Cleveland Clinic

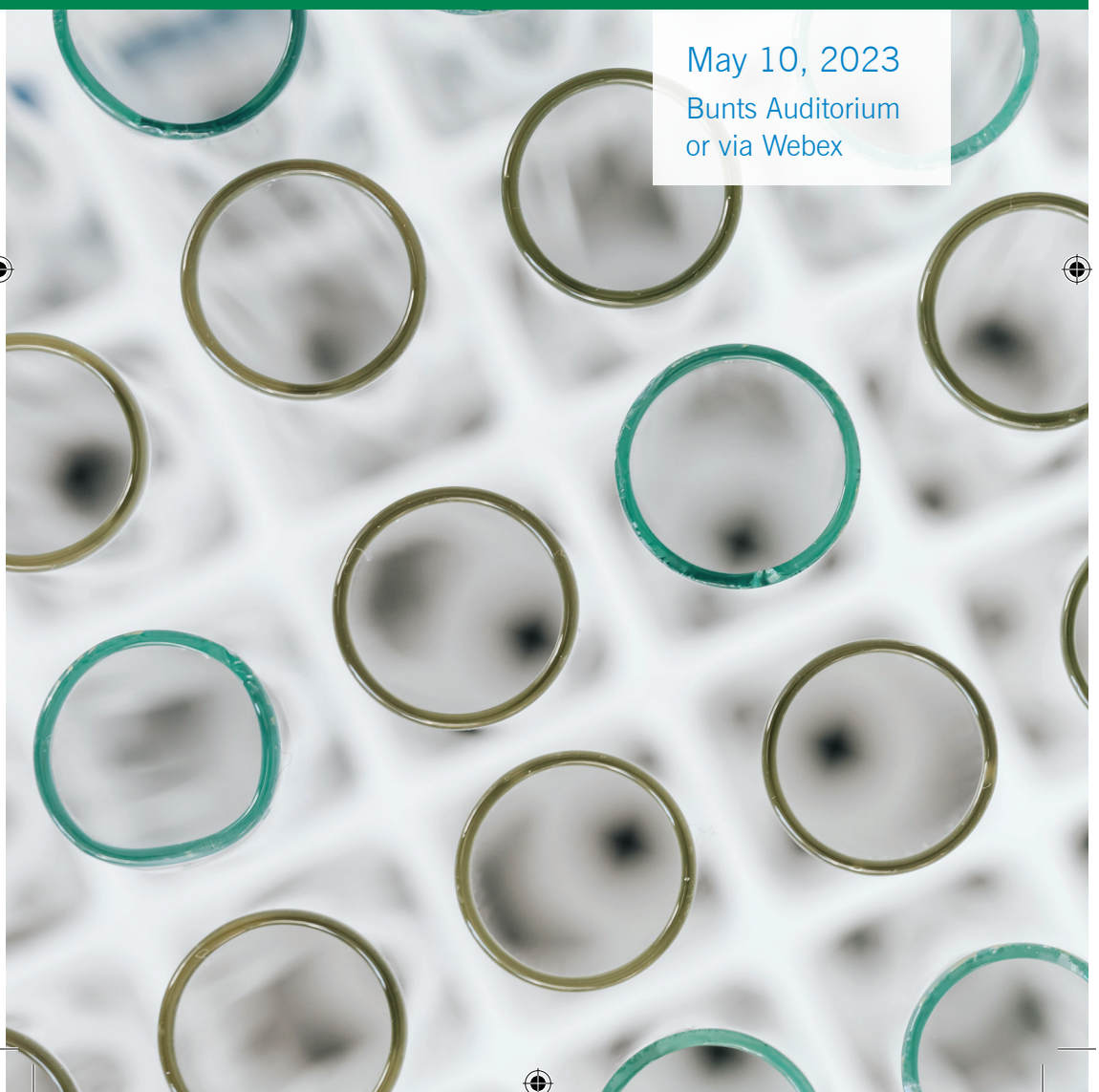
Obstetrics, Gynecology & Women's Health Institute

8TH ANNUAL

Research Day

May 10, 2023

Bunts Auditorium
or via Webex



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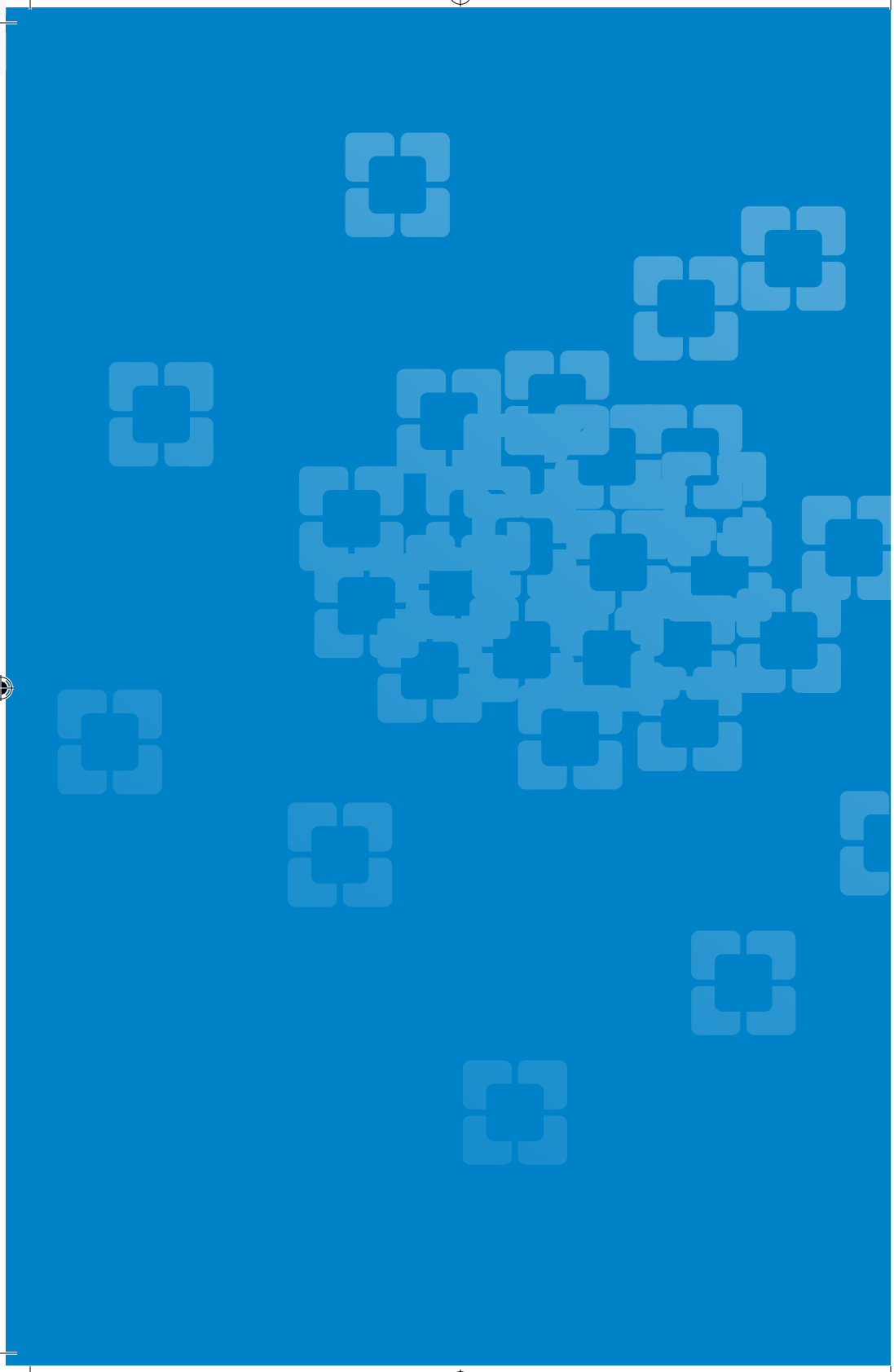
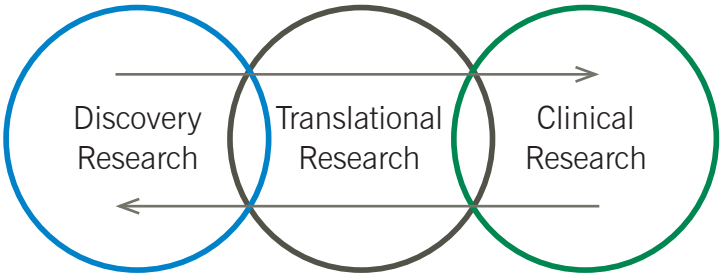




Key Note Address & Lecture

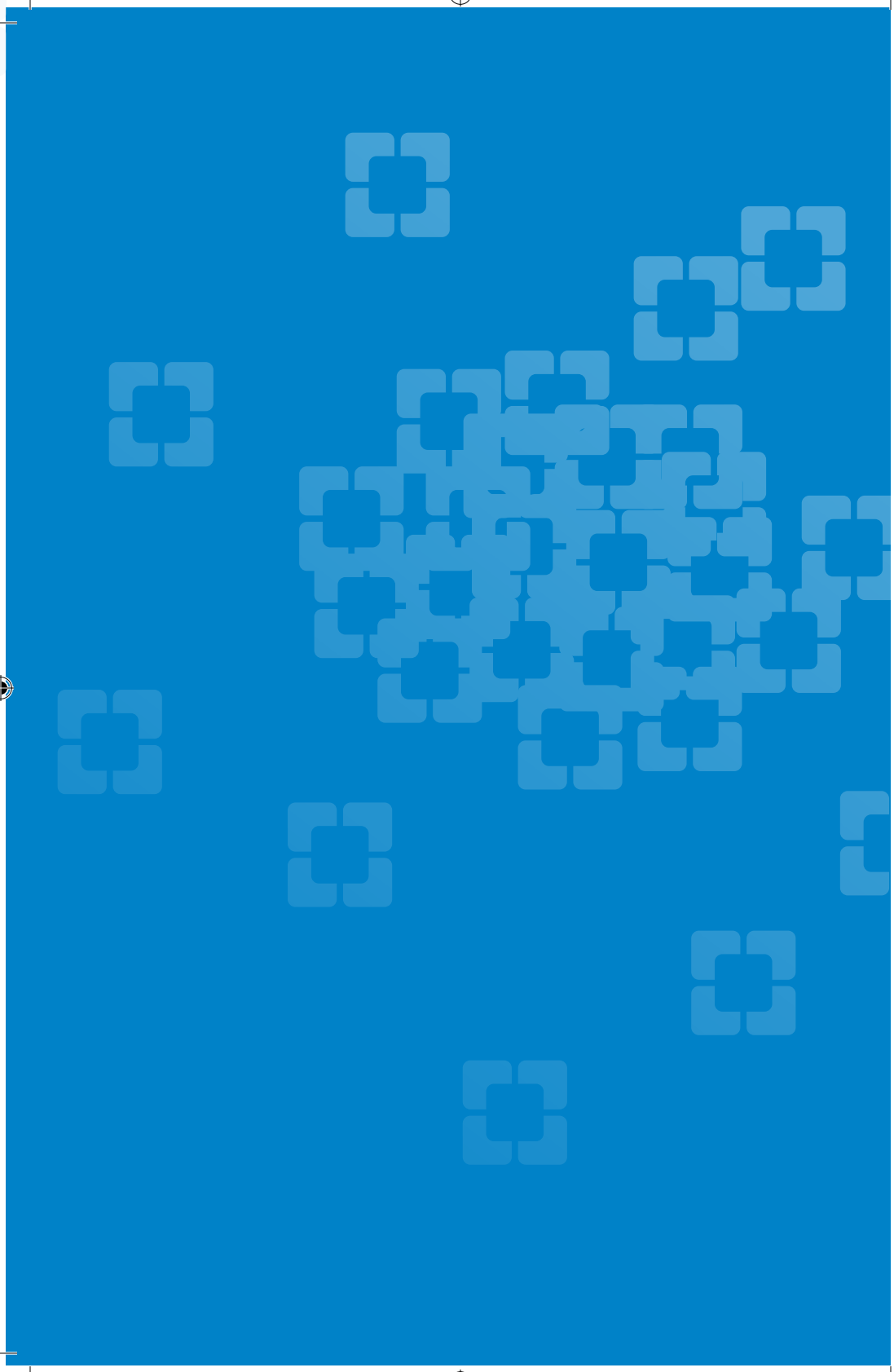
Sawsan As-Sanie, MD, MPH
Professor in Obstetrics & Gynecology
Co-Chief, Gynecology, Director, Minimally Invasive Gynecologic Surgery
Director, Endometriosis & Chronic Pelvic Pain Consultative Clinic
University of Michigan

Judges (Oral Presentations)

Sawsan As-Sanie, MD, MPH
Ashley Brant, DO
Jennifer Eaton, DO
Stacey Ehrenberg, MD
Erin Higgins, MD
Shannon Wallace, MD

Judges (Poster Presentations)

Mariam AlHilli, MD
Jonathan Emery, MD
Monique Katsuki, MD
Adina Kern-Goldberger, MD, MPH
Miguel Luna-Russo, MD



Agenda

7:00 am — **Presenter & Judges Registration**

7:15 am–7:20 am — **Welcome**
Tristi Muir, MD
Chair, Enterprise Women's Health Institute

7:20 am–7:25 am — **Introduction & Welcome**
Ruth Farrell, MD, MA
Vice Chair, Research, Enterprise Women's Health Institute

7:30 am–8:20 am — **Key Note Address**
The Social Injustice of Menstrual Pain: Erasing the Stigma and Being Part of the Solution
Sawsan (Suzie) As-Sanie, MD MPH
Robert K Ferguson and Virginia A Ferguson Professor in Obstetrics and Gynecology
Co-Chief of Gynecology
Director, Minimally Invasive Gynecologic Surgery
Director, Endometriosis and Chronic Pelvic Pain Program
University of Michigan

8:20 am–8:30 am — **Q&A**

8:30 am–8:40 am — **Break**

8:40–10:10 am PGY3 Resident Oral Presentations

8:40 am — ***Fetal Echocardiography Outcomes in Mothers at Increased Risk of Fetal Congenital Heart Disease***
Lauren Buckley, MD

8:50 am — Discussant: Annika Sinha, MD & Q&A

8:55 am — ***Necrotizing Soft Tissue Infections in Obstetric and Gynecologic Patients***
Catherine (Katie) Klammer, MD

9:05 am — Discussant: Imani Chatman, MD & Q&A

9:10 am — ***Incidence of and Risk Factors for Venous Thromboembolism in Recurrent Ovarian Cancer***
Erika Lampert, MD

9:20 am	Discussant: Julia Chalif, MD & Q&A
9:25 am	***Umbilical Cord Blood Collection during Cesarean Section: Impact on Maternal Blood Loss & Morbidity*** Madeline Lederer, MD
9:35 am	Discussant: Catherine Keller, MD & Q&A
9:40 am	***Prevalence of Polycystic Ovarian Syndrome in Young and Adolescent Transmasculine Patients Presenting for Gender Affirmation Care*** Sabrina Rangi, MD
9:50 am	Discussant: Kaia Schwartz, MD & Q&A
9:55 am	***Comparing Foley Balloon and Hygroscopic Dilators as Cervical Preparation Prior to Dilation and Evacuation*** Johnathan Zhao, MD
10:05 am	Discussant: Rachel Shin, MD & Q&A
10:10 am	**Refreshment Break & PGY2 Resident Poster Presentations**

10:45 am–12:15 pm	**Graduating Fellows Oral Presentation**
10:45 am	***Evolutionary Experimentation Highlights Collateral Sensitivity and Associated Gene-Expression Changes in Endometrial Cancer Cell Lines*** Sabrina Bedell, MD Fellow, Gynecologic Oncology
10:55 am	Q&A
11:00 am	***Activating the Immune System is Essential for the Efficacy of Heated Intraperitoneal Cisplatin in a Murine Model of Advanced Epithelial Ovarian Cancer*** Danielle Chau, MD Fellow, Gynecologic Oncology
11:10 am	Q&A
11:15 am	***Evaluating the Impact of Video-Based Surgical Coaching on Obstetrics and Gynecology Residents' Laparoscopic Suturing Skills*** Angelina Carey-Love, MD Clinical Fellow, Minimally Invasive Gynecologic Surgery

11:25 am	Q&A
11:30 am	***Hysterectomy in BRCA Carriers: What are the Differences Between Patients Who Have Hysterectomy at the Time of Risk Reducing BSO and Those That Opt for RRSO Without Hysterectomy?*** Alexa Fiffick, DO Clinical Fellow, Specialized Women's Health
11:40 am	Q&A
11:45 am	***The Presence of Cell Extrusion or Exclusion during Embryonic Compaction is Associated with Lower Rates of Blastocyst Formation and Poorer Morphologic Grade*** Christine Hur, MD Fellow, Reproductive Endocrinology & Infertility
11:55 am	Q&A
12:00 pm	***Postoperative Functional Outcomes in Patients Undergoing Combined Robotic Ventral Rectopexy and Sacrocolpopexy*** James Ross, MD Fellow, Female Pelvic Medicine and Reconstructive Surgery
12:10 pm	Q&A
12:15–1:00 pm	**Lunch Break & View Posters**

1:00 pm	**Innovations in Ob/Gyn Lecture**
	From Good to Great: The Power of Surgical Coaching in Cultivating a Culture of High Performance and Continuous Improvement Cara R. King, DO, MS Section Head, Minimally Invasive Gynecologic Surgery & Medical Gynecology; Program Director, MIGS Fellowship, Cleveland Clinic
1:50 pm	Q&A
2:00 pm	**Announcement of Award Winners & Closing Remarks** Ruth Farrell, MD, MA
2:20 pm	**Group picture of all presenters, award winners, speakers & Institute Leadership**

2:30–5:00 pm	Faculty Development/Breakout Sessions
TT1-100	***Statistical Support for Your Research Project: What is Included and How to Work With Your Statistician*** Meng Yao, MS, Biostatistician Cleveland Clinic, LRI Quantitative Health Sciences
TT1-102	***You've Done Your Interviews and Now What? Approaching Qualitative Analysis*** Ruth Farrell, MD, MA Cleveland Clinic, Enterprise Women's Health Institute

Past Research Day Award Winners

Resident Poster Presentation – 1st Place

2022	Erika Lampert, MD
2021	Rachel Shin, MD, MPH
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

2022	Rachel Shin, MD, MPH
2021	Jonathan Hunt, MD, MBA
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

2022	Michelle Kuznicki, MD, MA
2021	Laura Chambers, DO, MS
2020	Katie Crean-Tate, MD
2019	Elizabeth Conner, MD
2018	Tonya Nikki Thomas, MD
2017	Kathryn Maurer, MD
2016	Linnea Goodman, MD

Keynote Address & Lecture

Sawsan As-Sanie, MD, MPH

Professor in Obstetrics & Gynecology
Co-Chief, Gynecology, Director, Minimally Invasive Gynecologic Surgery
Director, Endometriosis & Chronic Pelvic Pain Consultative Clinic
University of Michigan

Dr. As-Sanie is the Ferguson Endowed Professor of Obstetrics and Gynecology, Co-Chief of Gynecology, Director of the Minimally Invasive Gynecologic Surgery Program and Fellowship, and Director of the Endometriosis and Chronic Pelvic Pain Program at the University of Michigan. Dr. As-Sanie is an NIH-funded clinician scientist and is committed to improving the healthcare of women with chronic pelvic pain and endometriosis by pursuing clinical and translational research in the epidemiology, neurobiology, and treatment of endometriosis and other pelvic pain disorders.

She has been involved in several different professional organizations committed to this mission. She is a Past-President of the International Pelvic Pain Society (IPPS), an elected member of the American Gynecological & Obstetrical Society (AGOS), Society for Gynecologic Surgeons (SGS), an Ambassador for the World Endometriosis Society (WES) and is currently Chair of the ASRM Endometriosis Special Interest Group. She is also a member of the Society of Women's Health Research Interdisciplinary Network on Female Pelvic Health and serves on the editorial board of the *Journal of Minimally Invasive Gynecology*.

Judges (Oral Presentations)

Sawsan As-Sanie, MD, MPH
Professor in Obstetrics & Gynecology
Co-Chief, Gynecology, Director, Minimally Invasive Gynecologic Surgery
Director, Endometriosis & Chronic Pelvic Pain Consultative Clinic
University of Michigan

Ashley Brant, DO
Assistant Professor
Cleveland Clinic
Enterprise Women's Health Institute
Obstetrics and Gynecology
Faculty, Obstetrics and Gynecology

Jennifer Eaton, DO
Staff Physician
Cleveland Clinic
Enterprise Women's Health Institute
Obstetrics and Gynecology
Medical Director, Obstetrics and Gynecology

Stacey Ehrenberg, MD
Staff Physician
Cleveland Clinic
Enterprise Women's Health Institute
Subspecialty Care for Women's Health
Faculty, Maternal Fetal Medicine

Erin Higgins, MD
Assistant Professor
Cleveland Clinic
Enterprise Women's Health Institute
Obstetrics and Gynecology
Faculty, Obstetrics and Gynecology

Shannon Wallace, MD
Assistant Professor
Cleveland Clinic
Enterprise Women's Health Institute
Subspecialty Care for Women's Health
Faculty, Urogynecology

Judges (Poster Presentation)

Mariam AlHilli, MD
Associate Professor
Cleveland Clinic
Enterprise Women's Health Institute
Subspecialty Care for Women's Health
Faculty, Gynecologic Oncology

Jonathan Emery, MD
Assistant Professor
Cleveland Clinic
Enterprise Women's Health Institute
Obstetrics and Gynecology
Vice Chair, Obstetrics and Gynecology

Monique Katsuki, MD
Associate Staff
Cleveland Clinic
Enterprise Women's Health Institute
Obstetrics and Gynecology
Faculty, Obstetrics and Gynecology

Adina Kern-Goldberger, MD, MPH
Staff Physician
Cleveland Clinic
Enterprise Women's Health Institute
Subspecialty Care for Women's Health
Faculty, Maternal Fetal Medicine

Miguel Luna-Russo, MD
Associate Staff
Cleveland Clinic
Enterprise Women's Health Institute
Subspecialty Care for Women's Health
Faculty, Minimally Invasive Gynecologic Surgery

Obstetrics, Gynecology & Women's Health Institute

PGY3 Resident Oral Presentations

Fetal Echocardiography Outcomes in Mothers at Increased Risk of Fetal Congenital Heart Disease – IRB 22-357

Lauren Buckley, MD

Objective: Guidelines recommend pregnant people with congenital heart disease (CHD) undergo fetal echocardiography as the incidence of offspring with CHD is estimated to be 3.5%. Evidence to support increased detection of echocardiogram is limited. Our study has two objectives: 1. Examine the rate of neonatal CHD in offspring of mothers with CHD in a contemporary cohort. 2. Evaluate the diagnostic accuracy of fetal echocardiogram in addition to level II anatomy ultrasound in pregnant patients with CHD.

Methods: This is an observational retrospective study of patients with CHD referred to a cardiac obstetric clinic in a large hospital system from 1/1/2013-1/1/2022. Maternal-Fetal Medicine interpreted all level II anatomy ultrasounds and pediatric cardiology interpreted all fetal echocardiograms. Sensitivity and specificity were calculated compared to neonatal diagnosis of CHD. Anatomy ultrasound results were compared to fetal echo results via McNamer's test. Rate of neonatal CHD was calculated as a percentage of the total number of infants born to pregnancies meeting inclusion criteria diagnosed with CHD. Fetal echo and anatomy ultrasound findings were compared to the gold standard of neonatal echocardiogram. Sensitivity and specificity were calculated.

Results: The below results include data that has been analyzed to date. Final data and conclusions will be presented at Research Day. A total of 158 pregnancies met inclusion criteria (45 excluded due to missing information). The rate of neonatal CHD diagnosed was 12.7% (20/158). Demographics were similar between the affected and unaffected pregnancies although affected pregnancies were significantly more likely to be affected by genetic condition (30% vs 5.8%, p=0.003). There was no significant disagreement between abnormal findings on level II anatomy and fetal echocardiogram (p=0.26). However, sensitivity of fetal echocardiogram for neonatal CHD was 50% and sensitivity of anatomy ultrasound was 35%. The specificity of both fetal echo and level II anatomy was 89.1%

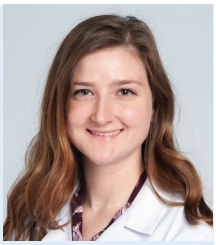
Conclusions: The rate of CHD in offspring of mothers with CHD may be higher than previously reported. Both level II anatomy ultrasound and fetal echo have a high specificity for fetal CHD. Fetal echocardiography interpretation by pediatric

cardiology increases sensitivity of screening for CHD in patients affected by CHD beyond the level II anatomy ultrasound.

Funding Source: None

Faculty Mentor: Maeve Hopkins, MD
Discussant: Annika Sinha, MD

Necrotizing Soft Tissue Infections in Obstetric and Gynecologic Patients – IRB 22-296



Catherine (Katie) Klammer, MD

Objective: Necrotizing soft tissue infections are rapidly progressive bacterial infections that manifest in diffuse subcutaneous necrosis. While uncommon, mortality rates remain high (13-50%) even with medical and surgical intervention (Roberts and Hester, 1972; Roberts, 1987; Nolan et al., 1993; Stephenson et al., 1992). Although several case reports and small studies regarding necrotizing soft tissue infections of the gynecologic tract have been published (Roberts and Hester 1987), there is not yet robust enough of a population to draw meaningful statistical conclusions.

Methods: By conducting a retrospective chart review of patients admitted to the Cleveland Clinic for necrotizing soft tissue infections of the gynecologic tract over the past 12 years, we describe patient and perioperative risk factors associated with length of admission, number of debridements, and mortality for gynecologic patients with necrotizing soft tissue infections.

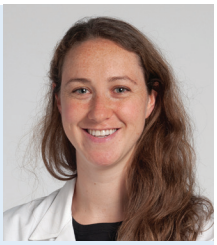
Results: An EMR inquiry of female patients with the ICD 10 codes for necrotizing soft tissue infection (M72.6), Necrotizing Fasciitis (M72.6), and Fournier's Gangrene (N49.3) was performed and yielded 79 charts. These charts were reviewed and 38 cases of necrotizing soft tissue infection of the gynecologic tract were identified. A preliminary complete review of 15 charts revealed an average age of 57 years old with a BMI of 40. Our patients' average ASA class was 2.6 with Charlston Comorbidity score of 2.9. The average pre-operative maximum temperature was 100.0 with WBC of 19 and lactate of 2.6. Average time to receiving antibiotics from presentation was 216.5 minutes.

Conclusions: Final complete review of all 38 cases will provide clinical information regarding optimal management strategies for necrotizing soft tissue infections of the gynecologic tract.

Funding source: None

Faculty Mentor: Roberto Vargas, MD
Discussant: Imani Chatman, MD

Incidence of and Risk Factors for Venous Thromboembolism in Recurrent Ovarian Cancer – IRB 22-085



Erika Lampert, MD

Objective: To report the incidence and impact of venous thromboembolism (VTE) in patients with recurrent ovarian cancer (OvCa) as well as evaluate predictors of VTE to identify patients who may benefit from thromboprophylaxis.

Methods: This was a retrospective single-institution cohort study in women with recurrent epithelial OvCa treated between 2008- 2021. Patients with a diagnosis of VTE prior to recurrence and those previously on anticoagulation were excluded. Univariate and multivariable analyses were performed**.**

Results: Among 449 patients with recurrent OvCa, 345 patients met inclusion criteria of which 77 (22.3%) developed VTE. There were no significant differences in mean age (62.3 vs 63.3 years, p=0.48), race (p=0.90), histology (p=0.11), stage (p=0.64), smoking (p=0.54), mean BMI (28.4 vs 26.8 kg/m2, p=0.056), or platinum-sensitivity (86% vs 76%, p=0.16) between those with or without VTE, respectively. Among patients with VTE, 53.3% had deep vein thrombosis, 40% had pulmonary embolism, and 6.7% developed both. 56 (72.7%) patients were actively receiving chemotherapy at time of VTE diagnosis, of which 44 (78.6%) were on ≥3rd line of chemotherapy. 37 (48%) patients were admitted to the hospital upon diagnosis, 9 (11.7%) had a bleeding complication while on anticoagulation, and one (1.3%) mortality occurred secondary to VTE. Patients with VTE received a higher total number of lines of chemotherapy compared to those without (median 5 vs 4 lines, p=0.012) and a higher median number of treatment lines was associated with increased VTE risk in a multivariate model (OR 1.14, CI 1.02-1.28, p=0.026). Khorana score was not predictive of VTE (p=0.24). There was no significant difference in overall survival (OS; median 62.9 vs 48.7 months,

p=0.19) between patients with and without VTE, respectively.

Conclusions: In this cohort, one in five women with recurrent OvCa developed a VTE, and the majority of VTEs occurred during ≥3rd treatment line of chemotherapy. Risk of VTE was higher while receiving chemotherapy and with increasing lines of chemotherapy. While VTE does not appear to impact OS in recurrent OvCa, nearly half of the diagnosed VTEs required hospitalization and more than 10% of patients experienced a bleeding complication on anticoagulation, highlighting the potential impact of VTE on quality of life and healthcare costs.

Funding source: None

Faculty Mentor: Mariam AlHilli, MD
Discussant: Julia Chalif, MD

Umbilical Cord Blood Collection during Cesarean Section: Impact on Maternal Blood Loss & Morbidity – IRB 22-561

Madeline Lederer, MD

Objective: Umbilical cord blood collection (UCBC) for stem cell banking is routinely performed during cesarean sections (CS). Few studies have examined the maternal impact UCBC has when collected during CS. The objective of this study is to evaluate whether UCBC at time of primary CS (PCS) is associated with increased maternal blood loss, operative time, and maternal morbidity.

Methods: Single-center retrospective cohort study of PCS at Fairview Hospital in 2021. Subjects younger than 18 years, multifetal gestations, emergency delivery, gestational age <34wks, and evidence of infection were excluded. Data was compared between subjects that had UCBC attempted at time of PCS and those that did not. Demographic data includes age, parity, gestational age, body mass index, race, ethnicity, labor status, fetal presentation, presence of hypertension, history of abdominal surgery, nature of CS and indication for CS. The primary outcome of the study was Quantitative Blood Loss (QBL). Secondary outcomes were operative time, administration of hemorrhage medications, and administration of blood transfusion.

Results: 802 charts were reviewed, 191 (23.8%) were excluded. Of the included 611 subjects, 151 (24.7%) had UCBC and 460 (75.3%) did not. The UCBC

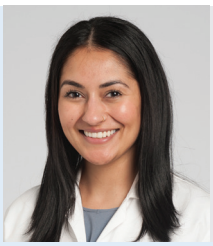
cohort had a higher average gestational age (39.1 vs 38.7, p=0.007), were less likely to have +labor status (59.9% vs 72.3%, p=0.004), were less likely to be on magnesium sulfate (5.9% vs 12.6%, p=0.022), were more likely to be scheduled CS (30.3% vs 18.3%, p=0.002). UCBC was associated with increased operative time in PCS (62.4 vs 56.8 min, p <0.001.) UCBC was also associated with increased rates of post-operative blood transfusion (7.2% vs 3.3%, p=0.036). The primary outcome measure, QBL, was slightly higher in the UCBC cohort (1091.5 vs 1007.5 mL, p=0.075) although this did not reach statistical significance. When comparing non-labored PCS, difference in QBL was significant (941.8 vs 798 mL, p=0.034.) There were no associations between UCBC and increased usage of hemorrhage medications.

Conclusions: UCBC increases QBL in non-labored PCS. UCBC increases operative time and post-operative blood transfusion in PCS. Patients should be appropriately counseled and selected for UCBC based on hemorrhage risk factors.

Funding source: None

Faculty Mentor: Maeve Hopkins, MD
Discussant: Catherine Keller, MD

Prevalence of Polycystic Ovarian Syndrome in Young and Adolescent Transmasculine Patients Presenting for Gender Affirmation Care – IRB 22-093



Sabrina Rangi, MD

Objective: To determine the incidence of PCOS and hyperandrogenism amongst adolescent transmasculine patients presenting to a tertiary care referral center for gender affirming care.

Methods: This was a retrospective study of transmasculine patients presenting to Cleveland Clinic for gender affirming hormone therapy (GAHT). PCOS was defined using the NIH 1990 criteria: oligomenorrhea with clinical and/or biochemical hyperandrogenism after exclusion of other androgen excess disorders.

Results: The described transgender population had a prevalence of PCOS of 28.8%. The transmasculine patients who met criteria for PCOS had both significantly higher levels of androgens in addition to higher BMIs when compared to

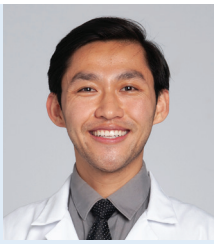
the patients without PCOS. Additionally, the PCOS patients had higher rates of dyslipidemia.

Conclusions: The prevalence of PCOS amongst transmasculine patients may be higher compared to the general population. Transmasculine patients with PCOS should be counseled regarding the long-term health implications associated with PCOS and screened appropriately to minimize risks**.**

Funding: None

Faculty Mentor: Cecile Ferrando, MD, MPH
Discussant: Kaia Schwartz, MD

Comparing Foley Balloon and Hygroscopic Dilators as Cervical Preparation Prior to Dilation and Evacuation – IRB 22-1367



Johnathan Zhao, MD

Objective: To determine whether the Foley balloon is more effective than Dilapan® hygroscopic dilators as cervical preparation for second-trimester dilation and evacuation (D&E).

Methods: Via electronic medical record review, this retrospective cohort study identified patients who received cervical preparation prior to same-day D&E by a single provider at an ambulatory surgery center in Cleveland, OH from January 1, 2022 to June 24, 2022. Inclusion criteria were patient age 18 years or greater, gestational age between 18w0d and 20w6d, and cervical preparation with misoprostol and one form of mechanical dilation (Foley balloon or Dilapan® dilators). Primary outcome was cervical dilation measured in French (Fr) immediately before D&E procedure; dilation was not measured beyond 51 Fr as this width is typically deemed sufficient for D&E. We determined 10 mm (approximately 3.3 Fr) to be a clinically significant difference in pre-D&E cervical dilation between the Foley and Dilapan® groups.

Results: Our analysis identified a total 41 patients (21 patients in Foley group, 20 patients in Dilapan® group). No significant demographic differences were identified between groups, and no complications occurred within the total sample. Cervical dilation pre-D&E was significantly greater in the Foley group (mean=50.5) compared to the Dilapan® group (mean=44.1) with $p<0.001$.

Statistically significant secondary outcomes favored the Foley group and included pain of intervention (Foley 2.4±1.7, Dilapan® 3.8±2.0, p=0.027), pain after D&E (Foley 1.7±1.6, Dilapan® 3.2±1.7, p=0.006), and estimated blood loss (Foley 24.5±9.6 mL, Dilapan® 61.3±20.4 mL, p<0.001). No statistically significant difference was noted in duration between intervention and surgery (Foley 235.0±51.6 min, Dilapan® 253.4±54.9 min, p=0.28) or duration of D&E (Foley 10.2±3.9 min, Dilapan® 9.7±5.0 min, p=0.73).

Conclusions: This data support that the Foley balloon is more effective than Dilapan® dilators in cervical dilation prior to D&E with decreased pain, blood loss, and cost without difference in latency or procedure duration.

Funding: None

Faculty Mentor: Mitchell Reider, MD
Discussant: Rachel Shin, MD

Obstetrics, Gynecology & Women's Health Institute

PGY2 Resident Poster Presentations

Patient Characteristics to Predict Response to Antihypertensive Medications in Severe Hypertension in Pregnancy: A Retrospective Cohort Study

Faculty Mentor: Justin Lappen, MD

Emily Armstrong, MD

Immediate Postpartum Levonorgestrel (Mirena) IUD Insertion: Analysis of Insertion Technique and Expulsion Rates

Faculty Mentor: Ashley Brant, DO

Riva Desai, MD

Simulation-Based Training in OB/GYN- Evaluating the Effectiveness of Simulation Based Training in Obstetrics and Gynecology Residents' Ability to Deliver Bad News

Faculty Mentor: Erin Higgins, MD

Katarina Fleckenstein, MD

Desired Fertility And Its' Impact On Health Related Quality of Life Post-Operatively in Women With Fibroids

Faculty Mentor: Linda Bradley, MD

Emily Frisch

Access to Ergonomic Equipment and Instruments among Obstetric and Gynecologic Surgeons

Faculty Mentor: Cara King, DO, MS

Olivia Neumann, MD

Impact of Highly Restrictive Abortion Bans on the Management of Pregnancies with known Trisomy 13/18: A Cost-Effective Analysis

Faculty Mentor: Maeve Hopkins, MD

Kirat Sandhu, MD

Implementation and Impact of the Early Pregnancy Assessment Clinic at Cleveland Clinic

Faculty Mentor: Ashley Brant, DO

Dominic Sandler, MD

Obstetrics, Gynecology & Women's Health Institute

Graduating Fellow Oral Presentations

Evolutionary Experimentation Highlights Collateral Sensitivity and Associated Gene-Expression Changes in Endometrial Cancer Cell Lines

Sabrina Bedell, MD

Objective: The purpose of this study was to determine if serial exposure to standard-of-care chemotherapy, carboplatin and paclitaxel, would lead to development of chemoresistance and identify potential novel vulnerabilities (collateral sensitivity) using an endometrial cancer cell line.

Methods: The low-grade wild-type TP53 endometrioid endometrial cancer cell line, JHUEM2, was used as the basis for evolutionary experimentation. Five evolutionary/treatment replicates underwent exposure to six "cycles" of carboplatin and paclitaxel, while three (control) replicates underwent serial passages with PBS/DMSO. Chemotherapy dosing was determined using baseline 50% inhibitory concentration (IC50) values. RNA was extracted prior to each new drug exposure and cell aliquots were obtained for collateral sensitivity analyses. Drug and radiation response curves were conducted at baseline and after each cycle of chemotherapy for a total of seven time points. Collateral sensitivity drug panel included carboplatin, paclitaxel, doxorubicin, letrozole, metformin, everolimus, cediranib, olaparib, neratinib, and AMG232. The IC50 of each drug was compared at each time point to determine development of collateral sensitivity or resistance. RNAseq was performed and differential gene expression determined using EdgeR. Over-representation analysis using Reactome pathways was performed.

Results: Following six cycles of carboplatin and paclitaxel, resistance to both carboplatin and paclitaxel was demonstrated by an increase in the mean IC50 from 1.008μM to 4.539μM ($p < 0.001$) for carboplatin, and 1.484nM to 3.236nM ($p = 0.003$) for paclitaxel. Collateral sensitivity to cediranib was demonstrated with a significant decrease in the mean IC50 from 1.663μM at baseline to 1.094μM ($p = 0.02$), in contrast with control replicates which did not show a significant shift in IC50 between baseline and post-chemotherapy. The remaining drugs in the panel and radiation therapy did not exhibit collateral resistance or sensitivity. Differential gene expression analysis and subsequent pathway over-representation demonstrated an increase in ribosome s6 kinase (RSK) activation and decrease in p16ink4a signaling.

Conclusions: Development of resistance to carboplatin and paclitaxel highlights potential collateral sensitivity to cediranib in the endometrial cancer cell line, JHUEM2. Therapeutic targeting of ribosome s6 kinase may also provide insight as to the contribution towards chemo-resistance. Conversely, the decrease in p16ink4a signaling may provide the rationale behind CDK4/6 inhibitor-driven cell senescence and remains to be therapeutically leveraged**.**

Funding: None

Faculty Mentor: Roberto Vargas, MD

Evaluating the Impact of Video-Based Surgical Coaching on Obstetrics and Gynecology Residents' Laparoscopic Suturing Skills – IRB 22-836

Angelina Carey-Love, MD

Objective: To evaluate the impact of a video-based surgical coaching intervention on technical performance during laparoscopic closure of the vaginal cuff among Obstetrics and Gynecology residents.

Methods: This single center, single-blinded, randomized controlled trial was conducted from August 2022 to June 2023. OB/GYN residents were enrolled and stratified based on year of residency training, and randomized into two groups, a control group and an intervention group. Each participant performed a ten-minute intraoperative vaginal cuff closure at baseline and at the end of the study period. All participants had access to an instructional video outlining laparoscopic suturing techniques and a validated vaginal cuff model in the simulation lab for independent practice during the study period. Additionally, the intervention group received three separate video-based surgical coaching sessions with a Minimally Invasive Gynecologic Surgery (MIGS) attending or fellow who underwent surgical coach training by the Academy for Surgical Coaching. All pre- and post-intervention videos were graded by two MIGS attendings who were blinded to the coaching status and resident year of training, using the Global Operative Assessment of Laparoscopic Skills (GOALS)-Plus tool. The kappa statistic was utilized to assess inter-grader reliability. Self-reported participant experience and perceived confidence performing this technical skill was also measured. GOALS-Plus scores and survey results were compared between groups and statistical analysis was performed using SAS and a p value of <0.05.

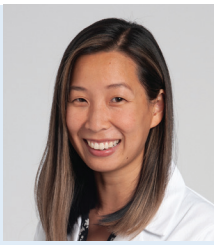
Results: Twenty-eight residents were enrolled in the study, half (n=14) in the control group and half (n=14) in the intervention group. Results still pending.

Conclusions: We hypothesize that Obstetrics and Gynecology residents who participate in a surgical coaching intervention (video-based coaching focused on laparoscopic vaginal cuff closure) will demonstrate improved task-specific technical skills compared to residents who do not participate in the intervention. These findings would provide evidence to implement surgical coaching into residency training curricula, with the goal of improving surgical performance and clinical care.

Funding: None

Faculty Mentor: Cara King, DO, MS

Activating the Immune System is Essential for the Efficacy of Heated Intraperitoneal Cisplatin in a Murine Model of Advanced Epithelial Ovarian Cancer



Danielle Chau, MD

Objective: To investigate whether the clinical benefit of hyperthermic intraperitoneal chemotherapy (HIPEC) in women with advanced epithelial ovarian cancer (EOC) is modulated by the immune system.

Methods: ID8 (luciferase-tagged) tumor bearing mice with or without an intact immune system were injected with cisplatin or vehicle with or without superficial heat (40°C) using an FDA approved hyperthermia unit for 20 minutes. Four treatment groups were evaluated: 1) vehicle without heat (V37) 2) vehicle with 40°C heat (V40) 3) cisplatin without heat (C37) and 4) cisplatin with 40°C heat (C40). Tumor growth was monitored via intraperitoneal D-luciferin. At necropsy timepoints (24 hours and 2 weeks post treatment), tumors were harvested, and immune populations were analyzed by flow cytometry. Statistical tests included analysis of variance, linear regression, and Wilcoxon test.

Results: Heated cisplatin treatment (C40) of immune-competent mice exhibited significant attenuation of tumor growth compared to non-heated cisplatin treatment (C37) (Fig. 1A). By day 14, there was a significant reduction in tumor burden in C40 mice compared to C37 mice, $p < 0.05$. There was no significant difference between V40 and V37 mice, indicating no benefit derived from heat therapy alone. Furthermore, when this same treatment paradigm was employed in immune compromised mice (Fig. 1B), the additive effect of heat and cisplatin

was lost. Upon endpoint analysis, CD3, CD4, Regulatory, and CD8 T cells were enriched in tumors treated with heat and cisplatin (C40) compared to cisplatin (C37) or heat alone (V40), $p < 0.05$.

Conclusions: Our findings reveal a role for the immune system in enhancing efficacy of heated chemotherapy in mouse models, suggesting that the beneficial effect of HIPEC is dependent on a synergistic effect of heat and chemotherapy to produce an augmented immune response. Further investigation is warranted to identify the immune populations that underlie the murine HIPEC phenotype in order to optimize the process by which HIPEC improves clinical outcomes.

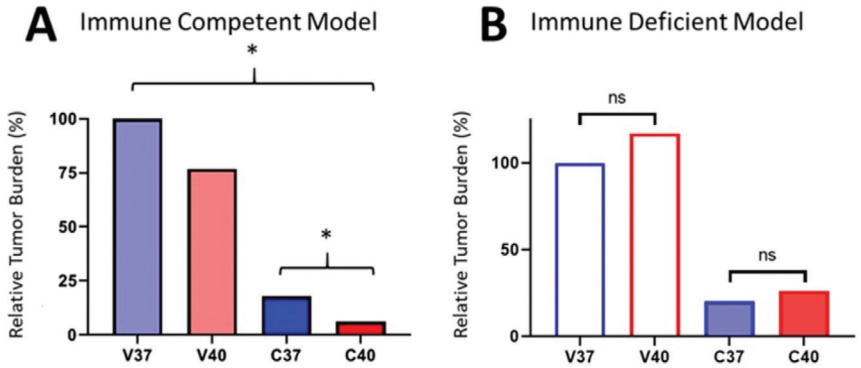


Figure 1: Hyperthermia plus cisplatin suppresses tumor growth via an immune dependent mechanism. The impact of heated cisplatin on inhibiting tumor growth (A) is lost in the absence of an intact immune system (B). *$p < 0.05$.

Funding: Velosano Grant 2021-2023 “Improving Ovarian Cancer Outcomes with Translational Studies of Hyperthermic Intraperitoneal Chemotherapy” PI: Robert Debernardo, Co-I: Danielle Chau.

Faculty Mentors: Ofer Reizes, PhD, Robert Debernardo, MD

Hysterectomy in BRCA carriers: What are the differences between patients who have hysterectomy at the time of risk reducing BSO and those that opt for RRSO without hysterectomy? – IRB 22-769

Alexa Fiffick, DO

Objective: We hypothesize that patients (even those followed at an Academic Center) may not be adhering to NCCN guidelines for RRSO at the appropriate age, are not receiving HRT as recommended, and are more likely to return to surgery for hysterectomy later. This hypothesis will be tested via the following Aims: Quantify how many BRCA-positive patients undergo recommended RRSO per NCCN guidelines and at what age, and what proportion have a concurrent hysterectomy. Determine the number of patients who use recommended HRT following RRSO and the duration of such therapy (date of surgery, date of first Rx for HRT, and date of last Rx for HRT unless contraindicated). We will also note age at HRT discontinuation. Determine how many BRCA-positive patients with risk-reducing bilateral salpingo-oophorectomy return to surgery for a total hysterectomy and what pathologic findings are identified (benign, hyperplasia without atypia, hyperplasia with atypia, endometrial carcinoma or other). We will quantify procedures related to bleeding: endometrial biopsy, ultrasound, D&C, and ablation. Determine if (and when) a patient has a Bone Mineral Density test, and what the results were.

Methods: This study will be a retrospective cohort study utilizing an established database of BRCA-positive patients followed at Cleveland Clinic from all departments from 2005-2022.

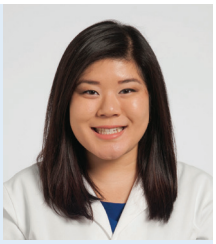
Results: Data Collection Still Pending

Conclusions: We hypothesize that patients (even those followed at an Academic Center) may not be adhering to NCCN guidelines for RRSO at the appropriate age, are not receiving HRT as recommended, and are more likely to return to surgery for hysterectomy later. If true, this knowledge will help to identify areas that need more attention to ensure patients receive guideline directed care for RRSO and HRT. Also, if true that hysterectomy after RRSO is more likely, it may redirect the conversations physicians and surgeons have when recommending RRSO +/- hysterectomy in BRCA carriers.

Funding source: None

Faculty Mentor: Holly Thacker, MD

The presence of cell extrusion or exclusion during embryonic compaction is associated with lower rates of blastocyst formation and poorer morphologic grade – IRB 5251 and IRB 14-566



Christine Hur, MD

Objective: To determine whether visualization of the embryonic compaction process through time- lapse imaging (TL) can assist in predicting likelihood of blastocyst formation, grade or ploidy

Methods: Patients undergoing in vitro fertilization (IVF) with preimplantation genetic testing for aneuploid (PGT-A) between June 2020 to January 2021 were included. Embryo morphokinetics and TL videos were reviewed in detail. Embryo compaction patterns were categorized as follows: 1) full compaction (CP-F), 2) partial with cell extrusion (P-ext), 3) partial with cell exclusion (P-exc) and 4) partial with both cell extrusion and exclusion (P-both). Blastocysts were graded by blast maturity (1-early, 2-full, 3-expanded, 4-hatched), inner cell mass score (1-good, 2-fair, 3-poor/absent) and trophectoderm grade (1-good, 2-fair, 3-poor). The association between CP, morphokinetics parameters, blastocyst formation, grade and ploidy were analyzed. Statistical analysis was performed using Kruskal-Wallis and Chi-Square tests with a p-value of <0.05 considered significant.

Results: A total of 349 embryos from 37 IVF cycles were included. Of the embryos which progressed to morula (n=281), the proportion of compaction patterns were found to be: CP-F 45.6%, P-exc 29.5%, P-ext 12.5% and P-both 12.5%. Embryos exhibiting a CP-F were more likely to proceed to blastocyst compared with those that demonstrated P-exc (95.3% v. 83.1%), P-ext (95.3% v. 82.9%), or P-both (95.3% v 82.9%) patterns. Each of these comparisons were found to be statistically significant. When compared with CP-F, partial compaction patterns exhibited a significant negative association with intercellular mass (ICM) score and trophectoderm (TE) grade. Of the 249 blastocysts formed, 200 were cryopreserved for future use. Further, 181 embryos had PGT-A results. Of those, 85 were diagnosed as euploid and 96 as aneuploid or mosaic. No association between compaction patterns and ploidy was identified in these data. When assessing morphokinetic parameters, it was found that a greater percentage of embryos demonstrating CP-F fell within optimal timing when compared to those with partial compaction patterns.

Conclusions: TL visualization of compaction patterns identified exclusions and extrusions as negative indicators of blastocyst formation. Partial compaction patterns were also associated with poorer ICM and TE grades. Complete compaction patterns were associated with higher proportions of embryos demonstrating optimal morphokinetic parameters.

Funding: N/A

Faculty Mentor: Nina Desai, PhD

Postoperative Functional Outcomes in Patients Undergoing Combined Robotic Ventral Rectopexy and Sacrocolpopexy (POURRS) – IRB 22-003

James Ross, MD

Objective: To evaluate functional outcomes and overall postoperative satisfaction in women who underwent combined robotic ventral rectopexy and sacrocolpopexy for concomitant pelvic organ prolapse (POP) and rectal prolapse (RP). Secondarily to compare functional outcomes between patients who had intermediate- and long-term follow-up and to describe adverse events associated with surgery.

Methods: This was a retrospective cohort and survey study of women with combined POP and RP who underwent surgical repair via a robotic approach between January 2018 and July 2021. Each patient was contacted to participate in a survey evaluating postoperative functional outcomes using the Pelvic Floor Disability Index 20 (PFDI-20), Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12), and Patient Global Impression of Improvement Scale (PGI-I). Outcomes were compared between patients who underwent surgery ≤ 24 months and > 24 months before survey completion.

Results: Of the total cohort of 107 patients, mean age and BMI were 63.7 ± 11.5 years and 25.0 ± 5.4 m2/kg respectively. 19% had a prior RP repair and 23% had a prior POP repair. Intraoperatively, a synthetic mesh was used in 100% of sacrocolpopexies and 81% of rectopexies. RP recurrence was reported in 10.4% of patients and objective POP recurrence was found in 7.5% of patients. 67 patients completed the surveys. The median time to survey follow-up was 18 months (8.8-51.8). At the time of survey, the mean PFDI-20 score was 95.7±53.7. The mean PISQ-12 score for all patients was 32.8±7.2 and the median PGI-I score was 2.0 (IQR 1.0-3.0).

Conclusions: In this cohort of patients who underwent a combined robotic ventral rectopexy and sacrocolpopexy, patient-reported postoperative symptom bother was low, sexual function was high, and their overall condition was much improved**.**

Funding: None

Faculty Mentor: Cecile Ferrando, MD, MPH

2022

Resident, Fellow and Faculty Publications

Obstetrics and Gynecology

1. Kuder MM, Baird R, Hopkins M, Lang DM. Anaphylaxis in Pregnancy. *Immunol Allergy Clin North Am*. 2023 Feb;43(1):103-116. doi: 10.1016/j.iac.2022.07.004. Epub 2022 Oct 28. Review. PubMed [citation] PMID: 36410997

2. Aderibigbe OA, Hackney DN, Ranzini AC, Lappen JR. Tight vs liberal control of mild postpartum hypertension: a randomized controlled trial. *Am J Obstet Gynecol MFM*. 2022 Nov 17;5(2):100818. doi: 10.1016/j.ajogmf.2022.100818. [Epub ahead of print] PubMed [citation] PMID: 36402355

3. Hull SJ, Duan X, Brant AR, Peng Ye P, Lotke PS, Huang JC, Coleman ME, Nalls P, Scott RK. Understanding Psychosocial Determinants of PrEP Uptake Among Cisgender Women Experiencing Heightened HIV Risk: Implications for Multi-Level Communication Intervention. *Health Commun*. 2022 Nov 18:1-12. doi: 10.1080/10410236.2022.2145781. [Epub ahead of print] PubMed [citation] PMID: 36398676

4. Hopkins MK, Dugoff L, Kuller JA. Guidelines for Cystic Fibrosis Carrier Screening in the Prenatal/Preconception Period. *Obstet Gynecol Surv.* 2022 Oct;77(10):606-610. doi: 10.1097/OGX.0000000000001062. Review. PubMed [citation] PMID: 36242530

5. Cleary EM, Kniss DA, Fette LM, Hughes BL, Saade GR, Dinsmoor MJ, Reddy UM, Gyamfi-Bannerman C, Varner MW, Goodnight WH, Tita ATN, Swamy GK, Heyborne KD, Chien EK, Chauhan SP, El-Sayed YY, Casey BM, Parry S, Simhan HN, Napolitano PG; Eunice Kennedy Shriver National Institute of Child Health Human Development Maternal-Fetal Medicine Units (MFMU) Network. The Association between Prenatal Nicotine Exposure and Offspring's Hearing Impairment. *Am J Perinatol.* 2022 Aug 25. doi: 10.1055/s-0042-1750407. [Epub ahead of print] PubMed [citation] PMID: 36007918

6. Grantz KL, Grewal J, Kim S, Grobman WA, Newman RB, Owen J, Sciscione A, Skupski D, Chien EK, Wing DA, Wapner RJ, Ranzini AC, Nageotte MP, Craigo S, Hinkle SN, D'Alton ME, He D, Tekola-Ayele F, Hediger ML, Buck Louis GM, Zhang C, Albert PS. Unified standard for fetal growth velocity: the Eunice Kennedy Shriver National Institute of Child Health and Human Development Fetal Growth Studies. *Am J Obstet Gynecol.* 2022 Dec;227(6):916-922.e1. doi: 10.1016/j.ajog.2022.07.045. Epub 2022 Aug 2. No abstract available. PubMed [citation] PMID: 35926648, PMCID: PMC9729377

7. Aderibigbe OA, Lappen JR, Gibson KS. Body composition in term neonates of mothers with hypertensive disorders of pregnancy. *Pediatr Res.* 2022 Jul 29. doi: 10.1038/s41390-022-02191-9. [Epub ahead of print] PubMed [citation] PMID: 35906316

8. Aderibigbe OA, Kuhr DL, McCarther NM, Hackney DN. Temporal Association Between Interracial Couples and Odds of Low Birth Weight Infants: Trends in National Vital Statistics Data from 1971 to 2016. *Reprod Sci.* 2022 Nov;29(11):3235-3241. doi: 10.1007/s43032-022-00935-w. Epub 2022 Jul 18. PubMed [citation] PMID: 35851682

9. Sinha A, Patterson B. Persistently elevated β-human chorionic gonadotropin level after vacuum-assisted uterine aspiration: a case report. *J Med Case Rep.* 2022 Jul 17;16(1):279. doi: 10.1186/s13256-022-03511-7. Review. PubMed [citation] PMID: 35842706, PMCID: PMC9288723

10. Kaur N, Heerema-McKenney A, Kollikonda S, Karnati S. Changing Course of an Umbilical Cord Mass - Chasing the Diagnosis of Angiomyxoma. *Pediatr Dev Pathol.* 2022 Sep-Oct;25(5):558-561. doi: 10.1177/10935266221106910. Epub 2022 Jun 4. PubMed [citation] PMID: 35658744

11. Scott RK, Hull SJ, Huang JC, Coleman M, Ye P, Lotke P, Beverley J, Moriarty P, Balaji D, Ward A, Holiday J, Brant AR, Cameron M, Elion R, Visconti A. Factors Associated with Intention to Initiate Pre-exposure Prophylaxis in Cisgender Women at High Behavioral Risk for HIV in Washington, D.C. *Arch Sex Behav.* 2022 Jul;51(5):2613-2624. doi: 10.1007/s10508-021-02274-4. Epub 2022 May 27. PubMed [citation] PMID: 35622077, PMCID: PMC9308717

12. Costantine MM, Sandoval GJ, Grobman WA, Reddy UM, Tita ATN, Silver RM, El-Sayed YY, Wapner RJ, Rouse DJ, Saade GR, Thorp JM Jr, Chauhan SP, Chien EK, Casey BM, Srinivas SK, Swamy GK, Simhan HN; Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units (MFMU) Network. Association of Body Mass Index With the Use of Health Care Resources in Low-Risk Nulliparous Pregnancies After 39 Weeks of Gestation. *Obstet Gynecol.* 2022 May 1;139(5):866-876. doi: 10.1097/AOG.0000000000004753. Epub 2022 Apr 5. PubMed [citation] PMID: 35576345, PMCID: PMC9142136

13. Dinsmoor MJ, Fette LM, Hughes BL, Rouse DJ, Saade GR, Reddy UM, Allard D, Mallett G, Thom EA, Gyamfi-Bannerman C, Varner MW, Goodnight WH, Tita ATN, Costantine MM, Swamy GK, Heyborne KD, Chien EK, Chauhan SP, El-Sayed YY, Casey BM, Parry S, Simhan HN, et al. Amniocentesis to diagnose congenital cytomegalovirus infection following maternal primary infection. *Am J Obstet Gynecol MFM*. 2022 Jul;4(4):100641. doi: 10.1016/j.ajogmf.2022.100641. Epub 2022 May 6. PubMed [citation] PMID: 35526782, PMCID: PMC9167787

14. Lewicki P, Brant A, Basourakos SP, Qiu Y, Chughtai B, Shoag JE. Patterns in Transvaginal Mesh Surgery After Government Regulation in the United States. *JAMA Surg*. 2022 Jun 1;157(6):542-543. doi: 10.1001/jamasurg.2022.0663. No abstract available. PubMed [citation] PMID: 35416946, PMCID: PMC9008563

15. Plunkett BA, Weiner SJ, Saade GR, Belfort MA, Blackwell SC, Thorp JM Jr, Tita ATN, Miller RS, McKenna DS, Chien EKS, Rouse DJ, El-Sayed YY, Sorokin Y, Caritis SN; Eunice Kennedy Shriver National Institute of Child Health Human Development Maternal-Fetal Medicine Units (MFMU) Network*. Maternal Diabetes and Intrapartum Fetal Electrocardiogram. *Am J Perinatol.* 2022 Jul 10. doi: 10.1055/a-1817-5788. [Epub ahead of print] PubMed [citation] PMID: 35381609, PMCID: PMC9532457

16. Jasthi D, Kollikonda S, Karnati S. Clinical course and long-term follow-up of a preterm infant with non-fatal respiratory distress syndrome due to heterozygous ABCA3 gene mutation: A case report and review of literature. *J Neonatal Perinatal*

Med. 2022;15(3):653-658. doi: 10.3233/NPM-210879. Review. PubMed [citation] PMID: 35342051

17. Shin RJ, Yao M, Akesson C, Blazel M, Mei L, Brant AR. An exploratory study comparing the quality of contraceptive counseling provided via telemedicine versus in-person visits. *Contraception*. 2022 Aug;112:86-92. doi: 10.1016/j.contraception.2022.02.004. Epub 2022 Mar 3. PubMed [citation] PMID: 35247368

18. Newman RB, Stevens DR, Hunt KJ, Grobman WA, Owen J, Sciscione A, Wapner RJ, Skupski D, Chien EK, Wing DA, Ranzini AC, Porto M, Grantz KL. Fetal Growth Biometry as Predictors of Shoulder Dystocia in a Low-Risk Obstetrical Population. *Am J Perinatol*. 2022 Jun 30. doi: 10.1055/a-1787-6991. [Epub ahead of print] PubMed [citation] PMID: 35240706, PMCID: PMC9627645

19 -to-Skin Contact at the Time of Delivery: A Randomized Controlled Trial. *AJP Rep.* 2022 Feb 4;12(1):e10-e16. doi: 10.1055/s-0041-1741540. eCollection 2022 Jan. PubMed [citation] PMID: 35141030, PMCID: PMC8816630

20. Rouse DJ, Fette LM, Hughes BL, Saade GR, Dinsmoor MJ, Reddy UM, Pass R, Allard D, Mallett G, Clifton RG, Saccoccio FM, Permar SR, Gyamfi-Bannerman C, Varner MW, Goodnight WH, Tita ATN, Costantine MM, Swamy GK, Heyborne KD, Chien EK, Chauhan SP, El-Sayed YY, et al. Noninvasive Prediction of Congenital Cytomegalovirus Infection After Maternal Primary Infection. *Obstet Gynecol.* 2022 Mar 1;139(3):400-406. doi: 10.1097/AOG.0000000000004691. PubMed [citation] PMID: 35115450, PMCID: PMC8857032

21. Wang EY, Perni UC, Gregg AR. Genetic Screening and Teratogenic Exposures: Considerations in Caring for the Uterus Transplant Patient. *Clin Obstet Gynecol*. 2022 Mar 1;65(1):76-83. doi: 10.1097/GRF.0000000000000677. PubMed [citation] PMID: 35045028

22. Perni UC, Wang EY, Gregg AR. Antepartum Care of the Uterus Transplant Patient: The Experience of 3 Successful US Centers. *Clin Obstet Gynecol.* 2022 Mar 1;65(1):84-91. doi: 10.1097/GRF.0000000000000682. PubMed [citation] PMID: 35045029

23. Fishel Bartal M, Premkumar A, Murguia Rice M, Reddy UM, Tita ATN, Silver RM, El-Sayed YY, Wapner RJ, Rouse DJ, Saade GR, Thorp JM Jr, Costantine MM, Chien EK, Casey BM, Srinivas SK, Swamy GK, Simhan HN; Eunice Kennedy Shriver National Institute of Child Health, Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network. Hypertension in pregnancy and adverse outcomes among low-risk nulliparous women expectantly managed at or after 39 weeks: a secondary analysis of a randomised controlled trial. *BJOG*. 2022 Jul;129(8):1396-1403. doi: 10.1111/1471-0528.17059. Epub 2022 Jan 6. PubMed [citation] PMID: 34927787, PMCID: PMC9207156

24. Pippen J, Stetson B, Doherty L, Varner MW, Casey BM, Reddy UM, Wapner RJ, Rouse DJ, Tita ATN, Thorp JM Jr, Chien EK, Saade GR, Blackwell SC; Eunice Kennedy Shriver National Institute of Child Health Human Development Maternal-Fetal Medicine Units Network. Neonatal Birthweight, Infant Feeding, and Childhood

Metabolic Markers. *Am J Perinatol.* 2022 Apr;39(6):584-591. doi: 10.1055/s-0041-1740056. Epub 2021 Dec 16. PubMed [citation] PMID: 34918330, PMCID: PMC9106839

25. Grantz KL, Grewal J, Kim S, Grobman WA, Newman RB, Owen J, Sciscione A, Skupski D, Chien EK, Wing DA, Wapner RJ, Ranzini AC, Nageotte MP, Craigo S, Hinkle SN, D'Alton ME, He D, Tekola-Ayele F, Hediger ML, Buck Louis GM, Zhang C, Albert PS. Unified standard for fetal growth: the Eunice Kennedy Shriver National Institute of Child Health and Human Development Fetal Growth Studies. *Am J Obstet Gynecol.* 2022 Apr;226(4):576-587.e2. doi: 10.1016/j.ajog.2021.12.006. Epub 2021 Dec 11. No abstract available. PubMed [citation] PMID: 34906542, PMCID: PMC9554735

26. Debbink MP, Ugwu LG, Grobman WA, Reddy UM, Tita ATN, El-Sayed YY, Wapner RJ, Rouse DJ, Saade GR, Thorp JM Jr, Chauhan SP, Costantine MM, Chien EK, Casey BM, Srinivas SK, Swamy GK, Simhan HN; Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network. Racial and Ethnic Inequities in Cesarean Birth and Maternal Morbidity in a Low-Risk, Nulliparous Cohort. *Obstet Gynecol.* 2022 Jan 1;139(1):73-82. doi: 10.1097/AOG.0000000000004620. PubMed [citation] PMID: 34856577, PMCID: PMC8678297

27. Aderibigbe OA, Lappen JR, Albertini M, Gibson KS. Comparing Two Testing Strategies: Universal versus Symptomatic SARS-CoV-2 Testing in Obstetric Patients. *Am J Perinatol*. 2022 Jul;39(9):909-914. doi: 10.1055/s-0041-1740017. Epub 2021 Nov 28. PubMed [citation] PMID: 34839480

28. Hopkins MK, Dugoff L. Screening for aneuploidy in twins. *Am J Obstet Gynecol MFM*. 2022 Mar;4(2S):100499. doi: 10.1016/j.ajogmf.2021.100499. Epub 2021 Oct 8. Review. PubMed [citation] PMID: 34634497

29. Bennett C, Munoz JL, Yao M, Singh K. Effects of delayed cord clamping on neonatal hyperbilirubinemia in pre-gestational diabetes at term. *J Matern Fetal Neonatal Med.* 2022 Dec;35(25):7267-7275. doi: 10.1080/14767058.2021.1946785. Epub 2021 Jul 29. PubMed [citation] PMID: 34320875

30. Kollikonda S, Chavan M, Cao C, Yao M, Hackett L, Karnati S. Transmission of severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) through infant feeding and early care practices: A systematic review. *J Neonatal Perinatal Med*. 2022;15(2):209-217. doi: 10.3233/NPM-210775. Review. PubMed [citation] PMID: 34219674

31. Vafai Y, Yeung EH, Sundaram R, Smarr MM, Gerlanc N, Grobman WA, Skupski D, Chien EK, Hinkle SN, Newman RB, Wing DA, Ranzini AC, Sciscione A, Grewal J, Zhang C, Grantz KL. Prenatal medication use in a prospective pregnancy cohort by pre-pregnancy obesity status. *J Matern Fetal Neonatal Med*. 2022 Dec;35(25):5799-5806. doi: 10.1080/14767058.2021.1893296. Epub 2021 Mar 11. PubMed [citation] PMID: 33706661, PMCID: PMC8802334

32. Vafai Y, Yeung EH, Sundaram R, Smarr MM, Gerlanc N, Grobman WA, Skupski D, Chien EK, Hinkle SN, Newman RB, Wing DA, Ranzini AC, Sciscione A, Grewal J, Zhang C, Grantz KL. Racial/Ethnic Differences in Prenatal Supplement and Medication Use in Low-Risk Pregnant Women. *Am J Perinatol.* 2022 Apr;39(6):623-632. doi: 10.1055/s-0040-1717097. Epub 2020 Oct 8. PubMed [citation] PMID: 33032328, PMCID: PMC8802333

Subspecialty Care for Women's Health

1. Li R, Kreher DA, Gubbels AL, Palermo TM, Benjamin AR, Irvine CS, Hart A, Jusko TA, Seplaki CL. Dysmenorrhea catastrophizing and functional impairment in female pelvic pain. *Front Pain Res (Lausanne).* 2023 Jan 6;3:1053026. doi: 10.3389/fpain.2022.1053026. eCollection 2022. PubMed [citation] PMID: 36688085, PMCID: PMC9853896

2. Cochran T, Fiffick A, Batur P. Update on Contraception. *J Womens Health* (Larchmt). 2022 Dec 30. doi: 10.1089/jwh.2022.0433. [Epub ahead of print] No abstract available. PubMed [citation] PMID: 36594930

3. Propst K, Yao M, Ferrando CA, Hickman LC. Impact of Obstetric Anal Sphincter Injuries on Postpartum Sexual Function: A Prospective Cohort Study. *Urogynecology* (Hagerstown). 2023 Jan 1;29(1):67-74. doi: 10.1097/SPV.0000000000001255. Epub 2022 Oct 4. PubMed [citation] PMID: 36548106

4. Soler M, Alfaro K, Masch RJ, Conzuelo Rodriguez G, Qu X, Wu S, Sun J, Hernández Jovel DM, Bonilla J, Puentes LO, Murillo R, Alonzo TA, Felix JC, Castle P, Cremer M. Safety and Acceptability of Three Ablation Treatments for High-Grade Cervical Precancer: Early Data From a Randomized Noninferiority Clinical Trial. *JCO Glob Oncol.* 2022 Dec;8:e2200112. doi: 10.1200/GO.22.00112. PubMed [citation] PMID: 36525620

5. Gurayah AA, Mason MM, Grewal MR, Nackeeran S, Martin LE, Wallace SL, Amin K, Syan R. Racial and socioeconomic disparities in cost and postoperative complications following sacrocolpopexy in a US National Inpatient Database. *World J Urol.* 2023 Jan;41(1):189-196. doi: 10.1007/s00345-022-04226-6. Epub 2022 Dec 14. PubMed [citation] PMID: 36515723

6. Woodburn KL, Yuan AS, Torosis M, Roberts K, Ferrando CA, Gutman RE. Sacrospinous Fixation and Vaginal Uterosacral Suspension-Evaluation in Uterine Preservation Surgery. *Urogynecology* (Hagerstown). 2022 Nov 23. doi: 10.1097/SPV.0000000000001304. [Epub ahead of print] PubMed [citation] PMID: 36516026

7. Farrell RM, Falcone T. Patients' Perceptions of the High Value of a Uterus. *J Minim Invasive Gynecol*. 2022 Dec 11. pii: S1553-4650(22)01038-X. doi: 10.1016/j.jmig.2022.12.006. [Epub ahead of print] No abstract available. PubMed [citation] PMID: 36516932

8. Wood N, Morton M, Shah SN, Yao M, Barnard H, Tewari S, Suresh A, Kollikonda S,AlHilli MM. Association between CT-based body composition assessment and patient outcomes during neoadjuvant chemotherapy for epithelial ovarian cancer.

Gynecol Oncol. 2022 Dec 9;169:55-63. doi: 10.1016/j.ygyno.2022.11.024. [Epub ahead of print] PubMed [citation] PMID: 36508759

9. Napoe GS, Luchristt D, Sridhar A, Ellington D, Ridgeway B, Mazloomdoost D, Sung V, Ninivaggio C, Harvie H, Santiago-Lastra Y, Gantz MG, Zyczynski HM. Reoperation for prolapse recurrence after sacrospinous mesh hysteropexy: characteristics of women choosing retreatment. *Int Urogynecol J.* 2023 Jan;34(1):255-261. doi: 10.1007/s00192-022-05411-2. Epub 2022 Nov 30. PubMed [citation] PMID: 36449027, PMCID: PMC9839581

10. Shah RD, Chernausek SD, El Ghormli L, Geffner ME, Keady J, Kelsey MM, Farrell R, Tesfaldet B, Tryggestad JB, Van Name M, Isganaitis E. Maternal Diabetes in Youth-Onset Type 2 Diabetes Is Associated with Progressive Dysglycemia and Risk of Complications. *J Clin Endocrinol Metab.* 2022 Nov 30. pii: dgac663. doi: 10.1210/clinem/dgac663. [Epub ahead of print] PubMed [citation] PMID: 36446741

11. McGuinness B, Llarena N, Falcone T, Richards EG. Uncommon Surgical Emergencies in the Adult Gynecologic Patient: Two Cases of Missed Diagnosis of Outflow Tract Obstruction from Congenital Uterine Anomalies. *Case Rep Obstet Gynecol.* 2022 Nov 16;2022:3179656. doi: 10.1155/2022/3179656. eCollection 2022. PubMed [citation] PMID: 36439239, PMCID: PMC9683970

12. Zhang G, Michener CM, Yang B. Low-Grade Ovarian Stromal Tumors with Genetic Alterations of the Wnt/β-Catenin Pathway That Is Crucial in Ovarian Follicle Development and Regulation. *Cancers* (Basel). 2022 Nov 16;14(22). pii: 5622. doi: 10.3390/cancers14225622. Review. PubMed [citation] PMID: 36428715, PMCID: PMC9688201

13. Ferrando CA. Updates on feminizing genital affirmation surgery (vaginoplasty) techniques. *Neurourol Urodyn*. 2022 Nov 24. doi: 10.1002/nau.25088. [Epub ahead of print] Review. PubMed [citation] PMID: 36423307

14. Craighead CG, Collart C, Frankel R, Rose S, Misra-Hebert AD, Tucker Edmonds B, Michie M, Chien E, Coleridge M, Goje O, Ranzini AC, Farrell RM. Impact of Telehealth on the Delivery of Prenatal Care During the COVID-19 Pandemic: Mixed Methods Study of the Barriers and Opportunities to Improve Health Care Communication in Discussions About Pregnancy and Prenatal Genetic Testing. *JMIR Form Res.* 2022 Dec 5;6(12):e38821. doi: 10.2196/38821. PubMed [citation] PMID: 36383634, PMCID: PMC9728023

15. Lua-Mailland LL, Wallace SL, Khan FA, Kannikal JJ, Israeli JM, Syan R. Review of Vaginal Approaches to Apical Prolapse Repair. *Curr Urol Rep.* 2022 Dec;23(12):335-344. doi: 10.1007/s11934-022-01124-7. Epub 2022 Nov 10. Review. PubMed [citation] PMID: 36355328

16. Kim H, Richards EG. Collateral damage in childbirth: cesarean delivery as a risk factor for endometriosis recurrence. *Fertil Steril.* 2022 Dec;118(6):1088-1089. doi: 10.1016/j.fertnstert.2022.10.022. Epub 2022 Nov 4. No abstract available. PubMed [citation] PMID: 36344287

17. Tewari S, Vargas R, Reizes O. The impact of obesity and adipokines on breast and gynecologic malignancies. *Ann N Y Acad Sci.* 2022 Dec;1518(1):131-150. doi: 10.1111/nyas.14916. Epub 2022 Oct 27. Review. PubMed [citation] PMID: 36302117

18. Goje O, Sobel R, Nyirjesy P, Goldstein SR, Spitzer M, Faught B, Larson S, King T, Azie NE, Angulo D, Sobel JD. Oral Ibrexafungerp for Vulvovaginal Candidiasis Treatment: An Analysis of VANISH 303 and VANISH 306. *J Womens Health* (Larchmt). 2022 Oct 17. doi: 10.1089/jwh.2022.0132. [Epub ahead of print] PubMed [citation] PMID: 36255448

19. Park AJ. The Current State of Surgical Ergonomics. *Urogynecology* (Hagerstown). 2022 Aug 1;28(8):461-465. doi: 10.1097/SPV.0000000000001229. PubMed [citation] PMID: 36256963

20. Garzon S, Grassi T, Mariani A, Kollikonda S, Weaver AL, McGree ME, Petersen IA, Weroha SJ, Glaser GE, Langstraat CL, Amarnath SR, AlHilli MM. Not all stage I and II endometrial cancers are created equal: Recurrence-free survival and cause-specific survival after observation or vaginal brachytherapy alone in all subgroups of early-stage high-intermediate and high-risk endometrial cancer. *Gynecol Oncol.* 2022 Dec;167(3):444-451. doi: 10.1016/j.ygyno.2022.10.004. Epub 2022 Oct 14. PubMed [citation] PMID: 36244826

21. Desai N, Spangler M, Nanavaty V, Gishto A, Brown A. New hyaluronan-based biomatrix for 3-D follicle culture yields functionally competent oocytes. *Reprod Biol Endocrinol*. 2022 Oct 10;20(1):148. doi: 10.1186/s12958-022-01019-9. PubMed [citation] PMID: 36217168, PMCID: PMC9549656

22. Chambers LM, Esakov Rhoades EL, Bharti R, Braley C, Tewari S, Trestan L, Alali Z, Bayik D, Lathia JD, Sangwan N, Bazeley P, Joehlin-Price AS, Wang Z, Dutta S, Dwidar M, Hajjar A, Ahern PP, Claesen J, Rose P, Vargas R, Brown JM, Michener CM, et al. Disruption of the Gut Microbiota Confers Cisplatin Resistance in Epithelial Ovarian Cancer. *Cancer Res.* 2022 Dec 16;82(24):4654-4669. doi: 10.1158/0008-5472.CAN-22-0455. PubMed [citation] PMID: 36206317, PMCID: PMC9772178

23. Omosigho U, Paraiso MFR, Chang OH. Revision sacrocolpopexy: tips and tricks for optimal outcomes. *Int Urogynecol J*. 2022 Oct 1. doi: 10.1007/s00192-022-05370-8. [Epub ahead of print] PubMed [citation] PMID: 36181549

24. Collart C, Craighead C, Rose S, Frankel R, Tucker Edmonds B, Perni U, Chien EK, Coleridge M, Ranzini A, Farrell RM. The Impact of Outpatient Prenatal Care Visitor Restrictions on Pregnant Patients and Partners During the COVID-19 Pandemic. *Womens Health Rep* (New Rochelle). 2022 Aug 4;3(1):718-727. doi: 10.1089/whr.2022.0031. eCollection 2022. PubMed [citation] PMID: 36147830, PMCID: PMC9436262

25. Donnez J, Taylor HS, Stewart EA, Bradley L, Marsh E, Archer D, Al-Hendy A, Petraglia F, Watts N, Gotteland JP, Bestel E, Terrill P, Loumaye E, Humberstone A, Garner E. Linzagolix with and without hormonal add-back therapy for the

treatment of symptomatic uterine fibroids: two randomised, placebo-controlled, phase 3 trials. *Lancet*. 2022 Sep 17;400(10356):896-907. doi: 10.1016/S0140-6736(22)01475-1. PubMed [citation] PMID: 36116480

26. Chung RK, Richards EG, Farrell R, Flyckt RL. Ascending toward a 30,000 foot view of uterus transplant. *Fertil Steril.* 2022 Sep;118(3):586-587. doi: 10.1016/j.fertnstert.2022.07.013. No abstract available. PubMed [citation] PMID: 36116804

27. Taljan KE, Cantu-Weinstein A, McKenna M, De Souza L, Meng Y, Gonsalves L, Goje O, Viguera AC. Risk for postpartum depressive symptoms among pregnant women in a tertiary care setting with and without a positive COVID-19 test. *Gen Hosp Psychiatry*. 2022 Nov-Dec;79:1-6. doi: 10.1016/j.genhosppsych.2022.08.006. Epub 2022 Sep 6. PubMed [citation] PMID: 36108453, PMCID: PMC9444579

28. Ross JH, Wallace SL, Ferrando CA. Postoperative void trial failure and same-day discharge following apical pelvic organ prolapse surgery: a retrospective matched case-control study. *Int Urogynecol J*. 2022 Aug 31. doi: 10.1007/s00192-022-05332-0. [Epub ahead of print] PubMed [citation] PMID: 36044062

29. Frisch EH, Falcone T, Flyckt RL, Tzakis AG, Kodish E, Richards EG. Uterus Transplantation: Revisiting the Question of Deceased Donors versus Living Donors for Organ Procurement. *J Clin Med.* 2022 Aug 3;11(15). pii: 4516. doi: 10.3390/jcm11154516. Review. PubMed [citation] PMID: 35956131, PMCID: PMC9369769

30. McManus JM, Vargas R, Bazeley PS, Schumacher FR, Sharifi N. Association Between Adrenal-Restrictive HSD3B1 Inheritance and Hormone-Independent Subtypes of Endometrial and Breast Cancer. *JNCI Cancer Spectr.* 2022 Sep 1;6(5). pii: pkac061. doi: 10.1093/jncics/pkac061. PubMed [citation] PMID: 35947687, PMCID: PMC9475354

31. Orlando MS, Carey-Love A, Attaran M, King CR. Surgical techniques for excision of juvenile cystic adenomyoma. *Fertil Steril.* 2022 Oct;118(4):810-811. doi: 10.1016/j.fertnstert.2022.06.025. Epub 2022 Aug 3. Review. PubMed [citation] PMID: 35931491

32. Orlando MS, Bradley LD. Implementation of Office Hysteroscopy for the Evaluation and Treatment of Intrauterine Pathology. *Obstet Gynecol.* 2022 Sep 1;140(3):499-513. doi: 10.1097/AOG.0000000000004898. Epub 2022 Aug 3. PubMed [citation] PMID: 35926213

33. Yuan AS, Propst KA, Ferrando CA. Postoperative pain and the need for intervention after sacrospinous ligament hysteropexy compared to colpopexy: a retrospective cohort study. *Int Urogynecol J.* 2022 Sep;33(9):2525-2531. doi: 10.1007/s00192-022-05301-7. Epub 2022 Jul 26. PubMed [citation] PMID: 35881177

34. AlHilli MM, Schold JD, Kelley J, Tang AS, Michener CM. Preoperative assessment using the five-factor modified frailty index: A call for standardized preoperative assessment and prehabilitation services in gynecologic oncology. *Gynecol Oncol*. 2022 Sep;166(3):379-388. doi: 10.1016/j.ygyno.2022.07.003. Epub 2022 Jul

19. PubMed [citation] PMID: 35863992

35. Pitiyarachchi O, Friedlander M, Java JJ, Chan JK, Armstrong DK, Markman M, Herzog TJ, Monk BJ, Backes F, Secord AA, Bonebrake A, Rose PG, Tewari KS, Lentz SS, Geller MA, Copeland LJ, Mannel RS. What proportion of patients with stage 3 ovarian cancer are potentially cured following intraperitoneal chemotherapy? Analysis of the long term (≥10 years) survivors in NRG/GOG randomized clinical trials of intraperitoneal and intravenous chemotherapy in stage III ovarian cancer. *Gynecol Oncol*. 2022 Sep;166(3):410-416. doi: 10.1016/j.ygyno.2022.07.004. Epub 2022 Jul 11. PubMed [citation] PMID: 35835612, PMCID: PMC9718158

36. Chang OH, Yao M, Ferrando CA, Paraiso MFR, Propst K. Determining the Ideal Intraoperative Resting Genital Hiatus Size-Balancing Surgical and Functional Outcomes. *Urogynecology* (Hagerstown). 2022 Oct 1;28(10):649-657. doi: 10.1097/SPV.0000000000001227. Epub 2022 Jul 2. PubMed [citation] PMID: 35830588

37. Rose PG. Ovarian cancer recurrence: is the definition of platinum sensitivity modified by PARPi, bevacizumab or other intervening treatments? : a clinical perspective. *Cancer Drug Resist.* 2022 May 12;5(2):415-423. doi: 10.20517/cdr.2022.01. eCollection 2022. PubMed [citation] PMID: 35800381, PMCID: PMC9255234

38. Johannesson L, Richards E, Reddy V, Walter J, Olthoff K, Quintini C, Tzakis A, Latif N, Porrett P, O'Neill K, Testa G. The First 5 Years of Uterus Transplant in the US: A Report From the United States Uterus Transplant Consortium. *JAMA Surg.* 2022 Sep 1;157(9):790-797. doi: 10.1001/jamasurg.2022.2612. PubMed [citation] PMID: 3579

39. Schwartz KM, Wright KN, Richards EG, King LP, Park AJ. Sustainability in Healthcare: A Call to Action for Surgeons and Healthcare Leaders. *J Minim Invasive Gynecol*. 2022 Sep;29(9):1040-1042. doi: 10.1016/j.jmig.2022.06.024. Epub 2022 Jul 1. No abstract available. PubMed [citation] PMID: 35788396

40. Casas-Puig V, Bretschneider CE, Walters MD, Ferrando CA. Risk Factors for Bladder Perforation at the Time of Retropubic Midurethral Sling Placement. *Female Pelvic Med Reconstr Surg.* 2022 Jul 1;28(7):444-451. doi: 10.1097/SPV.0000000000001192. Epub 2022 Apr 28. PubMed [citation] PMID: 35763669

41. Ferrando CA. Endometriosis in transmasculine individuals. *Reprod Fertil.* 2022 Apr 20;3(2):C7-C10. doi: 10.1530/RAF-21-0096. eCollection 2022 Apr 1. PubMed [citation] PMID: 35706580, PMCID: PMC9175596

42. Luna Russo M, Orlando MS, King C. Highly Differentiated Follicular Thyroid Carcinoma Arising from Struma Ovarii at the Time of Hysterectomy. *J Minim Invasive Gynecol*. 2022 Oct;29(10):1127-1128. doi: 10.1016/j.jmig.2022.06.009. Epub 2022 Jun 11. No abstract available. PubMed [citation] PMID: 35700872

43. Alfaro K, Soler M, Maza M, Flores M, López L, Rauda JC, Chacón A, Erazo P, Villatoro N, Mumenthaler E, Masch R, Conzuelo G, Felix JC, Cremer M. Cervical

Cancer Prevention in El Salvador: Gains to Date and Challenges for the Future. *Cancers* (Basel). 2022 Jun 3;14(11). pii: 2776. doi: 10.3390/cancers14112776. PubMed [citation] PMID: 35681756, PMCID: PMC9179345

44. Rose PG. Symptoms of Women With High-Risk Early-Stage Ovarian Cancer. *Obstet Gynecol*. 2022 Jun 1;139(6):1196. doi: 10.1097/AOG.0000000000004816. No abstract available. PubMed [citation] PMID: 35675621

45. Wallace SL, Kim Y, Lai E, Mehta S, Gaigbe-Togbe B, Zhang CA, Von Bargen EC, Sokol ER. Postoperative complications and pelvic organ prolapse recurrence following combined pelvic organ prolapse and rectal prolapse surgery compared with pelvic organ prolapse only surgery. *Am J Obstet Gynecol*. 2022 Aug;227(2):317.e1-317.e12. doi: 10.1016/j.ajog.2022.05.050. Epub 2022 May 30. PubMed [citation] PMID: 35654113

46. Bradley LD. Letter: Keeping Lawyers and Lifeguards Out of the Operating Room During Operative Hysteroscopy. *J Obstet Gynaecol Can*. 2022 May;44(5):472. doi: 10.1016/j.jogc.2022.03.001. No abstract available. PubMed [citation] PMID: 35577422

47. Fitzgerald JJ, Sokol ER, Rardin CR, Cundiff GW, Paraiso MFR, Chou J, Gutman RE. Long-Term Outcomes After Vaginal and Laparoscopic Mesh Hysteropexy for Uterovaginal Prolapse: A Parallel Cohort Study (eVAULT). *Female Pelvic Med Reconstr Surg*. 2022 Jun 1;28(6):e215-e221. doi: 10.1097/SPV.0000000000001188. Epub 2022 May 17. PubMed [citation] PMID: 35536663

48. Orlando MS, Cadish LA, Shepherd JP, Falcone T, Chang OH, Kho RM. Salpingo-oophorectomy or surveillance for ovarian endometrioma in asymptomatic premenopausal women: a cost-effectiveness analysis. *Am J Obstet Gynecol*. 2022 Aug;227(2):311.e1-311.e7. doi: 10.1016/j.ajog.2022.04.043. Epub 2022 Apr 28. PubMed [citation] PMID: 35490792

49. Morosky CM, Cox SM, Craig LB, Everett EN, Forstein DA, Graziano SC, Hampton BS, Hopkins L, Sims SM, Mckenzie ML, Royce C, Morgan HK; Undergraduate Medical Education Committee (Association of Professors of Gynecology and Obstetrics). Integration of health systems science and women's healthcare. *Am J Obstet Gynecol.* 2022 Aug;227(2):236-243. doi: 10.1016/j.ajog.2022.04.038. Epub 2022 Apr 27. PubMed [citation] PMID: 35489442

50. Chang OH, Cadish LA, Ridgeway BM, Shepherd JP. Economic considerations for the inclusion of midurethral sling as a treatment strategy for stress urinary incontinence. *BJOG*. 2022 Aug;129(9):1613-1614. doi: 10.1111/1471-0528.17176. Epub 2022 Apr 17. No abstract available. PubMed [citation] PMID: 35434948

51. Wu SS, Raymer CA, Kaufman BR, Isakov R, Ferrando CA. The Effect of Preoperative Gender-Affirming Hormone Therapy Use on Perioperative Adverse Events in Transmasculine Individuals Undergoing Masculinizing Chest Surgery for Gender Affirmation. *Aesthet Surg J*. 2022 Aug 24;42(9):1009-1016. doi: 10.1093/asj/sjac091. PubMed [citation] PMID: 35417528

52. Chambers LM, Chalif J, Vargas R. Analysis of patient experiences with gestational trophoblastic neoplasia reported on Instagram social media. *Gynecol Oncol.* 2022 Jun;165(3):603-609. doi: 10.1016/j.ygyno.2022.03.029. Epub 2022 Apr 8. PubMed [citation] PMID: 35410731

53. Chambers LM, Yao M, Morton M, Gruner M, Chichura A, Costales AB, Horowitz M, Rose PG, Michener CM, Debernardo R. Assessment of travel distance for hyperthermic intraperitoneal chemotherapy in women with ovarian cancer. *Gynecol Oncol Rep*. 2022 Feb 28;40:100951. doi: 10.1016/j.gore.2022.100951. eCollection 2022 Apr. PubMed [citation] PMID: 35392128, PMCID: PMC8980495

54. Tewari S, Chambers LM, Yao M, Michener CM. Evaluation of the Effect of Closure Technique on Incidence of Incisional Hernia after Single-Port Laparoscopy in Gynecologic Oncology Surgery. *J Minim Invasive Gynecol.* 2022 Jun;29(6):791-802.e1. doi: 10.1016/j.jmig.2022.03.006. Epub 2022 Mar 22. PubMed [citation] PMID: 35331927

55. Liu JF, Brady MF, Matulonis UA, Miller A, Kohn EC, Swisher EM, Cella D, Tew WP, Cloven NG, Muller CY, Bender DP, Moore RG, Michelin DP, Waggoner SE, Geller MA, Fujiwara K, D'Andre SD, Carney M, Alvarez Secord A, Moxley KM, Bookman MA. Olaparib With or Without Cediranib Versus Platinum-Based Chemotherapy in Recurrent Platinum-Sensitive Ovarian Cancer (NRG-GY004): A Randomized, Open-Label, Phase III Trial. *J Clin Oncol*. 2022 Jul 1;40(19):2138-2147. doi: 10.1200/JCO.21.02011. Epub 2022 Mar 15. PubMed [citation] PMID: 35290101, PMCID: PMC9242406

56. Chalif J, Yao M, Gruner M, Kuznicki M, Vargas R, Rose PG, Michener C, DeBernardo R, Chambers L. Incidence and prognostic significance of inguinal lymph node metastasis in women with newly diagnosed epithelial ovarian cancer. *Gynecol Oncol.* 2022 Apr;165(1):90-96. doi: 10.1016/j.ygyno.2022.01.026. Epub 2022 Mar 7. PubMed [citation] PMID: 35272875

57. Farrell R, Collart C, Craighead C, Pierce M, Chien E, Frankel R, Tucker Edmonds B, Perni U, Coleridge M, Ranzini AC, Rose S. The Successes and Challenges of Implementing Telehealth for Diverse Patient Populations Requiring Prenatal Care During COVID-19: Qualitative Study. *JMIR Form Res.* 2022 Mar 30;6(3):e32791. doi: 10.2196/32791. PubMed [citation] PMID: 35275833, PMCID: PMC8970157

58. Brant AR, Batur P, Arrigain S, Lopez R, Farrell RM. Out-of-Pocket Expenditures for Contraceptives During State Medicaid Expansion, 2013-2016. *Obstet Gynecol*. 2022 Apr 1;139(4):622-625. doi: 10.1097/AOG.0000000000004721. Epub 2022 Mar 10. No abstract available. PubMed [citation] PMID: 35271550

59. Giugale L, Sridhar A, Ferrante KL, Komesu YM, Meyer I, Smith AL, Myers D, Visco AG, Paraiso MFR, Mazloomdoost D, Gantz M, Zyczynski HM; NICHD Pelvic Floor Disorders Network. Long-term Urinary Outcomes After Transvaginal Uterovaginal Prolapse Repair With and Without Concomitant Midurethral Slings. *Female Pelvic Med Reconstr Surg.* 2022 Mar 1;28(3):142-148. doi: 10.1097/SPV.0000000000001160. PubMed [citation] PMID: 35272320, PMCID: PMC8928054

60. Ross JH, Sinha A, Propst K, Ferrando CA. Adherence to Pelvic Floor Physical Therapy Referrals in Women With Fecal Incontinence. *Female Pelvic Med Reconstr Surg*. 2022 Mar 1;28(3):e29-e33. doi: 10.1097/SPV.0000000000001140. PubMed [citation] PMID: 35272329

61. Farrell RM, Michie M. Considering Reprogenomics in the Ethical Future of Fetal Therapy Trials. *Am J Bioeth.* 2022 Mar;22(3):71-73. doi: 10.1080/15265161.2022.2027558. No abstract available. PubMed [citation] PMID: 35258428

62. Chang OH, Shepherd JP, St Martin B, Sokol ER, Wallace S. Surgical Correction of the Genital Hiatus at the Time of Sacrocolpopexy-Are Concurrent Posterior Repairs Cost-Effective? *Female Pelvic Med Reconstr Surg.* 2022 May 1;28(5):325-331. doi: 10.1097/SPV.0000000000001130. Epub 2021 Feb 16. PubMed [citation] PMID: 35234184

63. Mai PL, Miller A, Black A, Falk RT, Boggess JF, Tucker K, Stuckey AR, Rodriguez GC, Wong C, Amatruda TT, Wilkinson KJ, Modesitt SC, Yamada SD, Bixel KL, Glaser GE, Rose PG, Greene MH, Sherman ME. Effect of risk-reducing salpingo-oophorectomy on sex steroid hormone serum levels among postmenopausal women: an NRG Oncology/Gynecologic Oncology Group study. *Am J Obstet Gynecol.* 2022 Jul;227(1):61.e1-61.e18. doi: 10.1016/j.ajog.2022.02.022. Epub 2022 Feb 22. PubMed [citation] PMID: 35216968, PMCID: PMC9253062

64. Leyland N, Leonardi M, Murji A, Singh SS, Al-Hendy A, Bradley L. A Call-to-Action for Clinicians to Implement Evidence-Based Best Practices When Caring for Women with Uterine Fibroids. *Reprod Sci.* 2022 Apr;29(4):1188-1196. doi: 10.1007/s43032-022-00877-3. Epub 2022 Feb 17. PubMed [citation] PMID: 35178678, PMCID: PMC8853611

65. Orlando MS, Greenberg CC, Pavuluri Quamme SR, Yee A, Faerber AE, King CR. Surgical coaching in obstetrics and gynecology: an evidence-based strategy to elevate surgical education and promote lifelong learning. *Am J Obstet Gynecol.* 2022 Jul;227(1):51-56. doi: 10.1016/j.ajog.2022.02.006. Epub 2022 Feb 14. PubMed [citation] PMID: 35176285

66. Kho RM. In MIH, We Reap What We Sow. *J Minim Invasive Gynecol*. 2022 Apr;29(4):453-454. doi: 10.1016/j.jmig.2022.02.004. Epub 2022 Feb 14. No abstract available. PubMed [citation] PMID: 35176507

67. Donovan HS, Sereika SM, Wenzel LB, Edwards RP, Knapp JE, Hughes SH, Roberge MC, Thomas TH, Klein SJ, Spring MB, Nolte S, Landrum LM, Casey AC, Mutch DG, DeBernardo RL, Muller CY, Sullivan SA, Ward SE. Effects of the WRITE Symptoms Interventions on Symptoms and Quality of Life Among Patients With Recurrent Ovarian Cancers: An NRG Oncology/GOG Study (GOG-0259). *J Clin Oncol.* 2022 May 1;40(13):1464-1473. doi: 10.1200/JCO.21.00656. Epub 2022 Feb 7. PubMed [citation] PMID: 35130043, PMCID: PMC9061156

68. Orlando MS, Luna Russo MA, Richards EG, King CR, Park AJ, Bradley LD, Chapman GC. Racial and ethnic disparities in surgical care for endometriosis across the United

States. *Am J Obstet Gynecol.* 2022 Jun;226(6):824.e1-824.e11. doi: 10.1016/j.ajog.2022.01.021. Epub 2022 Jan 31. PubMed [citation] PMID: 35101410

69. Llarena NC, Hur CE, Yao M, Schwartz K, Falcone T, Desai N. The impact of endometriosis on embryo morphokinetics: embryos from endometriosis patients exhibit delayed cell cycle milestones and decreased blastulation rates. *J Assist Reprod Genet*. 2022 Mar;39(3):619-628. doi: 10.1007/s10815-022-02406-2. Epub 2022 Jan 31. PubMed [citation] PMID: 35099662, PMCID: PMC8995217

70. Soler M, Masch R, Saidu R, Cremer M. Thermal Ablation Treatment for Cervical Precancer (Cervical Intraepithelial Neoplasia Grade 2 or Higher [CIN2+]). *Methods Mol Biol*. 2022;2394:867-882. doi: 10.1007/978-1-0716-1811-0_46. Review. PubMed [citation] PMID: 35094363

71. Wallace S, Gurland B. Approaching Combined Rectal and Vaginal Prolapse. *Clin Colon Rectal Surg.* 2022 Jan 17;34(5):302-310. doi: 10.1055/s-0041-1726351. eCollection 2021 Sep. Review. PubMed [citation] PMID: 35069022, PMCID: PMC8763579

72. Chung RK, Salari S, Findley J, Richards EG, Flyckt RLR. Uterine Transplantation: Recipient Patient Populations. *Clin Obstet Gynecol*. 2022 Mar 1;65(1):15-23. doi: 10.1097/GRF.0000000000000672. PubMed [citation] PMID: 35045021

73. Trief PM, Uschner D, Tung M, Marcus MD, Rayas M, MacLeish S, Farrell R, Keady J, Chao L, Weinstock RS. Diabetes Distress in Young Adults With Youth-Onset Type 2 Diabetes: TODAY2 Study Results. *Diabetes Care*. 2022 Mar 1;45(3):529-537. doi: 10.2337/dc21-1689. PubMed [citation] PMID: 35015056, PMCID: PMC8918198

74. Hur CE, Goldberg JM. Minilaparotomy: a minimally invasive option for myomectomy. *Fertil Steril*. 2022 Feb;117(2):458. doi: 10.1016/j.fertnstert.2021.12.004. Epub 2021 Dec 31. No abstract available. PubMed [citation] PMID: 34980425

75. Cochran T, Iyer TK, Batur P. Osteoporosis Management. *J Womens Health* (Larchmt). 2022 Feb;31(2):154-157. doi: 10.1089/jwh.2021.0538. Epub 2021 Dec 28. No abstract available. PubMed [citation] PMID: 34962158

76. Farrell RM, Falcone T. Incorporating patient perspectives in the science of uterus transplantation. *BJOG*. 2022 Jun;129(7):1103. doi: 10.1111/1471-0528.17068. Epub 2022 Jan 4. No abstract available. PubMed [citation] PMID: 34928530

77. Hur C, Luna-Russo M, King C. Fertility-Preserving Surgical Management of a Cesarean Section Scar Ectopic Pregnancy. *J Minim Invasive Gynecol.* 2022 Feb;29(2):194. doi: 10.1016/j.jmig.2021.11.013. Epub 2021 Nov 21. PubMed [citation] PMID: 34818565

78. Orlando MS, Yao M, Chang OH, Shippey E, Bosko T, Cadish L, Falcone T, Kho RM. Perioperative outcomes in a nationwide sample of patients undergoing surgical treatment of ovarian endometriomas. *Fertil Steril*. 2022 Feb;117(2):444-453. doi: 10.1016/j.fertnstert.2021.10.008. Epub 2021 Nov 19. PubMed [citation] PMID: 34802687

79. AlHilli MM, Arend RC. International gynecologic cancer society (IGCS) 2021 meeting report. *Gynecol Oncol*. 2022 Jan;164(1):208-211. doi: 10.1016/j.ygyno.2021.10.086. Epub 2021 Nov 1. No abstract available. PubMed [citation] PMID: 34736783

80. Bussies PL, Richards EG, Rotz SJ, Falcone T. Targeted cancer treatment and fertility: effect of immunotherapy and small molecule inhibitors on female reproduction. *Reprod Biomed Online.* 2022 Jan;44(1):81-92. doi: 10.1016/j.rbmo.2021.09.004. Epub 2021 Sep 17. Review. PubMed [citation] PMID: 34674940

81. Hickman LC, Tran MC, Paraiso MFR, Walters MD, Ferrando CA. Intermediate term outcomes after transvaginal uterine-preserving surgery in women with uterovaginal prolapse. *Int Urogynecol J*. 2022 Jul;33(7):2005-2012. doi: 10.1007/s00192-021-04987-5. Epub 2021 Sep 29. PubMed [citation] PMID: 34586437, PMCID: PMC8479721

82. Stewart EA, Archer DF, Owens CD, Barnhart KT, Bradley LD, Feinberg EC, Gillispie-Bell V, Imudia AN, Liu R, Kim JH, Al-Hendy A. Reduction of Heavy Menstrual Bleeding in Women Not Designated as Responders to Elagolix Plus Add Back Therapy for Uterine Fibroids. *J Womens Health* (Larchmt). 2022 May;31(5):698-705. doi: 10.1089/jwh.2021.0152. Epub 2021 Sep 28. PubMed [citation] PMID: 34582715, PMCID: PMC9133968

83. Son J, Tran T, Yao M, Michener CM. Factors Associated With Unplanned Admission in Patients Intended for Same Day Discharge After Minimally Invasive Hysterectomy for Endometrial Cancer. *Surg Innov*. 2022 Jun;29(3):336-342. doi: 10.1177/15533506211041882. Epub 2021 Sep 1. PubMed [citation] PMID: 34470516

84. Kho RM, Chang OH, Hare A, Schaffer J, Hamner J, Northington GM, Metcalfe ND, Iglesia CB, Zelivianskaia AS, Hur HC, Seaman S, Mueller MG, Milad M, Ascher-Walsh C, Kossl K, Rardin C, Siddique M, Murphy M, Heit M. Surgical Outcomes in Benign Gynecologic Surgery Patients during the COVID-19 Pandemic (SOCOVID study). *J Minim Invasive Gynecol*. 2022 Feb;29(2):274-283.e1. doi: 10.1016/j.jmig.2021.08.011. Epub 2021 Aug 23. PubMed [citation] PMID: 34438045, PMCID: PMC8381624

85. Chang OH, Cadish LA, Kailasam A, Ridgeway BM, Shepherd JP. Impact of the availability of midurethral slings on treatment strategies for stress urinary incontinence: a cost-effectiveness analysis. *BJOG*. 2022 Feb;129(3):500-508. doi: 10.1111/1471-0528.16850. Epub 2021 Aug 17. PubMed [citation] PMID: 34314554

86. Berman JM, Bradley L, Hawkins SM, Levy B. Uterine Fibroids in Black Women: A Race-Stratified Subgroup Analysis of Treatment Outcomes After Laparoscopic Radiofrequency Ablation. *J Womens Health* (Larchmt). 2022 Apr;31(4):593-599. doi: 10.1089/jwh.2020.9001. Epub 2021 Jul 20. PubMed [citation] PMID: 34287028, PMCID: PMC9063135

87. Kho RM, Desai VB, Schwartz PE, Wright JD, Gross CP, Hutchison LM, Boscoe FP, Lin H, Xu X. Endometrial Sampling for Preoperative Diagnosis of Uterine Leiomyosarcoma. *J Minim Invasive Gynecol*. 2022 Jan;29(1):119-127. doi: 10.1016/j.jmig.2021.07.004. Epub 2021 Jul 13. PubMed [citation] PMID: 34265441, PMCID: PMC8752465

88. Weinstein MM, Collins S, Quiroz L, Anger JT, Paraiso MFR, DeLong J, Richter HE. Multicenter Randomized Controlled Trial of Pelvic Floor Muscle Training with a Motion-based Digital Therapeutic Device versus Pelvic Floor Muscle Training Alone for Treatment of Stress-predominant Urinary Incontinence. *Female Pelvic Med Reconstr Surg*. 2022 Jan 1;28(1):1-6. doi: 10.1097/SPV.0000000000001052. PubMed [citation] PMID: 33787561

89. Akusoba C, Hogue O, Radeva M, Goje O. Risk of urinary tract infection following vaginal delivery: a comparison between intermittent and indwelling bladder catheterization. *J Matern Fetal Neonatal Med.* 2022 Jun;35(11):2077-2084. doi: 10.1080/14767058.2020.1777968. Epub 2020 Jun 21. PubMed [citation] PMID: 32567434

90. Craig ME, Sudanagunta S, Billow M. Anatomy, Abdomen and Pelvis, Broad Ligaments. 2022 Jul 25. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. PubMed [citation] PMID: 29763118

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