COLUMBIA | OBSTETRICS AND GYNECOLOGY

The Department of Obstetrics and Gynecology
presents our

Annual Sloane Academic Assembly

2019 PGY-3 Residents and Graduating Fellows

with special guest speaker

Fidel A. Valea, MD

Chair, Department of Obstetrics and Gynecology

Virginia Tech Carilion School of Medicine

Faculty

Chair	Mary E. D'Alton, MD
Program Director	Rini B. Ratan, MD
Associate Program Director	Richard Berkowitz, MD

Division Chiefs

General Obstetrics & Gynecology	Katarina Eisinger, MD
Maternal-Fetal Medicine	Lynn Simpson, MD
Family Planning & Preventive Services	Carolyn Westhoff, MD
Reproductive Endocrinology & Infertility	Zev Williams, MD, PhD
Gynecologic Oncology	Jason D. Wright, MD
Gynecologic Specialty Surgery	Arnold P. Advincula, MD
Allen Hospital	Dara Matseoane-Peterssen, MD
Hudson Valley Hospital	Meera Garcia, MD
Lawrence Hospital	Anna Burgansky, MD

Fellowship Directors

Maternal-Fetal Medicine	Cynthia Gyamfi-Bannerman, MD
Family Planning & Preventive Services	Anne Davis, MD
Reproductive Endocrinology & Infertility	Roger Lobo, MD
Gynecologic Oncology	Jason D. Wright, MD
Minimally Invasive Gynecologic Surgery	Jeannie Kim, MD

Session 1

7:00am Continental Breakfast

7:30am Welcome and Introduction
Mary E. D'Alton, MD, Willard C. Rappleye Professor of Obstetrics and Gynecology and Chair, Department of Obstetrics & Gynecology

Resident Presentations

7:35am Introduction
Rini B. Ratan, MD, Residency Program Director
Richard L. Berkowitz, MD, Associate Residency Program Director

7:40am *The Association of Education and Race on Preterm Birth Risk in Women with Prior Preterm Birth*
Presenter: Eve Overton, MD | **Preceptors:** Cynthia Gyamfi-Bannerman, MD; Alex Friedman, MD, and Russell Miller, MD

7:55am *Use of Fundamentals of Laparoscopic Surgery (FLS) Testing to Assess Gynecologic Surgeons: 10 Years of Experience*
Presenter: Sierra Seaman, MD | **Preceptor:** Hye-Chun Hur, MD

8:10am *Epidemiology and Risk Factors for Life-Threatening Complications in Severe Ovarian Hyperstimulation Syndrome (OHSS) in a Nationwide Sample*
Presenter: Jessica Selter, MD | **Preceptors:** Eric Forman, MD; Roger Lobo, MD; Zev Williams, MD

8:25am *Use and Outcomes of Neoadjuvant Chemotherapy for Metastatic Endometrial Cancer*
Presenter: Claire Tobias | **Preceptor:** Jason D.Wright, MD

8:40am *Male Factor and Mosaicism: Assessing the Contribution of Abnormal Semen Parameters to Rate of Mosaicism in Next Generation Sequencing (NGS) Preimplantation Genetic Testing for Aneuploidy (PGT-A) Intracytoplasmic Sperm Injection (ICSI) Cycles*
Presenter: Sally F. Vitez, MD | **Preceptor:** Eric Forman, MD; Zev Williams, MD

8:55am *Hypertensive Postpartum Admissions Among Women Without a History of Hypertension or Preeclampsia*
Presenter: Timothy Wen, MD | **Preceptor:** Alexander Friedman, MD

Reproductive Endocrinology and Infertility Fellow Presentation

9:10am Introduction
Roger Lobo, MD, Fellowship Director, Division of Reproductive Endocrinology & Infertility

9:15am *Replication Stress Limits the Developmental Potential of Human Preimplantation Embryos*
Presenter: Katherine L. Palmerola, MD | **Preceptors:** Dieter Egli, PhD; Roger Lobo, MD

Family Planning Fellows Presentations

9:30am Introduction
Anne Davis MD, Fellowship Director, Division of Family Planning & Preventive Services

9:35am *The Effect of Dolutegravir-based ART on Plasma Etonogestrel Levels Among Women with HIV using Contraceptive Implants in Botswana*
Presenter: Ian Joseph Bishop, MD | **Preceptor:** Carolyn Westhoff, MD

9:50am *Claims-Based Contraceptive Performance Measures at NewYork-Presbyterian Hospital, 2016 to 2018*
Presenter: Surya Cooper, MD | **Preceptor:** Carolyn Westhoff, MD

10:05am Break

Session 2

Maternal-Fetal Medicine Fellow Presentations

10:20am Introduction
Cynthia Gyamfi-Bannerman, MD, Fellowship Director, Division of Maternal-Fetal Medicine

10:25am *Quantitative Activity Levels and Gestational Age at Delivery: A Prospective Cohort Study among Nulliparous Women*
Presenter: Whitney Booker, MD | **Preceptor:** Cynthia Gyamfi-Bannerman, MD

10:40am *Effect of Chlorhexidine vs. Povidone Iodine vs. Saline Vaginal Preparation on Bacterial Colony Counts in Women Undergoing Elective Cesarean Delivery*
Presenter: Cassandra Duffy, MD | **Preceptors:** Cynthia Gyamfi-Bannerman, MD; Yiping W. Han, PhD

10:55am *Impact of Delayed Cord Clamping on Maternal Blood Loss in Term Cesareans: A Randomized Trial*
Presenter: Stephanie Purisch MD | **Preceptor:** Cynthia Gyamfi-Bannerman, MD

Minimally Invasive Gynecologic Surgery Fellow Presentation

11:10am Introduction
Arnold P. Advincula, MD, Chief, Division of Gynecologic Specialty Surgery

11:15am *A model for predicting the GEARS score from virtual reality surgical simulator metrics*
Presenter: Ariel Kate Dubin, MD | **Preceptors:** Arnold P. Advincula, MD; Roger Smith, MD

Gynecologic Oncology Fellow Presentation

11:30am Introduction
Jason Wright, MD, Chief, Division of Gynecologic Oncology

11:35am *Adoptive Dendritic Cell Transfer Following Platinum-based Chemotherapy Extends Overall Host Survival in a Pre-clinical Model of Metastatic Ovarian Cancer*
Presenter: Ama Buskwofie, MD | **Preceptor:** Juan R. Cubillos-Ruiz, MD

Session 3

11:50am Introduction
Mary E. D'Alton, MD

11:55am *The Evolution of Resident Education in Obstetrics and Gynecology*
Fidel A. Valea, Chair, Obstetrics and Gynecology. Virginia Tech Carilion School of Medicine

12:40pm Lunch
Riverview Terrace, Heart Center

Ian Joseph Bishop, MD, MPH

The son of an American diplomat, **Ian Bishop** grew up in Washington, DC; Nairobi; London; Tel Aviv; and Honolulu. He completed his undergraduate degree at Yale University and medical school at the University of Miami Miller School of Medicine in Miami, FL. He completed his residency at Jackson Memorial Hospital/University of Miami and served as administrative chief resident. He is now completing his Fellowship in Family Planning at CUIMC and returning as faculty to the University of Miami to start a Division of Family Planning. He and his wife, Vanessa, recently had a son named Ollie. He also has a blind miniature dachshund named Willie. Currently both are vying for loudest in the household.

The Effect of Dolutegravir-based ART on Plasma Etonogestrel Levels Among Women with HIV using Contraceptive Implants in Botswana

Mentor: Carolyn Westhoff
Authors: Ian Joseph Bishop, Chelsea Morroni, Alida Gertz, Renu Nandakumar, Nicholas Teodoro, Neo Moshashane, Boikhutso Simon, Opelo Badubi, and Carolyn Westhoff

Background: The etonogestrel (ENG) implant is the most effective contraceptive method available and increasingly used in sub-Saharan Africa. However, its use is complicated in high-HIV prevalence settings due to drug-drug interactions with efavirenz-based (EFV) antiretroviral therapy (ART) reducing contraceptive efficacy. Following the SINGLE trial, dolutegravir-based (DTG) ART is replacing EFV-based ART as first-line therapy in many settings. Botswana, where 30% of reproductive age women are living with HIV, was the first country in Africa to adopt DTG as first-line therapy. The effect of DTG-based ART on the ENG implant has not been studied.

Objectives: Our primary objective is to evaluate whether concomitant use of DTG-based ART decreases steady-state plasma ENG concentrations among implant-users compared to ART-naïve, HIV-negative women. The two secondary aims are (1) to compare ENG concentrations between women using DTG-based ART to women receiving EFV-based ART, and (2) to describe the proportion of women in each group with plasma ENG concentration levels below that posited to be adequate for ovulation suppression (<90 pg/mL).

Methods: This is a non-randomized, parallel-group study, with three arms (n=90 per arm): ART-naïve women, women using DTG-based ART, and women using EFV-based ART. Blood is collected from the arm contralateral to the implant at three to twelve months post-insertion. A recent undetectable viral load (defined as <400 copies/mL) is used as a surrogate measure of ART adherence. We will examine the distribution of implant duration use between the groups, and, if different, use regression to adjust for any differences in duration of implant use.

Prelimary Results: Recruitment is ongoing. To date, our analysis includes 85 ART-naïve women, 13 women using DTG-based ART, and 12 women using EFV-based ART. All women living with HIV included in the study had undetectable viral loads. Geometric mean (GM) ENG plasma concentration was 222.3 (±94.4), 220.8 (±104.5), and 69.2 (±29.8) pg/mL among the ART-naïve, DTG-, and EFV-based ART groups, respectively. Duration of implant use was similar among the groups: 180 (±82), 202 (±72), and 223 (±109) days, respectively. Of those receiving EFV-based ART, 9/12 (75%) had ENG plasma concentrations below 90 pg/mL. In contrast, all women in the ART-naïve and DTG-based ART groups had ENG concentrations above 90 pg/mL.

Conclusions: Preliminary data suggest similar ENG plasma concentrations among HIV-naïve women and women living with HIV using DTG-based ART. However, the use of EFV-based ART decreased ENG plasma concentrations by 69% compared to ART-naïve women. Concomitant use of the ENG implant and DTG-based ART does not appear to impair contraceptive efficacy by decreasing ENG plasma concentrations.

Whitney Booker, MD

Whitney Booker was born New Brunswick, NJ and completed her undergraduate degree in Biomedical Engineering at Columbia University. She worked for three years conducting clinical research at Columbia University Medical Center while obtaining her master's degree in Biomedical Sciences at Mount Sinai School of Medicine. After completing medical school at University of Illinois at Chicago, she returned to New York to complete her residency at Mount Sinai, where her interest in high risk obstetrics was ignited.

Quantitative Activity Levels and Gestational Age at Delivery: A Prospective Cohort Study among Nulliparous Women

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Mentor: Cynthia Gyamfi-Bannerman
Authors: Whitney Booker, Etoroabasi Ekpe, Yuan Zhang, Ananth Cande, Vanessa Nieto, Cynthia Gyamfi-Bannerman

Background: Physical activity in pregnancy has maternal and fetal benefit, and is recommended by the American College of Obstetricians and Gynecologists. In the context of improving birth outcomes, providers have continued to prescribe activity restriction. This premise is based on the hypothesis that an increased level of activity is related to preterm delivery. However, evidence for this commonly used intervention has not been established.

Objective: To determine whether physical activity in pregnancy, as measured in steps per day (steps/day), correlates to gestational age at delivery.

Study Design: A prospective observational cohort study was conducted from October 2017 to July 2018 that evaluated the correlation between steps/day and gestational age at delivery. Nulliparous patients between 10 0/7 and 23 6/7 weeks gestation were enrolled and not instructed to modify their physical activity during their pregnancy. Physical activity was measured using the Fitbit Flex 2. For the purpose of the analysis, the primary exposure was divided into 2 groups: a low activity group (<5000 steps/day) and a high activity group (≥5000 steps/day). Our primary outcome was gestational age at delivery, as a function of steps/day. Secondary outcomes included antepartum, intrapartum and postpartum complications. Patients were also asked if they were placed on activity restriction by their providers.

Results: A total of 134 patients were analyzed, of which 81% averaged ≥5000 steps/day. The high activity group wore the Fitbit tracker for a median of 133 days (IQR 73-171), and had a median of 7634 (IQR 6366-9114) steps/day. When comparing the low activity group (<5000 steps/ day) to the high activity group (≥5000 steps/day), there was no difference in gestational age at delivery (39.4, IQR 37.9-40.6 vs. 39.3, IQR 38.1-40.6, p=0.90). Also, there was no difference in median steps/day between those patients who delivered preterm in compared to those who delivered at term (7765, IQR 5188-10387 vs. 6971, IQR 5412-8517, p=0.61). The median steps/day did not correlate significantly with gestational age at delivery (r= -0.05, p=0.56). 19 patients who reported that their physician placed them on bedrest or modified physical activity during the pregnancy, and there was no difference in preterm versus term births (30% vs. 14.3%, p=0.19). There were no differences in antepartum, intrapartum or postpartum outcomes when comparing the low versus high activity group.

Conclusions: This is the first prospective clinical trial to assess quantitative physical activity levels in relation to gestational age at delivery in nulliparous patients. We found no difference in median steps/day in women who deliver preterm compared to those who delivered at term. In nulliparous patients, this study demonstrates that physical activity does not mitigate gestational age at delivery.

Ama Buskwofie, MD

Ama Buskwofie was born in Denver Colorado and completed her undergraduate degree in Biology at Colorado State University. She then moved south to complete her medical degree at Duke University School of Medicine in Durham, NC. Dr. Buskwofie then moved to Boston, Mass. to complete her residency at the Harvard combined residency program between Brigham and Women's Hospital and the Massachusetts General Hospital where her love of gynecologic oncology was fostered. She is currently completing her final year of Gynecologic Oncology at the NYP Columbia/Cornell program and has decided to stay in the area by joining the faculty practice at Westchester Medical Center.

Adoptive Dendritic Cell Transfer Following Platinum-based Chemotherapy Extends Overall Host Survival in a Pre-clinical Model of Metastatic Ovarian Cancer

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Mentor: Juan R. Cubillos-Ruiz
Authors: Ama C. Buskwofie, Eli Teran-Cabanillas, Tito Sandoval-Medina and Juan R. Cubillos-Ruiz

Background: Chemotherapeutic drugs and surgery have proven only partially effective in treating advanced ovarian cancer, with 5-year survival rates (OS) remaining at less than 27%. Immunotherapy treatment using dendritic cell (DC) vaccination alone has shown minimal benefit in patients with advanced ovarian cancer. We examined whether therapeutic DC-based vaccination could enhance the efficacy of cytotoxic drugs in the treatment of primary metastatic ovarian cancer.

Methods: Wild type mice were injected intraperitoneally (IP) with 2.5 million ID8 ovarian cancer cells to recapitulate the aggressive microenvironment of human metastatic ovarian cancer. Mice were divided into 4 treatment groups: untreated, cisplatin only, DC vaccination only and cisplatin plus DC vaccination. Following confirmation of ovarian cancer dissemination at day 13, cisplatin (5mcg/gm) was administered IP every two weeks for 3 cycles, followed by weekly IP infusions of 3 million bone marrow-derived DCs. Mice were imaged using bioluminescence and weighed biweekly to monitor tumor burden and ascites accumulation. Survival analysis using Log-Rank analysis of Kaplan-Meier data was preformed. Each group contained 8 mice to provide a 5% significance level and 95% power to detect differences in survival of 20% or greater.

Results: Metastatic ovarian cancer was developed in thirty-two mice. Untreated mice accumulated ascites significantly faster than mice in the treatment groups. No significant difference in median survival was observed between untreated mice and the group receiving therapeutic DC transfer alone (79 vs 83 days). Mice treated with cisplatin alone demonstrated a median survival of 128 days, which was significantly longer than that of the untreated group or the group treated with DCs alone ($p=0.0023$). Notably, mice treated with cisplatin followed by adoptive DC transfer survived an average of 29 days longer than mice receiving cisplatin alone (128 vs 157 days; $P= 0.0002$)

Conclusions: Compared with chemotherapy alone, adoptive DC immunotherapy following cisplatin treatment significantly increased median survival rates in mice with ovarian cancer. DC-mediated anti-tumor effects are therefore enhanced in the setting of recent chemotherapy.

Surya Cooper, MD, MPH

Surya Cooper grew up in Wichita, Kan. She relocated to the northeast and completed her undergraduate degree at Cornell University. She became interested in preventive care and completed her MPH at Columbia University then went on to medical school at St George's University in Grenada. She completed her residency in Pennsylvania at Geisinger Medical Center where she became interested in technology in health care. She combined all of her interests during her Fellowship in Family Planning at Columbia University. Following fellowship, she is moving to San Jose, Calif. to practice Ob/Gyn with a focus on Family Planning at Santa Clara Valley Medical Center.

Claims-Based Contraceptive Performance Measures at New York Presbyterian Hospital 2016 to 2018

Mentor: Carolyn Westhoff, MD
Authors: Surya Cooper, Tanvi Jain, Ryan Levy, Janet Garth, Carolyn Westhoff

Background: Performance measures are a standardized tool used to assess quality of healthcare. The Office of Population Affairs and CDC developed an initial set of performance measures for contraceptive care which the National Quality Forum (NQF) endorsed in November 2016. Health care providers, payers, purchasers, health plans, and policy makers can use performance measures as a tool to assess the quality of and access to contraceptive services.

Performance measures are comprised of a numerator and a denominator. The numerator is the number of women provided with the specified contraception and the denominator is all women at risk of unintended pregnancy. Each component can be ascertained from billing claims data including diagnosis codes, procedure codes, device codes and drug codes.

The NQF-endorsed measures have been validated primarily with data from free-standing family planning focused clinics. There is no information on measure use at a large academic medical center and across specialties.

Objective: To compare contraceptive provision from 2016-2018 across ambulatory care clinics at New York Presbyterian Hospital (NYPH) annually, quarterly and by clinic specialty using the NQF-endorsed contraceptive care measures.

Methods: We evaluated contraception provision at 31 clinics across 6 specialties at the NYPH Ambulatory Clinic Network using the NQF-endorsed contraceptive care measures. We evaluated women ages 15 to 44 at risk of unintended pregnancy using claims-based data according to measure specifications. We assessed most- and moderately-effective contraceptive provision and LARC provision by clinic specialty: OB/GYN, Family Medicine, Pediatrics, Internal Medicine and School-Based clinics compared to the Family Planning Clinic. We calculated the measures annually and quarterly.

Results: We included 97,487 patient visits from 2016 to 2018. Most- and moderately-effective contraception provision was highest in the Family Planning Clinic (60% of 32,934 visits) followed by OB/GYN (47% of 36,919 visits), School-based clinics (39% of 5113 visits), Family Medicine (34% of 7894 visits), Pediatrics (27% of 2868 visits), then Internal Medicine (19% of 11,750 visits). LARC provision was also highest in the Family Planning clinic (18%) followed by School-based (9%), OB/GYN and Pediatrics (2%). Family Medicine (1%) and Internal Medicine 0%. Adjusting for clinic location and patient age distribution did not change overall results. Overall most- and moderately-effective contraception provision was 47% of 33,374 visits in 2016, 45% of 33,020 visits in 2017 and 41% of 31,084 visits in 2018. This downward trend persisted in the quarterly data. LARC provision remained stable.

Conclusions: The contraceptive care measures are a feasible tool to measure contraceptive provision and identify trends over time and can be used to assess quality improvement project effectiveness.

Ariel Kate Dubin, MD

Ariel Dubin was born and raised in Los Gatos, Calif. She completed her undergraduate degree in Neuroscience and Women's Studies at Wellesley College. She worked for one year at an autism research center of excellence in San Diego before attending medical school at Georgetown University. She returned home to complete her residency at Kaiser Permanente in Santa Clara, Calif. After graduation, she spent the first year of MIGS fellowship researching surgical simulation at the Nicholson Center in Orlando, FL. She then moved north to complete the clinical years of fellowship at Columbia University. She will be joining Kaiser Permanente in Modesto, Calif. as the regional lead of the Chronic Pelvic Pain and Endometriosis Center and minimally invasive gynecologic surgery team. She is looking forward to spending time in the California sunshine and enjoying her new home in wine country.

A Model for Predicting the GEARS Score from Virtual Reality Surgical Simulator Metrics

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Mentors: Roger Smith, Arnold Advincula
Authors: Ariel Kate Dubin, Danielle Julian, Alyssa Tanaka, Patricia Mattingly, Roger Smith

Background: Surgical education relies heavily upon simulation. Assessment tools include robotic simulator assessments and Global Evaluative Assessment of Robotic Skills (GEARS) metrics, which have been validated. Training programs use GEARS for proficiency testing; however, it requires a trained human evaluator. Due to limited time, learners are reliant on surgical simulator feedback to improve their skills. GEARS and simulator scores have been shown to be correlated but how these correlations can be used for the learner is unknown. Our goal is to develop a model for predicting GEARS score using simulator metrics.

Methods: This group used linear and multivariate logistic regressions on previously reported data. Subjects performed simple (Ring and Rail 1) and complex (Suture Sponge 1) tasks on simulators, the dV-Trainer (dVT) and the da Vinci Skills Simulator (dVSS). They were scored via simulator metrics and GEARS. The scores from these two assessment tools were then correlated. Linear regression models and multivariate regression models were then developed from these correlations.

Results: A linear model for each simulator and exercise showed a positive linear correlation. Equations were developed for predicting GEARS Total Score from simulator Overall Score.

Next, the effects of each individual simulator metric on the GEARS Total Score for each simulator and exercise were examined. On the dVSS, Excessive Instrument Force was significant for Ring and Rail 1 and Instrument Collision was significant for Suture Sponge 1. On the dVT, Time to Complete was significant for both exercises. Once the significant variables were identified, multivariate models were generated.

Comparing the predicted GEARS Total Score from the linear model (using only simulator Overall Score) to that using the multivariate model (using the significant variables for each simulator and exercise), the results were similar.

Conclusions: Our results suggest that trainees can use simulator Overall Score to predict GEARS Total Score using our linear regression equations. This can improve the training process for those preparing for high-stakes assessments.

Cassandra R. Duffy, MD, MPH

Cassie Duffy grew up in Holliston, Mass. She studied Art History at Johns Hopkins University and then joined the Peace Corps where she served as a rural community health development volunteer for two years in Burkina Faso. She completed medical school at Washington University in St. Louis and returned to Baltimore to complete a Master in Public Health at Johns Hopkins. She was an Ob/Gyn resident at Columbia University and was fortunate to stay here for fellowship training in maternal-fetal medicine. In the fall, she will join the faculty at Beth Israel Deaconess Medical Center in Boston.

Effect of Chlorhexidine vs. Povidone Iodine vs. Saline Vaginal Preparation on Bacterial Colony Counts in Women Undergoing Elective Cesarean Delivery

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Mentors: Cynthia Gyamfi-Bannerman, Yiping Han
Authors: Cassandra R. Duffy, Jeewon Garcia-So, Barouyr Ajemia, Mara Roxana Rubinstein, Cynthia Gyamfi-Bannerman, Yiping W. Han

Background: Precesarean vaginal preparation significantly reduces rates of postpartum endometritis. Although 10% povidone iodine (PI) is the most commonly used vaginal antiseptic, limited evidence suggests that chlorhexidine gluconate (CHG) solutions may be more effective.

Methods: We conducted a prospective randomized controlled trial of 0.5% CHG vs. 10% PI vs. saline vaginal preparation in women undergoing elective cesarean delivery at 34 weeks gestation or greater. Women in labor or those with ruptured membranes, chorioamnionitis, abnormal placentation or allergy to the study agents were excluded. Sterile vaginal cultures were performed immediately before and five to ten minutes after vaginal cleansing. Our primary outcome was post-intervention aerobic and anaerobic bacterial colony counts. Secondary outcomes included adverse events and maternal infections.

Results: Twenty-nine women consented and underwent CHG (n=10), PI (n=9), or saline (n=10) vaginal preparation. Groups were similar with respect to maternal age, BMI, race, ethnicity, parity, GBS status, and gestational age. Compared to CHG and saline, PI vaginal preparation resulted in the greatest decrease in colony counts in both aerobic and anaerobic culture. 10% PI eliminated 99.9% and 99.5% of aerobic and anaerobic bacteria, respectively. Although all solutions significantly decreased bacterial colony counts, 0.5% CHG performed no better than saline in reducing anaerobic bacteria. There were no reported side effects or postpartum infections.

Conclusions: Compared to 0.5% CHG, 10% PI was more effective at reducing vaginal bacterial colony counts in women undergoing elective cesarean delivery.

Eve Overton, MD

Eve Overton was born on Long Island, NY and completed her undergraduate degree in the Biological Basis of Behavior and English Literature at the University of Pennsylvania. She worked for several years in neuroscience and bioethics research at Penn and UCSF. She then completed medical school at Yale University in New Haven, Connecticut. She returned home to New York to complete her residency at Columbia University. She is excited to be applying for fellowship in Maternal Fetal Medicine.

The Association of Education and Race on Preterm Birth Risk in Women with Prior Preterm Birth

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Mentor: Cynthia Gyamfi-Bannerman
Authors: Eve Overton, Caitlyn Baptiste, Cynthia Gyamfi-Bannerman

Background: Preterm delivery is a major cause of neonatal death and disability. The rate of preterm birth continues to rise, and now comprises 9.6% of all births. Furthermore, rates of preterm birth in the USA are almost double that of similar high income countries. There are limited studies evaluating education's impact on gestational age and perinatal delivery outcomes. Here, we use a cohort including a large number of geographically and ethnically diverse American women with prior preterm birth history to assess the association of education on preterm birth and adverse pregnancy outcomes.

Methods: We conducted a secondary analysis of a multicenter, randomized placebo-controlled trial of 17 alpha-hydroxprogesterone caproate (17-OHP) for preterm birth prevention in women with a previous preterm delivery. Our study included non-anomalous, singleton gestations. We excluded infants with aneuploidy, those who had cerclage placed during gestation, and those known to be alive but with missing outcome data. Our primary exposure was education level. Education level was divided into four groups: those with less than high school education, some high school, high school graduates, and those who completed education beyond high school. Our primary outcome was gestational age at delivery. Our secondary outcomes included neonatal respiratory distress (RDS), necrotizing enterocolitis (NEC) and intraventricular hemorrhage (IVH), retinopathy of prematurity (ROP) and birth weight. We conducted ANOVAs and fit a logistic regression model, adjusting for possible confounders related to preterm birth risk.

Results: 443 patients were included for analysis. The groups differed by maternal age, race, marital status, and rates of smoking during pregnancy. The groups had similar maternal BMI, infection rates, gestational diabetes rates, maternal drug and alcohol use, and assigned trial arm. In total, 185 (41.76%) of patients delivered prior to 37 weeks. In univariate analysis, the highest education group was associated with a significantly decreased risk of preterm birth at less than 32 weeks ($p < 0.015$), although there was no significant difference in preterm birth at less than 35 weeks ($p < 0.76$) and less than 37 weeks ($p< 0.41$). There were no significant differences in secondary outcomes of RDS, IVH, NEC, ROP and birth weight. When controlling for race, patients in the lowest education group had 4.6 fold increased odds of preterm birth at less than 32 weeks than the highest education group ($p< 0.013$).

Conclusions: In a population of women at increased risk of preterm delivery, high levels of education were associated with significantly decreased preterm birth risk at 32 weeks, even when adjusting for race.

Katherine L. Palmerola, MD

Katherine Palmerola was born in New York City and raised in the Philadelphia suburb of Yardley. She studied the Biological Basis of Behavior at University of Pennsylvania before moving to rural Hershey where she attended medical school at Pennsylvania State University. She happily returned to New York City to complete residency at Columbia University and stayed on board for her fellowship training in Reproductive Endocrinology and Infertility. Following graduation, Dr. Palmerola will be relocating to Miami to join IVFMD, a private practice fertility network.

Replication stress limits the developmental potential of human preimplantation embryos

Mentors: Dieter Egli, Roger Lobo

Background: Human preimplantation embryos show abnormal nucleation and DNA damage, compromising cell cycle progression and developmental potential. The molecular mechanisms and timing of these abnormalities are unknown. We identified endogenous DNA damage and repair mechanisms in human embryos and developed a murine model to study developmental consequences of replication stress in preimplantation embryos. Furthermore, we aimed to clarify the timing of DNA replication in the first cell cycle of developing human zygotes and identify regions of late DNA replication.

Methods: Endogenous DNA damage and repair pathways were evaluated in humans using donated oocytes (n=25) and embryos (n=20). Immunofluorescent staining detected DNA damage (γH2AX, RPA), repair (RPAS33, RPA S4/S8, Rad51, 53BP1), and micronucleation. Timing of S-phase progression was evaluated by identifying the presence and pattern of EdU incorporation during the first cell cycle.Consequences of genomic instability were studied in a murine model using aphidicolin, a DNA polymerase inhibitor that increases endogenous chromosome fragility1. Mouse zygotes (n=500) were briefly exposed to aphidicolin in the first cell cycle, then evaluated at 1-cell, 2-cell, 4-8-cell and blastocyst stage. Immunofluorescent staining detected DNA damage and repair. Cleavage progression, blastulation and embryo quality were assessed versus controls.

Results: Human preimplantation embryos show endogenous DNA damage, demonstrated by γH2AX, RPA and abnormal nucleation. Cleavage embryos had significantly greater foci and micronucleation vs blastocysts (γH2AX cleavage mean 2.3 vs blastocyst 1.0, $p < 0.0001$; RPA cleavage mean 1.7 vs 0.3, $p<0.0001$; abnormal nucleation cleavage mean 15.9% vs blastocyst 4.2%, $p<0.0001$). DNA damage foci coincided with RPAS33, indicating RPA phosphorylation by G2 checkpoint kinase ATR, Rad51, indicating repair by homologous recombination, and 53BP1, indicating unrepaired DNA in the prior cell cycle is passed to daughter cells through mitosis.

Human zygotes replicate DNA between 3 and 13 hours post-fertilization, with periods of early DNA replication (3 to 6 hours post-ICSI) and late DNA replication (10 to 14 hours post-ICSI).

Mouse zygotes replicated DNA until shortly before mitotic entry. Aphidicolin-induced replication delay resulted in DNA damage (γH2AX and RPA), and RPAS33, indicating an ATR-dependent G2 checkpoint. Additional DNA repair mechanisms included Rad51 and 53BP1, similar to human embryos. Though some unreplicated DNA is tolerated in mitosis and compatible with euploidy, aphidicolin-induced under replication in the first cell cycle precipitated instability in later cell cycles, leading to decreased blastulation (45% after 8h aphidicolin vs 91.8% control, $p<0.0001$), and poor quality embryos as evidenced by significantly fewer total cells and inner cell mass with significantly greater DNA damage and micronucleation with increasing duration of aphidicolin exposure compared to controls.

Conclusions: Human zygotes contain regions of late DNA replication that correspond to gene deserts and are a source of replication stress. In the murine model, DNA damage responses to incomplete replication in G2 (ATR and Rad51), and the G1 response to unreplicated DNA (53BP1) mirror endogenous repair activity in human preimplantation embryos. Developmental consequences of replication stress likely persist beyond the preimplantation stage and may contribute to failed implantation or miscarriage. The murine model of genomic instability enables further studies and the development of targeted therapeutics.

Stephanie Purisch, MD

Stephanie Purisch was born in Washington, DC, and grew up in North Potomac, MD. She completed her undergraduate degree in Biology and Anthropology at Washington University in St. Louis. She earned her medical degree from Weill Cornell Medical College in New York City. After four years in Philadelphia for residency at the Hospital of the University of Pennsylvania, she returned to New York for Columbia's Maternal-Fetal Medicine fellowship. Dr. Purisch is thrilled to be joining Columbia's MFM faculty after graduation.

Impact of Delayed Cord Clamping on Maternal Blood Loss in Term Cesareans: A Randomized Trial

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Mentor: Cynthia Gyamfi-Bannerman
Authors: Stephanie Purisch, Cande Ananth, Brittany Arditi, Logan Mauney, Barouyr Ajemian, Amy Heiderich, Tina Leone, Cynthia Gyamfi-Bannerman

Objective: The American College of Obstetricians and Gynecologists recommends a delay in umbilical cord clamping in term infants for at least 30-60 sec after birth, irrespective of mode of delivery. However, most literature supporting this practice is from low risk vaginal deliveries. There are no published data specific to women (or neonates) undergoing cesarean delivery, where the mean blood loss is at least twice that of a vaginal delivery with the potential for increased bleeding from delayed hysterotomy closure. We performed a randomized trial to compare maternal blood loss with immediate cord clamping (ICC) versus delayed cord clamping (DCC) in term cesarean delivery.

Study Design: Two-center, randomized clinical trial comparing maternal blood loss with ICC (≤15 sec after birth) versus DCC (60 sec after birth) in term cesarean delivery (NCT03150641). Women undergoing scheduled cesarean of full term singleton gestations were eligible. Those with abnormal placentation, fetal anomalies, known fetal anemia, growth restriction with abnormal Dopplers, preeclampsia, significant maternal anemia, bleeding disorders, planned cord blood banking or refusal of blood products were excluded. Immediately before delivery, women were randomized in a 1:1 ratio to ICC or DCC. The primary outcome was drop in maternal hemoglobin (Hgb) from pre-op to post-op day one. Secondary maternal outcomes included estimated blood loss, postpartum hemorrhage (>1000 mL), need for uterotonics and blood transfusion. The main secondary neonatal outcome was neonatal hemoglobin at 24-72 hours of life. Assuming a mean hemoglobin change of -1.37 ± 0.87 g/dL, and anticipating 20% crossover, the required sample size (two-tailed α=0.05, β=0.1; 90% power) to detect a one standard deviation (0.9 g/dL) difference in the primary outcome between groups was 53 women per group. Analysis was based on intention-to-treat.

Results: From October 2017 to February 2018, 113 women were randomized (56 to ICC, and 57 to DCC). There was no difference in the primary outcome, with a mean drop in Hgb of 1.78 ± 0.91 g/dL and 1.90 ± 0.91 g/dL in the ICC and DCC groups (P=0.49). Secondary maternal outcomes were similar between groups. Neonatal hemoglobin, available for 90 neonates (79.6%), was higher with delayed compared to immediate cord clamping (18.1 ± 2.5 vs 16.4 ± 1.9 g/dL; P <0.001).

Conclusions: In scheduled cesarean delivery at term, DCC is not associated with increased maternal blood loss but does achieve higher neonatal Hgb levels at 24-72 hrs of life.

Sierra J. Seaman, MD

Sierra Seaman hails from sunny Panama City, Fla. She completed her undergraduate degree in biology and psychology at the University of Florida. She then began her migration north, completing medical school at University of Virginia before moving to New York City. She is excited to be staying at Columbia University after residency for her fellowship in Minimally Invasive Gynecologic Surgery.

Use of Fundamentals of Laparoscopic Surgery (FLS) Testing to Assess Gynecologic Surgeons: 10 Years of Experience

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Mentor: Hye-Chun Hur
Authors: Sierra Seaman, Elisa Jorgensen, Angela Tramontano, Daniel Jones, Monica Mendiola, Hope Ricciotti, Hye-Chun Hur

Objective: To assess Fundamentals of Laparoscopic Surgery (FLS) exam scores among Ob/Gyn and general surgery providers.

Methods: This is a descriptive study of all FLS examinees in OBGYN and general surgery and at a single academic institution (Beth Israel Deaconess Medical Center [BIDMC], Boston, Mass.) from July 2007 to May 2018. We compared categorical and continuous variables with Chi-square, t, and Wilcoxon rank-sum tests.

Results: 205 BIDMC trainees and faculty took the FLS exam between July 2007 and May 2018 of which 176 were identified to be Ob/Gyn or general surgery providers. The FLS pass rate was high for both specialties (98.7% Ob/Gyn, 99.0% surgery, p= 0.42). When comparing providers in Ob/Gyn and general surgery, no difference was found in manual skills score (mean 594.9 Ob/Gyn vs 601.0 surgery, p=0.59), however, a significant difference was noted in the cognitive scores with surgery providers scoring higher than Ob/Gyn providers (mean 533.8 Ob/Gyn vs 583.4 surgery, p=0.0003). In a multivariate linear regression model adjusting for specialty, level of training, age, sex, and test year, none of the variables were significant predictors for manual scores. However, age, sex, and test year were predictors for cognitive scores with greater scores associated with younger age, male sex, and advancing calendar year. Surgical specialty was not a predictor for manual or cognitive scores.

Conclusions: Overall, both Ob/Gyn and surgery residents had a high FLS pass rate. The manual skills test scores were comparable between specialties, but the cognitive scores were lower for Ob/Gyn compared to surgery providers. Further investigation regarding validity of the cognitive component of the FLS exam for Ob/Gyn providers may be warranted.

Jessica Selter, MD

Jessica Selter was born in Bethesda, MD and completed her undergraduate degree in neuroscience at Duke University. She worked for two years at the National Institutes of Health before completing medical school at Johns Hopkins University. She was thrilled to move to New York to complete her residency at Columbia University and is excited to apply to Reproductive Endocrinology and Infertility for fellowship this summer.

Epidemiology and Risk Factors for Life-Threatening Complications in Severe Ovarian Hyperstimulation Syndrome (OHSS) in a Nationwide Sample

Mentors: Eric Forman, Zev Williams, Roger Lobo
Authors: Jessica Selter, Timothy Wen, Katherine Palmerola, Alexander Friedman, Zev Williams, Eric Forman

Objective: To evaluate risk factors for life-threatening complications in patients with severe OHSS in a nationwide sample.

Study Design: Retrospective cohort study

Materials and Methods: Data were derived from the Nationwide Inpatient Sample (NIS) for OHSS admission for 2002-11. The NIS is a database containing information on 8 million hospital admissions yearly from more than 40 states and 1000 hospitals, and contains a weighting system that allows for calculation of population estimates. Patient (age, race, payer status, comorbidities, income) and hospital (region, bed-size, teaching status, location) variables were examined for association with life-threatening complications (deep vein thrombosis/pulmonary embolism [DVT/PE], acute respiratory distress syndrome [ARDS], renal failure [RF], intubation), non-routine discharge (discharge to skilled nursing facility, transfer hospital), length of stay (LOS), and total hospital charges. Survey-adjusted multivariable logistic regression models controlling for these factors assessed the primary exposure of comorbidities with complications.

Results: A total of 11,562 patients were hospitalized with severe OHSS from 2002-2011. All admitted patients were pregnant. The majority were white (55.7%), with private insurance (87.7%), age 25-39 (84.6%), at an urban hospital (95%). 19.3% of patients had comorbidities (hypertension, diabetes, obesity, hypothyroidism, anemia). Death occurred in 9 patients. Life- threatening complications occurred in 4.4% of patients (DVT/PE 2.2%, RF 1.5%, ARDS 0.9%, intubation 0.5%). Older patients >= 40 years old (OR 3.4 95% CI: 1.1, 10.8 p=0.04), ones with comorbidities (OR=2.1, 95% CI: 1.3, 3.3, p<0.01), and African American patients (OR=2.1, 95% CI: 1.2, 3.7, p<0.01) were more likely to develop these life-threatening conditions. Patients with comorbidities (OR=0.5, 95% CI: 0.3, 0.8, p<0.01), were also less likely to have routine discharge from the hospital. Adjusting for patient and hospital demographics, patients with comorbidities were more likely to develop DVT/PE (OR 2.5, 95% CI: 1.3, 4.8, p<0.01) and RF (OR=2.3, 95% CI: 1.2, 4.2, p=0.01). Patients who developed life-threatening complications had longer LOS (OR=3.7, 95% CI: 2.3, 6.1, p<0.01) and higher hospital cost (OR=1.7, 95% CI: 1.2, 2.4, p<0.01).

Conclusions: Patients with common comorbidities have worse outcomes in severe OHSS. Furthermore, these complications are associated with high cost and hospital burden. Given the increasing number of IVF patients with comorbidities, these findings suggest that risk stratification and closer monitoring of patients who have these comorbid conditions may prevent the development of severe OHSS and life-threatening complications. Additionally, utilizing freeze-all cycles to avoid pregnancy should be considered for these patients to decrease risk of OHSS and severe late complications.

Claire Tobias, MD

Claire Tobias was born in Toronto, Canada and completed her undergraduate degree in Psychology at McGill University. She briefly worked at the Hospital for Sick Children in Toronto as the Fetal Alcohol Syndrome Clinic Coordinator before moving to New York to pursue premedical studies at Columbia University's Postbac Premed Program. She went on to complete her medical studies at Columbia University Vagelos College of Physicians and Surgeons, and is currently completing her OBGYN residency at NewYork-Presbyterian Hospital. She loves all aspects of OBGYN and plans to become a Generalist upon graduation.

Use and Outcomes of Neoadjuvant Chemotherapy for Metastatic Endometrial Cancer

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Mentor: Jason Wright
Authors: Claire Tobias, Ling Chen, Caryn St. Clair, Ana Tergas, June Hou, Alexander Melamed, Cande Ananth, Alfred Neugut, Dawn Hershman, Jason Wright

Background: While primary cytoreductive surgery (PDS) is often considered the standard of care for stage IV endometrial cancer, PDS is associated with significant morbidity and poor survival. Neoadjuvant chemotherapy (NACT) has been proposed as an alternative treatment strategy. We analyzed the use and outcomes of NACT for women with stage IV endometrial cancer.

Methods: The National Cancer Database was used to identify women with stage IV endometrial cancer treated from 2010-2015. The cohort was limited to women 70 years or younger with minimal comorbidity (comorbidity score=0). Women were stratified based on receipt of NACT or PDS. A propensity score analysis with inverse probability weighting was performed to balance the clinical characteristics of the groups. As the cohort displayed non-proportional hazards in the Cox proportional hazards models, survival was examined using flexible parametric Royston-Parmer models to account for time-varying hazards with use of NACT.

An intention to treat (ITT) analysis was performed as well as a per protocol (PP) analysis that included only women who received treatment with both chemotherapy and surgery (in either sequence).

Results: Of a total of 4890 women with stage IV endometrial cancer, NACT was utilized in 19.5% of patients. NACT use increased from 16.0% in 2010 to 23.9% in 2015 ($P<0.001$). In a multivariable model, more recent year of diagnosis, Medicaid coverage, stage IVB disease and serous histology were associated with use of NACT ($P<0.05$ for all). In a propensity score balanced cohort, use of NACT displayed a time-varying association with survival. In the ITT analysis, use of NACT was associated with decreased mortality for the first 3 months after diagnosis (hazard ratio [HR] at 2 months=0.81; 95% confidence interval [CI], 0.66-0.999). After 4 months, the survival curves crossed and receipt of NACT was associated with increased mortality (HR at 6 months=1.23; 95% CI, 1.09-1.39). Similarly, in the PP analysis, use of NACT was associated with decreased mortality for the first 8 months after diagnosis (HR at 6 months=0.79; 95% CI, 0.63-0.98). After 9 months the survival curves crossed and receipt of NACT was associated with increased mortality (HR at 12 months=1.22; 95% CI, 1.04-1.43).

Conclusions: Use of NACT for stage IV endometrial cancer is increasing. The relationship between use of NACT and survival is complex. Women treated with PDS are at increased risk of early death but have a more favorable long-term prognosis.

Sally F. Vitez, MD

Sally F. Vitez was born in Haddonfield, NJ and completed her undergraduate degree in Molecular Biology at Kenyon College. Immediately following graduation she lived and worked in Arusha, Tanzania teaching high school students. She then spent three years at the National Institutes of Health in Washington, DC where she conducted pediatric genetic research for the National Eye Institute. She returned home to New Jersey attending Rutgers Robert Wood Johnson Medical School where her passion for women's health was realized.

She entered residency at Columbia University with an open mind and was interested in all aspects of obstetrics and gynecology. Ultimately, she was drawn to the unique intersection of medicine, ethics, and science within the field of Reproductive Endocrinology and Infertility. She is currently applying for fellowship and excited to pursue a career in REI.

Male Factor and Mosaicism: Assessing the Contribution of Abnormal Semen Parameters to Rate of Mosaicism in Next Generation Sequencing (NGS) Preimplantation Genetic Testing for Aneuploidy (PGT-A) Intracytoplasmic Sperm Injection (ICSI) Cycles

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Mentors: Eric Forman, Zev Williams
Authors: Sally Vitez, Katherine Palmerola, Eric Forman

Purpose: The advancements in the field of assisted reproductive technology, namely the growth of preimplantation genetic testing for aneuploidy (PGT-A), have led to an increase in transfer of single euploid embryos, a decrease in rates of multiples, all while maintaining high ongoing pregnancy rates. Furthermore, comprehensive chromosome screening platforms have facilitated a deeper interrogation of the embryo genome, including the identification of lower level genetic abnormalities such as chromosomal mosaicism. Here we evaluate the influence of abnormal semen parameters on the rate of mosaicism in PGT-A tested embryos.

Methods: We performed a retrospective review of women undergoing intracytoplasmic sperm injection (ICSI) and PGT-A via day 5 or 6 trophectoderm biopsy at a single academic fertility center from July 1, 2015 to September 1, 2017. NGS was performed at a single reference lab. The primary outcome was the rate of euploid, aneuploid, and mosaic embryos compared between cohorts of a given abnormal semen parameter.

Results: A total of 219 ART-ICSI cycles with PGT-A testing were analyzed. PGT-A cycles with oligozoospermia demonstrated a higher proportion of mosaicembryos compared to normozoospermic PGT cycles (34% versus 18%, p= 0.005%). Similarly, PGT cycles with oligoasthenozoospermia demonstrated a higher proportion of mosaic embryos compared to normozoospermic PGT cycles (39.5% versus 18%, p=0.003) and a lower rate of euploid embryos compared with normozoospermic PGT cycles (10.5% versus 31.1%, p=0.01). PGT cycles with asthenozoospermia demonstrated non-significant increased rate of mosaic embryos compared to normozoospermic cycles (25.3% versus 18%, p=0.06%).

Conclusions: Abnormal semen parameters influence rate of mosaicism in next generation sequencing PGT-A embryos.

Timothy Wen, MD, MPH

Timothy Wen was born in New York City, growing up in New Jersey and subsequently San Diego. He completed his undergraduate degree in biology/political science at UCLA followed by his Master of Public Health at the Mailman School of Public Health at Columbia University. He became interested in Ob/Gyn after returning to Los Angeles for medical school at the Keck School of Medicine at USC. As a fourth-year student, he did an Maternal-Fetal Medicine elective at Columbia, which led him to venture away from Los Angeles for residency in New York City. After keeping an open mind for the first two weeks of residency, he decided on a career in MFM and is applying this summer.

Hypertensive Postpartum Admissions Among Women Without a History of Hypertension or Preeclampsia

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Mentor: Alexander Friedman
Authors: Timothy Wen, Jason Wright, Dena Goffman, Mary D'Alton, Alexander Friedman

Background: Hypertensive diseases of pregnancy (HDP) are a leading cause of maternal morbidity and mortality with an unpredictable disease course. Risk for postpartum readmission for HDP among women without HDP or chronic hypertension (cHTN) during delivery hospitalization is not well characterized. This analysis determined risk factors for HDP-associated readmissions among women without HDP or cHTN during delivery.

Methods: The Healthcare Cost and Utilization Project's Nationwide Readmissions Database for 2010-2014 was used to evaluate risk for postpartum readmission for preeclampsia and hypertension within 60 days of discharge from a delivery hospitalization among women without these diagnoses during delivery in this cohort study. Obstetric, medical, demographic, and hospital factors associated with postpartum readmission were analyzed. Risk was characterized as unadjusted and adjusted risk ratio with 95% CI. As a secondary outcome, risk for severe maternal morbidity during readmissions was also evaluated comparing women with and without hypertensive diagnoses during their delivery hospitalization.

Results: Of 14.2 million delivery hospitalizations from 2010-2014 without HDP or cHTN, 20,656 women (0.15%) were readmitted within 60 days with the primary diagnosis of HDP. Factors strongly associated with readmission included older maternal age, lowest income quartile, multiple gestation, chronic kidney disease, and lupus. Over 90% of readmissions occurred within 20 days of discharge. For the secondary outcome, risk for severe maternal morbidity during readmission was higher for women without a hypertensive indication during their delivery compared with women with a diagnosis (12.1% vs 6.9%, $P<0.01$).

Conclusions: While the risk for hypertensive postpartum readmissions for women without delivery-hospitalization preeclampsia or hypertension is low, when readmitted, these women are at high risk for severe morbidity both absolutely and compared to women with prior diagnoses of HDP and cHTN. Future comparative effectiveness and clinical research is indicated to determine whether earlier postpartum identification of elevated blood pressure followed by increased surveillance and counseling may further reduce risk.

Prior Resident and Fellow Research Publications

2018

Noelle Breslin, MD	*Impact of Timing of Delivery on Maternal and Neonatal Outcomes for Women with Three Previous Cesarean Deliveries*
Stephanie Cham, MD	*Development and Validation of a Risk Calculator for Adverse Perioperative Outcomes for Women with Ovarian Cancer*
Sudeshna Chatterjee-Paer, MD	*Evaluation of Financial Toxicity in Women with Gynecology Malignancies: A Cross-Sectional Study*
Rosa Cui, MD	*Trends in Use and Survival Associated with Fertility-Sparing Trachelectomy for Young Women with Early Stage Cervical Cancer*
Catha Fischer, MD	*Mitochondrial Replacement Therapy (MRT) in MELAS Cancer Patients*
Lisa Gabor, MD	*Adherence to Established Guidelines for Chemotherapy-induced Nausea and Vomiting in Women Undergoing Treatment for Gynecologic Cancer*
Joses A. Jain, MD	*Renal Artery Doppler Studies in the Assessment of Monochorionic, Diamniotic Twin Pregnancies With and Without Twin-Twin Transfusion Syndrome*
Adina Kern-Goldberger, MD, MPH	*A Cross-Sectional Assessment of Maternal Vital Signs and Serum Lactate in Women Presenting for Acute Care in Pregnancy*
Patricia J. Mattingly, MD	*Virtual Reality Robotic Simulation Performance: Simulator vs. Human Assessment*
Mirella Mourad, MD	*Human Cervical Smooth Muscle Stretch Increases Pro-Inflammatory Cytokine Secretion*
Olivia Myrick, MD	*Improved Counseling Surrounding Periviable Delivieries at NewYork-Presbyterian Hospital*
Chioma Ndubisi, MD	*Auricular Acupunctur as Adjunct for Pain Management During First-Trimester Abortion: A Randomized, Double-Blinded, Three-Arm Trial*
Emilie L. Vander Haar, MD	*Stillbirth and Infection*