by a single surgeon within our hospital system. Utilizing an interrupted time-series design, we compared outcomes between surgeries without UBM application to the vaginal cuff during May 2007-August 2012 (Period 1) and those with UBM application (MicroMatrix® product manufactured by Acell, Inc.) during September 2012-December 2016 (Period 2). Diagnoses and readmissions within 30 days of surgery were studied as relating to abscess or cellulitis, urinary tract infection (UTI), wound dehiscence, excessive fluid loss/accumulation, and intestinal obstruction. To balance patient characteristics and assess change in diagnosis and readmission odds between periods, we used logistic regression with stabilized inverse probability of treatment weighting. Weights were computed separately for each of 5 consecutive subperiods, and diagnostic testing was performed to ensure common support and balanced patient characteristics between periods, as well as corresponding subperiods. As between-period change in diagnosis or readmission odds may result simply from unaltered temporal change (i.e., a consistent non-zero slope) across periods, we
recognized differences in slopes or both means and slopes as potentially necessary to infer an effect of UBM use. To test for unequal means and slopes, the main and interaction effects of period and time-within-period (i.e., number of days since period start) were incorporated into all models. Non-significant interaction effects were removed from all models and odds ratios (OR) with 95% confidence intervals (CI) were estimated, representing measures of effect size.

**Results:** In total, 2,195 patients underwent hysterectomy during the study. Following patient exclusions due to supracervical/subtotal hysterectomy, multiple partial hysterectomies, and surgery location outside of two primary hospitals, 2,039 patients remained in the study during Periods 1 (n=1,079) and 2 (n=960). UBM products were variable in early Period 2, with 42% sheet only and 45% sheet-plus-hydrated powder use in 2012. In 2013, applications included 56% hydrated powder only, 27% sheet only, and 12% sheet-plus-hydrated powder. In 2014-2016, over 90% of patients received hydrated powder only. Examination of patient characteristics revealed greater use of anti-infectives and hormonal therapies in Period 1 and employment, obesity, ASA physical status class ≥3, respiratory disorders, sleep apnea, recent cancer diagnosis, and history of abdominal surgery more prevalent in Period 2. Following weighting, between-period and between-subperiod balance and common support were achieved. Odds of infection and complication diagnoses rose sharply and significantly during the first year of Period 2 for all outcomes of interest, except wound dehiscence and excessive fluid loss/accumulation. Despite such increases, common slopes between periods suggested similarly significant within-period declines for all outcomes but UTI. Moreover, periods showed similar overall or late-period odds of diagnosis for all outcomes but excessive fluid loss/accumulation. For UTI, a period x time-within-period interaction revealed significant decline in diagnosis odds within Period 2 only. For fluid loss/accumulation, mean odds were significantly less in Period 2 (OR 0.40, 95% CI 0.24-0.66). Odds of infection and complication-related readmissions also showed common declining slopes. However, mean odds of readmission were less in Period 2 than 1, with significant between-period differences observed for fluid loss/accumulation (OR 0.34, 95% CI 0.15-0.77) and intestinal obstruction (OR 0.48, 95% CI 0.26-0.88).

**Conclusions:** Despite abrupt increases in odds of postoperative infection and complication diagnoses during early UBM use, study periods showed similar overall or late-period odds. For all outcomes, either common declining slopes were observed in the odds of diagnosis or decline was
significantly greater during UBM use. Moreover, related readmissions were typically less likely during UBM use, with common declining slopes between periods. Changes in hospital policies regarding diagnostic criteria and change in electronic medical record platform were possible drivers of reduced readmission rates. Patterns in diagnosis may also reflect the provider's learning curve in UBM product selection and application. While UBM may decrease postoperative infections and complications, a randomized controlled trial should be considered for estimating its true effect and overcoming uncontrolled heterogeneity.
Poster #35

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Purpose:
1. To describe a case of cesarean scar pregnancy (CSP) whose management complications represent a maternal mortality "near miss" and serves as a warning to others.

2. To critically review international literature on this under-appreciated but increasingly common and deceptively dangerous cause of ectopic pregnancy.

3. To propose an effective initial CSP management protocol for use until eventual prospective clinical studies can be completed and this treatment algorithm refined.

Methods: Case Report. Description of a 35 year old G:8 P:7 Hispanic woman with 3 prior C-sections diagnosed by ultrasound at 7-8 weeks gestation with a CSP just prior to an elective pregnancy termination. Subspecialty referral confirmed the diagnosis and the patient declined surgical management. Therapy consisted of single dose intramuscular methotrexate with insertion of a double balloon intrauterine catheter prior to discharge from hospital an hour later. The patient then traveled 300 miles home but within 48 hours became septic. She still desired medical management but progressed to diagnostic laparoscopy after 3 hours of observation. When a collection of fluid and tissue were visualized on the uterine surface, open laparotomy was required to dissect infected gestational tissue from the bladder. Extensive necrosis and inflammation of the uterine scar resulted in a total abdominal hysterectomy. Despite I.V. antibiotics an evaluation of progressive postoperative pulmonary symptoms on day 3 eventually revealed a pelvic abscess by day 5. Percutaneous drainage was required. The patient was discharged home on day 7 with oral Levaquin and doxycycline and had no further complications.

Results: With nearly a third of all births in the United States now performed abdominally, the incidence of cesarean scar pregnancy (CSP) has risen proportionally. A CSP occurs when a subsequent pregnancy implantation is at or very near a previous surgical scar. The more previous cesareans the greater the risk of CSP. The incidence of CSP has been
reported to be between 1/531 and 1/2500 repeat cesarean sections. The clinical impact of this rarest form of ectopic pregnancy is enormous due to the potential for a catastrophic outcome. Nevertheless, surprisingly few obstetricians and other childbirth providers have ever managed a CSP while some deny ever hearing of a case.

A critical review of the international CSP literature includes a few limited retrospective cohort studies of CSP but mostly scattered case reports providing anecdotal management guidance at best. Although there have been reports of live births with CSP, significant maternal morbidity has also been described; therefore, most cases are aggressively terminated in the first trimester. Both surgical and nonsurgical therapy as well as various combinations of agents and procedures have been described in the literature with varying outcomes. Reported retrospective cohort studies of CSP range in size from 20-100 patients and took years to accumulate.

Consider the difficulty of planning a prospective study trial using just 200 cases of CSP, divided into multiple arms. This would require 1,000,000 viable pregnancies with a 20% repeat Cesarean rate and a CSP incidence of 1:1000. The logistics and time required are mind boggling. Fortunately the existing literature can provide considerable guidance using the 200-300 reported cases that are currently available, despite some of the obvious limitations noted above.

**Conclusions:** Based on a critical review of existing CSP world literature the following protocol is recommended for first trimester therapy, assuming appropriate consultation is completed and patient consent is obtained.

1. A single intra-gestational sac injection of methotrexate (25 mg/ml solution) under ultrasound guidance in an outpatient setting resulted in 98% complete resolution with no adverse events or additional therapy. Serum β-hCG levels rise initially but return to normal within 6-7 weeks. A double dose (50 mg/ml solution) with overnight fasting also results in an almost complete cure even more quickly.

2. On the other hand, patients receiving single dose intra-muscular methotrexate (50 mg/m² body surface area) were all failures and required subsequent dilatation and evacuation therapy. Multiple doses (up to 5) of I.M. methotrexate, while usually successful, are inferior to single dose direct gestational sac injection because of increased adverse side effects and extended length of hospital stay.
Poster #36
An Interesting Case of Transitional Cell Carcinoma of the Endometrium

Tra V Pham, MD, Thomas Buekers, MD, Rabbie K Hanna, MD

Henry Ford Health System, Detroit, MI

Background: Transitional cell carcinoma (TCC) of the endometrium, a relatively rare subtype of endometrial carcinoma, resembles papillary carcinoma of the urothelium. Of note, there are only 21 reported cases in the literature. TCC is typically seen in postmenopausal women and symptoms at diagnosis include postmenopausal bleeding, intermenstrual bleeding, anemia, and/or abdominal pain.

Case Report: A 60-year-old nulliparous woman initially presented to her primary care provider for postmenopausal bleeding. She reported vaginal discharge, cramping, with continuous spotting for one-month duration. She had an ultrasound done which revealed a 8.3 x 3.6 x 4.0 cm uterus with a 1.5 cm endometrial stripe with normal ovaries. She underwent a dilation and curettage with hysteroscopy with pathology findings of endometrioid adenocarcinoma FIGO grade 3. Computed tomography of the abdomen and pelvis showed no evidence of metastatic disease.

She underwent a robotic-assisted hysterectomy, bilateral salpingo-oohorectomy, pelvic and para-aortic lymph node sampling, and cystoscopy. Her postoperative course was uncomplicated. Pathology revealed stage 1A, grade 3 mixed endometrial carcinoma with transitional cell differentiation (90%), clear cell carcinoma (5%), and serous carcinoma (5%). The case was discussed at the multidisciplinary tumor board with recommendations for adjuvant vaginal brachytherapy and carboplatin/taxol chemotherapy.

Pathology Findings: Tumor appeared tan-white, friable, necrotic and exophytic on anterior endometrium with separate aggregate tumor fragments consisting of similar tan-white friable necrotic tissue. The greatest dimension of the lesion was 2.0 x 1.8 cm with invasion less than 50% of the myometrium.

The histologic studies showed a unique morphology. Majority of the tumor was formed by papillary low-grade transitional cell tumor associated with endometrioid adenocarcinoma cells, suggesting endometrioid adenocarcinoma with transitional cell differentiation. The endometrioid adenocarcinoma also demonstrated focal mucinous and squamous differentiation.
In addition, multiple foci demonstrated marked nuclear atypia in glandular and papillary growth patterns. Although the foci exhibited wild-type pattern of p53 expression, they also show a high-grade serous carcinoma component. Furthermore, scattered areas of solid nodules, tubules of adenocarcinoma with clear cytoplasm were also identified. These areas were associated with marked nuclear atypia and hyaline globules with Napsin-A expression, which favored to represent foci of clear cell carcinoma.

Due to the mixed phenotype and the patient's age, the tumor was tested for mismatch repair protein expression, which showed intact nuclear expression of MLH-1, PMS2, MSH2, and MSH6. Immunohistochemical staining showed wild-type expression of p53, CK5/6 and p40 focal positivity, estrogen receptor positive, progesterone receptor positive, and Napsin-A focal positivity.

Discussion: Transitional cell carcinomas are relatively rare neoplasms of the female genital tract. Although it is most common in the ovary, there are limited case reports identifying this distinct subtype of endometrial carcinoma with morphologic features of urothelial differentiation while retaining a Mullerian immunoprofile. The classification of TCC as recommended by Lininger et al. is defined when >50% of the tumor is composed of TCC. However, the World Health Organization requires >90% of the tumor to resemble TCC to be considered pure TCC of the endometrium. Nevertheless, because of the limited information regarding TCC, it is important to note the presence of TCC in any amount to further elucidate the clinical impact of this morphological subtype.

Lininger et al. report that transitional cell differentiation may be a result from genetic mutations or local genomic imprinting; however, these hypotheses remain speculative and require further studies. Furthermore, they suggest that TCCs appear to have an aggressive invasive pattern; however, they concluded that it may not represent an aggressive histological variant of endometrial carcinoma and recommend radiation therapy as a reasonable adjuvant therapy.

The varying adjuvant therapies reflects the limited knowledge on this variant; therefore, this case study helps to broaden the morphological and histological continuum of endometrial carcinomas for further identification and management of this unique subtype.
Examining the Relationship Between Differing Institution-Based Prenatal Diabetes Treatment Algorithms, Glucose Management and Perceived Patient Self-Efficacy

Liliana M Palencia, MD¹, J. Ricardo Loret de Mola, MD¹, Kristina Roloff, MD², Teresa Wilson, BA¹, Kathleen Groesch, MS¹, Paula Diaz-Sylvester, PhD¹, Sandraluz Lara-Cinisomo, MD³

Southern Illinois University School of Medicine, Springfield, IL¹, Arrowhead Regional Medical Center, Colton, CA², University of Illinois, Urbana-Champaign, IL³

Background: Diabetes, gestational or pre-existing, is rapidly growing in the United States population. Diabetes can result in negative antepartum and postpartum outcomes and can also have a negative effect on a woman's perceived self-efficacy. Self-efficacy is related to diabetic management, particularly as patients can learn to control their diabetes. While diabetes is often seen in pregnancy, treatment and referral protocols are often institution specific. Our objective is to explore the feasibility of a study investigating specific diabetes management protocols, glucose control, self-efficacy and patient demo-graphics in two diverse outpatient settings.

Methods: This is an observational, cross-sectional study of a diverse sample of English- and Spanish-speaking pregnant women undergoing management for Type 1, Type 2 or gestational diabetes at prenatal clinics in California and Illinois. Participants are enrolled between 27 weeks and 40 weeks gestational age. Once enrolled, participants complete a demographic questionnaire, a diabetes education survey, and a self-efficacy scale specific for diabetes. A hemoglobin A1c level and a random blood glucose value are also collected at the time surveys are completed. The time of last meal is noted. Additionally, we compare whether patients receive their care instruction at a specialized diabetes clinic (California site) versus a standard prenatal clinic (Illinois site) that incorporates referrals to diabetic educators and endocrinology. Data collection is underway. The target enrollment across the two sites is 228. Differences by institution in enrollment, demographic characteristics, type of diabetic education, patients’ diabetes self-efficacy, random blood glucose levels, and hemoglobin A1c levels will be compared. Summary statistics on each measure will be computed and chi-square tests and analysis of variance will be conducted to determine differences on each measure by site. In addition, data on referrals and institution specific diabetes management protocols and algorithms will be reported.
Results: Based on preliminary data to date, there are observable differences in sample characteristics by site. In Illinois (site 1), women are predominantly non-Hispanic, Caucasian and African-American (65% and 20 %, respectively), whereas in California (site 2) subjects are primarily Hispanic (80%). In addition, initial data analysis also suggests differences in diagnosis by site, with women from site 1 versus site 2 diagnosed with a greater percentage of Type I or Type 2 diabetes (25% versus 4 %). Gestational diabetes breakdown is similar at site 1 and 2 (70% versus 72%), with pre-diabetes and unknown classification (both self-reported) comprising the remainder of the population enrolled to date.

Conclusions: This study will provide information on a diverse patient population’s demographic characteristics, diabetes education, self-efficacy and glucose control. This study will also clarify if institution specific protocols and diabetes education practice influence glucose control during pregnancy. These findings will help elucidate the downstream effects of institution specific diabetes management on patient self-efficacy and glucose control.
Poster #38
Six Kids, Three Cervices, Two Uteri, Who Knew?

Alyssa M Erb, DO and Christopher Fabricant, MD

Jersey Shore University Medical Center, Neptune, NJ

Background: Uterine anomalies are common in young women, pelvic organ prolapse is not. In uterine didelphys, each cervix has its own corresponding endometrial cavity, and cervix to cavity discordance is not known to exist. Prolapse in the setting of Mullerian anomalies is uncommon, yet we present a case of a young grand multipara with both. MRI is considered the diagnostic test of choice with nearly 100% accuracy, though it failed to diagnose the third cervix in this case.

Case: N.C is a 44yo G6P6006 with a history of six uncomplicated, full term normal spontaneous vaginal deliveries who presented complaining of vaginal bulge. Exam revealed Stage 2 prolapse of a normal appearing uterus and cervix with complete prolapse of a second cervix. During surgery, a cervix in triplicate was noted, with the double cervix completely prolapsed. She underwent an uncomplicated supracervical hysterectomy, bilateral salpingoophorectomy with sacral colpopexy of the left sided cervix, and total hysterectomy of the right sided uterus and cervices.

Conclusion: To our knowledge, this is the only case of cervix in triplicate that has been reported. This supports the growing amount of evidence for a new classification of Mullerian duct anomalies and begs the question of whether women with these anomalies are at higher risk of prolapse secondary to distortion of support anatomy.
**Poster #39**  
*The Disease of Kings Made a Surprising Appearance in the Obstetrics Clinic: Gout in Pregnancy*

Camille C Ricciardi, DO\(^1\), Yousef Elfanagely, MS\(^3\), Fred D. Fumia, Deborah Alpert, MD, PhD\(^1\), Debra Gussman, MD\(^1\)

Jersey Shore University Medical Center, Neptune, NJ\(^1\), Rutgers Robert Wood Johnson School of Medicine, New Brunswick, NJ\(^2\)

**Body of Abstract:** Our goal is to present a case of gout in pregnancy and to the literature on this rare occurrence in pregnancy.

**Case Summary:** A 27 year old at 30 weeks gestation presented with a 3 day history of excruciating pain in her right big toe. She was unable to stand. No other joints were involved. There was no history of trauma or fever. She has no past history of arthritis or kidney stones. There was a strong family history of gout. She was afebrile, without adenopathy or skin abnormalities. She had a classic podagra of the first metatarsal joint on the right. Labs performed showed a normal blood count, normal complete metabolic panel, uric acid 3.8 mg/L (2.4–6 mg/L), and there were a few amorphous urine crystals. Her symptoms markedly improved with one dose of methylprednisolone. A week of corticosteroid therapy resolved her symptoms completely. Her pregnancy continued without complication. She continued to do well without another attack for the following two years and through the next pregnancy.

**Conclusion:** Gout is uncommon in pregnancy. A review of the literature from 1958 to the present identified 12 pregnant patients suffering from gout. Patients ranged in age from 24-37 years and primigravida to gravida 10. Gout attacks were reported in all trimesters and post-partum. Patients had clinical courses which included joint pain, tophi, urinary stones, and uremia. Pregnancy complications included pregnancy loss, premature delivery, anemia, and pre-eclampsia. Our patient was fortunate. She responded clinically to a methylprednisolone dose pack. She did not develop any further episodes or pregnancy complications. If needed, she could have had the diagnosis confirmed with joint aspiration. Low dose corticosteroids and colchicine may be used for acute gout during pregnancy, whereas NSAIDs should be avoided. Some of the uric acid lowering medications can be used during pregnancy depending on the trimester of administration.
Central Prize Award

2005
“Impact of Chromic Catgut Versus Polyglactin 910 Versus Fast-Absorbing Polyglactin 910 Sutures for Perineal Repairs: A Randomized Control Trial”
Emmanuel Bujold, M.D.
Sainte-Justine Hospital, University Montreal
Montreal, Quebec

2006
“Comparison of the Adequacy of the Conventional Smears to Liquid-Based Preparations on Vaginal Cuffs”
Kory A. Harward, D.O.
Aultman Health Foundation/NEOUCOM
Canton, Ohio

2007
“Triggering Receptors of Myeloid Cells (TREM)-1: A Novel Marker of Infection Associated Spontaneous Preterm Birth”
Stephen J. Fortunato, M.D.
Centennial Women's Hospital
Nashville, Tennessee

2008
“Yolk Sac on Transvaginal Ultrasound as a Prognostic Indicator in the Treatment of Ectopic Pregnancy with Single-Dose Methotrexate”
Gary H. Lipscomb, M.D.
University of Tennessee
Memphis, Tennessee

2009
“Soluble Fms-Like Tyrosine-1 (sFlt-1) Production is Enhanced During Hypertension in Response to Tumor Necrosis Factor-alpha (TNF-α) and Agonistic Autoantibodies to the Angiotension II Type I Receptor (ATI-AA)”
Marc R. Parrish, D.O.
University of Mississippi Medical Center
Jackson, Mississippi
Central Prize Award

2010
“The Impact of Genotype on Nifedipine Pharmacokinetics When Used as a Tocolytic”
David M. Haas, M.D.
Indiana University School of Medicine
Indianapolis, Indiana

2011
“Reducing Postpartum Hemorrhage with Removal of Placenta at 10 vs 15 Minutes: A Randomized Clinical Trial”
Everett F. Magann, M.D.
University of Arkansas for Medical Sciences
Little Rock, Arkansas

2012
“Harnessing the Electronic Health Record for the Provision of Population-Based Preconception Care”
Heather L. Straub, M.D.
Northshore University HealthSystem
Evanston, Illinois

2013
"Cost Effectiveness and Clinical Utility of Repeated Syphilis Screening in the Third Trimester in a High-Risk Population”
Linda-Dalal J. Shiber, M.D.
MetroHealth/Case Western Reserve University
Cleveland, Ohio

2014
“A Study of Preterm Neonates: Delayed Cord Clamping vs. Delayed Cord Clamping plus Cord Stripping, a Prospective Randomized Trial. Is Cord Stripping Beneficial?”
Margaret S. Krueger, D.O.
Univ. South Alabama Children's and Women's Hospital
Mobile, Alabama
Central Prize Award

2015
“Randomized Clinical Trial of Medical Therapy vs. Radiofrequency Endometrial Ablation in the Initial Treatment of Heavy Menstrual Bleeding: Treatment Outcomes and Life Quality Assessment”
Sherif A. Shazly, M.B., B.Ch.
Mayo Clinic
Rochester, Minnesota

2016
Gustavo Vilchez, M.D.
University of Missouri - Kansas City
Kansas City, Missouri

2017
“Association Between Gestational Weight Gain Adequacy and Composite Maternal and Neonatal Morbidity”
Han-Yang Chen, Ph.D.
The University of Texas Health Science Center
Houston, Texas

2018
“A Comparison of Vaginal Versus Buccal Misoprostol for Term Cervical Ripening in Women for Labor Induction at Term (the IMPROVE Trial): A Triple Masked Randomized Controlled Trial”
David M. Haas, M.D.
Indiana University School of Medicine
Indianapolis, Indiana
President’s Certificate of Merit Award

2005
“Detection of Gestational Diabetes Mellitus by Homeostatic Indices of Insulin Sensitivity: A Preliminary Study”
Robert P. Kauffman, M.D.
Texas Tech University School Medicine
Amarillo, Texas

2006
“The Clinical Utility of Maternal Depression Screening Before and After Delivery”
Trent E.J. Gordon, M.S.
Evanston Northwestern Healthcare
Evanston, Illinois

2007
“In Vitro Chemotaxis of Human Bone Marrow-Derived Mesenchymal Stem Cells Following Exposure to Soluble Factors from Epithelial Ovarian Carcinoma Cell Lines”
Neelima Vegesna, M.D.
Southern Illinois University School of Medicine
Springfield, Illinois

2008
“In Vitro Vascular Reactivity in a Mouse Model of Preeclampsia Induced by Over-Expression of sFlt-1”
Fangxian Lu, M.D.
University of Texas Medical Branch
Galveston, Texas

2009
“Mild Preeclampsia Near Term: Deliver or Deliberate? The Prospective Randomized PreNaTe Trial”
Michelle Y. Owens, M.D.
University of Mississippi Medical Center
Jackson, Mississippi
President’s Certificate of Merit Award

2010
“Cervical Ripening for Induction of Labor: A Prospective Randomized Trial of Misoprostol versus Oxytocin in Conjunction with Foley Balloon”

Erica R. Downey, M.D.
Aultman Hospital
Canton, Ohio

2011

Suneet P. Chauhan, M.D.
Eastern Virginia Medical School
Norfolk, Virginia

2012
“Peripartum Complications with Cesarean Delivery: A Review of Maternal-Fetal Medicine Unit Publications”

Ibrahim A.I. Hammad, M.D.
Eastern Virginia Medical School
Norfolk, Virginia

2013
"Obstetric Recommendations in ACOG Practice Bulletins vs UpToDate: A Comparison”

Emily N. Myer, M.D.
Eastern Virginia Medical School
Norfolk, Virginia

2014
“The Effects of Metformin on Postpartum Weight Retention in Women with Gestational Diabetes: A Randomized, Placebo-Controlled Trial”

Jerrie S. Refuerzo, M.D.
Univ. of Texas Health Science Center at Houston
Houston, Texas
President’s Certificate of Merit Award

2015
“Acute Fetal Behavioral Response to Prenatal Yoga: A Single Blinded, Randomized Controlled Trial (TRY Yoga Study)”
Shilpa Babbar, M.D.
University of Missouri Kansas City
Kansas City, Missouri

2016
“Assessment of Twin Fetal Growth: Use of Singletons versus Twin-Specific Nomograms”
Hector Mendez-Figueroa, M.D.
University of Texas Health Science Center
Houston, Texas

2017
“Preoperative Cesarean Section Intravenous Acetaminophen Treatment for Postoperative Pain Control: A Randomized Double-Blinded Placebo Control Trial”
Sarah K. Shelton, M.D.
University of Tennessee Medical Center
Knoxville, Tennessee

2018
“Intention to Treat: Obstetrical Management at the Threshold of Viability”
Tiffany R. Tonismae, M.D.
Indiana University School of Medicine
Indianapolis, Indiana
Community Hospital Award

2005
“Multilocus Interactions as Maternal TNF-α, IL-6 and IL-6R Genes Predict Spontaneous Preterm Labor in European-American Women”
Stephen F. Fortunato, M.D.
Centennial Women's Hospital
Nashville, Tennessee

2006
“Amniotic Fluid Interleukin (IL)-1 and IL-8 Concentrations: Racial Disparity in Spontaneous Preterm Birth”
Stephen J. Fortunato, M.D.
Centennial Women's Hospital
Nashville, Tennessee

2007
“Racial Disparity in Maternal-Fetal Genetic Epistasis in Spontaneous Preterm Birth”
Stephen J. Fortunato, M.D.
Centennial Women's Hospital
Nashville, Tennessee

2008
“Distinct Pathophysiologic Pathways Induced by In Vitro Infection and Cigarette Smoke in Normal Human Fetal Membranes”
Stephen J. Fortunato, M.D.
Centennial Women's Hospital
Nashville, Tennessee

2009
“C-Reactive Protein and the Outcome of Emergency Cerclage”
Sogol Jahedi, M.D.
Advocate Lutheran General Hospital
Park Ridge, Illinois

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Community Hospital Award

2010
“Aberrant Fetal Growth and Mortality (Early, Late, and Postneonatal): An Analysis of Milwaukee Births, 1996-2007”  
Suneet P. Chauhan, M.D.  
University of Wisconsin School of Medicine  
Milwaukee, Wisconsin

2011
“Group B Streptococcus Colonization Leads to Early-Term Births”  
Stephen J. Fortunato, M.D.  
The Perinatal Research Center  
Nashville, Tennessee

2012
“Development of an OB Dashboard: Measuring What Matters in Perinatal Quality and Safety”  
Gregory L. Goyert, M.D.  
Henry Ford Health System  
Detroit, Michigan

2013
"Human Lysophosphatidylcholine Acyl-transferase 1 mRNA is Found in Amniotic Fluid and Maternal Serum”  
Robert A. Welch, M.D.  
Providence Hospital & Medical Centers  
Southfield, Michigan

2014
“Prospective Comparison of Efficacy, Outcomes, and Cost of Laparoscopic, Vaginal, and Robotic Approaches to Hysterectomy in a Community Institution”  
Dana M. Benden, M.D.  
Gundersen Health System  
La Crosse, Wisconsin
Community Hospital Award

2015
“A Randomized Control Trial of Foley Catheter Placement for Induction of Labor: Stylette vs. No Stylette”
Marie M. Forgie, D.O.
Aurora Sinai Medical Center
Milwaukee, Wisconsin

2016
“Severe Maternal Morbidity and Hospital Cost Among Hospitalized Deliveries in the United States”
Han-Yang Chen, Ph.D.
Aurora Health Care
Milwaukee, Wisconsin

2017
“Management of the Third Stage of Labor in Second Trimester Deliveries: How Long is Too Long?”
Jessica A. Behrens, D.O.
Aurora Sinai Medical Center
Milwaukee, Wisconsin

2018
“Newborn Birth Weight or Body Mass Index: Predictors of the Duration of Neonatal Brachial Plexus Palsy”
Leen Al-Hafez, M.D.
Houston Methodist Hospital
Houston, Texas
Young Investigator Award

2005
“Pregnancy Loss After First Trimester Viability in Patients with Sickle Cell Trait: Time for A Reappraisal?”
Michelle Y. Taylor, M.D.
University of Mississippi Medical Center
Jackson, Mississippi

2006
“An Evaluation of Health Care Providers' Sexual Violence Screening Practices”
Heather L. Littleton, Ph.D.
University of Texas Medical Branch
Galveston, Texas

2007
“Autologous Platelet Gel in Reduction of Pfannenstiel Cesarean Incision Drainage in Obese Women: A Randomized Controlled Trial”
Alexis G. Johnston, D.O.
Aultman Hospital
Canton, Ohio

2008
“Vascular Function in the Offspring Later in Life in a Mouse Model of Maternal Obesity and Preeclampsia”
Egle Bytautiene, M.D.
University of Texas Medical Branch
Galveston, Texas

2009
“Extended Antibiotic Prophylaxis for Prevention of Surgical Site Infections in Morbidly Obese Women Undergoing Combined Hysterectomy and Medically Indicated Panniculectomy: A Cohort Study”
Sherif A. El-Nashar, M.D.
Mayo Clinic
Rochester, Minnesota
Young Investigator Award

2010
“Phenazopyridine Does Not Improve Catheter-Associated Discomfort Following Gynecologic Surgery: Results of a Randomized Controlled Trial”
Charles K. Anderson, M.D.
Loyola Univ. Medical Center
Maywood, Illinois

2011
“Racial Difference in Gestational Age Specific Neonatal Morbidity: Further Evidence for Different Gestational Lengths”
Ryan W. Loftin, M.D.
University of Cincinnati
Cincinnati, Ohio

2012
“Knowledge of Nutrition During Pregnancy: A Survey of CAOG Members”
Stephanie T. Trexler, M.D.
Eastern Virginia Medical School
Norfolk, Virginia

2013
“When is the Optimal Time to Deliver Women with Stable Placenta Previa?”
Laura A. Hart, M.D.
UT Health - University of Texas Medical School
Houston, Texas

2014
“Differential Morbidity Among Preterm Small versus Appropriate for Gestational Age: Perhaps Unverifiable”
Caroline C. Marrs, M.D.
Univ. of Texas Health Science Center at Houston
Houston, Texas
Young Investigator Award

2015
“Body Mass Index and Magnesium Sulfate Neuroprotection: A Secondary Analysis From a Multicenter Randomized Control Trial”

Gustavo Vilchez, M.D.
Wayne State Univ./Detroit Med. Center
Detroit, Michigan

2016
“Diabetes During Pregnancy: Influence of Body Mass Index on Composite Morbidity”

Amy E. O’Neil Dudley, M.D., MPH
McGovern Medical School- UTHealth
Houston, Texas

2017
Among Diabetics Sonographic Estimated Fetal Weight and Composite Neonatal Morbidity: Suspected Appropriate versus Large for Gestational Age

Leen Al-hafez, M.D.
Houston Methodist Hospital
Houston, Texas

2018
“Hypertension Among Women of Reproductive Age: Impact of 2017 American College of Cardiology/American Heart Association High Blood Pressure Guideline”

Han-Yang Chen, Ph.D.
University of Texas Health Science Center
Houston, Texas
Dr. George Morley was one of America’s most distinguished gynecologic oncology surgeons and truly a memorable leader in the specialty. He spent his entire academic career at The University of Michigan, Ann Arbor where he was revered by students, house staff, colleagues and patients. Although Dr. Morley was widely published, it was in the operating room where he is fondly remembered for being a patient and effective teacher who inspired and motivated through talent and effervescent enthusiasm. Many of the principles he held most dear he collected in his beloved “Morleyisms,” a booklet of sayings he used to help with his mentoring and philosophy of living life to the fullest. Dr. Morley often said “I got to treat, and to train to treat – what more could anyone ask for:” a fitting epitaph for this great physician and humanitarian.
DR. GEORGE W. MORLEY
MEMORIAL PAPER

2006
“Endometrial Cells Identified in Cervical
Cytology in Women ≥ 40 Years of Age:
Criteria for Appropriate Endometrial Evaluation”
Heather N. Beal, M.D.
Southern Illinois University School of Medicine
Springfield, Illinois

2007
“Family History as a Risk Factor for
Pelvic Organ Prolapse”
Mary T. McLennan, M.D.
St. Louis University
St. Louis, Missouri

2008
“Laparoscopically-Assisted Uterine
Fibroid Cryoablation (UFC)”
Harriette L. Hampton, M.D.
University of Mississippi
Jackson, Mississippi

2009
“Activity of Dasatinib a Novel Small Molecule
Kinase Inhibitor of Both the SRC and ABL
Proteins in Human Endometrial Cancer Cells
Along With SRC Expression in a Large
Cohort of Surgically Staged Nonendometroid
(Type II) Endometrial Cancers”
Boris J.N. Winterhoff, M.D.
Mayo Clinic
Rochester, Minnesota

2010
“Radical Parametrectomy for Cervical
Cancer Found on Pathological Examination of
Extrrafascial Hysterectomy: A Cohort Study
& A Systemic Review of the Literature”
Sherif A. El-Nashar, M.D.
Mayo Clinic
Rochester, Minnesota
DR. GEORGE W. MORLEY
MEMORIAL PAPER

2011
“The Impact of the Mismanagement of Atypical Glandular Cell Pap Tests”
Jessica J. Shank, M.D.
University of Michigan
Ann Arbor, Michigan

2012
“Hysterectomy Trends Since 2003: The Impact of Technology on Traditional Routes”
Katherine E. Kowalczyk, D.O.
Grand Rapids Medical Education Partners
Grand Rapids, Michigan

2013
"Utilization of an Ex Vivo Human Placental Perfusion Model to Predict Potential Fetal Exposure to Carboplatin During Pregnancy”
Judith A. Smith, Pharm.D.
UT MD Anderson Cancer Center
Houston, Texas

2014
“A Prospective Study on the Incidence of Post-Operative Lymphedema in Women with Endometrial Cancer”
Elizabeth E. Hopp, M.D.
Medical College of Wisconsin
Milwaukee, Wisconsin

2015
“Tumor Diameter as a Predictor of Lymphatic Dissemination in Endometrioid Endometrial Cancer”
Danielle M. Greer, Ph.D.
Center for Urban Population Health
Aurora UW Medical Group
Milwaukee, Wisconsin
DR. GEORGE W. MORLEY
MEMORIAL PAPER

2016
“Outcomes of Vaginal Hysterectomy With and Without Perceived Contraindications to Vaginal Surgery”
Jennifer J. Schmitt, D.O.
Mayo Clinic
Rochester, Minnesota

2017
“Initial Impact of a Cervical Cancer Screening and Tracking Program Within a Community Health System’s Electronic Health Record”
Alexa R. Lowry, B.S.
Univ. of Wisconsin School of Medicine & Public Health
La Crosse, Wisconsin

2018
“Chronic Diseases, Self-Reported Health Status and Prescription Opioid Analgesic Use Among Women of Reproductive Age”
Han-Yang Chen, Ph.D.
University of Texas Health Science Center
Houston, Texas
Dr. Jack Pritchard is considered by many to be the “father of modern obstetrics.” At age 33 Dr. Pritchard became Chair of Ob-Gyn at the University of Texas Southwestern and Chief of Ob-Gyn at Parkland Hospital in Dallas, where he dedicated his career to being a relentless champion of patient care as the classic “triple threat:” teacher, researcher and clinician. As a pioneer in evidence-based medicine, the most important member of his life-long research team was his wife, Signe. In 1969 Dr. Pritchard became the editor of the 14th Edition of *Williams Obstetrics*, crafting this century old classic to remain as relevant today as in the past. Jack Pritchard’s greatest legacy “lies in the countless thousands of ob-gyn’s, those trained and those to follow, and in the countless millions of women and infants, some yet unborn, who will be enriched by his priceless contributions to the art and science of ob-gyn.”
DR. JACK A. PRITCHARD MEMORIAL PAPER

2006
“Expectant Management of Preterm Premature Rupture of Membranes and Non-Vertex Presentations: What Are the Risks?”
David F. Lewis, Jr., M.D.
Louisiana State University Health Science Center Shreveport, Louisiana

2007
“Comparison of Intracervical Foley Bulb Methodologist for Cervical Ripening: A Randomized Clinical Trial”
Jason M. Hoppe, D.O.
Aultman Hospital Canton, Ohio

2008
“Overestimation of Fetal Weight by Ultrasound: Does It Increase Cesarean Delivery for Labor Arrest?”
Jerrie S. Refuerzo, M.D.
University Texas Health Science Center Houston, Texas

2009
“Randomized Clinical Trial Evaluating the Frequency of Membrane Sweeping with an Unfavorable Cervix at 39 Weeks”
Everett F. Magann, M.D.
Navel Medical Center - Portsmouth Portsmouth, Virginia

2010
“Study of Obstetric Foley Techniques (The SOFT Trial): A Randomized Controlled Trial”
Megan J. Dejong, M.D.
Loyola Univ. Medical Center Maywood, Illinois
DR. JACK A. PRITCHARD
MEMORIAL PAPER

2011
“Cost-Effectiveness of Routine Third Trimester Antibody Screening in Rh Negative Pregnancies”
Jill E. Minger, M.D.
MetroHealth Medical Center
South Euclid, Ohio

2012
“Outcomes in Cephalic versus Non-cephalic Fetuses in the Setting of Preterm Premature Rupture of Membranes”
Jean R. Goodman, M.D.
Univ. Oklahoma Health Sciences Center
Oklahoma City, Oklahoma

2013
"Circulating Cell-Free Nucleic Acid (CCFNA) Screening for Fetal Aneuploidy: Changing the Landscape of Prenatal Screening and Diagnosis”
Lee P. Shulman, MD
Feinberg School Medicine/Northwestern University
Chicago, Illinois

2014
“Maternal and Cord Blood Levels of Docosahexaenoic Acid (DHA) After Commercially Available Supplementation”
Steffen A. Brown, M.D.
University of New Mexico School of Medicine
Albuquerque, New Mexico

2015
“UltraSound Examinations to Improve Detection of Fetal Growth Restriction in Uncomplicated Pregnancies: A Pilot, Multi-Center Randomized Clinical Trial (USE RCT)”
Ibrahim A. Hammad, M.D.
Eastern Virginia Medical School
Norfolk, Virginia
DR. JACK A. PRITCHARD MEMORIAL PAPER

2016
“Racial/Ethnic Disparity in Magnesium Sulfate Adverse Effects: A Sub-Group Analysis of a Multicenter Randomized Controlled Trial”
Gustavo Vilchez, M.D.
University of Missouri - Kansas City
Kansas City, Missouri

2017
“Risk of Neonatal and Infant Mortality in Twins and Singletons by Gestational Age in the United States”
Han-Yang Chen, Ph.D.
The University of Texas Health Science Center
Houston, Texas

2018
“Persistence and Extent of Neonatal Brachial Plexus Palsy: Association with Number of Maneuvers and Duration of Shoulder Dystocia”
Morgen S. Doty, D.O.
Univ. of Texas Health Science Center
Houston, Texas
Distinguished Professor Lectureship Honoring

Kermit E. Krantz, M.D.

“Dr. Krantz: The MMK and So Much More”
Introduction by
Tom G. Sullivan, M.D.
Presented by
John W. Calkins, M.D.

University of Kansas Medical Center
Kansas City, Kansas
October 20, 2008

KERMIT E. KRANTZ, M.D. 
(1923 – 2007)

Dr. Kermit Krantz was the world-renowned forefather of urogynecology and pelvic reconstructive surgery who is best known as the co-developer of the Marshall-Marchetti-Krantz (MMK) procedure for urinary stress incontinence. Trained as an anatomist, Dr. Krantz also invented the expandable women’s tampon still used today. An identical twin who was orphaned by age 13, Kermit Krantz spent 31 years as Chairman of Ob-Gyn at The University of Kansas Medical Center in Kansas City where he championed patient rights above all else. At the University Hospital he is credited with desegregating labor, delivery and the nursery. A brilliant diagnostician and devoted researcher who is fondly remembered for his irrepressible personality, Dr. Krantz was equally esteemed by the clinicians he trained and the countless patients he cared for.
DR. KERMIT E. KRANTZ
MEMORIAL PAPER

2008
“Glycine Absorption in Operative Hysteroscopy: The Impact of Anesthesia.”
Marie-Eve Bergeron, M.D.
Centre Hospitalier Universitaire de Quebec
Quebec, Canada

2009
William J. Todia, M.D.
MetroHealth/Case Western Reserve University
Cleveland, Ohio

2010
“Resolution of Chronic Pelvic Pain After Hysterectomy and Alternative Treatments: Does Depression Make a Difference?”
Lee A. Learman, M.D., Ph.D.
Indiana University School of Medicine
Indianapolis, Indiana

2011
“Cervical Cancer Screening in the United States 1993-2010: Characteristics of Women Who are Never Screened”
Suneet P. Chauhan, M.D.
Eastern Virginia Medical School
Norfolk, Virginia

2012
“Burnout Among the Alumni from the University of Kansas Obstetrics and Gynecology Residency Programs”
Kimberly A. Brey, M.D.
University of Kansas School of Medicine
Kansas City, Kansas
DR. KERMIT E. KRANTZ MEMORIAL PAPER

2013
“Cervical Cytology and Histology in Women Following Solid Organ Transplant, A Longitudinal Cohort”
Margaret E. Long, M.D.
Mayo Clinic
Rochester, Minnesota

2014
“Evaluation of Ethics Education in Obstetrics & Gynecology Residency Programs: A Survey of Ob/Gyn Residency Program Directors”
John J. Byrne, M.D., MPH
University of Chicago
Chicago, Illinois

2015
“Molecular Evaluation of Fetal and Newborn Skeletal Dysplasia: Applying Next Generation Sequencing (NGS) to Providing Accurate Diagnostic Information”
Lee P. Shulman, M.D.
Feinberg School of Medicine/ Northwestern University
Chicago, Illinois

2016
“Correlates of Long-Acting Reversible Contraception versus Sterilization Use in Advanced Maternal Age”
Shelby N. Apodaca, M.D.
Texas Tech University - El Paso
El Paso, Texas

2017
“Randomized Clinical Trial: Diathermy versus Scalpel in Abdominal Wall Incisions During Repeat Cesarean Delivery”
Martin J. Caliendo, M.D.
Women and Children's Hosp. of Buffalo
Buffalo, New York
DR. KERMIT E. KRANTZ
MEMORIAL PAPER

2018
“How Long is Too Long? Intraoperative Time Intervals and Umbilical Artery pH Depression at Scheduled Cesarean”
Rebecca R. Rimsza, M.D.
Saint Louis Univ. School of Medicine
St. Louis, Missouri
Dr. Bryan Cowan
FAR (Fellows and Residents)
Research Network Award

INAUGURATED 2012
Suneet P. Chauhan, M.D., P.I.

BRYAN D. COWAN, M.D.
(1949 – 2011)

Dr. Bryan Cowan was President of the Central Association of Obstetricians and Gynecologists at its 75th Annual Meeting in 2008. His distinguished career in reproductive endocrinology culminated as Chair of the Department of Obstetrics and Gynecology at the University of Mississippi Medical Center in Jackson. A lifelong dedication to mentoring and scholarship instilled a respect for research in all the residents and fellows he trained. Following Dr. Cowan’s premature death, the CAOG and his wife, Dr. Harriette Hampton, have jointly established this research network to honor his legacy and to encourage future women’s health care research.
Dr. Bryan D. Cowan
FAR (Fellows and Residents)
Research Network Award

2012
“Neonatal Brachial Plexus Palsy with Vaginal Birth After Cesarean: A Case Control Study”
Ibrahim A.I. Hammad, M.D.
Eastern Virginia Medical School
Norfolk, Virginia

2013
"Shoulder Dystocia is Strongly Associated With a Large Fetal Abdominal-Head Circumference Size Difference”
Theresa M. Conyac, M.D.
NorthShore University HealthSystem
Evanston, Illinois

2014
“Tocolysis in Patients with Advanced Preterm Labor: A Randomized Clinical Trail”
Ann R. Tucker, M.S.
University Mississippi Medical Center
Jackson, Mississippi

2015
“Use of Scoring Systems to Predict Prolonged Hospitalization and Severity of Acute Pyelonephritis in Pregnancy”
Amy M. Valent, D.O.
University of Cincinnati
Cincinnati, Ohio

2016
“Histologic Chorioamnionitis with Funisitis and Likelihood of Suspected Triple I at Term: A Case-Control Study”
Morgen S. Doty, D.O.
Saint Peter's University Hospital
New Brunswick, New Jersey

2017 and 2018
No Candidate Research Papers

202
Central Poster Awards

2005
“Variation in Expression of VEGF and VEGF Receptors in Ovarian Cancer Cell Lines”
Lisa M. Little, M.D.
Southern Illinois University School of Medicine
Springfield, Illinois

“Inquiry Into Shoulder Pain Following Laparoscopy”
David J. Mitchell, M.D.
Aultman Health Foundation
Canton, Ohio

2006
“The Impact of Combined Antibiotic Prophylaxis in Twin Pregnancies Complicated by Preterm Premature Rupture of Membranes”
Amy Farrell, M.D.
St. Louis University School of Medicine
St. Louis, Missouri

“Findings in Patients With an HCG Below 2000 mIU/ml Undergoing D&C to Exclude Ectopic Pregnancy”
Gary H. Lipscomb, M.D.
University of Tennessee Health Science Center
Memphis, Tennessee

2007
“The Impact of Maternal Obesity on Satisfactory Detailed Anatomic Ultrasound Image Acquisition”
Fadi R. Khoury, M.D.
CASE-MetroHealth Medical Center
Cleveland, Ohio

“Thrombotic Thrombocytopenic Purpura (TTP) in the Pregnant or Puerperal Patient 1955-2006: Primary of Recurrent Disease Sometimes Associated with Preeclampsia/HELLP Syndrome”
James N. Martin, Jr., M.D.
University of Mississippi Medical Center
Jackson, Mississippi

203
Central Poster Awards

2008
“The Neonatologist in Alleged Perinatal Asphyxia: The Obstetrician’s Best Friend”
Jonathan K. Muraskas, M.D.
Loyola University Medical Center
Maywood, Illinois

“Utilization of Delayed Umbilical Cord Clamping Among SMFM Membership”
Jessica L. Nyholm, M.D.
University of Minnesota
Minneapolis, Minnesota

2009
Non-Gynecologic Disease Detected at the Time of Gynecologic Surgery: A Continuing Diagnostic Challenge”
Allan A. Adajar, M.D.
St. Francis Hospital
Evanston, Illinois

"Early Return of Bowel Function After Gynecologic Surgery Using Chewing Gum”
James M. Clark, M.D.
Aultman Health Foundation
Canton, Ohio

"Vaginal Cleansing Before Cesarean Delivery to Reduce Postoperative Infectious Morbidities: A Randomized Controlled Trial”
David M. Haas, M.D.
Indiana University School of Medicine
Indianapolis, Indiana

"Fetal Gastroschisis: Epidemiological Characteristics and Maternal-Fetal Outcomes”
Kiran B. Tam Tam, M.D.
University of Mississippi Medical Center
Jackson, Mississippi
Central Poster Awards

2010

Outcomes Study: A Prospective/Observational Study of 2,331 Pubic Bone Stabilization Sling Procedures for Stress Urinary Incontinence. Is This Procedure Equal to other Anti-Incontinent Procedures?

Stephen H. Cruikshank, M.D.
West Va. Univ. School of Med. (Charleston Campus)
Charleston, West Virginia

Absence of the Fourth Ventricle in First-Trimester Fetuses: The Intracranial Translucency (IT) as a Potential Screening Tool for Fetal Neural Tube Defects in the Late First Trimester

Norman A. Ginsberg, M.D.
Feinberg School of Medicine of Northwestern University Chicago, Illinois

The Effect of Antenatal Corticosteroids on Maternal Serum Glucose Values in Women with Gestational and Pre-gestational Diabetes

Allison E. Kreiner, M.D.
Akron General Medical Center
Akron, Ohio

Unaffected Women with BRCA 1/2 Mutations and Their Use of Family History in Making Decisions Concerning Prophylactic Surgery

Carly J. Stewart, B.A.
Feinberg School of Medicine of Northwestern University Chicago, Illinois
Central Poster Awards

2011

"Diagnostic Accuracy of Saline Infusion Sonohysterography in Patients with Endometrial Polyps”
Riva N. Branch, M.D.
Advocate Illinois Masonic Medical Center
Chicago, Illinois

"Birth Attendant and Neonatal Mortality in Newborns Delivered at 37 Weeks or Later: United States, 2000-2004”
Han-Yang Chen, M.S.
Center for Urban Population Health and University of Wisconsin Madison, School of Medicine and Public Health
Madison, Wisconsin

Cesarean Section and the Effect on Bladder Capacity”
Jessica Fischetti-Galvin, D.O.
Jersey Shore University Medical Center
Neptune, New Jersey

"Uterine Rupture and Perinatal Morbidity and Mortality Associated with Oxytocin Use in a Trial of Labor with a Prior Uterine Scar”
Elliot M. Levine, M.D.
Illinois Masonic Medical Center
Chicago, Illinois
Central Poster Awards

2012

“An Unusual and Rare Presentation of Problems in a Community Hospital Can Place a Patient at Significant Risk: A Report of a Ten Year Old Female with a Pelvic Mass and Pain with Subsequent Surgery, Discharge, and an Acute Abdomen Three Weeks Later”

Michael G. Flax, M.D.
University of New Mexico
Albuquerque, New Mexico

“Gestational Length: How Long is too Long?”

Norman A. Ginsberg, M.D.
Northwestern Feinberg School of Medicine
Chicago, Illinois

“What Prevents Eligible Patients from Receiving Progesterone Therapy to Prevent Recurrent Preterm Birth”

Amanda Meyer, M.D.
Advocate Lutheran General Hospital
Park Ridge, Illinois

“Outcomes of Different Routes of Hysterectomy by Uterine Weight in Overweight and Obese Patients”

Danish S. Siddiqui, M.D.
Aurora Sinai Medical Center
Milwaukee Wisconsin
Central Poster Awards

2013

"The Impact of Diminished Ovarian Reserve on IVF Delivery Rates"
Tamara A. Adducci, M.D.
Medical College of Wisconsin
Milwaukee, Wisconsin

“Decreasing the Abdominal Approach with Evolution of Robotic Surgery Program for Treatment of Endometrial Cancer Patients in a Community Institution”
Dana M. Benden, M.D.
Gundersen Lutheran Medical Center
La Crosse, Wisconsin

“Retained Products of Conception in Patients with a Negative Urine hCG: A Case Series Report”
Carlos Fernandez, M.D.
Advocate Illinois Masonic Medical Center
Chicago, Illinois

"Neonatal Brachial Plexus Palsy in Cesarean Section"
Gloria T. Too, M.D.
Eastern Virginia Medical School
Norfolk, Virginia
Central Poster Awards

2014

“Clinico-Pathological Findings of Hysterectomy Specimens in Women with Abnormal Uterine Bleeding: Are We Taking Full Advantage of Minimally Invasive Techniques?”

Morgan A. Morton, M.D.
University of Nebraska Medical Center
Omaha, Nebraska

“Variation in Management Strategies and Outcomes Between Sterilized and Non-Sterilized Patients with Abnormal Uterine Bleeding”

Steven J. Radtke, M.D.
Southern Illinois Univ. School of Medicine
Springfield, Illinois

“The Use of Prostaglandin E₁ in Peripartum Patients with Asthma”

Megan C. Rooney Thompson, M.D.
University of Tennessee Medical Center
Knoxville, Tennessee

“Cervical Length Screening: Are Cervical Portio Measurements Acceptable for Screening?”

Melissa L. Verchio, M.D.
Aultman Hospital
Canton, Ohio
“Management of a Live Cervical Ectopic Pregnancy”
Carlos M. Fernandez, M.D.
Advocate Illinois Masonic Medical Center
Chicago, Illinois

“Diagnosing Pulmonary Embolism in Pregnancy: Are Biomarkers and Clinical Prediction Models Useful?”
Rachel Fournogerakis, M.D.
Advocate Lutheran General Hospital
Park Ridge, Illinois

“Risk Stratification and Prophylaxis of Venous Thromboembolic Events in Obstetrics and Gynecology”
Elliot M. Levine, M.D.
Advocate Illinois Masonic Medical Center
Chicago, Illinois

“Incidence of Chorioamnionitis and Risk of Neonatal Infection”
Angela D. Yates, M.D.
University of Tennessee Medical Center
Knoxville, Tennessee
Central Poster Awards

2016

“Development of a Novel Antibody-Based Assay for Simultaneous Identification of a Pathogen and Determination of its Antimicrobial Susceptibility”
Jonathan P. Faro, M.D./Ph.D.
The Woman's Hospital of Texas
Houston, Texas

“Decidualized Endometrioma of Pregnancy: A Cause for Concern”
Carlos M. Fernandez, M.D.
Illinois Masonic Medical Center
Chicago, Illinois

“Decline in Frequency of Acute PID Following Preventative Screening”
Elliot M. Levine, M.D.
Illinois Masonic Medical Center
Chicago, Illinois

“Obstetric Triage: A Model for Analysis of an Acute Care Service”
Megan L. Smith, M.D.
Aultman Hospital
Canton, Ohio
“The Effects of Volume and Timing of Blood Loss on Cefazolin Adipose Concentrations Using a Validated Physiologic Model”
Avinash S. Patil, M.D.
Valley Perinatal Services
Phoenix, Arizona

“Clinical Variance of the NTSV Metric”
Melissa Dennis, M.D.
Advocate Illinois Masonic Medical Center
Chicago, Illinois

“Radiofrequency Volumetric Thermal Ablation of Uterine Leiomyomata: Comparison with Other Methods”
Elliot M. Levine, M.D.
Advocate Illinois Masonic Medical Center
Chicago, Illinois

“Maternal Complications Associated with Periviable Delivery”
Robert M. Rossi, M.D.
University of Cincinnati College of Medicine
Cincinnati, Ohio
Annual Meetings & Presiding Presidents

1929
St. Louis, Missouri
Washington Univ-Barnes
Palmer Findley, M.D.* (Pro Tem)

1930
Excelsior Springs, Missouri
The Elms Hotel
Palmer Findley, M.D.*

1931
Chicago, Illinois
Shoreland Hotel
Fred J. Taussig, M.D.*

1932
Memphis, Tennessee
Peabody Hotel
Rudolph W. Holmes, M.D.*

1933
Milwaukee, Wisconsin
Hotel Schroeder
Norman F. Miller, M.D.*
Percy W. Toombs, M.D.*

1934
New Orleans, Louisiana
Roosevelt Hotel
Everett D. Plass, M.D.*

1935
Omaha, Nebraska
Fontenelle Hotel
Willard R Cooke, M.D.*

1936
Detroit, Michigan
Hotel Statler
Buford G. Hamilton, M.D.*

1937
Dallas, Texas
Adolphus Hotel
Jean P. Pratt, M.D.*

*Deceased
1938
Minneapolis, Minnesota
Radisson Hotel
Robert D. Mussey, M.D.*

1939
Kansas City, Missouri
Muehlenbach Hotel
Ralph A. Reis, M.D.*

1940
Indianapolis, Indiana
Lincoln Hotel
Jennings C. Litzenberg, M.D.*

1941
New Orleans, Louisiana
Roosevelt Hotel
Thomas B. Sellers, M.D.*

1942-1945
No Meetings, World War II

1946
Chicago, Illinois
Drake Hotel
John H. Moore, M.D.*

1947
Louisville, Kentucky
Brown Hotel
Earl C. Sage, M.D.*

1948
Denver, Colorado
Shirley Savoy Hotel
William Mengert, M.D.*

1949
Oklahoma City, Oklahoma
Hall of Mirrors, Municipal Auditorium
George Kamperman, M.D.*

1950
Milwaukee, Wisconsin
Hotel Schroeder
Lawrence M. Randall, M.D.*
1951
Detroit, Michigan
Hotel Statler
*Russell J. Moe, M.D.*

1952
Memphis, Tennessee
Peabody Hotel
*John I. Brewer, M.D.*

1953
Houston, Texas
Shamrock Hotel
*W. O. Johnson, M.D.*

1954
St. Louis, Missouri
Jefferson Hotel
*Harold C. Mack, M.D.*

1955
Columbus, Missouri
Deshler-Hilton
*Frank L. McPhail, M.D.*

1956
New Orleans, Louisiana
Roosevelt Hotel
*Harold L. Gainey, M.D.*

1957
Omaha, Nebraska
Sheraton-Fontanelle
*Arthur B. Hunt, M.D.*

1958
Minneapolis, Minnesota
Leamington Hotel
*Herbert E. Schmitz, M.D.*

1959
Chicago, Illinois
Drake Hotel
*Axel N. Arneson, M.D.*
1960
Kansas City, Missouri
Muehlenbach Hotel
**Isadore Dyer, M.D.***

1961
Cleveland, Ohio
Statler-Hilton
**Edwin J. DeCosta, M.D.***

1962
Dallas, Texas
Sheraton-Dallas
**Richard D. Bryant, M.D.***

1963
Denver, Colorado
Denver Hilton
**Zeph J.R. Hollenbeck, M.D.***

1964
Milwaukee, Wisconsin
Schroeder Hotel
**Kenneth E. Cox, M.D.***

1965
Cincinnati, Ohio
Netherland Hotel
**Herman L. Gardner, M.D.***

1966
Biloxi, Mississippi
Broadwater Beach Hotel
**William C. Keettel, M.D.***

1967
Detroit, Michigan
Sheraton-Cadillac
**C. Paul Hodgkinson, M.D.***

1968
Oklahoma City, Oklahoma
Skirvin Hotel
**C. Gordon Johnson, M.D.***
1969
Memphis, Tennessee
Sheraton-Peabody
Frederick J. Hofmeister, M.D.*

1970
Chicago, Illinois
Drake Hotel
George J.L. Wulff, Jr., M.D.*

1971
White Sulphur Springs, West Virginia
The Greenbrier
Thomas W. McElin, M.D.*

1972
St. Louis, Missouri
Stouffer's Riverfront Inn
James S. Krieger, M.D.*

1973
Scottsdale, Arizona
Camelback Inn/Mountain Shadows
David G. Decker, M.D.*

1974
New Orleans, Louisiana
Royal Sonesta
Russell J. Paalman, M.D.*

1975
Colorado Springs, Colorado
The Broadmoor
Brooks Ranney, M.D.*

1976
Houston, Texas
Shamrock Hilton
Raymond H. Kaufman, M.D.*

1977
Biloxi, Mississippi
Broadwater Beach Hotel
Clifford P. Goplerud, M.D.*
1978
Kansas City, Missouri
Crown Center
William B. Goddard, M.D.*

1979
White Sulphur Springs, West Virginia
The Greenbrier
John B. Nettles, M.D.

1980
Minneapolis, Minnesota
Radisson South
Tommy N. Evans, M.D.*

1981
Scottsdale, Arizona
Camelback Inn/Mountain Shadows
David G. Anderson, M.D.

1982
San Antonio, Texas
Hilton Palacio Del Rio
Warren H. Pearse, M.D.*

1983
Colorado Springs, Colorado
The Broadmoor
Sam P. Patterson, M.D.*

1984
Detroit, Michigan
Westin Renaissance Center
Kenneth J. Vander Kolk, M.D.

1985
New Orleans, Louisiana
Fairmont Hotel
George D. Malkasian, Jr., M.D.

1986
Milwaukee, Wisconsin
Hyatt Regency
Joseph C. Scott, Jr., M.D.
1987
Tarpon Springs, Florida
Innisbrook
*Stacy R. Stephens, M.D.*

1988
Salt Lake City, Utah
Marriott Hotel
*Preston V. Dilts, Jr., M.D.*

1989
Scottsdale, Arizona
Camelback Inn/Mountain Shadows
*James H. Maxwell, M.D.*

1990
Louisville, Kentucky
The Galt House
*L. Russell Malinak, M.D.*

1991
Colorado Springs, Colorado
The Broadmoor
*James P. Youngblood, M.D.*

1992
Chicago, Illinois
Westin Hotel
*John J. Sciarra, M.D., PhD*

1993
White Sulphur Springs, West Virginia
The Greenbrier
*William R. Anderson, M.D.*

1994
Memphis, Tennessee
Peabody Hotel
*Bruce H. Drukker, M.D.*

1995
Palm Desert, California
Marriott's Desert Springs
*Melvin V. Gerbie, M.D.*
1996
Houston, Texas
Lincoln Post Oak
*James G. Blythe, M.D.*

1997
Scottsdale, Arizona
The Scottsdale Princess
*Karl C. Podratz, M.D., PhD*

1998
Kansas City, Missouri
Westin Crown Center
*Washington C. Hill, M.D.*

1999
Maui, Hawaii
Ritz Carlton Kapalua
*John C. Morrison, M.D.*

2000
Chicago, Illinois
Fairmont Hotel
*Robert J. Sokol, M.D.*

2001
No Meeting – Cancelled After 9/11

2002
Las Vegas, Nevada
Bally's Hotel & Casino
*Paul G. Tomich, M.D.*

2003
La Jolla, California
Torrey Pines - Hilton
*Sherman Elias, M.D.*

2004
Washington, D.C.
Omni Shoreham Hotel
*Abbey B. Berenson, M.D.*
2005
Scottsdale, Arizona
Camelback Inn Resort
*Stephen H. Cruikshank, M.D.*

2006
Las Vegas, Nevada
The Venetian Resort
Jerry J. St. Pierre, M.D.

2007
Chicago, Illinois
The Drake Hotel
Mark I. Evans, M.D.

2008
New Orleans, Louisiana
The Ritz Carlton
*Bryan D. Cowan, M.D.*

2009
Maui, Hawaii
The Grand Wailea
Dennis J. Lutz, M.D.

2010
Las Vegas, Nevada
The Venetian Resort
Christine H. Comstock, M.D.

2011
Nassau, Bahamas
The Atlantis Resort
Gayle L. Olson, M.D.

2012
Chicago, Illinois
The Drake Hotel
John W. Calkins, M.D.

2013
Napa, California
The Meritage Resort
Stephen J. Fortunato, M.D.

2014
Albuquerque, New Mexico
The Tamaya Resort
Kirk D. Ramin, M.D.
2015
Charleston, South Carolina
Charleston Marriott
Barbara V. Parilla, M.D.

2016
Las Vegas, Nevada
The Venetian Resort
Roger P. Smith, M.D.

2017
Scottsdale, Arizona
Scottsdale Plaza Resort
David F. Lewis, M.D.

2018
Minneapolis, Minnesota
Radisson Blu Mall of America
Lee P. Shulman, M.D.
Keynote Speaker

2005
“Aging is Everybody’s Business”
Suzanne R. Kunkel, Ph.D.
Oxford, Ohio

2006
“Ethnobotany: The Quest for New Cures”
Paul A. Cox, Ph.D.
Provo, Utah

2007
“Government and Politics in Women’s Healthcare”
Ruth S. Hanft, Ph.D.
Washington, D.C.

2008
No Designated Keynote Speaker

2009
“The Future of Women's Health Care: I Once Was A Doctor”
Norman F. Gant, Jr., M.D.
Dallas, Texas

2010
“Counseling Patients for Cardiovascular Risk”
Barry A. Franklin, Ph.D.
William Beaumont Hospital Health Center
Royal Oak, Michigan

2011
“Obstetrical Trials that Changed Clinical Practice”
Catherine Y. Spong, M.D.
Bethesda, Maryland

2012
“Healthcare Disparities for Women Worldwide: Report from a Year as Jefferson Fellow”
Douglas W. Laube, M.D.
University of Wisconsin Medical School
Madison, Wisconsin
Keynote Speaker

2013
“Putting the ‘M’ Back in Maternal Fetal Medicine”
Larry C. Gilstrap, III, M.D.
American Board Ob-Gyn
Dallas, Texas

2014
“Future Changes in the Practice of Obstetrics and Gynecology”
Willam F. Rayburn, M.D.
University of New Mexico
Albuquerque, New Mexico

2015
“Cancer Survivorship: Navigating the Aftermath”
Sigrun Hallmeyer, M.D.
Oncology Specialists, SC
Park Ridge, Illinois

2016
“The Second Victim”
Patrice M. Weiss, M.D.
Virginia Tech Carilion School Medicine
Roanoke, Virginia

2017
“The New Labor Guidelines: Better or Not?”
Thomas J. Garite M.D.
E.J. Quilligan Professor Emeritus
University of California, Irvine
Littleton, Colorado

2018
“50 Years of Progress in Ob-Gyn Genetic Testing”
Joe Leigh Simpson, M.D.
Florida International Univ. College Med.
Miami, Florida
CAOG VISIONARY AWARD

Inaugurated in 2007 to recognize visionary leadership and “game changing” contributions which have fundamentally altered both the structure and the stature of the Central Association of Obstetricians & Gynecologists. By its very definition this award is bestowed infrequently with great admiration for exceptional dedication and service.

RECIPIENTS

Karl C. Podratz, M.D., Ph.D.
Awarded 2007
“As President in 1997 his vision introduced the CAOG to a professional management model as institutional support waned and he also promoted the current election process for officers and trustees.”

Mark I. Evans, M.D.
Awarded 2009
“As President in 2007 his vision championed both academic and community excellence which translated into and promoted the vigorous clinically oriented portion of the scientific program enjoyed annually.”

Dennis J. Lutz, M.D.
Awarded 2015
“As CAOG Managing Director since 2005 and as President in 2009 his vision firmly established financial viability and operational templates while his prodigious corporate memory instilled an enduring legacy based on tradition.”
“PTO Endowment Fund”

In 1994 the CAOG established the PTO Fund (Presidents-Trustees-Officers) and solicited voluntary contributions from all past presidents, past board members and past officers to supplement the operating funds. Since 1999 the serving officers and board members have also been annually asked to each contribute generously so the Fund continued to grow.

In 2005 the Board created a permanent “PTO Endowment Fund” with interest income providing stipends for the annual scientific awards. Donations are annually solicited to continue to grow that fund. All contributors are recognized in both the quarterly CAOG Newsletter and the Annual Program Book. Thanks again to these 2018 special supporters.

2018 PTO Fund Contributors

Kofi S. Amankwah, M.D.
David G. Anderson, M.D.
Lester A. Ballard, Jr., M.D.
Vanessa M. Barnabei, M.D., Ph.D.
John J. Barton, M.D.
John J. Battaglino, Jr., M.D.
Everett A. Beguin, Jr., M.D.
Joe E. Belew, M.D.
Fredrik F. Broekhuizen, M.D.
Donald K. Bryan, M.D.
Paul D. Burstein, M.D.
John W. Calkins, M.D.
Robert P. Carter, M.D.
Allan G. Charles, M.D.
Suneet P. Chauhan, M.D.
John W. Chisholm, M.D.
Christine H. Comstock, M.D.
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2020
The Meritage Resort
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October 28, 29, 30, 31
(Wed., Thurs., Fri., & Sat.)