Cleveland Clinic

Obstetrics, Gynecology & Women's Health Institute

6TH ANNUAL

Research Day

May 12, 2021 via Webex

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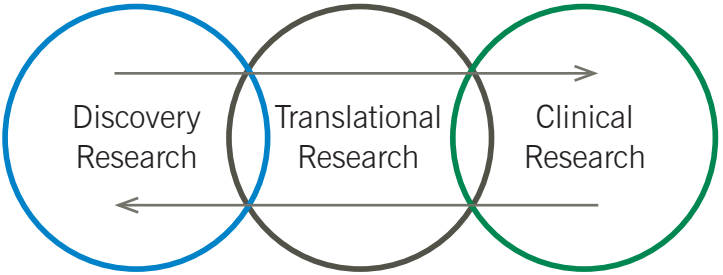
Obstetrics, Gynecology & Women's Health Institute

RESEARCH DAY

May 12, 2021

Cleveland Clinic



Key Note Address & Lecture

Paula Amato, MD, MCR
Professor
Department of Obstetrics and Gynecology
Division of Reproductive Endocrinology & Infertility
Oregon Health & Science University

Judges (Oral Presentations)

Mariam AlHilli, MD

Paula Amato, MD

Mariam Cremer, MD, MPH

Jeffrey Goldberg, MD

Rosanne Kho, MD

Giancarlo Mari, MD

Shannon Wallace, MD

Judges (Poster Presentations)

Cara King, DO

Justin Lappen, MD

Amy Park, MD

Stephanie Ricci, MD

Elliott Richards, MD

Agenda

7:45 am	**Presenter & Judges Registration**
8:15–8:20 am	**Welcome** Chad Michener, MD Interim Institute Chair, Ob/Gyn & Women's Health Institute
8:20–8:25 am	**Introduction & Welcome** Ruth Farrell, MD, MA Vice Chair, Research, Ob/Gyn & Women's Health Institute
8:25–9:10 am	**Key Note Address** ***Germline Gene Therapy: Promise & Peril*** Paula Amato, MD Professor, Department of Obstetrics and Gynecology Division of Reproductive Endocrinology and Infertility Oregon Health & Science University Center for Health & Healing
9:10–9:15 am	**Q&A**

9:15–10:30 am	**Graduating Fellow Oral Presentations**
9:15 am	***Development and validation of the Value of Uterus (VALUS) instrument for women undergoing pelvic organ prolapse surgery*** Olivia Chang, MD, MPH Fellow, Female Pelvic Medicine & Reconstructive Surgery
9:25 am	Q&A
9:30 am	***Antibiotic treatment worsens outcomes following primary platinum chemotherapy in ovarian cancer: Potential role of the gut microbiome?*** Laura Chambers, DO, MS Fellow, Gynecologic Oncology
9:40 am	Q&A

9:45 am	***Single-cell sequencing reveals inflammatory pathway induction in immune cell populations within the tumor microenvironment following intra-operative administration of hyperthermic intraperitoneal chemotherapy (HIPEC) in patients with advanced ovarian cancer*** Max Horowitz, MD, PhD Fellow, Gynecologic Oncology
9:55 am	Q&A
10:00 am	***The role of endometriosis-specific MRI protocol in the diagnosis and management of patients with endometriosis-related pelvic pain*** Miguel Luna, MD Clinical Fellow, Minimally Invasive Gynecologic Surgery
10:10 am	Q&A
10:15 am	***The role of M1 to M2 polarization in the pathophysiology of endometriosis*** Jenna Rehmer, MD Fellow, Reproductive Endocrinology & Infertility
10:25 am	Q&A
10:30–10:45 am	**Break**

10:45 am–12:05 pm	**PGY2 Poster Presentations**
10:45 am	***Risk factors for bacteriuria in urogynecologic patients undergoing preoperative urodynamic testing*** Rachael Baird, MD, MS
10:52 am	Q&A
10:55 am	***Prognostic Significance of Groin Metastases at time of diagnosis in patients with high grade serous ovarian carcinoma*** Julia Chalif, MD
11:02 am	Q&A

11:05 am	***A retrospective look at pre-eclampsia within the cleveland clinic health system: Are there opportunities for early diagnosis and intervention in African-American women?*** Alexandra "Imani" Chatman, MD
11:12 am	Q&A
11:15 am	***Evaluating patient satisfaction with 2-week post-operative virtual visits compared to in-office visits: A randomized control trial*** Catherine Keller, MD
11:22 am	Q&A
11:25 am	***Spontaneous abortion rate during the COVID-19 pandemic*** Kaia Schwartz, MD
11:32 am	Q&A
11:35 am	***Contraceptive counseling through telemedicine: patient characteristics and the quality of counseling*** Rachel Shin, MD, MPH
11:42 am	Q&A
11:45 am	***The effect of estrogen therapy on spermatogenesis in transgender women*** Annika Sinha, MD
11:52 am	Q&A
11:55 am	***Sarcopenia is associated with higher surgical complexity in patients undergoing interval cytoreduction for advanced epithelial ovarian carcinoma*** Nicole Wood, MD
12:02 am	Q&A
12:05–12:15 am	**Break**

12:15–2 pm	PGY3 Resident Oral Presentations
12:15 pm	***Reported case numbers and variability in delivery route and volume by obstetrician-gynecologist residents from 2003 to 2019*** Carrie Bennett, MD
12:25 pm	Discussant Alyssa Herrmann, MD and Q&A
12:30 pm	***Anastomotic leak following interval debulking surgery with or without hyperthermic intraperitoneal chemotherapy in women with advanced epithelial ovarian cancer*** Morgan Gruner, MD
12:40 pm	Discussant Jessica Son, MD and Q&A
12:45 pm	***Longitudinal change in mammographic density with hormonal contraceptive use*** Jonathan Hunt, MD, MBA
12:55 pm	Discussant Anna Chichura, MD and Q&A
1:00 pm	***How do endometrial biopsy results correlate with hysteroscopic findings in women presenting with abnormal and postmenopausal uterine bleeding?*** Kate Lintel, MD
1:10 pm	Discussant Melanie Katz, MD and Q&A
1:15 pm	***Success rate of bilateral oophorectomy at the time of vaginal hysterectomy for pelvic organ prolapse – Intention Matters*** Cory Messingschlager, MD
1:25 pm	Discussant Lia Miceli, MD and Q&A
1:30 pm	***Assessing feasibility and perioperative outcomes with minimally invasive surgery compared with laparotomy for interval debulking surgery with hyperthermic intraperitoneal chemotherapy for advanced epithelial ovarian cancer*** Molly Morton, MD
1:40 pm	Discussant Anna Chichura, MD and Q&A

1:45 pm ***Prenatal hemoglobinopathy screening amongst nulliparous black women in a resident clinic population***
Rebecca Omosigho, MD

1:55 pm Discussant Lia Miceli, MD and Q&A

2–2:55 pm Innovations in Ob/Gyn Lecture

2:00 pm ***Anti-Müllerian hormone in the female: From inhibition of Müllerian structures to prevention of ovarian aging***
Laura Detti, MD
Chair, Department of Subspecialty Care for Women's Health
Faculty, Reproductive Endocrinology and Infertility

2:40 pm Q&A

2:55 pm **Announcement of Award Winners & Closing Remarks**
Ruth Farrell, MD, MA

3:05 pm Group picture of all presenters and award winners

3:30–5 pm Faculty Development / Breakout Sessions

Session 1
How to build, manage, and import data into a research REDCap

Session 2
Writing strong specific aims page: Your elevator speech for grant reviewers

Session 3
What are reviewers looking for in your proposal: Insights from study section members

Past Research Day Award Winners

Resident Poster Presentation – 1st Place

2020	Carrie Bennett, MD
2019	Jessica Son, MD
2018	Sarah Hershman, MD
2017	Caitlin Carr, MD
2016	Laura Moulton, DO, MS

Resident Oral Presentation – 1st Place

2020	Anna Chichura, MD
	Alyssa Herrmann, MD
2019	Emily Holthaus, MD
2018	Caitlin Carr, MD
	Julian Gingold, MD, PhD
2017	Laura Moulton, DO, MS
2016	Jamie Stanhiser, MD
2016	Lisa Caronia Hickman, MD

Fellow Oral Presentation – 1st Place

2020	Katie Crean-Tate, MD
2019	Elizabeth Conner, MD
2018	Tonya Nikki Thomas, MD
2017	Kathryn Maurer, MD
2016	Linnea Goodman, MD

Key Note Address & Lecture

Paula Amato, MD

Professor, Department of Obstetrics and Gynecology
Division of Reproductive Endocrinology and Infertility
Oregon Health & Science University Center for
Health & Healing

Paula Amato, MD specializes in the science of caring for patients with infertility, polycystic ovary syndrome, and menopausal issues. Her research interests include stem cells, metabolic-endocrine interactions, and environmental impacts on reproductive health. Dr. Amato finds her work intellectually stimulating and highly rewarding. The science of reproduction and connecting with individuals and families are what inspired her to pursue a career in reproductive endocrinology and infertility.

Originally from Toronto, Canada, Dr. Amato loves the Pacific Northwest and says that OHSU is a great fit for her. In addition to outdoor sports, reading, independent music and film, and ethnic food, Dr. Amato enjoys spending time with her partner and their two dogs.

Judges (Oral Presentations)

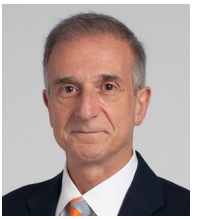
Paula Amato, MD
Professor, Department of Obstetrics and Gynecology
Division of Reproductive Endocrinology and Infertility
Oregon Health & Science University
Center for Health & Healing

Mariam AlHilli, MD
Assistant Professor of Surgery
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Gynecologic Oncology

Mariam Cremer, MD, MPH
Associate Professor of Ob/Gyn & Reproductive Biology
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Global Health/Family Planning

Jeffrey Goldberg, MD
Professor of Surgery
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Section Head, Reproductive Endocrinology & Infertility

Rosanne Kho, MD
Clinical Assistant Professor of Ob-Gyn & Reproductive Biology
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Section Head, Minimally Invasive Gynecologic Surgery



Giancarlo Mari, MD
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Faculty, Maternal Fetal Medicine

Shannon Wallace, MD
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Associate Staff, Female Pelvic Medicine & Reconstructive Surgery

Judges (Poster Presentation)

Cara King, DO
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Associate Staff, Minimally Invasive Gynecologic Surgery

Mitchell Reider, MD
Assistant Professor of Ob-Gyn & Reproductive Biology
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Director, Family Planning

Judges (Poster Presentation), continued

Justin Lappen, MD
Associate Professor of Ob-Gyn & Reproductive Biology
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Section Head, Maternal Fetal Medicine

Elliott Richards, MD, PhD
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Associate Staff, Reproductive Endocrinology & Infertility

Amy Park, MD
Clinical Instructor of Surgery
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Section Head, Female Pelvic Medicine & Reconstructive Surgery

Stephanie Ricci, MD
Assistant Professor of Ob-Gyn & Reproductive Biology
Cleveland Clinic
Obstetrics, Gynecology & Women's Health Institute
Subspecialty Care for Women's Health
Staff, Gynecologic Oncology

Obstetrics, Gynecology & Women's Health Institute
Graduating Fellows

Oral Presentations

Development and validation of the Value of Uterus (VALUS) instrument for women undergoing pelvic organ prolapse surgery

Olivia Chang, MD, MPH

Objective: The objective of this study was to develop a reliable and valid instrument to measure the patient's valuation of her uterus.

Methods: The Value of Uterus (VALUS) instrument was developed based on existing literature and expert experience with uterine preservation. The resulting VALUS instrument is 9-items and includes a visual analog scale (VAS): "how important is it to you to keep your uterus when you have a gynecologic condition?" To validate the instrument, we recruited 51 women over 45 years old with uterovaginal prolapse who were scheduled to undergo vaginal surgery with or without hysterectomy between 05/2020 to 12/2020. We excluded women who desired future childbearing, or those with contraindications to uterine preservation. Internal reliability of the instrument was measured with Cronbach's alpha. For convergent validity, in the absence of preexisting tools to measure uterine preferences, correlation between VALUS with the VAS question was evaluated with Pearson correlation coefficient. For known groups validity, VALUS summary scores were compared between women who underwent hysteropexy versus hysterectomy using t-test. Intra-class correlation coefficient was used to assess test-retest reliability with VALUS administered to women twice. Lastly, a receiver operating characteristic (ROC) curve analysis was conducted to identify a cut-off VALUS score for predicting whether a woman would undergo hysteropexy (versus hysterectomy).

Results: 51 patients were recruited (26 patients in the hysterectomy group and 25 patients in the hysteropexy group), with a mean age of 64±10 years. There were no differences in demographics between the two groups. Cronbach's alpha was 0.91, suggesting excellent internal consistency of the items in the VALUS instrument. VALUS was highly correlated to the VAS question with $r=0.91$ (95% CI 0.65-0.89, $p<0.001$). Patients in the hysteropexy group had significantly higher VALUS scores (indicating greater value placed on the uterus) compared to women who underwent hysterectomy (30.0 vs. 18.9, $p<0.001$). Test-retest reliability was good (ICC=0.89) in 42 women who completed the instrument twice. ROC curve analysis identified a VALUS cut-off score ≥23 to predict hysteropexy (sensitivity=95.8%; specificity=76%).

Conclusions: VALUS is the first reliable and valid 9-item instrument that measures a woman's valuation of her uterus.

Funding: This study was partially supported by an unrestricted grant from the Foundation for Female Health Awareness.

Faculty Mentor(s): Mark Walters, MD

Antibiotic treatment worsens outcomes following primary platinum chemotherapy in ovarian cancer: Potential role of the gut microbiome?

Laura Chambers, DO, MS

Objective: To determine whether antibiotic treatment (ABX) during platinum chemotherapy impacts progression-free survival (PFS) and overall survival (OS) in ovarian cancer (EOC).

Methods: This was a preclinical animal study with an associated retrospective study. For the animal experiment, C57Bl/6 mice were assigned to two cohorts: ABX or control water. After two weeks, EOC cell lines were injected intraperitoneally (IP). Mice were treated with IP cisplatin 5mg/kg weekly or placebo. Stool samples were processed using 16S rRNA sequencing. The retrospective cohort study was performed in women with newly diagnosed stage III/IV EOC who underwent cytoreductive surgery (CRS) and PC from 2009-2015. ABX for >48 hours, including ABX against gram-positive (G+) bacteria, were recorded. The impact of ABX on PFS and OS was assessed using univariate and multivariable Cox regression models.

Results: In H_2O mice, cisplatin reduced tumor size vs. placebo ($p<0.001$), but for ABX groups, no response in tumor size was seen with cisplatin vs. placebo ($p>0.05$). ABX groups had significantly worse survival vs. H20 (ABX/cisplatin – 64d, ABX/placebo – 66d, H_20/cisplatin – 84d, H_20/placebo – 68.5d; $p<0.0001$). H20/CIS mice, with the slowest tumor growth, had significantly increased *Bacteroides* and *Lactobacillus* species vs. ABX/CIS mice (Figure 1). For the patient study, of 424 eligible women, 34.7% (n=147) received ABX, with 11.3% (n=48) treated with anti-G+ ABX. ABX during PC decreased PFS (17.4 vs. 23.1 months, HR 1.50, 95% CI 1.20-1.88, $p<0.001$) and OS (45.6 vs. 62.4 months, HR 1.63, 95% CI 1.27-2.08, $p<0.001$) compared to no ABX. Similarly, anti-G+

ABX worsened PFS (16.5 vs. 23.1 months; HR 1.85, 95% CI 1.33-2.55) and OS (35.0 vs. 62.4 months; HR 2.12, 95% CI 1.50-3.0, p<0.001). On multivariable analysis, all ABX and anti-G+ ABX during PC significantly reduced PFS (HR 1.31, 95% CI 1.04-1.65, p=0.02), (HR 1.50, 95% CI 1.07-2.10, p=0.02) and OS (HR 1.52, 95% CI 1.18-1.96, p=0.001), (HR 1.83, 95% CI 1.27-2.62, p=0.001) respectively.

Conclusions: Utilizing a preclinical EOC model, ABX disruption of the gut microbiome led to accelerated tumor growth and decreased survival. Similarly, in this retrospective study of women with newly diagnosed advanced EOC undergoing PC, ABX was associated with decreased PFS and OS.

Funding: Funded by Velosano and RPC grant

Faculty Mentor(s): Ofer Reizes, PhD, Roberto Vargas, MD

Single-cell sequencing reveals inflammatory pathway induction in immune cell populations within the tumor microenvironment following intra-operative administration of hyperthermic intraperitoneal chemotherapy (HIPEC) in patients with advanced ovarian cancer

Max Horowitz, MD, PhD

Objective: Epithelial ovarian cancer (EOC) is a leading cause of cancer death in women. There have been few significant advances in the treatment of advanced EOC in the past decade, and standard of care remains a combination of surgery and chemotherapy. A randomized controlled trial recently showed that hyperthermic intraperitoneal chemotherapy (HIPEC) with cisplatin at the time of interval cytoreductive surgery significantly improves the survival of patients with advanced EOC. Further enhancing the clinical efficacy of HIPEC is dependent on determining the mechanism(s) and cell types that mediate its beneficial effect. We have previously demonstrated in EOC cell lines that: 1) hyperthermia potentiates the cytotoxic effects of cisplatin (albeit modestly), and 2) immune and inflammatory pathways in these cells are uniquely altered by hyperthermic cisplatin.

Methods: To test the hypothesis that immune/inflammatory pathways are critical to the efficacy of HIPEC in patients with advanced EOC, we obtained tumor speci-

mens under an IRB-approved protocol from patients with advanced EOC undergoing interval cytoreductive surgery with HIPEC. For each patient, a portion of omental tumor was obtained before and after HIPEC (90 minutes of cisplatin at 42°C) and specimens were analyzed on a 10X Genomics Single-cell RNA-sequencing platform. Cells were clustered on UMAP plots and their identity was inferred based on their gene expression pattern. We then interrogated which cells demonstrate a heat-shock response.

Results: We found that the most profound response is observed predominantly in immune cells within the tumor microenvironment. Pathway analysis within these cellular sub-populations revealed induction of multiple inflammatory pathways following HIPEC. CGAS (cyclic GMP-AMP synthase) was identified as an upstream mediator of many of these inflammatory pathways within these immune cells in the tumor microenvironment.

Conclusions: Taken together, these data suggest that the synergistic effect of hyperthermia and cisplatin in HIPEC is mediated by induction of inflammatory pathways within immune cells in the tumor microenvironment and that cGAS may be an important regulator of this response. Ongoing translational experiments are underway in a novel mouse model of HIPEC our group has developed to further characterize the role of the immune system in mediating the cytotoxic effects of HIPEC.

Funding: Velosano Funds

Faculty Mentor(s): Ofer Reizes, PhD

The role of endometriosis-specific MRI protocol in the diagnosis and management of patients with endometriosis-related pelvic pain

Miguel Luna, MD

Objective: Preoperative MRI (85% sensitivity, 96% specificity) is helpful in the surgical planning of patients with bowel endometriosis. As yet, there is no comparative study evaluating the significance of preoperative imaging on diagnosis, patient management and surgical outcomes. The primary goal of this study was to evaluate the impact of the endometriosis-specific MRI protocol (EsMRIp) established at the Cleveland Clinic on the diagnosis and management of new patients who presented with endometriosis-related pelvic pain. Proportion of patients un-

dergoing diagnostic laparoscopy, specific treatment modalities - medical, surgical or combined medical/surgical therapy – and surgical outcomes were compared before and after protocol establishment.

Methods: EsMRIp was established at the Clinic in Jan 2017. All new patients >18yoa who presented with endometriosis-related pelvic pain between 2015-2019 were included. Patients who were pregnant, with known cancer or previous diagnosis of endometriosis were excluded. Patient demographics, frequency of diagnostic laparoscopies (defined as absence of preoperative imaging and a surgery performed for the primary purpose of diagnosing endometriosis), treatment modality, operative time, EBL, intra- and postoperative complications, reoperation rates, and hospital length of stay were evaluated.

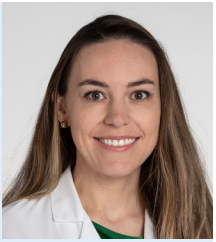
Results: A total of 1,228 new patients were identified and 361 met study criteria. There were no significant differences in patient demographics. EsMRIp has 60.7% specificity and 80% specificity. Diagnostic laparoscopies were performed more often before EsMRIp (41.9% before vs 27.0% after, $p = 0.036$; OR 0.51, 95% CI 0.28-0.96). After EsMRIp, patients were more likely to receive medical therapy alone (50.4% vs. 25.5%) or combined surgical/medical therapy (17.9% vs. 7.3%) and less likely to be treated with surgery alone (16.1% vs. 24.4%) ($p<0.001$). There were no differences in rates of intraoperative non-gynecologic consultations, postoperative complications, readmissions, or reoperations before and after EsMRIp.

Conclusions: Our preliminary study revealed that institutional implementation of a preoperative EsMRIp was associated with fewer diagnostic laparoscopies and treatment of patients with surgery alone. More patients received medical alone and combined medical and surgical treatments after EsMRIp use. Further prospective studies to validate the above-mentioned trends and evaluate pain and fertility outcomes would be helpful.

Funding: None

Faculty Mentor(s): Rosanne Kho, MD

The role of M1 to M2 polarization in the pathophysiology of endometriosis



Jenna Rehmer, MD

Objective: We hypothesize that the cross-talk between macrophages, neuronal cells, and estrogen-secreting cells provides a conducive microenvironment for lesion development and pathogenesis of endometriosis. We put forth that it is the activation of the alternative M2 macrophage pathway that is critical to endometriosis lesion formation and stabilization.

AIM 1. Test the hypothesis that endometriosis lesions with distinct phenotypes are a consequence of the unique microenvironment signals and interplay of unique cell types within lesions and that these unique signatures are necessary for lesion development and maturation.

AIM 2. Test the hypothesis that the innate immunity, via M1 to M2 polarization, is paramount in lesion development, stabilization, and maturation and that understanding these signaling pathways will lead to targets for therapeutic intervention.

Methods: AIM 1. Perform a systematic transcriptomic delineation of human endometriosis at the single cell resolution. Tissue collection will be from patients with stage III-IV endometriosis. Four distinct phenotypic lesions, peritoneal fluid, and endometrial biopsy will be processed for each of the patients. High through-put single cell-RNA-sequencing will be performed on each sample.

AIM 2. This will be accomplished through an in vivo endometriosis mouse model utilizing IL-4 receptor α-chain-deficient mice which are unable to produce M2 macrophages. Lesions and control tissues will be identified and extracted and for histological analysis. Peritoneal fluid and blood from the animals will be collected for analysis of innate immunity pathways.

Expected Results: AIM 1. We anticipate that various phenotypic lesions will be comprised of similar cell types, but with unique transcriptomic profiles distinct to phenotype. We predict the M1 to M2 phenotypic transition is required for the maturation and stabilization of ectopic lesions. We expect variation in the relative abundance and transcriptomic activity of M1 and M2 macrophages across phenotypically distinct lesions.

AIM 2. Given the hypothesized role of M2 macrophages to endometriotic lesion

formation, we anticipate that abrogation of this immune pathway will be sufficient to prevent lesion formation.

Conclusions: This study will provide an unprecedented high-resolution characterization of the role of the macrophages in endometriosis by isolation of single cells and exploration of individual transcriptomic profile. This will improve our understanding of endometriosis etiology, expression, and differentiation.

Funding: RPC #347

Faculty Mentor(s): Cara King, DO and Ofer Reizes, PhD

PGY2 Obstetrics & Gynecology Residents

Poster Presentations

Risk factors for bacteriuria in urogynecologic patients undergoing preoperative urodynamic testing

Faculty Mentor(s): Cecile Ferrando, MD, MPH

Rachael Baird, MD, MS

Prognostic significance of groin metastases at time of diagnosis in patients with high grade serous ovarian carcinoma

Faculty Mentor(s): Robert DeBernardo, MD and Laura Chambers, DO

Julia Chalif, MD

A retrospective look at pre-eclampsia within the Cleveland Clinic Health System: Are there opportunities for early diagnosis and intervention in African-American women?

Faculty Mentor(s): Oluwatosin Goje, MD

Imani Chatman, MD

Evaluating patient satisfaction with 2-week post-operative virtual visits compared to in-office visits: A randomized control trial

Faculty Mentor(s): Rosanne Kho, MD

Catherine Keller, MD

Spontaneous abortion rate during COVID-19 pandemic

Faculty Mentor(s): Jonathan Seibert, MD

Kaia Schwartz, MD

Contraceptive counseling through telemedicine: Patient characteristics and the quality of counseling

Faculty Mentor(s): Ashley Brant, DO, MPH

Rachel Shin, MD, MPH

The effect of estrogen on spermatogenesis in transgender women

Faculty Mentor(s): Cecile Ferrando, MD, MPH

Annika Sinha, MD

Sarcopenia is associated with higher surgical complexity in patients undergoing interval cytoreduction for advanced epithelial ovarian carcinoma

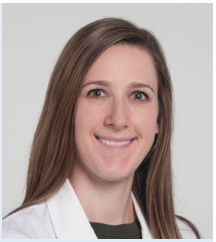
Faculty Mentor(s): Mariam AlHilli, MD

Nicole Wood, MD

PGY3 Obstetrics & Gynecology Residents

Oral Presentations

Reported case numbers and variability in delivery route and volume by obstetrician-gynecologist residents from 2003 to 2019



Carrie Bennett, MD

Objective: The objective of this study was to analyze trends in number and route of obstetric deliveries performed by graduating OB/GYN residents in the United States as logged within the ACGME database.)

Methods: The ACGME case log data were examined for OB/GYN residents graduating between 2003 and 2019. Delivery case volume numbers for spontaneous vaginal delivery (SVD), cesarean delivery (CD), forceps-assisted vaginal delivery (FAVD), and vacuum-assisted vaginal delivery (VAVD) were extracted and analyzed over time using linear regression. To compare variability in logged cases, residents at the 70th percentile for number of cases logged were compared to residents at the 30th percentile for number of cases logged.

Results: Obstetric delivery data for 20,268 OB/GYN residents was collected from 2003-2019. Over this period, the mean SVD numbers significantly decreased over time by 20% from 320.8±138.7 to 256.1±75.6 (slope -2.6, $p<0.001$), however, no significant difference was noted in reported CD cases, with an 8% increase from 191.8±80.1 to 206.8±69.7 (slope 0.136, $p=0.873$), per graduating resident. Notably, the mean reported FAVD cases decreased by 75% from 23.8±21.9 to 6±6.8 per graduating resident (slope -0.851, $p<0.001$). Similarly, the mean VAVD logs decreased by 37% from 23.8±17.1 to 15±9.5 (slope -0.542, $p<0.001$). The ratio of reported resident case logs comparing volume at the 70th percentile compared to volume at the 30th percentile demonstrated a significant decrease over time for SVD (slope -0.015, $p<0.001$), CD (slope -0.015, $p<0.001$) and VAVD (slope -0.033, $p<.001$), but was significantly increased for FAVD (slope .07, $p=.0065$).

Conclusions: In this study of the ACGME reported case logs, we identify that the reported number of obstetric deliveries performed by OB/GYN residents in the United States is changing, with a significant decline appreciated from 2003-2019 in logged numbers of SVD, VAVD and FAVD, without a difference in reported CD cases per graduating resident. Further, substantial variation is seen among resident volume nationwide, with the difference in high and low volume resident FAVD experience increasing over time. Awareness of these data should inform ACGME and

educators about reasonable targets, increased need for simulation, and new ways to teach all modes of deliveries effectively in all residency programs.

Funding source: None

Faculty Mentor(s): Edward Chien, MD, MBA and Laura Chambers, DO, MS
Discussant: Alyssa Herrmann, MD

Anastomotic leak following interval debulking surgery with or without hyperthermic intraperitoneal chemotherapy in women with advanced epithelial ovarian cancer

Morgan Gruner, MD

Objective: To evaluate the incidence and associated risk factors for anastomotic failure following interval debulking surgery with or without hyperthermic intraperitoneal chemotherapy (HIPEC) in women with advanced ovarian cancer.

Methods: We performed a retrospective cohort study in women with stage III/IV high-grade ovarian cancer treated with neoadjuvant chemotherapy followed by interval debulking surgery with colorectal resection and HIPEC from 2017-2020. These patients were compared to a historical control cohort who underwent interval debulking surgery with colorectal resection without HIPEC from 2009-2016. Data was collected for demographics, surgical variables, and perioperative outcomes. The univariate analysis compared progression-free survival and overall survival.

Results: In total, 61 women were identified; 21 (34.4%) underwent interval debulking surgery with HIPEC from 2017-2020, and 40 underwent interval debulking surgery alone from 2009-2016. The mean age at surgery was 63.1±9.2 and 66.3 ± 9.5 years in the interval debulking surgery with and without HIPEC groups, respectively (p=0.21). The cumulative incidence of anastomotic leak rate was 8.2% (n=5). There was no significant difference in anastomotic leak rate for women who underwent interval debulking surgery with HIPEC (9.5%, n=2) versus without HIPEC (7.5%, n=3) (p=0.99). While there was no difference in progression-free survival (12.2 vs. 13.3 months, log-rank p=0.31), overall survival (9.4 vs. 36.8 months, log-rank p=0.015) was significantly decreased following postoperative anastomotic leak.

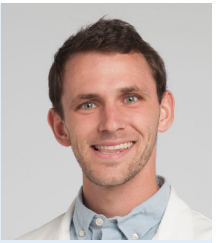
Conclusions: In this retrospective series of women with advanced ovarian cancer, HIPEC was not associated with increased risk for anastomotic leak at the time of interval debulking surgery with colorectal resection and reanastomosis. While

further study is needed, the use of HIPEC alone should not preclude colorectal resection or dictate practices for colonic diversion in women undergoing interval debulking.

Funding source: None

Faculty Mentor(s): Chad Michener, MD
Discussant: Jessica Son, MD

Longitudinal change in mammographic density with hormonal contraceptive use



Jonathan Hunt, MD, MBA

Objective: To describe the longitudinal relationship between mammographic density and hormonal contraceptive (HC) use in reproductive-aged women.

Methods: Patients 35-50 years old who underwent 5+ screening mammograms within a 7.5-year period between 2004-2019 were identified. Demographic, mammographic, and HC use data were collected for a randomly selected cohort. Patients were categorized into four cohorts based on HC exposure before the baseline mammogram: 1) never exposed, 2) always exposed, 3) interval HC start, 4) interval HC stop. Primary outcome was BI-RADS breast density category (BDC) change between initial and final mammograms. Secondary outcome was time to BDC change after HC start or stop.

Results: Of the 723 patients included, those with no HC exposure were more likely to experience a BDC increase compared to those with continuous HC exposure (15.9% vs 7.6%, P=.04), but there was no significant difference in the final BDC between groups. Those who started HC during the screening interval had a shorter median time to first inter-screening BDC increase compared to nonusers (13.4 vs 25.3 months, P=.046), but were not more likely to increase BDC from initial to final mammogram. Those who discontinued HC during the screening interval were not more likely to decrease BDC from initial to final mammogram when compared to those with continuous HC exposure (14.0% vs 17.4%, P=.60).

Conclusions: HC use may be associated with a transient increase in mammographic BDC, but appears to return to baseline with long-term follow-up with or without HC discontinuation.

Funding source: None

Faculty Mentor(s): Pelin Batur, MD
Discussant: Anna Chichura, MD

How do endometrial biopsy results correlate with hysteroscopic findings in women presenting with abnormal and postmenopausal uterine bleeding?

Kate Lintel, MD

Objective: The primary objective of this study was to compare endometrial biopsy pathology results with subsequent operative hysteroscopy pathology in women undergoing evaluation for abnormal and postmenopausal uterine bleeding. The secondary objectives were to describe the length of time from initial endometrial biopsy to hysteroscopic evaluation and to describe intermediate treatments utilized before hysteroscopy.

Methods: This study is a retrospective cohort study of women presenting for evaluation of abnormal and postmenopausal uterine bleeding between January 2015 and December 2019. Patients were identified by their Current Procedural Terminology (CPT) codes for endometrial biopsy and surgical hysteroscopy. Once patients were identified, the electronic medical record was queried and data were collected for patients who met our inclusion criteria. Women were included if they underwent endometrial biopsy followed by operative hysteroscopy within 24 months for abnormal uterine or postmenopausal bleeding. Women were excluded if they underwent more than one endometrial biopsy or hysteroscopy up to five years preceding or any time following the procedures, or who underwent endometrial biopsy followed by hysteroscopy after more than 24 months. All procedures were performed by physicians within the Women's Health Institute throughout the Cleveland Clinic hospital system.

Results: We identified 2223 records based on CPT codes of which 689 met criteria for inclusion. The mean age of the cohort was 49 (□10), 30.1% (206) were postmenopausal and the median duration of abnormal or postmenopausal bleeding leading up to time of presentation was of 3.5 (1.5-9) months. Of the patients who had hysteroscopic pathology demonstrating endometrial polyp, 30.6% (81) had an endometrial polyp detected on endometrial biopsy pathology; and, of the patients who did not have endometrial polyp on hysteroscopic pathology, 9.9%

(42) had an endometrial polyp on endometrial biopsy pathology. Of the patients who had hyperplasia without atypia on hysteroscopy, 28.6% (4) were detected on endometrial biopsy, and of the patients who had hyperplasia with atypia on hysteroscopy, 5.9% (1) was detected on endometrial biopsy. There were 12 cases of confirmed or suspected malignancy on hysteroscopic pathology, of which 8.3% (1) was detected on endometrial biopsy. Of the patients who had insufficient specimen from endometrial biopsy, 21% (15) had insufficient specimen from hysteroscopy. The median number of days from endometrial biopsy to hysteroscopy was 48 (25-95) days. There was no association between number of days between endometrial biopsy and hysteroscopy and hysteroscopic pathology demonstrating hyperplasia or malignancy. Several interval non-surgical treatments were used between the time of the endometrial biopsy and operative hysteroscopy; the most common were: daily oral hormonal therapy (11.3% n=78), high dose oral hormonal therapy (5.7% n=39) and tranexamic acid (1.5% n=10). The overall adverse event rate for hysteroscopy was 1.3% (n=9), with the most common being uterine perforation (0.6%, n = 4) and unexpected bleeding (0.4%, n=3).

Conclusions: In this study of women with abnormal and/or postmenopausal uterine bleeding undergoing evaluation, the majority of endometrial polyps found on hysteroscopic evaluation were not detected on office endometrial biopsy. Furthermore, several cases of endometrial hyperplasia and malignancy were undetected by endometrial biopsy. Hysteroscopy is a very low risk surgery that can be scheduled within a reasonable amount of time following endometrial biopsy to both evaluate and treat uterine bleeding.

Funding source: None

Faculty Mentor(s): Linda Bradley, MD and Cecile Ferrando, MD, MPH
Discussant: Anna Melanie Katz, MD

Success rate of bilateral oophorectomy at the time of vaginal hysterectomy for pelvic organ prolapse – Intention Matters

Cory Messingschlager, MD

Objective: To determine the incidence of successful bilateral salpingo-oophorectomy (BSO) at the time of vaginal hysterectomy in patients with uterovaginal prolapse, and to evaluate factors associated with successful BSO, including the sur-

geons' determination to perform the procedure.

Methods: This is a retrospective chart review of all women who underwent vaginal hysterectomy for uterovaginal prolapse and consented for concurrent BSO "if possible" and "including extraordinary measures" at a tertiary medical center between January 2014 and December 2019.

Results: A total of 454 patients underwent vaginal hysterectomy for uterovaginal prolapse and were consented for BSO during the study period. Of these, 420 patients (92.5%) were consented for "BSO if possible" and 34 patients (7.5%) were consented for "BSO including extraordinary measures". "Success" was defined as ability to perform BSO vaginally. The success rate of BSO in all patients was 58.9% (n=267). Of the patients consented for extraordinary measures, the success rate was 91.2% (n=31). The 3 cases where vaginal BSO could not be performed vaginally were successfully completed laparoscopically. Patients who were in the "BSO if possible" group had a success rate of 55.5% (n=233). Patients who had a successful BSO were more likely to have had prior vaginal deliveries (97.8% vs 96.3 %, p=.04), as well as a concurrent posterior repair at the time of hysterectomy (71.9% vs 59.9%, p=.007). Once confounders were controlled for, concurrent posterior repair remained associated with success (adjOR 1.78 [95% CI=1.19-2.65]). Successful BSO was also associated with a longer operative time compared to unsuccessful cases (151 min vs 134 min, p<.001). Patients in the successful BSO group were more likely than the unsuccessful group to have the following indications for BSO: a family history ovarian cancer, personal breast cancer history and/or patient request for definitive removal.

Conclusions: When the pre-operative intention is to perform a BSO with extraordinary measures, the success rate of BSO at the time of vaginal hysterectomy for uterovaginal prolapse is high, compared to when BSO is simply an opportunistic procedure. This suggests that the success rate of BSO at the time of pelvic organ prolapse surgery is closely linked to the surgeon's determination to complete this procedure vaginally.

Funding source: None

Faculty Mentor(s): Cecile Ferrando, MD, MPH and Olivia Chang, MD, MPH
Discussant: Lia Miceli, MD

Assessing feasibility and perioperative outcomes with minimally invasive surgery compared with laparotomy for interval debulking surgery with hyperthermic intraperitoneal chemotherapy for advanced epithelial ovarian cancer

Molly Morton, MD

Objective: To determine perioperative outcomes in women with epithelial ovarian cancer (EOC) undergoing interval cytoreductive surgery with hyperthermic intraperitoneal chemotherapy (HIPEC) via minimally invasive interval debulking surgery (MIIDS) or laparotomy (LAP).

Methods: A single institution cohort study was performed of women with high-grade stage III or IV epithelial ovarian, fallopian tube, and primary peritoneal carcinomas treated at Cleveland Clinic from 2017-2019 contained with a prospectively maintained HIPEC registry. Patient demographics, surgical factors, and postoperative outcomes were collected by retrospective chart review. Statistical analysis performed including continuous measures summarized using means and quartiles and compared using Wilcoxon rank sum tests. Categorical factors were summarized using frequencies and percentages and compared using Fisher's exact tests. Log rank test was performed to determine recurrence free survival.

Results: 50 women identified; ten (20.0%) underwent MIS + HIPEC and 40 (80.0%) LAP + HIPEC. Median age of patients in the MIS group was 71.1 vs. 64.2 years in LAP (p=0.031), otherwise characteristics were similar between groups. All patients who underwent MIS and LAP had optimal cytoreduction with no difference in rate of R0 resection (70.0% vs. 77.5%; p=0.39). There was no significant difference in ICU admissions, estimated blood loss, operative time, or use of vasopressors. There was no difference in 30 day adverse major and minor events for MIS vs. LAP, but length of stay was decreased for those who underwent MIS (3 vs. 4 days, p=0.016). Time to initiation of chemotherapy following surgery was not significantly different between groups (26.2 days vs 32.0 days, p=0.090). Interim analysis was performed for RFS at a median follow up duration of 15.1 months, with no difference in recurrence free survival (median 15.0 vs 17.2 months log-rank, p=0.30) for MIS vs. LAP.

Conclusions: Our data suggest that HIPEC with MIIDS is safe, effective and has a

comparable incidence of adverse perioperative outcomes to LAP. Rate of achieving R0 cytoreduction was equivalent for both. MIS with HIPEC is associated shorter hospitalization and decreased time between chemotherapy treatments compared to LAP. An MIS approach should not prevent surgeons from utilizing HIPEC where indicated for management of advanced EOC.

Funding source: None

Faculty Mentor(s): Chad Michener, MD
Discussant: Anna Chichura, MD

Prenatal Hemoglobinopathy Screening amongst Nulliparous Black Women in a Resident Clinic Population

Rebecca Omosigho, MD

Objective: To investigate if there an association between post-graduate year status and probability of receiving hemoglobinopathy evaluation at the time of initial prenatal visit in a resident clinic population and the percentage of patients that receive hemoglobinopathy screen at initial prenatal visit (IPV).

Methods: This is a retrospective analysis using the electronic medical recorded of patients at Cleveland Clinic Foundation Westown Physician Center. Nulliparous women that were seen for initial prenatal visit at Westown Physician Center with a resident provider from January 1, 2016 to January 30, 2020 we included. Statistical analysis is reported in medians, quartiles, frequencies, percentages and compared using Wilcoxon rank sum tests. Categorical factors were summarized using frequencies and percentages and were compared using Pearson's chi-square tests or Fisher's exact tests.

Results: When comparing patients without hemoglobinopathy screening ordered at IPV versus not ordered, there is no significant difference in age, gravity and parity. Median age of patient without screening ordered patients was 22.0 (IQR: 19.0-24.0) while ordered patients had median age 21.5 (IQR: 18.0-26.0). Of the 52 women included in the study 14 (26%) of patients had hemoglobin electrophoresis ordered at the time of initial prenatal visit. No patients were identified as having sickle cell trait. There was no significant association between screening ordered and PGY status (p=0.76).

Conclusions: Prenatal genetic screening is an important to offer all women especially in populations with high carrier frequencies. In our resident population only one-fourth of women were receiving appropriate screening at the time of IPV. This area deserves continued research at our institution and possible adjustment to EMR for quality improvement in conjunction with resident education.

Funding source: None

Faculty Mentor(s): Stacie Jhaveri, MD
Discussant: Lia Miceli, MD

2019–2020

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