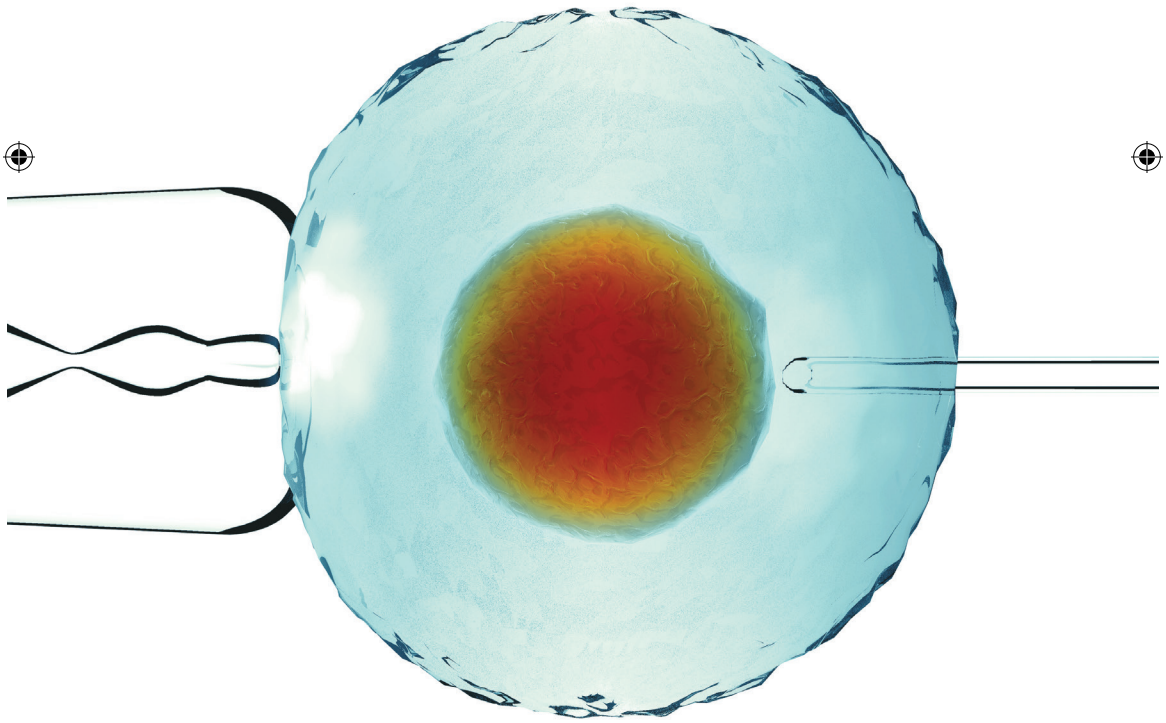
Cleveland Clinic

Obstetrics, Gynecology & Women's Health Institute

7TH ANNUAL

Research Day



May 11, 2022
via Webex

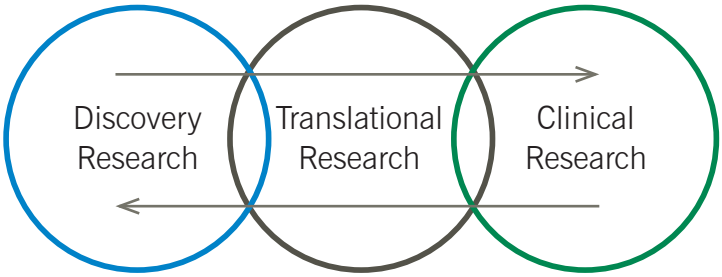
7TH ANNUAL

Obstetrics, Gynecology & Women's Health Institute

RESEARCH DAY

May 11, 2022

Cleveland Clinic



Key Note Address & Lecture

Jeffrey Peipert, MD, MPH, PhD
Clarence E. Ehrlich Professor and Chair
Department of Obstetrics and Gynecology
Indiana University School of Medicine

Judges (Oral Presentations)

Jeffrey Peipert, MD, MPH, PhD
Pelin Batur, MD
Ashley Brant, DO
Miriam Cremer, MD, MPH
Justin Lappen, MD
Elliott Richards, MD
Roberto Vargas, MD

Judges (Poster Presentations)

Jeffrey Peipert, MD, MPH, PhD
Stacey Ehrenberg, MD
Jonathan Emery, MD
Holly Thacker, MD
Miguel Luna Russo, MD

Agenda

7:00 am	**Presenter & Judges Registration**
7:15 am–7:20 am	**Welcome** Tristi Muir, MD Chair, Ob/Gyn & Women's Health Institute
7:20 am–7:25 am	Introduction & Welcome Ruth Farrell, MD, MA Vice Chair, Research, Ob/Gyn & Women's Health Institute
7:25 am–8:10 am	**Key Note Address** ***The Contraceptive CHOICE Project to Path4You: Lessons Learned*** Jeffrey Peipert, MD, MPH, PhD Clarence E. Ehrlich Professor and Chair Department of Obstetrics and Gynecology Indiana University School of Medicine
8:10 am–8:20 am	**Q&A**

8:20–10:30 am	**PGY3 RESIDENT ORAL PRESENTATIONS**
8:20 am	***The Risk of Venous Thromboembolism in Patients With and Without Leiomyomas Undergoing Hysterectomy*** Annika Sinha, MD
8:30 am	Discussant: Cory Messingschlager, MD & Q&A
8:35 am	***Management of Abnormal Urinalysis Results in Urogynecologic Patients Undergoing Preoperative Urodynamic Testing Prior to pelvic Organ Prolapse Surgery*** Rachael Baird, MD
8:45 am	Discussant: Cory Messingschlager, MD & Q&A

8:50 am	***Incidence and Prognostic Significance of Inguinal Lymph Node Metastasis in Women with Newly Diagnosed Epithelial Ovarian Cancer*** Julia Chalif, MD
9:00 am	Discussant: Morgan Gruner, MD & Q&A
9:05 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?*** Imani Chatman, MD
9:15 am	Discussant: Kate Lintel, MD & Q&A
9:20 am	***Provider Practice Patterns Pertaining to Malpresentation in Pregnancies Conceived Via Assisted Reproductive Technology*** Catherine Keller, MD
9:30 am	Discussant: Carrie Bennett, MD & Q&A
9:35 am	***Endometrial Abnormalities During Endometrial Maturation for Frozen Embryo Transfer (FET): A Pilot Study*** Kaia Schwartz, MD
9:45 am	Discussant: Molly Morton, MD & Q&A
9:50 am	***An Exploratory Study Comparing the Quality of Contraceptive Counseling Provided Via Telemedicine Versus In-Person Visits*** Rachel Shin, MD
10:00 am	Discussant: Carrie Bennett, MD & Q&A
10:05 am	***Perioperative Adverse Events In Women Undergoing Concurrent Mid-urethral Sling Placement at the Time of Minimally Invasive Benign Gynecologic Surgery*** Nicole Wood, MD
10:15 am	Discussant: Becca Omosigho, MD & Q&A
10:20 am	**Break & PGY 2 Poster Presentations Viewing and Judging Online**

10:40 am–12:45 pm	GRADUATING FELLOWS ORAL PRESENTATION
10:40 am	***Ovarian Senescence: Is There an Explanation for Variability in ovarian Aging?*** Tiffany Cochran, MD Clinical Fellow, Specialized Women's Health
10:50 am	Q&A
10:55 am	***The Symptoms and Timing of Menopause in Women with Polycystic Ovarian Syndrome*** Tara Iyer, MD Clinical Fellow, Specialized Women's Health
11:05 am	Q&A
11:10 am	***The Validation of Novel Methods to Differentiate Radiation Sensitivity in Cervical Cancer Cell Lines Allows for the Development of a Gene Signature Predictive of Radiation Response*** Michelle Kuznicki, MD Fellow, Gynecologic Oncology
11:20 am	Q&A
11:25 am	***Is There an Association Between 6-month Genital Hiatus Size and 24-month Composite Subjective Prolapse Recurrence following Minimally Invasive Sacrocolpopexy?*** Vivana Casas Puig, MD Fellow, Female Pelvic Medicine & Reconstructive Surgery
11:35 am	Q&A
11:40 am	***The Standard versus No Opioid Prescription after Prolapse and Anti-Incontinence Surgery (STOP-PAIN) Trial*** Angela Yuan, MD Fellow, Female Pelvic Medicine & Reconstructive Surgery
11:50 am	Q&A
11:55 am	***Salpingo-Oophorectomy or Surveillance for Ovarian Endometrioma in Asymptomatic Premenopausal Women: A Cost-Effectiveness Analysis*** Megan Orlando, MD Clinical Fellow, Minimally Invasive Gynecologic Surgery

12:05 pm	Q&A
12:10 pm	***Caloric Restriction Increases Ovarian FOXO3A Expression in a Mouse Delayed Aging Model: Implications for Reproductive Longevity*** Natalia Llarena, MD Fellow, Reproductive Endocrinology & Infertility
12:20 pm	Q&A
12:25 pm	***The FLOWER Trial: A Randomized Trial Comparing Perioperative Pelvic Floor Physical Therapy to Current Standard of Care in Transgender Women Undergoing Vaginoplasty For Gender Affirmation*** Frances Grimstad, MD Clinical Fellow, Transgender Medicine & Surgery
12:35 pm	Q&A
12:40–1:05 pm	**Lunch Break & Review posters online**

1:05–2:00 pm	**INNOVATIONS IN OB/GYN & WOMEN'S HEALTH INSTITUTE LECTURE**
1:05 pm	***Ob/Gyn & Women's Health Institute Innovations Lecture Development of Fetal Surgery at Cleveland Clinic: Serendipity, Teamwork and Innovation*** Darrell Cass, MD Director of Fetal Surgery, Director of Fetal Care Center, Cleveland Clinic
1:50 pm	Q&A
2:05 pm	**Announcement of Award Winners & Closing Remarks** Ruth Farrell, MD, MA
2:30 pm	Group picture of all presenters, award winners, speakers & Institute Leadership

2:30–5:00 pm FACULTY DEVELOPMENT/PANEL DISCUSSION RESEARCH TO REDUCE HEALTHCARE DISPARITIES IN WOMEN'S HEALTH

2:30 pm **Panel**

Mariam Cremer, MD, MPH
Cleveland Clinic, Ob/Gyn & Women's Health Institute

Ronald Hickman, RN, PhD
Bolton School of Nursing Case Western Reserve University

Sarah Ronis, MD, MPH
University Hospitals of Cleveland

Kristie Ross, MD
University Hospitals of Cleveland

Darcy Freeman, MPH, PhD
Case Western Reserve University

Jarrod E. Dalton, PhD
Cleveland Clinic, Quantitative Health Sciences

Past Research Day Award Winners

Resident Poster Presentation – 1st Place

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

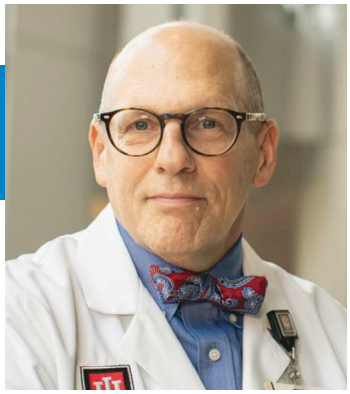
2021	Jonathan Hunt, MD, MBA
2020	Anna Chichura, MD
	Alyssa Herrmann, MD
2019	Emily Holthaus, MD
2018	Caitlin Carr, MD
	Julian Gingold, MD, PhD
2017	Laura Moulton, DO, MS
2016	Jamie Stanhiser, MD
2016	Lisa Caronia Hickman, MD

Fellow Oral Presentation – 1st Place

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

Jeffrey Peipert, MD, MPH, PhD



Clarence E. Ehrlich Professor and Chair
Department of Obstetrics and Gynecology
Indiana University School of Medicine

Jeffrey Peipert, MD, MPH, PhD is the Clarence E. Ehrlich Professor and Chair of Obstetrics and Gynecology at Indiana University School of Medicine. He is board-certified in obstetrics and gynecology and has a doctorate in epidemiology. He has conducted numerous studies including: NICHD-funded randomized trial of a computer-based intervention to encourage dual method contraceptive use to prevent unplanned pregnancy and STIs and an NIH-funded randomized trial of therapy for pelvic inflammatory disease (PEACH Study).

Dr. Peipert was also the Principal Investigator of a large prospective study, the Contraceptive CHOICE Project, which recruited 9,256 women and successfully followed them for 2-3 years for contraceptive effectiveness, satisfaction, and continuation rates. Dr. Peipert 's research interests are family planning, STI prevention, women's health and public health.

Judges (Oral Presentations)

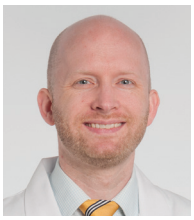
Jeffrey Peipert, MD, MPH, PhD
Clarence E. Ehrlich Professor and Chair
Department of Obstetrics and Gynecology
Indiana University School of Medicine

Ashley Brant, DO
Assistant Professor of Surgery
Cleveland Clinic
Obstetrics, Gynecology & Women's
Health Institute
Obstetrics and Gynecology

Pelin Batur, MD
Assistant Professor of Ob/Gyn &
Reproductive Medicine
Cleveland Clinic
Obstetrics, Gynecology & Women's Health
Institute
Subspecialty Care for Women's Health
Specialized Women's Health

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

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



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

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

Judges (Poster Presentation)

Jeffrey Peipert, MD, MPH, PhD
Clarence E. Ehrlich Professor and Chair
Department of Obstetrics and Gynecology
Indiana University School of Medicine

Holly Thacker, MD
Professor of Ob-Gyn & Reproductive Biology
Cleveland Clinic
Obstetrics, Gynecology & Women's
Health Institute
Subspecialty Care for Women's Health
Section Head, Specialized Women's Health

Stacey Ehrenberg, MD
Staff, Cleveland Clinic
Obstetrics, Gynecology & Women's
Health Institute
Obstetrics and Gynecology

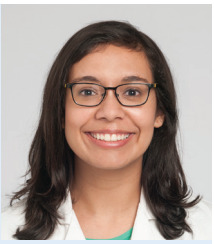
Miguel Luna Russo, MD
Associate Staff, Cleveland Clinic
Obstetrics, Gynecology & Women's
Health Institute
Subspecialty Care for Women's Health
Faculty, Minimally Invasive
Gynecologic Surgery

Jonathan Emery, MD
Faculty Council Representative of
Ob-Gyn & Reproductive Biology
Assistant Professor of Ob-Gyn &
Reproductive Biology
Cleveland Clinic
Obstetrics, Gynecology & Women's
Health Institute
Obsetrics & Gynecology
Vice Chair, Obstetrics & Gynecology

Obstetrics, Gynecology & Women's Health Institute

PGY3 Resident Oral Presentations

The Risk of Venous Thromboembolism in Patients With and Without Leiomyomas Undergoing Hysterectomy



Annika Sinha, MD

Objective: Leiomyomas occur in 80% of women and can require hysterectomy for management. The risk for venous thromboembolism (VTE) is 0.7% for any hysterectomy. However, it has been theorized that large uterine size due to fibroids increases VTE risk due to pelvic vasculature compression. The objective of this study is to evaluate if the risk of VTE of women undergoing surgeries for fibroid-related indications is different compared to women undergoing hysterectomy for non-fibroid related indications. We also aimed to determine the preexisting incidence of VTE between the groups and identify risk factors for VTE.

Methods: Patients who underwent hysterectomy by any route at an academic center between January 2019-December 2019 were included. Demographic, pathology, and VTE diagnosis data were assessed. Preoperative VTE occurred prior to surgery. Perioperative VTE occurred within 6 weeks of surgery. Patients with malignancy and known thrombophilias were excluded.

Results: A total of 1,029 patients were included, of which 687 patients had fibroids and 342 had none. Patients with fibroids were likely to be older, have higher BMI, larger uterine size, and greater EBL ($p<0.05$). Of the total cohort, 22 patients (2.0%) had VTE, of which 19 (1.8%) were preexisting, and 3 (0.2%) occurred peri-operatively. Ten of the 22 patients (45%) with preexisting VTE had fibroids; none of whom developed perioperative VTE. The presence of fibroids did not increase odds of perioperative VTE (OR 0.2, CI [0.02-2.7]). Those with preexisting VTE were more likely to have increased BMI, Charleston Comorbidity Index (CCI), postoperative length of stay and ASA risk score ($P<0.05$). In both univariate analysis and logistic model, both fibroids and total uterine size was not associated with preexisting VTE (univariate $p= 0.18$, $p=0.50$; logistic model $p=0.08$, $p=0.17$ respectively). Higher BMI and ASA score of 3-4 are associated with higher odds of preexisting VTE (1 unit increase of BMI OR 1.06, CI [1.0-1.1]; OR 3.6 [1.4-9.3]). However, specifically in patients with fibroids, only ASA score of 3-4 is associated with higher odds of preexisting VTE (OR 4.2, CI 1.2-15.1).

Conclusions: Patients undergoing hysterectomy for fibroid-related indications

are not at increased risk for VTE compared to patients undergoing surgery for non-fibroid-related indications. Preexisting VTE in patients with fibroids did not increase the risk for perioperative VTE. Overall, for patients with fibroids, higher ASA scores are associated with VTE event.

Funding Source: None

Faculty Mentor: Rosanne Kho, MD
Disscussant: Becca Omosigho, MD

Management of Abnormal Urinalysis Results in Urogynecologic Patients Undergoing Preoperative Urodynamic Testing Prior to Surgery for Pelvic Organ Prolapse

Rachel Baird, MD, MS

Objective: To evaluate the management of abnormal urinalysis in women undergoing preoperative urodynamic testing prior to pelvic organ prolapse surgery.

Methods: This is a retrospective study of women age 18 years or older undergoing preoperative urodynamic testing at the Cleveland Clinic Center for Urogynecology & Pelvic Reconstructive Surgery prior to pelvic organ prolapse surgery from January 2016-December 2018. Records were reviewed for presence of pelvic organ prolapse and urinalysis results. Abnormal urinalysis result was defined as the presence of blood, leukocyte esterase, and/or nitrites. These abnormal urinalysis results were divided into two groups. A urinalysis positive for only blood or leukocyte esterase was included in the "broad definition" group. A urinalysis positive for nitrites or blood and leukocyte esterase was included in the "narrow definition" group.

Results: One third of patients undergoing urodynamic testing had an abnormal urinalysis result (303 of 1684 patients, 31%). Of these 303 patients, 243 (80%) were included in the broad definition group and 60 (20%) were included in the narrow definition group. Patients in the narrow definition group were older (69 vs. 61 years, $p<0.001$), more likely to be postmenopausal (93% vs. 75%, $p=0.003$), and more likely to have prior pelvic organ prolapse surgery (30% vs. 14%, $p=0.003$). Seventy-two percent of patients in the narrow definition

group had a urine culture obtained versus 5% in the broad definition group ($p<0.001$) with 63% of those in the narrow definition group ultimately having a positive urine culture. Twenty-three percent of patients in the narrow definition group had their urodynamics cancelled or rescheduled versus only 2% in the broad definition group ($p<0.001$). Two patients had their surgery cancelled or postponed. There were no differences in post-operative urinary retention or urinary tract infection between the broad and narrow groups.

Conclusions: Patients with positive nitrites or positive blood and leukocyte esterase in their pre-operative urinalysis were more likely to have their urodynamic testing cancelled or rescheduled but did not have increased risk of post-operative urinary retention or urinary tract infection. Providers can be reassured that a narrowly defined abnormal urinalysis result at time of urodynamic testing does not affect clinically significant surgical outcomes.

Funding source: None

Faculty Mentor: Cecile Ferrando, MD, MPH
Discussant: Cory Messingschlager, MD

Incidence and Prognostic Significance of Inguinal Lymph Node Metastasis in Women with Newly Diagnosed Epithelial Ovarian Cancer– IRB#18-1339

Julia Chalif, MD

Objective: To assess incidence and oncologic outcomes in women with advanced epithelial ovarian cancer (EOC) with inguinal lymph node metastasis (ILNM) at diagnosis**.**

Methods: An IRB-approved, retrospective single-institution cohort study was performed in women with stage III/IV EOC from 2009-2017. Patients with inguinal lymphadenopathy (defined as >1cm in short axis) clinically or radiographically were identified. The impact of ILNM on progression-free survival (PFS) and overall survival (OS) were assessed.

Results: Of the 562 women with advanced EOC, 18 (3.2%) had ILNM at diagnosis, accounting for 25.7% of all patients with stage IVB disease (n=70). Five patients (27.7%) had a known genetic predisposition for EOC, including BRCA1 (11.1%, n=2), BRCA2 (11.1%, n=2) and BRIP1 (5.6%, n=1). The

majority of patients underwent optimal primary cytoreductive surgery (CRS), including debulking of inguinal nodal metastasis (83.3%, n=15), with 50% (n=9) having no gross residual disease after surgery. There was no difference in PFS (19.9 vs. 19.9 vs. 17.2 months, p=0.84) or OS (137.2 vs. 52.9 vs. 67.6 months, p=0.29) in women with stage III/IV with ILNM, stage III/IV without ILNM, and stage IVB disease without ILNM, respectively. Progression-free survival was improved in women with ILNM who underwent an optimal resection to no macroscopic disease vs. non-optimal resection (27.4 vs. 14.3 months, p=0.019). Median overall survival at the time of analysis did not reach statistical significance (137.2 vs. 57.3 months, p=0.24).

Conclusions: In this retrospective cohort study, 3.2% of women with advanced EOC presented with ILNM at diagnosis. Although ILNM did not portend worse clinical outcomes compared to all Stage III/IV and Stage IVB patients, respectively, resection to no gross residual disease was associated with improved PFS.

Funding source: None

Faculty Mentor: Robert DeBernardo, MD
Discussant: Morgan Gruner, 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?

Alexandra Imani Chatman, MD

Objective: To evaluate the diagnosis and management of all women who delivered within the Cleveland Clinic Cleveland area hospitals in the year 2018 with a diagnosis of pre-eclampsia.

Methods: This was a retrospective chart review of 346 patients who delivered at the Cleveland Clinic Women's Health Institute in the year 2018. Initial search was for patients with ICD 10 diagnosis codes for preeclampsia which had to be present before delivery. The primary outcome measure was whether or not the diagnosis of gestational hypertension or preeclampsia was made when the patient met criteria. Patients were then screened for the following demographics: age, race, pre-pregnancy BMI, last pre-pregnancy blood pressure, pregnancy

episode start date, pregnancy start date, delivery date/location, type 1 or 2 diabetes, obesity, gravidity, parity, tobacco use, initial prenatal visit blood pressure, history of preeclampsia in prior pregnancy, chronic hypertension, and whether or not the patient was started on baby aspirin between 12 & 28 weeks gestational age. Gestational age at time of diagnosis of gestational hypertension were collected in addition to sequalae such as presence of pulmonary edema, eclampsia, and readmission to hospital for postpartum preeclampsia. If patients were not diagnosed when they met criteria, a difference in the number of days between when they met criteria and when they were officially diagnosed was calculated and recorded. Comparisons were made between black, white, and other race patients. Categorial variables are presented as n/N (%) with 95% confidence intervals. These will be compared using Pearson's chi-square or Fisher's exact tests. Continuous variables will be presented as mean +/- SD, median [P25, P75], N (column%).

Results: 346 patients were included in the study. Of those patients, 339 or 98% were diagnosed with gestational hypertension or preeclampsia when they met criteria for the disease. 7 patients or 2% were not diagnosed when they met criteria for the disease. This study was an exploratory study and a power calculation was not performed.

Black patients had a statistically significantly higher pre-pregnancy BMI on average when compared to other races (34.8 ± 9.4 vs 30.7 ± 7.7, $p<0.001$). Black patients were also statistically significantly more likely to have a pre-existing diagnosis of chronic hypertension (44.6% vs 21.2%).

There were 49 patients who had a history of chronic hypertension that were not started on baby aspirin between 12-28 weeks. There were 10 patients with a history of preeclampsia in a prior pregnancy who were not started on baby aspirin between 12-28 weeks.

Conclusions: There were only 2% of patients who experienced a delay in diagnosis of gestational hypertension or preeclampsia. Therefore, the outcome of interest was too rare to detect any significant difference between the black and white populations. However, the study did find that 49 patients with a clear indication for baby aspirin prophylaxis were not started on it and went on to develop chronic hypertension with superimposed preeclampsia. Black patients were statistically more likely to have a higher pre-pregnancy BMI and a pre-existing diagnosis of chronic hypertension when compared to women of all other races.

Funding source: None

Faculty Mentor: Oluwatosin Goje, MD
Discussant: Kate Lintel, MD

Provider Practice Patterns Pertaining to Malpresentation in Pregnancies Conceived Via Assisted Reproductive Technology

Catherine Keller, MD

Objective: To analyze rates of external cephalic version (ECV) attempts in ART pregnancies.

Methods: An IRB-approved, retrospective cohort study was performed in patients who delivered at a single institution from 2014-2020 with diagnosis of malpresentation. Method of conception was defined as ART or spontaneously conceived. Patients undergoing intrauterine insemination were excluded. Primary outcome was the proportion of patients offered ECV in pregnancies conceived by ART compared to pregnancies conceived spontaneously.

Results: The study included 179 patients; 118 spontaneously conceived and 61 conceived with ART. ART patients were older (35.3 ± 3.7) than spontaneously conceived patients (30.1 ± 5.4) ($p<0.001$) and more likely to have private insurance (98.4% versus 76.7%, respectively, [$p<0.001$]). ECV was offered for 61.0% (n=72) of spontaneously conceived patients and 67.2% (n=41) of ART patients (p=0.42). Patients who spontaneously conceived were more likely to accept ECV when offered, with 38.9% (n=28) versus 20.5% (n=9) of ART patients (p=0.039). ECV success rates were similar: 48% (n=12) for non-ART and 40% (n=6) for ART patients (p=0.62).

Conclusions: While ECV was offered at the same rate in spontaneously conceived and ART pregnancies, patients who conceived with ART were less likely to accept ECV at our institution. Further research is needed in this population to understand the decision-making process surrounding ECV.

Funding: None

Faculty Mentor: Jeffrey Goldberg, MD
Discussant: Jonathan Hunt, MD, MBA

Endometrial Abnormalities During Endometrial Maturation for Frozen Embryo Transfer (FET): A Pilot Study

Kaia Schwartz, MD

Objective: We sought to retrospectively analyze the ultrasound characteristics of patients undergoing medicated endometrial maturation for FET to identify characteristics of abnormal endometrial echoes on transvaginal ultrasound performed prior to FET. Secondly, we aimed to identify if any of these abnormal endometrial characteristics were associated with FET pregnancy outcomes. We present preliminary data on the first 22 consecutive patients.

Methods: Abnormal endometria were diagnosed by the presence of polyps, cystic lesions, heterogeneous morphology (coexisting hypo- and hyperechoic areas), homogeneous morphology (as opposed to a normal trilaminar endometrium). All patients had undergone a uterine cavity assessment with an office hysteroscopy or a sonohysterogram prior to starting stimulation. Endometrial characteristics and patient demographics, including FET outcomes, were collected. All endometrial ultrasounds were performed by skilled sonographers leading up to FET, typically occurring between stimulation day 8-15. Evaluation of the endometrial echo morphology was performed by one of seven physicians on duty for IVF that day, and verified by a second physician. Outcome measures were cycle cancellation, failed conception, early pregnancy loss/biochemical pregnancy, and ongoing pregnancy. Fisher's Exact test and correlations were used to analyze the data and a $p<0.05$ determined statistical significance (R statistical program version 4).

Results: Of 22 abnormal endometria, 7 embryo transfers resulted in failed conception (23.3%), 4 resulted in ongoing pregnancy (13.3%), 6 cycle cancellations (20.0%), 2 early pregnancy losses (6.7%), and 2 biochemical pregnancies (6.7%). Of the endometrial characteristics analyzed, cystic lesions seen on the mid-cycle endometrial ultrasound were associated with either a cancelled cycle (22.7%), failed conception (22.7%), biochemical pregnancy (4.5%), or early pregnancy loss (9.1%) versus only 9.1% associated with ongoing pregnancy ($p=0.18$). Homogenous endometria were associated with no conception 9.1%, cancelled cycle in 9.1%, and with biochemical pregnancy in 4.5% of cases. Homogenous endometria were not associated with any ongoing pregnancies ($p=0.65$). When a polyp was present, FET would be cancelled.

Conclusions: The presence of endometrial abnormalities at endometrial ultrasound in preparation for FET was correlated with poor cycle outcomes (cancelled cycle, no conception, or early pregnancy loss/biochemical pregnancy) in the majority of the cases. Furthermore, there appears to be a possible association between poor FET outcome and endometrial cystic lesions. The association was not statistically significant, but the overall detrimental impact of endometrial abnormalities on FET cycles warrants further investigation in larger cohorts, which the authors intend to accomplish with expansion of the present study.

Funding: None

Faculty Mentor: Laura Detti, M
Discussant: Molly Morton, MD

An Exploratory Study Comparing the Quality of Contraceptive Counseling Provided Via Telemedicine Versus In-Person Visits

Rachel Shin, MD, MPH

Objective: To assess the quality of contraceptive counseling during telemedicine and office visits.

Methods: We conducted a cross-sectional study at Cleveland Clinic Women's Health Institute to compare contraceptive counseling quality between telemedicine (synchronous video) and office visits. We identified eligible patients through ambulatory encounters with primary contraceptive management or counseling ICD-10 codes. Respondents completed a survey assessing demographics, quality of contraceptive counseling, contraceptive method choice, affinity for technology, and attitudes toward telemedicine. We used the validated Interpersonal Quality of Family Planning (IQFP) scale to assess counseling quality. We used the Wilcoxon rank sum test, Pearson's chi-square test and Fisher's exact test to compare baseline characteristics.

Results: Of all eligible patients, 110/380 (29%) completed the survey. Of those who were successfully contacted by phone or mail, 110/201 (55%) completed the survey. The IQFP scores were 'high quality' for 28/52 (54%) of telemedicine-visit respondents versus 37/58 (64%) of office-visit respondents ($p = 0.29$). The birth control pill was the most popular method, chosen by

27/52 (52%) of telemedicine-visit respondents and 24/58 (41%) of office-visit respondents ($p = 0.27$). Telemedicine respondents identified ease of communication and less scheduling difficulty as factors that promote telemedicine use. Office-visit respondents identified privacy and communication concerns as factors that deter telemedicine use.

Conclusions: When patients self-select the encounter type, their assessment of the quality of contraceptive counseling among telemedicine and office visits is similar, with no statistically significant differences in contraceptive method chosen. Results from this single-center study support the integration of telemedicine in contraceptive service provision.

Funding: Falcone Grant

Faculty Mentor: Ashley Brant, DO, MPH
Discussant: Molly Morton, MD

Perioperative Adverse Events In Women Undergoing Concurrent Mid-urethral Sling Placement at the Time of Minimally Invasive Benign Gynecologic Surgery

Nicole Wood, MD

Objective: To compare perioperative complication rates between women undergoing mid-urethral sling (MUS) placement at the time of benign gynecologic surgery and those undergoing MUS procedures alone.

Methods: This is a retrospective matched cohort study of women undergoing MUS placement with or without concurrent minimally-invasive benign gynecologic surgery from January 2010 through December 2020. Women who had undergone concurrent minimally invasive gynecologic surgery and MUS placement for stress urinary incontinence were identified by their Current Procedural Terminology (CPT) codes. Once identified, they were matched to a cohort of women who had undergone MUS placement alone. Subjects were matched by age, surgeon, and date of surgery. Once identified, the electronic medical record was queried for demographic and perioperative data. Definitions for adverse events were determined a priori and captured at defined time points up to 12 months following surgery.

Results: A total of 38 patients met inclusion criteria for the concurrent surgery group, and 152 patients were matched accordingly. Mean age and BMI were 51 years and 22-173 kg/m^2. Patient characteristics were similar between the groups with the following exceptions: the concurrent surgery group had fewer previous vaginal surgeries ($p=0.005$), and a more frequent history of fibroids ($p=0.01$), benign adnexal disease ($p<0.001$), and endometriosis ($p<0.001$). The majority of the slings placed in the MUS-only group were retropubic (69%). Clavien-Dindo Grade 1 and Grade 2 adverse events were more frequent in the concurrent surgery group (5% vs 0%, $p=0.04$, 16% vs 6%, $p=0.04$). Similarly, composite post-operative resource utilization was greater in the concurrent surgery group (76% vs 49%, $p=0.003$). The rate of mesh extrusion/erosion ($p=0.03$) and sling lysis/excision rates ($p=0.02$) were found to be higher in the concurrent surgery group. On logistic regression, concurrent surgery cases were no longer associated with Clavien-Dindo Grade 2 events (adj OR 3.95, 95% CI 0.61-25.4), but remained significantly associated with sling mesh erosion (adj OR 12.6, 95% CI 1.4- 116.4).

Conclusions: Midurethral sling placement at the time of minimally invasive benign gynecologic surgery is safe, but is associated with a higher rate of postoperative resource utilization and sling mesh erosion and revision rates.

Funding: None

Faculty Mentor: Cecile Ferrando, MD, MPH
Discussant: Becca Omosigho, MD

PGY2 Obstetrics & Gynecology Residents

Poster Presentations

Fetal Echocardiography Outcomes in Mothers at Increased Risk of Fetal Congential Heart Disease

Faculty Mentor: Maeve Hopkins, MD

Lauren Buckley, MD

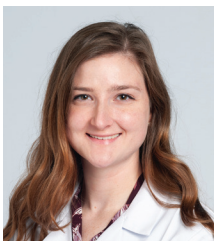
Evaluation of Oxytocin Dysfunction as a Predictor of Developing Autism-Like Behavior in a *Pten* Mutant Mouse Model

Faculty Mentor: Charis Eng, MD, PhD

Parker Bussies, MD

Necrotizing Soft Tissue Infections in Obstetric and Gynecologic Patients

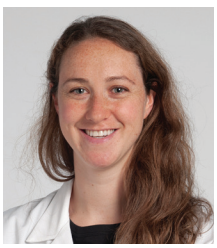
Faculty Mentor: Roberto Vargas, MD



Katie Klammer, MD

Efficacy and Toxicity of Carboplatin and Gemcitabine dosed on Day 1/Day 8 versus Day 1 alone for Platinum-sensitive Recurrent Epithelial Ovarian Cancer

Faculty Mentor: Robert DeBernardo, MD



Erika Lampert, MD

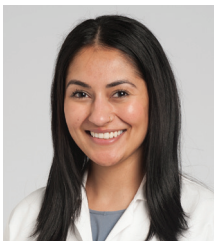
Umbilical Cord Blood Collection during Cesarean Section: Impact on Maternal Blood Loss

Faculty Mentor: Maeve Hopkins, MD

Madeline Lederer, MD

Prevalence of Polycystic Ovarian Syndrome in Young and Adolescent Transmasculine Patients Presenting for Gender Affirmation Care

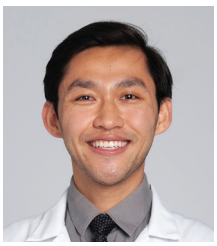
Faculty Mentor: Cecile Ferrando, MD, MPH



Sabrina Rangi, MD

Foley Balloon for Cervical Preparation Prior to Surgical Abortion

Faculty Mentor: Mitchell Reider, MD



Johnathan Zhao, MD

Graduating Fellow

Oral Presentations

Reported Case Numbers and Variability in Delivery Route and Volume by Obstetrician-Gynecologist Residents from 2003 to 2019

Tiffany Cochran, MD

Objective: Ovarian aging is an intricate physiologic process resulting in the age-specific, irreversible decline in the number and quality of the primordial follicle pool (PFP) to the point of infecundity and cessation of hormonal production resulting in menopause. The 12 months following the last menstrual cycle signals menopause after losing ovarian function, and its timing is affected by genetics. It is well studied that ovarian reserve decreases chronologically with age. Ovarian aging happens faster than other bodily organs, causing infertility and leading to harmful health diseases such as cardiovascular and ischemic heart disease, osteoporosis and loss of bone density, Alzheimer's disease, and weight gain and changes in the adipose deposition. Maintaining ovarian function also has a caveat associated with increased risk for breast, ovarian, and endometrial cancer. The rate of decline for ovarian reserve varies widely even among females of similar age. Within our Center for Specialized Women's health menopause clinic, we have witnessed several women who spontaneously had a return of ovarian function with the return of menstrual bleeding from the active uterine lining with a benign investigation for bleeding. These specific cases of return of ovarian function sparked curiosity in questioning the mechanism. Since age at menopause has been identified as a critical marker of a woman's health, research efforts to investigate the physiology of ovarian aging and factors that influence ovarian reserve are imperative. We know ovarian aging is influenced by multiple factors such as environment, nutrition, and genetics. Here we will conduct a retrospective study observing the effect of multiple factors (melatonin, metformin, parity, ethnicity, body mass index, age of menarche, age at first and last birth, smoking history, and diet) on ovarian aging. This study aims to increase research efforts to investigate the impact of multiple factors on ovarian function.

Methods: The EMR will be searched to obtain information about demographics, relevant clinical information, and menopause diagnosis. Baseline characteristics of interest will include age, BMI, ethnicity, gravidity/parity, age of menarche, age at first and last birth, smoking history, A1c, blood glucose, TSH, free T4 and T3, use of specific medications (melatonin, metformin, or hormonal contraceptives), FSH and AMH testing, menstrual cycles, history of malignancy (chemotherapy,

malignancy, and surgery), symptoms of menopause (severity and duration).

Results: IRB recently approved. Epic Chart received on 03/28/2022 for data collection

Conclusions: IRB recently approved. Epic Chart received on 03/28/2022 for data collection

Funding: None

Faculty Mentor: Holly L Thacker, MD and Ula Abed Alwahab, MD

The Symptoms and Timing of Menopause in Women with Polycystic Ovarian Syndrome

Tara Iyer, MD

Objective: This study aims to increase research efforts to investigate the implications of menopause for women diagnosed with PCOS. Specifically, this study aims to evaluate the effect of PCOS on the timing of menopause and severity of menopausal symptoms, when controlling for influential clinical factors and co-morbidities.

Methods: The study will be an observational, retrospective cohort study with random selection for the cohort control. The data for this study will be collected via chart review. Our study population will include postmenopausal women with PCOS as diagnosed by the clinical definition of menopause and the Rotterdam criteria for PCOS. The EMR will be searched to obtain information about demographics, relevant clinical information, PCOS and menopause diagnosis. Baseline characteristics of interest will include age, BMI, gravidity/parity, insulin resistance (HgbA1c), smoking, CAD, hormonal contraception, FSH and AMH testing, menstrual cycles, history of infertility treatment, history of depression, history of malignancy (chemotherapy, malignancy, surgery), symptoms of menopause (prevalence, severity, duration)

Analysis:
Aim 1: Between study cohort and control cohort, approximately normally-distributed continuous measures will be summarized using means and standard deviations and will be compared using two-sample t-tests. Continuous measures

that show departure from normality and ordinal measures will be summarized using medians and quartiles and will be compared using Wilcoxon rank sum tests. Categorical factors will be summarized using frequencies and percentages and will be compared using Pearson's chi-square tests or Fisher's Exact tests. Linear regressions adjusting for factors of clinical importance will be performed for menopause age.

Aim 2, 3: Depending on the distribution of final data, Pearson or Spearman correlation will be calculated between the menopause age and other continuous variables. For each level of categorical factors, the X will be summarized using mean and standard deviation or median and quartiles, and will be compared using ANOVA or Kruskal-Wallis tests.

All analyses will be done using SAS (version 9.4, The SAS Institute, Cary, NC) and a $p < 0.05$ will be considered statistically significant.

Results: In progress

Conclusions: In progress

Funding: None

Faculty Mentor: Holly L. Thacker, MD

The Validation of Novel Methods to Differentiate Radiation Sensitivity in Cervical Cancer Cell Lines Allows for the Development of a Gene Signature Predictive of Radiation Response

Michelle Kuznicki, MD

Objective: In cervical cancer cell lines (CCCL) we aimed to 1) Validate a high throughput (HTP) assay as a reliable method for determining radiation sensitivity. 2) Validate area under the radiation response curve (AUC) as an accurate measure of radiation sensitivity. 3) Use RNA sequencing to explore differential gene expression based on AUC.

Methods: The HTP assay utilized 96-well plates and a multidrop liquid handler for high replicate plating. Plates were exposed to radiation and cell survival was determined at 9 days using luminescence signal measurement after application of Cell-Titer-Glo. Colony Forming Assay (CFAs) were performed using 6 well

plates, cells were exposed to radiation, and cell survival at 9 days was determined by manually counting colonies. Surviving fraction at 2Gy (SF2) and AUC were measured. CFAs were completed for 6 CCCL and HTP was completed for 16 CC cell lines. Pearson correlation coefficients were used for linear correlations and one-way ANOVA was used to determine differences in HTP AUC between cell lines. Illumina hiseq double end paired RNA sequencing of each cell line was completed. Differential gene expression between CCCL was calculated using edgeR and DESeq2 packages in R. Partial least squares (PLS) model was used to determine relative impact of gene expression on AUC. A gene signature that correlated with AUC was then developed using PLS and differential expression data.

Results: In 6 CCCL CFA SF2 correlated with CFA AUC (Pearson r=0.987, p=<0.0002) and CFA AUC correlated with HTP AUC (Pearson r= 0.932, p=0.0068), Figure 1.1-1.2. HTP SF2 correlated with HTP AUC (Pearson =0.868, p=0.068). Differential radiation sensitivity in 16 CCCL was found using both HTP SF2 (F=7.201, p=<0.0001), and HTP AUC (F=17.44, p=< 0.0001), Figure 1.3 and 1.4. RNAseq analysis demonstrated significantly differentially expressed genes based on AUC and using this data a predictive gene signature was created (Figure 2)

Conclusions: We have demonstrated the HTP correlates with gold standard CFA in cervical cancer cell lines and that AUC correlates with SF2. Using RNA seq and AUC we were able to detect differential gene expression and develop a gene signature that is predictive of radiation phenotype.

Funding: 2020 Cleveland Clinic Research Program Committees Grant

Faculty Mentor: Roberto Vargas, MD

Is There an Association Between 6-month Genital Hiatus Size and 24-month Composite Subjective Prolapse Recurrence following Minimally Invasive Sacrocolpopexy?

Viviana Casas Puig, MD

Objective: To describe 24-month composite subjective prolapse recurrence following MI-SCP between patients with a 6-month post-operative GH<3cm compared to those ≥3cm; and, to explore the impact of concurrent level 3 support procedures on subjective prolapse recurrence, bowel, and sexual function.

Methods: This was a secondary analysis of two randomized, single-blinded controlled trials of women who underwent MI-SCP for uterovaginal or vaginal vault prolapse from June 2014 through January 2020. Women who had a documented preoperative and 6-month postoperative POP-Q examination, and those who had completed the PFDI-20 questionnaire preoperatively and at 6- and 24 months postoperatively were included. Our primary outcome was composite subjective prolapse recurrence defined as retreatment with either a pessary or surgery, and/or a positive response to question 3 of the PFDI-20 questionnaire. A ROC curve was generated to identify a 6-month GH cut point associated with 24-month composite prolapse recurrence. Based on this threshold, patients were categorized as having a GH<3cm or GH≥3cm.

Results: A total of 108 women met inclusion criteria. 35 patients (32%) underwent robotic-assisted SCP and 73 (68%) laparoscopic SCP. The majority of women were white (94%), postmenopausal (94%), and had stage 3 POP (56%). 23 (21%) patients had a GH<3cm and 85 (79%) patients a GH≥3cm. Women with a 6-month GH<3cm were older (65±7 vs 60±8, p=0.002); otherwise, patient characteristics were similar between the groups. A total of 13 patients (12%) had a composite prolapse recurrence at 24-months: 12 patients (11.1%) reported bothersome vaginal bulge symptoms, and 3 patients (2.8%) underwent retreatment with surgery. A ROC curve demonstrated that a 6-month postoperative GH size of 3cm had 84.6% sensitivity (CI, 65-100%) to predict bothersome vaginal bulge and/or retreatment at 24 months (AUC=0.52). Composite subjective prolapse recurrence did not differ between the groups, however, only patients with a 6-month GH>3cm underwent retreatment. Of the patients, 45% (49) underwent a concurrent level 3 support procedure at the time of MI-SCP.

Conclusions: 24-month composite subjective failure following MI-SCP did not differ based on 6-month GH size; however, surgical failure was only seen in patients with a GH size ≥3cm. Concurrent level 3 support procedures were not associated with subjective prolapse recurrence, bowel symptoms, or de novo dyspareunia.

Funding source: None

Faculty Mentor: Cecile Ferrando, MD, MPH

The Standard versus No Opioid Prescription after Prolapse and Anti-Incontinence Surgery (STOP-PAIN) Trial

Angela S. Yuan, MD

Objective: To determine if a restrictive opioid prescription protocol is acceptable to patients after minor and major urogynecologic surgery, compared to standard opioid prescribing practices.

Methods: This was a pragmatic, non-inferiority, randomized trial of patients who underwent minor (e.g. colporrhaphy or mid-urethral sling) and major (e.g. vaginal or minimally-invasive abdominal prolapse repair) urogynecologic surgery. Subjects were randomized to receive a standard opioid prescription (3-10 tablets of oxycodone 5 mg) or no opioid prescription upon discharge. All patients received multimodal pain medications. Exclusion criteria included a history of preoperative opioid use, allergy to study medications, and a score of ³30 on the Pain Catastrophizing Scale. Subjects were asked to record their pain medication use and pain levels for 7 days. The primary outcome was satisfaction with pain control reported at the 6 week postoperative visit. The non-inferiority margin was 15 percentage points. A sample size of 128 subjects (64 per arm) was planned.

Results: To date, a total of 113 patients have been randomized, with 55 patients assigned to the Standard Opioid Prescription arm, and 58 assigned to the Restricted Opioid Prescription arm. The following are results from a preliminary analysis of the available data. Mean age of subjects was 56 ± 12.4 years, and subjects were predominantly white (106 [91.4%]), non-Hispanic (111 [95.7%]) and postmenopausal (74 [63.8%]). At 6 weeks, satisfaction with pain control was reported in 90.7% and 92.7% of subjects in the Standard and Restricted arms, respectively (p=.706). Sample size has not yet been achieved to demonstrate non-inferiority. Median prescribed number of opioid tablets at discharge was 5 (interquartile range [IQR] 5-10) for Standard arm subjects and 0 (IQR 0-5) for Restricted arm subjects (p<.001). Opioid use was significantly lower in the Restricted arm (median [IQR] 0 [0-1]) compared to Standard arm (1 [0-2.8]), p=.023. There were also fewer unused opioid tablets in the Restricted arm (median [IQR] 1 [0-9]) compared to Standard (5 [3-8]), p<.001. No postoperative opioid use was seen in 71.9% of Restricted arm patients compared to only 48.9% of Standard arm patients (p=.016). These

findings were sustained in planned sub-analyses of subjects who underwent minor vs. major surgeries.

Conclusions: In this preliminary analysis of patients randomized to standard versus restricted opioid quantities prescribed after urogynecologic surgery, significantly less opioid use was seen with the restrictive protocol without impact on satisfaction rates.

Funding: Supported by a grant from the Lerner Research Institute Research Program Committees (RPC 1785).

Faculty Mentor: Cecile Ferrando, MD, MPH

Salpingo-Oophorectomy or Surveillance for Ovarian Endometrioma in Asymptomatic Premenopausal Women: a Cost-Effectiveness Analysis

Megan Orlando, MD

Objective: To determine if performing unilateral salpingo-oophorectomy (USO) is cost-effective for prevention of death compared to surveillance for asymptomatic endometriomas.

Methods: We created a cost-effectiveness model using TreeAge Pro with a lifetime horizon. Our hypothetical cohort included premenopausal patients with two ovaries who do not desire fertility. Those diagnosed with asymptomatic endometrioma underwent USO or surveillance (ultrasound 6-12 weeks after diagnosis, then annually). Our primary effectiveness outcome was mortality, including death from ovarian cancer or surgery and all-cause mortality related to surgical menopause (+/- hormone replacement therapy). We modeled the probabilities of surgical complications, occult malignancy, development of contralateral adnexal pathology, surgical menopause, use of hormone replacement therapy, and development of ovarian cancer. Costs included surgical procedures, complications, ultrasound surveillance, hormone therapy, and treatment of ovarian cancer, with information gathered from Medicare reimbursement data and published literature. Cost-effectiveness was determined using the incremental cost-effectiveness ratio (ICER) of Δ costs / Δ deaths with a willingness-to-pay (WTP) threshold of $11.6 million as the value of a statistical life. Multiple one-way sensitivity analyses were performed to evaluate model robustness..

Results: Our model demonstrated that USO is associated with improved outcomes compared to surveillance, with fewer deaths (0.28% vs.1.50%) and fewer cases of ovarian cancer (0.42% vs. 2.96%). However, USO costs more than surveillance at $6,403.43 vs. $5,381.39 per case of incidental endometrioma. The ICER showed that USO costs $83,773.77 per death prevented and $40,237.80 per case of ovarian cancer prevented compared to surveillance. As both values were well below the WTP threshold, USO is cost-effective and the preferred strategy. If USO were chosen over surveillance for premenopausal patients with incidental endometriomas, one diagnosis of ovarian cancer would be prevented in every 40 patients and one death averted in every 82 patients. We performed one-way sensitivity analyses for all input variables, and determined that there were no reasonable inputs that would alter our conclusions.

Conclusions: USO is cost-effective and the preferred strategy compared to surveillance for the management of incidental endometrioma in a premenopausal patient not desiring fertility. USO incurs fewer deaths and fewer cases of ovarian cancer with costs below national willingness-to-pay thresholds.

Funding: None

Faculty Mentor: Rosanne Kho, MD

Caloric Restriction Increases Ovarian FOXO3A Expression in a Mouse Delayed Aging Model: Implications for Reproductive Longevity

Natalia Llarena, MD

Objective: To evaluate the nutritional triggers, specifically the contribution of amino acid composition during CR, as well as the molecular mechanisms, by which CR impacts ovarian reserve during physiologic aging in mice.

Methods: Twenty-six 9-month-old female C57BL/6 mice were divided into 4 groups: (1) ad libitum feeding, (2) 40% caloric restriction (CR), (3) 40% CR + non-essential glycine amino acid supplementation (CR + Gly), and (4) 40% CR + sulfur amino acid supplementation (CR + SAA). CR was continued for 12 weeks. Following CR, the ovarian reserve was quantified. Formalin-fixed ovaries were sectioned and stained with hematoxylin and eosin for primordial follicle counts. Quantitative polymerase chain reaction (qPCR) was used to

quantify levels of ovarian expression of forkhead box protein O3A (FOXO3A), an important suppressor of follicular activation, growth hormone receptor (GHR), and insulin-like growth factor-1 (IGF-1).

Results: Primordial follicle counts increased in the 40% CR (53 vs 41, p = 0.7) and CR + Gly supplementation groups (82 vs 41, p = 0.029) compared to the ad-lib fed group. There was no increase in primordial follicles in the CR + SAA group (44 vs 41, p = 0.99). The relative expression of FOXO3A was increased by 10-fold in the CR group (p = 0.3) and 20-fold in the CR + Gly group compared to the ad lib group (p = 0.016). There was no increase in FOXO3A expression in the CR + SAA group. Relative GHR expression was decreased 4-fold in the CR + Gly compared to the ad-lib¬-fed animals (p = 0.07). There was no difference in IGF-1 levels between the CR + Gly group and controls; however, levels of IGF-1 in the CR + SAA group increased dramatically by 100-fold (p = 0.001).

Conclusions: CR (40%) with Gly supplementation significantly increases ovarian reserve in a mouse model of physiologic aging. The improvement in ovarian reserve appears to be mediated by an increase in the expression of FOXO3A, an important suppressor of follicular activation. This study provides insight into pathways that regulate the ovarian reserve. These pathways can be leveraged to design interventions that prolong the reproductive lifespan.

Funding source: NIH/NIA

Requirement of Hydrogen Sulfide for the Benefits of Dietary Sulfur Amino Acid Restriction

This project seeks to identify a central factor driving aging in order to develop targeted interventions to delay the onset or even reverse aging-related pathologies. I will test age related declines of endogenous hydrogen sulfide production and if it is delayed by DR, and the requirement for increased H2S to deliver the longevity benefit of DR.

K99 Phase: 08/15/2015 - 10/31/2016

R00 Phase: 04/01/2017- 03/31/2020

Faculty Mentor: Christopher Hine, PhD

The FLOWER Trial: A Randomized Trial Comparing Perioperative Pelvic Floor Physical Therapy to Current Standard of Care in Transgender Women Undergoing Vaginoplasty for Gender Affirmation

Frances Grimstad, MD

Objective: To compare the effectiveness of postoperative pelvic floor physical therapy (PFPT) compared to no PFPT in transgender women undergoing vaginoplasty surgery for gender affirmation.

Methods: This is a randomized double-blind study of transgender adult women undergoing full-depth vaginoplasty. Patients were randomized to one of two groups: PFPT or no PFPT following vaginoplasty. Those who were randomized to PFPT were additionally randomized to receiving or not receiving additional preoperative PFPT. We determined that 17 subjects in each arm were needed to detect a difference of 2 (+/-1) points between the two groups (PFPT versus no PFPT) with 80% power and a significance level of 0.05. Accounting for potential drop out as well as unforeseen factors in recruiting we are plaining to recruit 20 subjects to each arm, for a total of 40 subjects. Primary outcome was patient reported ease of dilation 12 weeks following surgery. Secondary outcome was severity of pelvic floor dysfunction at 12 weeks, assessed by the Colorectal-Anal Distress Inventory (CRAD-8), Urogenital Distress Inventory (UDI-6), Pelvic Floor Impact Questionnaire (PFIQ-7), and Patient Impression of Improvement (PGI-I).

Results To date, 36 patients have qualified for the study, 31 enrolled. Of those, four were lost to follow up at the 12-week postoperative visit, 22 completed the study, and four are actively enrolled. One had their surgery postponed following the initial enrollment. Mean age and BMI of those enrolled thus far (n=31) were 33.1±14.5 years and 24.6±4.1 kg/m2., respectively. The majority (n=29, 93.5%) were white with two African American patients. Patients had been on estrogen hormone therapy for a mean of 53.9±49.3 months. Four participants had a history of chronic pain. Analysis of outcomes data is pending completion of study enrollment. This will include comparing ease of dilation and pelvic floor symptoms between arms. We will also perform subgroup analyses, between those who underwent both preoperative and postoperative PFPT, and postoperative PFPT alone. Binary logistic regression will be used to assess the influence of various patient factors on the patient reported ease of dilation as

well as pelvic floor symptoms.

Conclusions This is the first randomized study to interrogate the utility of PFPT following full-depth vaginoplasty in transgender women.

Funding source: none

Faculty Mentor: Cecile Ferrando, MD, MPH

2021

Resident, Fellow and Faculty Publications

Ob/Gyn

1. Fishel Bartal M, Premkumar A, Rice MM, 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 people expectantly managed at or after 39 weeks: a secondary analysis of a randomized controlled trial. *BJOG*. 2021 Dec 20. doi: 10.1111/1471-0528.17059. [Epub ahead of print] PubMed [citation] PMID: 34927787

2. 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.* 2021 Dec 16. doi: 10.1055/s-0041-1740056. [Epub ahead of print] PubMed [citation] PMID: 34918330

3. 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 NICHD Fetal Growth Studies. *Am J Obstet Gynecol.* 2021 Dec 11. pii: S0002-9378(21)02644-2. doi: 10.1016/j.ajog.2021.12.006. [Epub ahead of print] No abstract available. PubMed [citation] PMID: 34906542

4. 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.* 2021 Nov 28. doi: 10.1055/s-0041-1740017. [Epub ahead of print] PubMed [citation] PMID: 34839480

5. Costantine MM, Rice MM, Landon MB, Varner MW, Casey BM, Reddy UM, Wapner RJ, Rouse DJ, Tita ATN, Thorp JM, Chien EK, Peaceman AM, Blackwell SC; Eunice Kennedy Shriver National Institute of Child Health Human Development Maternal-Fetal Medicine Units (MFMU) Network. Oral Glucose Tolerance Test in Pregnancy and Subsequent Maternal Hypertension. *Am J Perinatol.* 2021 Nov 16. doi: 10.1055/s-0041-1740007. [Epub ahead of print] PubMed [citation] PMID: 34784611

6. Hopkins MK, Dugoff L. Screening for aneuploidy in twins. *Am J Obstet Gynecol MFM*. 2021 Oct 8:100499. doi: 10.1016/j.ajogmf.2021.100499. [Epub ahead of print] Review. PubMed [citation] PMID: 34634497

7. Brant AR, Kollikonda S, Yao M, Mei L, Emery J. Use of Immediate Postpartum Long-Acting Reversible Contraception Before and After a State Policy Mandated Inpatient Access. *Obstet Gynecol.* 2021 Nov 1;138(5):732-737. doi: 10.1097/AOG.0000000000004560. PubMed [citation] PMID: 34619694

8. Braginsky L, Weiner SJ, Saade GR, Varner MW, Blackwell SC, Reddy UM, 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. Intrapartum Fetal Electrocardiogram in Small- and Large-for-Gestational Age Fetuses. *Am J Perinatol*. 2021 Dec;38(14):1465-1471. doi: 10.1055/s-0041-1735285. Epub 2021 Aug 31. PubMed [citation] PMID: 34464982, PMCID: PMC8608729

9. Reddy UM, Weiner SJ, Saade GR, Varner MW, Blackwell SC, Thorp JM Jr, Tita ATN, Miller RS, Peaceman AM, McKenna DS, Chien EKS, Rouse DJ, El-Sayed YY, Sorokin Y, Caritis SN; Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network. Intrapartum Resuscitation Interventions for Category II Fetal Heart Rate Tracings and Improvement to Category I. *Obstet Gynecol.* 2021 Sep 1;138(3):409-416. doi: 10.1097/AOG.0000000000004508. PubMed [citation] PMID: 34352857, PMCID: PMC8506980

10. Andrikopoulou M, Bushman ET, Rice MM, Grobman WA, Reddy UM, Silver RM, El-Sayed YY, 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 Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network. Maternal and Neonatal Outcomes in Nulliparous Participants Undergoing Labor Induction by Cervical Ripening Method. *Am J Perinatol*. 2021 Aug 5. doi: 10.1055/s-0041-1732379. [Epub ahead of print] PubMed [citation] PMID: 34352922

11. 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*. 2021 Jul 29:1-9. doi: 10.1080/14767058.2021.1946785. [Epub ahead of print] PubMed [citation] PMID: 34320875

12. Hughes BL, Clifton RG, Rouse DJ, Saade GR, Dinsmoor MJ, Reddy UM, Pass R, Allard D, Mallett G, Fette LM, Gyamfi-Bannerman C, Varner MW, Goodnight WH, Tita ATN, Costantine MM, Swamy GK, Gibbs RS, Chien EK, Chauhan SP, El-Sayed YY, Casey BM, Parry S, et al. A Trial of Hyperimmune Globulin to Prevent Congenital Cytomegalovirus Infection. *N Engl J Med*. 2021 Jul 29;385(5):436-444. doi: 10.1056/NEJMoa1913569. PubMed [citation] PMID: 34320288, PMCID: PMC8363945

13. Chavan M, Qureshi H, Karnati S, Kollikonda S. COVID-19 Vaccination in Pregnancy: The Benefits Outweigh the Risks. *J Obstet Gynaecol Can.* 2021 Jul;43(7):814-816. doi: 10.1016/j.jogc.2021.03.010. No abstract available. PubMed [citation] PMID: 34253304, PMCID: PMC8267012

14. 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*. 2021 Jun 29. doi: 10.3233/NPM-210775. [Epub ahead of print] Review. PubMed [citation] PMID: 34219674

15. Hopkins MK, Koelper N, Caldwell S, Dyr B, Dugoff L. Obesity and no-call results: optimal timing of cell-free DNA testing and redraw. *Am J Obstet Gynecol.* 2021 Sep;225(3):351. doi: 10.1016/j.ajog.2021.05.027. Epub 2021 May 27. No

abstract available. PubMed [citation] PMID: 34051167

16. Gyamfi-Bannerman C, Jablonski KA, Blackwell SC, Tita ATN, Reddy UM, Jain L, Saade GR, Rouse DJ, Clark EAS, Thorp JM Jr, Chien EK, Peaceman AM, Gibbs RS, Swamy GK, Norton ME, Casey BM, Caritis SN, Tolosa JE, Sorokin Y, VanDorsten JP; Eunice Kennedy Shriver National Institute of Child Health Human Development Maternal-Fetal Medicine Units Network. Evaluation of Hypoglycemia in Neonates of Women at Risk for Late Preterm Delivery: An Antenatal Late Preterm Steroids Trial Cohort Study. *Am J Perinatol*. 2021 May 27. doi: 10.1055/s-0041-1729561. [Epub ahead of print] PubMed [citation] PMID: 34044454, PMCID: PMC8626537

17. Bennett C, Chambers LM, Yao M, Chien E, Berghella V. Reported case numbers and variability in delivery route and volume by obstetrics and gynecology residents from 2003 to 2019. *Am J Obstet Gynecol MFM*. 2021 Sep;3(5):100398. doi: 10.1016/j.ajogmf.2021.100398. Epub 2021 May 14. PubMed [citation] PMID: 33992831

18. Winkel AF, Fitzmaurice LE, Jhaveri SA, Tristan SB, Woodland MB, Morgan HK. The paradox of teaching wellness: Lessons from a national obstetrics and gynaecology resident curriculum. *Clin Teach*. 2021 Aug;18(4):417-423. doi: 10.1111/tct.13360. Epub 2021 May 9. PubMed [citation] PMID: 33969629 PubMed [citation] PMID: 33953742, PMCID: PMC8057898

19. Jhaveri S, Komarlu R, Worley S, Shahbah D, Gurumoorthi M, Zahka K. Left Atrial Strain and Function in Pediatric Hypertrophic Cardiomyopathy. *J Am Soc Echocardiogr.* 2021 Sep;34(9):996-1006. doi: 10.1016/j.echo.2021.04.014. Epub 2021 Apr 27. PubMed [citation] PMID: 33915246

20. Hopkins MK, Koelper N, Caldwell S, Dyr B, Dugoff L. Obesity and no call results: optimal timing of cell-free DNA testing and redraw. *Am J Obstet Gynecol.* 2021 Oct;225(4):417.e1-417.e10. doi: 10.1016/j.ajog.2021.04.212. Epub 2021 Apr 8. PubMed [citation] PMID: 33839096

21. Goldstein SA, Sorenson L, Chapa JB, Krasuski RA. Pregnancy in a woman with congenitally corrected transposition of the great arteries. *Cleve Clin J Med*. 2021 Apr 1;88(4):228-236. doi: 10.3949/ccjm.88a.20136. No abstract available. PubMed [citation] PMID: 33795247

22. Kollikonda S, Chavan M. Endometriosis Scarring-A Potential Etiology for Spontaneous Hemoperitoneum in Pregnancy. *J Obstet Gynaecol Can*. 2021 Aug;43(8):998-1000. doi: 10.1016/j.jogc.2021.03.013. Epub 2021 Mar 31. PubMed [citation] PMID: 33798766

23. 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*. 2021 Mar 11:1-8. doi: 10.1080/14767058.2021.1893296. [Epub ahead of print] PubMed [citation] PMID: 33706661

24. Emery JD, Moussa D. Vaccination in pregnancy: A call to all providers for help. *Cleve Clin J Med.* 2021 Mar 1;88(3):157-162. doi: 10.3949/ccjm.88a.20111. Review. PubMed [citation] PMID: 33648968

25. Schenone CV, Argoti P, Goedecke P, Mari G. Neonatal blood pressure before and after delayed umbilical cord clamping. *J Matern Fetal Neonatal Med.* 2021 Jan 21:1-5. doi: 10.1080/14767058.2021.1876656. [Epub ahead of print] PubMed [citation] PMID: 33478292

26. Lappen JR, Bailit JL, Gibson KS. Reply. *Am J Obstet Gynecol MFM*. 2021 Jan;3(1):100236. doi: 10.1016/j.ajogmf.2020.100236. Epub 2020 Sep 21. No abstract available. PubMed [citation] PMID: 33451602

27. Tita ATN, Doherty L, Grobman WA, Reddy UM, Silver RM, Mallett G, Rice MM, 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, Macones GA; Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network. Maternal and Perinatal Outcomes of Expectant Management of Full-Term, Low-Risk, Nulliparous Patients. *Obstet Gynecol.* 2021 Feb 1;137(2):250-257. doi: 10.1097/AOG.0000000000004230. PubMed [citation] PMID: 33416294, PMCID: PMC8404416

28. Hopkins MK, Dugoff L. Screening for Aneuploidy in the Patient With Diabesity: Pearls and Pitfalls. *Clin Obstet Gynecol.* 2021 Mar 1;64(1):136-143. doi: 10.1097/GRF.0000000000000589. PubMed [citation] PMID: 33306499

29. Durnwald C, Mele L, Landon MB, Varner MW, Casey BM, Reddy UM, Wapner RJ, Rouse DJ, Tita ATN, Thorp JM Jr, Chien EK, Saade GR, Peaceman AM, Blackwell SC; Eunice Kennedy Shriver National Institute of Child Health Human Development (NICHD) Maternal Fetal Medicine Units (MFMU) Network. Fibroblast Growth Factor 21 and Metabolic Dysfunction in Women with a Prior Glucose-Intolerant Pregnancy. *Am J Perinatol.* 2021 Nov;38(13):1380-1385. doi: 10.1055/s-0040-1712966. Epub 2020 Jun 23. PubMed [citation] PMID: 32575141, PMCID: PMC7755696

30. Battarbee AN, Sandoval G, Grobman WA, Reddy UM, Tita ATN, Silver RM, El-Sayed YY, Wapner RJ, Rouse DJ, Saade GR, Chauhan SP, Iams JD, Chien EK, Casey BM, Gibbs RS, Srinivas SK, Swamy GK, Simhan HN; Eunice Kennedy Shriver National Institute of Child Health Human Development Maternal-Fetal Medicine Units (MFMU) Network. Maternal and Neonatal Outcomes Associated with Amniotomy among Nulliparous Women Undergoing Labor Induction at Term. *Am J Perinatol.* 2021 Aug;38(S 01):e239-e248. doi: 10.1055/s-0040-1709464. Epub 2020 Apr 16. PubMed [citation] PMID: 32299106, PMCID: PMC7572589

1. Rose PG, Chambers LM, Kuznicki M. To PARPI or Not to PARPI BRCA Mutated Ovarian Cancer Following First-line Chemotherapy, That is the Question? *Gynecol Obstet* (Sunnyvale). 2021;11(7). pii: 561. Epub 2021 Aug 3. No abstract available. PubMed [citation] PMID: 34925958, PMCID: PMC8681040

2. Rose PG, Yao M, Chambers LM, Mei L, Le P. The Overtreatment and Cost Effectiveness of Primary versus Secondary Maintenance Therapy with Poly-Adenosine Ribose Phosphate Inhibitors (PARPi) for Epithelial Ovarian Cancer (EOC). *Gynecol Obstet* (Sunnyvale). 2021;11(9). pii: 570. Epub 2021 Oct 7. PubMed [citation] PMID: 34925959, PMCID: PMC8681231

3. Farrell RM, Falcone T. Incorporating patient perspectives in the science of uterus transplantation. *BJOG*. 2021 Dec 20. doi: 10.1111/1471-0528.17068. [Epub ahead of print] No abstract available. PubMed [citation] PMID: 34928530

4. Ni Y, Soliman A, Joehlin-Price A, Rose PG, Vlad A, Edwards RP, Mahdi H. High TGF-β signature predicts immunotherapy resistance in gynecologic cancer patients treated with immune checkpoint inhibition. *NPJ Precis Oncol.* 2021 Dec 17;5(1):101. doi: 10.1038/s41698-021-00242-8. PubMed [citation] PMID: 34921236

5. Farrell RM, Pierce M, Collart C, Yao M, Coleridge M, Chien EK, Rose SS, Lintel M, Perni U, Edmonds BT. Decision-making for prenatal genetic screening: how will pregnant women navigate a growing number of aneuploidy and carrier screening options? *BMC Pregnancy Childbirth*. 2021 Dec 4;21(1):806. doi: 10.1186/s12884-021-04282-7. PubMed [citation] PMID: 34863134, PMCID: PMC8642756

6. Hur C, Luna-Russo M, King C. Fertility-Preserving, Surgical Management of a Cesarean Section Scar Ectopic Pregnancy. *J Minim Invasive Gynecol.* 2021 Nov 21. pii: S1553-4650(21)01281-4. doi: 10.1016/j.jmig.2021.11.013. [Epub ahead of print] PubMed [citation] PMID: 34818565

7. 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*. 2021 Nov 19. pii: S0015-0282(21)02131-2. doi: 10.1016/j.fertnstert.2021.10.008. [Epub ahead of print] PubMed [citation] PMID: 34802687

8. Detti L, Christiansen ME, Peregrin-Alvarez I. Endometrial Abnormalities: Correlation Between Different Diagnostic Modalities. *J Ultrasound Med*. 2021 Nov 13. doi: 10.1002/jum.15880. [Epub ahead of print] PubMed [citation] PMID: 34773663

9. Chambers LM, Chau D, Yao M, Costales AB, Rose PG, Michener CM, Debernardo R, Vargas R. Efficacy of hyperthermic intraperitoneal chemotherapy and interval debulking surgery in women with advanced uterine serous carcinoma. *Gynecol Oncol Rep.* 2021 Oct 15;38:100876. doi: 10.1016/j.gore.2021.100876. eCollection 2021 Nov. PubMed [citation] PMID: 34761096, PMCID: PMC8567198

10. Hur C, Falcone T. Fertility and Pregnancy Outcomes after Robotic-assisted Laparoscopic Myomectomy in a Canadian Cohort. *J Minim Invasive Gynecol.* 2021 Nov 8. pii: S1553-4650(21)01237-1. doi: 10.1016/j.jmig.2021.11.001. [Epub ahead of print] No abstract available. PubMed [citation] PMID: 34763065

11. AlHilli MM, Arend RC. International gynecologic cancer society (IGCS) 2021 meeting report. *Gynecol Oncol.* 2021 Nov 1. pii: S0090-8258(21)01548-1. doi: 10.1016/j.ygyno.2021.10.086. [Epub ahead of print] No abstract available. PubMed [citation] PMID: 34736783

12. Detti L. Options for preserving fertility in women undergoing gonadotoxic treatment. *Cleve Clin J Med.* 2021 Nov 2;88(11):607-612. doi: 10.3949/ccjm.88gr.21001. PubMed [citation] PMID: 34728486

13. Detti L, Francillon L, Christiansen ME, Peregrin-Alvarez I, Goedecke PJ, Bursac Z, Roman RA. Author Correction: Early pregnancy ultrasound measurements and prediction of first trimester pregnancy loss: A logistic model. *Sci Rep*. 2021 Oct 28;11(1):21598. doi: 10.1038/s41598-021-01235-0. No abstract available. PubMed [citation] PMID: 34711901, PMCID: PMC8553926

14. Derisavifard S, Chang OH, Propst K, Goldman HB. Surgical Correction of Pelvic Organ Prolapse Has No Effect on Renal Function. *Female Pelvic Med Reconstr Surg.* 2021 Nov 1;27(11):e673-e676. doi: 10.1097/SPV.0000000000001086. PubMed [citation] PMID: 34705798

15. Franasiak JM, Alecsandru D, Forman EJ, Gemmell LC, Goldberg JM, Llarena N, Margolis C, Laven J, Schoenmakers S, Seli E. A review of the pathophysiology of recurrent implantation failure. *Fertil Steril.* 2021 Dec;116(6):1436-1448. doi: 10.1016/j.fertnstert.2021.09.014. Epub 2021 Oct 19. Review. PubMed [citation] PMID: 34674825

16. 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*. 2021 Sep 17. pii: S1472-6483(21)00434-X. doi: 10.1016/j.rbmo.2021.09.004. [Epub ahead of print] Review. PubMed [citation] PMID: 34674940

17. Desai KT, Alfaro K, Mendoza L, Faron M, Mesich B, Maza M, Dominguez R, Valenzuela A, Acosta CD, Martínez M, Felix JC, Masch R, Smith JS, Gabrilovich S, Wu T, Plump M, Novetsky AP, Einstein MH, Douglas NC, Cremer M, Wentzensen N. Multisite Clinical Validation of Isothermal Amplification-Based SARS-CoV-2 Detection Assays Using Different Sampling Strategies. *Microbiol Spectr.* 2021 Oct 31;9(2):e0084621. doi: 10.1128/Spectrum.00846-21. Epub 2021 Oct 20. PubMed [citation] PMID: 34668736, PMCID: PMC8528118

18. Levinson K, Beavis AL, Purdy C, Rositch AF, Viswanathan A, Wolfson AH, Kelly MG, Tewari KS, McNally L, Guntupalli SR, Ragab O, Lee YC, Miller DS, Huh WK, Wilkinson KJ, Spirtos NM, Le LV, Casablanca Y, Holman LL, Waggoner SE, Fader AN. Corrigendum to "Beyond Sedlis-A novel histology-specific nomogram for predicting cervical cancer recurrence risk: An NRG/GOG ancillary analysis" [*Gynecologic*

Oncology 162 (2021) 532-538]. *Gynecol Oncol.* 2021 Dec;163(3):616-617. doi: 10.1016/j.ygyno.2021.09.017. Epub 2021 Oct 12. No abstract available. PubMed [citation] PMID: 34654574, PMCID: PMC8627434

19. Carugno J, Grimbizis G, Franchini M, Alonso L, Bradley L, Campo R, Catena U, Carlo A, Attilio DSS, Martin F, Haimovich S, Isaacson K, Moawad N, Saridogan E, Clark TJ. International Consensus Statement for Recommended Terminology Describing Hysteroscopic Procedures. *J Minim Invasive Gynecol.* 2021 Oct 12. pii: S1553-4650(21)01214-0. doi: 10.1016/j.jmig.2021.10.004. [Epub ahead of print] PubMed [citation] PMID: 34648932

20. AlHilli MM, Rybicki L, Carr C, Yao M, Amarnath S, Vargas R, Debernardo R, Michener C, Rose PG. Development and validation of a comprehensive clinical risk-scoring model for prediction of overall survival in patients with endometrioid endometrial carcinoma. *Gynecol Oncol.* 2021 Dec;163(3):511-516. doi: 10.1016/j.ygyno.2021.09.008. Epub 2021 Oct 1. PubMed [citation] PMID: 34607712

21. Batur P. In postmenopausal women, multimodal or US screening for ovarian cancer did not reduce ovarian cancer mortality. *Ann Intern Med*. 2021 Oct;174(10):JC114. doi: 10.7326/ACPJ202110190-114. Epub 2021 Oct 5. PubMed [citation] PMID: 34606322

22. Wiser A, Quinlan JD, Batur P. Risk-based guidelines: Redefining management of abnormal cervical cancer screening results. *Cleve Clin J Med*. 2021 Oct 1;88(10):556-560. doi: 10.3949/ccjm.88a.20193. PubMed [citation] PMID: 34598920

23. Goje OT, Brown H, Nyirjesy P, London RS, Muzny C, Arrindell D. Diagnosis of Vaginitis: New Thinking for a New Era. *Popul Health Manag*. 2021 Oct;24(5):616-621. doi: 10.1089/pop.2021.29006.rtd. Epub 2021 Sep 28. No abstract available. PubMed [citation] PMID: 34590887

24. 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*. 2021 Sep 29. doi: 10.1007/s00192-021-04987-5. [Epub ahead of print] PubMed [citation] PMID: 34586437, PMCID: PMC8479721

25. 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). 2021 Sep 28. doi: 10.1089/jwh.2021.0152. [Epub ahead of print] PubMed [citation] PMID: 34582715

26. Muneyyirci-Delale O, Archer DF, Owens CD, Barnhart KT, Bradley LD, Feinberg E, Gillispie V, Hurtado S, Kim JH, Wang A, Wang H, Stewart EA. Efficacy and safety of elagolix with add-back therapy in women with uterine fibroids and coexisting adenomyosis. F S Rep. 2021 May 26;2(3):338-346. doi: 10.1016/j.xfre.2021.05.004. eCollection 2021 Sep. PubMed [citation] PMID: 34553161,

PMCID: PMC8441572

27. Rose PG, Yao M, Chambers LM, Mahdi H, DeBernardo R, Michener CM, AlHilli M, Ricci S, Vargas R. PARP inhibitors decrease response to subsequent platinum-based chemotherapy in patients with BRCA mutated ovarian cancer. *Anticancer Drugs.* 2021 Nov 1;32(10):1086-1092. doi: 10.1097/CAD.0000000000001219. PubMed [citation] PMID: 34520432

28. 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.* 2021 Sep 1:15533506211041882. doi: 10.1177/15533506211041882. [Epub ahead of print] PubMed [citation] PMID: 34470516

29. 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*. 2021 Aug 23. pii: S1553-4650(21)00390-3. doi: 10.1016/j.jmig.2021.08.011. [Epub ahead of print] PubMed [citation] PMID: 34438045, PMCID: PMC8381624

30. Chapman GC, Slopnick EA, Roberts K, Sheyn D, El-Nashar SA, Mangel JM, Hijaz AK. Pelvic Organ Prolapse Surgery in the Elderly and Frail: Safety of a Reconstructive Versus Obliterative Approach. *Female Pelvic Med Reconstr Surg*. 2021 Sep 1;27(9):e620-e625. doi: 10.1097/SPV.0000000000001029. PubMed [citation] PMID: 34432731

31. Ni Y, Soliman A, Joehlin-Price A, Abdul-Karim F, Rose PG, Mahdi H. Immune cells and signatures characterize tumor microenvironment and predict outcome in ovarian and endometrial cancers. *Immunotherapy*. 2021 Oct;13(14):1179-1192. doi: 10.2217/imt-2021-0052. Epub 2021 Aug 23. PubMed [citation] PMID: 34424031

32. Bennett C, Chambers LM, Son J, Goje O. Newly diagnosed immune thrombocytopenia in a pregnant patient after coronavirus disease 2019 vaccination. *J Obstet Gynaecol* Res. 2021 Nov;47(11):4077-4080. doi: 10.1111/jog.14978. Epub 2021 Aug 22. PubMed [citation] PMID: 34420249, PMCID: PMC8661984

33. Madsen AM, Hickman LC, Propst K. Recognition and Management of Pelvic Floor Disorders in Pregnancy and the Postpartum Period. *Obstet Gynecol Clin North Am*. 2021 Sep;48(3):571-584. doi: 10.1016/j.ogc.2021.05.009. Review. PubMed [citation] PMID: 34416938

34. Hunt JT, Chambers LM, Yao M, Joehlin-Price A, Debernardo R, Rose PG. Lenvatinib plus pembrolizumab in patients with advanced or recurrent uterine carcinosarcoma. *Gynecol Oncol Rep*. 2021 Jul 24;37:100840. doi: 10.1016/j.gore.2021.100840. eCollection 2021 Aug. PubMed [citation] PMID: 34401435, PMCID: PMC8350419

35. Abbas A, Gruner M, Karohl J, Rose PG, Joehlin-Price A, Stover D, Mahdi H. Case

Report: Circulating Tumor DNA Fraction Analysis Using Ultra-Low-Pass Whole-Genome Sequencing Correlates Response to Chemoradiation and Recurrence in Stage IV Small-Cell Carcinoma of the Cervix - A Longitudinal Study. *Front Oncol.* 2021 Jul 26;11:652683. doi: 10.3389/fonc.2021.652683. eCollection 2021. PubMed [citation] PMID: 34381704, PMCID: PMC8350481

36. Alfaro K, Maza M, Cremer M, Masch R, Soler M. Removing global barriers to cervical cancer prevention and moving towards elimination. *Nat Rev Cancer*. 2021 Oct;21(10):607-608. doi: 10.1038/s41568-021-00396-4. No abstract available. PubMed [citation] PMID: 34376828, PMCID: PMC8353608

37. 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*. 2021 Jul 27. doi: 10.1111/1471-0528.16850. [Epub ahead of print] PubMed [citation] PMID: 34314554

38. Boyd Tressler A, Markwei M, Fortin C, Yao M, Procop GW, Soper DE, Goje O. Risks for Recurrent Vulvovaginal Candidiasis Caused by Non-Albicans Candida Versus Candida Albicans. *J Womens Health* (Larchmt). 2021 Nov;30(11):1588-1596. doi: 10.1089/jwh.2020.8811. Epub 2021 Jul 22. PubMed [citation] PMID: 34292794

39. Parker W, Bradley L, Rodriguez V, Bacon C, Venable S. Trends in Use of Myomectomy for the Surgical Management of Uterine Leiomyomas in Perimenopausal and Postmenopausal Women. *Obstet Gynecol.* 2021 Aug 1;138(2):309-310. doi: 10.1097/AOG.0000000000004494. No abstract available. PubMed [citation] PMID: 34293760

40. 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). 2021 Jul 20. doi: 10.1089/jwh.2020.9001. [Epub ahead of print] PubMed [citation] PMID: 34287028

41. Detti L, Peregrin-Alvarez I, Saed GM. Association between redundant endometrium and endometrial polyps: a pilot study. *Minerva Obstet Gynecol.* 2021 Jul 20. doi: 10.23736/S2724-606X.21.04887-9. [Epub ahead of print] PubMed [citation] PMID: 34282611

42. Ghoniem K, Larish AM, Dinoi G, Zhou XC, Alhilli M, Wallace S, Wohlmuth C, Baiocchi G, Tokgozoglu N, Raspagliesi F, Buda A, Zanagnolo V, Zapardiel I, Jagasia N, Giuntoli R 2nd, Glickman A, Peiretti M, Lanner M, Chacon E, Di Guilmi J, Pereira A, Laas E, et al. Oncologic outcomes of endometrial cancer in patients with low-volume metastasis in the sentinel lymph nodes: An international multi-institutional study. *Gynecol Oncol.* 2021 Sep;162(3):590-598. doi: 10.1016/j.ygyno.2021.06.031. Epub 2021 Jul 15. PubMed [citation] PMID: 34274133

43. 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.* 2021 Jul 13. pii: S1553-4650(21)00338-1. doi: 10.1016/j.jmig.2021.07.004. [Epub ahead of print]

PubMed [citation] PMID: 34265441

44. Beffa L, Rosen M. Trauma Laparotomies Result in Incisional Hernias, So What Is Next? *JAMA Surg*. 2021 Sep 1;156(9):e213103. doi: 10.1001/jamasurg.2021.3103. Epub 2021 Sep 8. No abstract available. PubMed [citation] PMID: 34259809

45. Gruner M, Chambers LM, Yao M, Chichura A, Morton M, Costales AB, Horowitz M, Rose PG, Debernardo R, Michener CM. Anastomotic leak following interval debulking surgery with or without hyperthermic intraperitoneal chemotherapy in women with advanced epithelial ovarian Cancer. *Gynecol Oncol.* 2021 Sep;162(3):645-651. doi: 10.1016/j.ygyno.2021.06.034. Epub 2021 Jul 9. PubMed [citation] PMID: 34247768

46. Sung VW, Richter HE, Moalli P, Weidner AC, Nguyen JN, Smith AL, Dunivan G, Ridgeway B, Borello-France D, Newman DK, Mazloomdoost D, Carper B, Gantz MG; NICHD Pelvic Floor Disorders Network. Characteristics Associated With Treatment Failure 1 Year After Midurethral Sling in Women With Mixed Urinary Incontinence. *Obstet Gynecol.* 2021 Aug 1;138(2):199-207. doi: 10.1097/AOG.0000000000004444. PubMed [citation] PMID: 34237755

47. Levinson K, Beavis AL, Purdy C, Rositch AF, Viswanathan A, Wolfson AH, Kelly MG, Tewari KS, McNally L, Guntupalli SR, Ragab O, Lee YC, Miller DS, Huh WK, Wilkinson KJ, Spirtos NM, Van Le L, Casablanca Y, Holman LL, Waggoner SE, Fader AN. Beyond Sedlis-A novel histology-specific nomogram for predicting cervical cancer recurrence risk: An NRG/GOG ancillary analysis. Gynecol Oncol. 2021 Sep;162(3):532-538. doi: 10.1016/j.ygyno.2021.06.017. Epub 2021 Jul 1. Erratum in: *Gynecol Oncol.* 2021 Dec;163(3):616-617. PubMed [citation] PMID: 34217544, PMCID: PMC8405564

48. Chambers LM, Bussies P, Vargas R, Esakov E, Tewari S, Reizes O, Michener C. The Microbiome and Gynecologic Cancer: Current Evidence and Future Opportunities. *Curr Oncol Rep.* 2021 Jun 14;23(8):92. doi: 10.1007/s11912-021-01079-x. Review. PubMed [citation] PMID: 34125319

49. Chambers LM, Chalif J, Yao M, Chichura A, Morton M, Gruner M, Costales AB, Horowitz M, Chau DB, Vargas R, Rose PG, Michener CM, Debernardo R. Modified frailty index predicts postoperative complications in women with gynecologic cancer undergoing cytoreductive surgery and hyperthermic intraperitoneal chemotherapy. *Gynecol Oncol.* 2021 Aug;162(2):368-374. doi: 10.1016/j.ygyno.2021.05.013. Epub 2021 May 31. PubMed [citation] PMID: 34083027

50. Bowen ST, Moalli PA, Abramowitch SD, Lockhart ME, Weidner AC, Ferrando CA, Nager CW, Richter HE, Rardin CR, Komesu YM, Harvie HS, Mazloomdoost D, Sridhar A, Gantz MG; Eunice Kennedy Shriver National Institute of Child Health and Human Development Pelvic Floor Disorders Network. Defining mechanisms of recurrence following apical prolapse repair based on imaging criteria. *Am J Obstet Gynecol.* 2021 Nov;225(5):506.e1-506.e28. doi: 10.1016/j.ajog.2021.05.041. Epub 2021 Jun 1. PubMed [citation] PMID: 34087229, PMCID: PMC8578187

51. Richards EG, Farrell RM, Ricci S, Perni U, Quintini C, Tzakis A, Falcone T. Uterus transplantation: state of the art in 2021. *J Assist Reprod Genet.* 2021 Sep;38(9):2251-2259. doi: 10.1007/s10815-021-02245-7. Epub 2021 May 31. Review. PubMed [citation] PMID: 34057644, PMCID: PMC8490545

52. Davenport A, Hoang E, Hazen N, Brunn E, Kho R, Truong MD, Iglesia CB. #MIGS: Minimally Invasive Gynecologic Surgery Tag Ontology Project. *J Minim Invasive Gynecol*. 2021 Dec;28(12):2025-2027. doi: 10.1016/j.jmig.2021.05.012. Epub 2021 May 21. PubMed [citation] PMID: 34029744

53. Shastri T, Rasendran C, Markwei M, Hur C, Goje O. Impact of the COVID-19 Pandemic and Obstetrician and Gynecologist Workforce Distribution on Vaccine Deployment and Predicting Women's Healthcare Shortages. *Cureus*. 2021 Apr 18;13(4):e14545. doi: 10.7759/cureus.14545. PubMed [citation] PMID: 34017660, PMCID: PMC8130649

54. Chambers LM, Yao M, Morton M, Chichura A, Costales AB, Horowitz M, Gruner MF, Rose PG, Michener CM, DeBernardo R. Perioperative outcomes of cytoreductive surgery with hyperthermic intraperitoneal chemotherapy in elderly women with epithelial ovarian cancer: analysis of a prospective registry. *Int J Gynecol Cancer.* 2021 Jul;31(7):1021-1030. doi: 10.1136/ijgc-2021-002622. Epub 2021 May 18. PubMed [citation] PMID: 34006567

55. Detti L, Peregrin-Alvarez I, Roman RA, Levi D'Ancona R, Gordon JC, Christiansen ME. A comparison of four systems for uterine septum diagnosis and indication for surgical correction. *Minerva Obstet Gynecol.* 2021 Jun;73(3):376-383. doi: 10.23736/S2724-606X.21.04789-4. Review. PubMed [citation] PMID: 34008393

56. Uccella S, Kho RM, Garzon S, Casarin J, Zorzato PC, Ghezzi F. The Large Uterus Classification System: a prospective observational study. *BJOG*. 2021 Aug;128(9):1526-1533. doi: 10.1111/1471-0528.16753. Epub 2021 Jun 8. PubMed [citation] PMID: 33988895, PMCID: PMC8362220

57. Godown J, Butler A, Lebovitz DJ, Chapman G. Predictors of Deceased Organ Donation in the Pediatric Population. *Pediatrics*. 2021 Jun;147(6). pii: e2020009506. doi: 10.1542/peds.2020-009506. Epub 2021 May 7. PubMed [citation] PMID: 33963074

58. Markwei MT, Babatunde I, Rathi N, Fan C, Prah MA, Joo J, Hackett L, Soper DE, Goje O. Preincision adjunctive prophylaxis for cesarean deliveries a systematic review and meta-analysis. *Am J Obstet Gynecol.* 2021 Oct;225(4):382.e1-382.e13. doi: 10.1016/j.ajog.2021.04.259. Epub 2021 May 5. PubMed [citation] PMID: 33964219

59. Chattopadhyay R, Richards E, Libby V, Flyckt R. Preimplantation genetic testing for aneuploidy in uterus transplant patients. *Ther Adv Reprod Health*. 2021 Apr 20;15:26334941211009848. doi: 10.1177/26334941211009848. eCollection 2021 Jan-Dec. Review. PubMed [citation] PMID: 33959719, PMCID: PMC8064656

60. Burkett LS, Siddique M, Zeymo A, Brunn EA, Gutman RE, Park AJ, Iglesia CB. Clobetasol Compared With Fractionated Carbon Dioxide Laser for Lichen Sclerosus: A Randomized Controlled Trial. *Obstet Gynecol*. 2021 Jun 1;137(6):968-978. doi: 10.1097/AOG.0000000000004332. PubMed [citation] PMID: 33957642

61. Kho RM. vNOTES: Is it the Panacea We Are All Hoping for? *J Minim Invasive Gynecol.* 2021 Jun;28(6):1146-1147. doi: 10.1016/j.jmig.2021.04.012. Epub 2021 Apr 29. No abstract available. PubMed [citation] PMID: 33933655

62. Markwei M, Goje O. Optimizing mother-baby wellness during the 2019 coronavirus disease pandemic: A case for telemedicine. *Womens Health* (Lond). 2021 Jan-Dec;17:17455065211013262. doi: 10.1177/17455065211013262. PubMed [citation] PMID: 33926323, PMCID: PMC8111547

63. Smile TD, Reddy CA, Qiao-Guan G, Winter WI, Stephans KL, Woody NM, Balagamwala EH, Amarnath SR, Magnelli A, AlHilli MM, Michener CM, Mahdi H, DeBernardo RL, Rose PG, Cherian SS. Stereotactic body radiotherapy for the treatment of oligometastatic gynecological malignancy in the abdomen and pelvis: A single-institution experience. *J Radiosurg SBRT*. 2021;7(3):189-197. PubMed [citation] PMID: 33898082, PMCID: PMC8055243

64. Denby KJ, Cho L, Toljan K, Patil M, Ferrando CA. Assessment of Cardiovascular Risk in Transgender Patients Presenting for Gender-Affirming Care. *Am J Med.* 2021 Aug;134(8):1002-1008. doi: 10.1016/j.amjmed.2021.02.031. Epub 2021 Apr 23. PubMed [citation] PMID: 33895118

65. Chapman GC, Sheyn D, Slopnick EA, Roberts K, El-Nashar SA, Henderson JW, Mangel J, Hijaz AK, Pollard RR, Mahajan ST. Tamsulosin vs placebo to prevent postoperative urinary retention following female pelvic reconstructive surgery: a multicenter randomized controlled trial. *Am J Obstet Gynecol.* 2021 Sep;225(3):274.e1-274.e11. doi: 10.1016/j.ajog.2021.04.236. Epub 2021 Apr 21. PubMed [citation] PMID: 33894146

66. Crean-Tate KK, Braley C, Dey G, Esakov E, Saygin C, Trestan A, Silver DJ, Turaga SM, Connor EV, DeBernardo R, Michener CM, Rose PG, Lathia J, Reizes O. Pretreatment with LCK inhibitors chemosensitizes cisplatin-resistant endometrioid ovarian tumors. *J Ovarian Res.* 2021 Apr 22;14(1):55. doi: 10.1186/s13048-021-00797-x. PubMed [citation] PMID: 33888137, PMCID: PMC8063392

67. Wallace SL, Enemchukwu EA, Mishra K, Neshatian L, Chen B, Rogo-Gupta L, Sokol ER, Gurland BH. Postoperative complications and recurrence rates after rectal prolapse surgery versus combined rectal prolapse and pelvic organ prolapse surgery. *Int Urogynecol J*. 2021 Sep;32(9):2401-2411. doi: 10.1007/s00192-021-04778-y. Epub 2021 Apr 17. PubMed [citation] PMID: 33864476

68. Chambers LM, Watson CH, Yao M, Levinson K, Alvarez RD, Eskander RN, Buechel M, Michener CM, Jernigan A. Survey of trends in authorship assignment in gynecologic oncology: Keeping score and playing fair. *Gynecol Oncol Rep*. 2021 Mar 23;36:100755. doi: 10.1016/j.gore.2021.100755. eCollection 2021 May. PubMed [citation] PMID: 33855146, PMCID: PMC8027688

69. AlHilli MM, Pederson HJ. Controversies in Hereditary Cancer Management. *Obstet Gynecol.* 2021 May 1;137(5):941-955. doi: 10.1097/AOG.0000000000004364. PubMed [citation] PMID: 33831930

70. Parra SG, López-Orellana LM, Molina Duque AR, Carns JL, Schwarz RA, Smith CA, Ortiz Silvestre M, Diaz Bazan S, Felix JC, Ramalingam P, Castle PE, Cremer ML, Maza M, Schmeler KM, Richards-Kortum RR. Reply to: Comments on Cervical cancer prevention in El Salvador: A prospective evaluation of screening and triage strategies incorporating high-resolution microendoscopy to detect cervical precancer. *Int J Cancer.* 2021 Apr 4. doi: 10.1002/ijc.33586. [Epub ahead of print] No abstract available. PubMed [citation] PMID: 33817804

71. 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*. 2021 Mar 23. doi: 10.1097/SPV.0000000000001052. [Epub ahead of print] PubMed [citation] PMID: 33787561

72. Roberts K, Slopnick E, Chapman G, Mangel J, Sheyn D. Adverse Cardiovascular Events Associated With Female Pelvic Reconstructive Surgery. *Female Pelvic Med Reconstr Surg*. 2021 Apr 1;27(4):230-237. doi: 10.1097/SPV.0000000000000912. PubMed [citation] PMID: 33770806

73. Nager CW, Visco AG, Richter HE, Rardin CR, Komesu Y, Harvie HS, Zyczynski HM, Paraiso MFR, Mazloomdoost D, Sridhar A, Thomas S; National Institute of Child Health and Human Development Pelvic Floor Disorders Network. Effect of sacrospinous hysteropexy with graft vs vaginal hysterectomy with uterosacral ligament suspension on treatment failure in women with uterovaginal prolapse: 5-year results of a randomized clinical trial. *Am J Obstet Gynecol*. 2021 Aug;225(2):153.e1-153.e31. doi: 10.1016/j.ajog.2021.03.012. Epub 2021 Mar 12. PubMed [citation] PMID: 33716071, PMCID: PMC8328912

74. Feinberg EC, Cedars M, Chaudhari G, DeCherney A, Falcone T, Scott RT Jr, Rosenwaks Z. Reproductive Endocrinology and Infertility fellowship programs: Does one size fit all? *Fertil Steril*. 2021 Mar;115(3):569-575. doi: 10.1016/j.fertnstert.2021.01.036. No abstract available. PubMed [citation] PMID: 33712101

75. Richter LA, Bradley SE, Desale S, Richter HE, Park AJ, Iglesia CB. Association of Pelvic Organ Prolapse Quantification examination D point with uterosacral ligament suspension outcomes: the "OPTIMAL" D point. Int Urogynecol J. 2021 Aug;32(8):2179-2184. doi: 10.1007/s00192-021-04687-0. Epub 2021 Mar 12. PubMed [citation] PMID: 33710427 77. Detti L. Symptomatic and Asymptomatic Isthmocele: Impact on Reproductive Outcomes. *J Minim Invasive Gynecol.* 2021 May;28(5):915-916. doi: 10.1016/j.jmig.2021.02.014. Epub 2021 Mar 3. No abstract available. PubMed [citation] PMID: 33676008

76. Yadav GS, Chapman GC, Raju R, El-Nashar SA, Occhino JA. Perioperative outcomes of reconstructive surgery for apical prolapse in the very elderly: a national contemporary analysis. *Int Urogynecol J.* 2021 Jun;32(6):1391-1398. doi:

10.1007/s00192-021-04673-6. Epub 2021 Feb 27. PubMed [citation] PMID: 33638678

77. Lee M, Farrell RM, Flyckt R. An insider perspective from Mayer-Rokitansky-Küster-Hauser syndrome patients on uterus transplantation. *Fertil Steril.* 2021 Apr;115(4):911-912. doi: 10.1016/j.fertnstert.2021.01.031. Epub 2021 Feb 20. No abstract available. PubMed [citation] PMID: 33618896

78. Davis AC, Richards EG, Arian SE, Falcone T, Desai N, Yao M, Chiesa-Vottero A, Flyckt R. Diverse Approaches to Ovarian Tissue Cryopreservation Have Equivalent Outcomes in Markers of Tissue Viability. *Reprod Sci.* 2021 Aug;28(8):2129-2135. doi: 10.1007/s43032-021-00486-6. Epub 2021 Feb 18. PubMed [citation] PMID: 33599949

79. Pendlebury A, Radeva M, Rose PG. Surgical lymph node assessment influences adjuvant therapy in clinically apparent stage I endometrioid endometrial carcinoma, meeting Mayo criteria for lymphadenectomy. *J Surg Oncol.* 2021 Apr;123(5):1292-1298. doi: 10.1002/jso.26265. Epub 2021 Feb 16. PubMed [citation] PMID: 33592112

80. Farrell RM, Pierce M, Collart C, Craighead C, Coleridge M, Chien EK, Perni U, Frankel R, Ranzini A, Edmonds BT, Rose SS. The impact of the emergence of COVID-19 on women's prenatal genetic testing decisions. *Prenat Diagn*. 2021 Jul;41(8):1009-1017. doi: 10.1002/pd.5902. Epub 2021 Mar 5. PubMed [citation] PMID: 33569794, PMCID: PMC8014673

81. Chambers LM, Yao M, Morton M, Gruner M, Chichura A, Horowitz M, Costales AB, Rose PG, Michener CM, Debernardo R. Patterns of recurrence in women with advanced and recurrent epithelial ovarian cancer treated with cytoreductive surgery and hyperthermic intraperitoneal chemotherapy. *Gynecol Oncol.* 2021 May;161(2):389-395. doi: 10.1016/j.ygyno.2021.01.039. Epub 2021 Feb 5. PubMed [citation] PMID: 33551202

82. Leslie KK, Filiaci VL, Mallen AR, Thiel KW, Devor EJ, Moxley K, Richardson D, Mutch D, Secord AA, Tewari KS, McDonald ME, Mathews C, Cosgrove C, Dewdney S, Casablanca Y, Jackson A, Rose PG, Zhou X, McHale M, Lankes H, Levine DA, Aghajanian C. Mutated p53 portends improvement in outcomes when bevacizumab is combined with chemotherapy in advanced/recurrent endometrial cancer: An NRG Oncology study. *Gynecol Oncol.* 2021 Apr;161(1):113-121. doi: 10.1016/j.ygyno.2021.01.025. Epub 2021 Feb 2. PubMed [citation] PMID: 33541735, PMCID: PMC7994192

83. Batur P. In women aged 40 to 48 y, annual mammography vs. usual care reduced breast cancer mortality at 10 but not 23 y. *Ann Intern Med.* 2021 Feb;174(2):JC18. doi: 10.7326/ACPJ202102160-018. Epub 2021 Feb 2. PubMed [citation] PMID: 33524283

84. Chambers LM, Michener CM, Rose PG, Reizes O, Yao M, Vargas R. Impact of antibiotic treatment on immunotherapy response in women with recurrent gynecologic cancer. *Gynecol Oncol.* 2021 Apr;161(1):211-220. doi: 10.1016/j.

ygyno.2021.01.015. Epub 2021 Jan 24. PubMed [citation] PMID: 33504455

85. Ferrando CA, Chapman G, Pollard R. Preoperative Pain Symptoms and the Incidence of Endometriosis in Transgender Men Undergoing Hysterectomy for Gender Affirmation. *J Minim Invasive Gynecol.* 2021 Sep;28(9):1579-1584. doi: 10.1016/j.jmig.2021.01.018. Epub 2021 Jan 23. PubMed [citation] PMID: 33497725

86. Orlando MS, Chang OH, Luna Russo MA, Kho RM. Institutional protocols for coronavirus disease 2019 testing in elective gynecologic surgery across sites for the Society of Gynecologic Surgeons' Surgical Outcomes during the COVID-19 pandemic (SOCOVID) study. *Am J Obstet Gynecol.* 2021 May;224(5):540-542. doi: 10.1016/j.ajog.2021.01.013. Epub 2021 Jan 22. No abstract available. PubMed [citation] PMID: 33493487, PMCID: PMC7826006

87. Yuan AS, Chang OH, Ferrando CA. Perioperative Adverse Events in Women Undergoing Vaginal Prolapse Repair With Uterine Preservation Versus Concurrent Hysterectomy: A Matched Cohort Study. *Female Pelvic Med Reconstr Surg*. 2021 Oct 1;27(10):621-626. doi: 10.1097/SPV.0000000000001011. PubMed [citation] PMID: 33476105

88. Chichura A, Chambers LM, Costales AB, Yao M, Gruner M, Morton M, Rose PG, Vargas R, Michener CM, Debernardo R. Impact of intra-operative factors upon peri-operative outcomes in women undergoing hyperthermic intraperitoneal chemotherapy for gynecologic cancer. *Gynecol Oncol.* 2021 Apr;161(1):194-201. doi: 10.1016/j.ygyno.2021.01.006. Epub 2021 Jan 16. PubMed [citation] PMID: 33468319

89. Ferrando CA, Paraiso MFR. A prospective randomized trial comparing Restorelle® Y mesh and flat mesh for laparoscopic and robotic-assisted laparoscopic sacrocolpopexy: 24-month outcomes. *Int Urogynecol J.* 2021 Jun;32(6):1565-1570. doi: 10.1007/s00192-020-04657-y. Epub 2021 Jan 20. PubMed [citation] PMID: 33471144

90. Chang OH, Tewari S, Sun JY, Ferrando CA. Risk factors for ureteral obstruction and the diagnostic value of the "cysto-under-tension" technique at the time of uterosacral colpopexy. *Int Urogynecol J.* 2021 Nov;32(11):2985-2992. doi: 10.1007/s00192-020-04650-5. Epub 2021 Jan 15. PubMed [citation] PMID: 33449125

91. Tzakis A, Falcone T, Quintini C, Ricci S, Richards E, Farrell R, Perni U, Miller C. Comment on: "The Evolution of Transplantation From Saving Lives to Fertility Treatment: DEUTS (Dallas UtErus Transplant Study), Testa et al. Ann Surg. 2020 Sept; 272(3):411-417" and Related Commentary. *Ann Surg.* 2021 Dec 1;274(6):e868. doi: 10.1097/SLA.0000000000004747. No abstract available. PubMed [citation] PMID: 33443895

92. Das D, Sinha A, Yao M, Michener CM. Author's Reply. *J Minim Invasive Gynecol.* 2021 Apr;28(4):913-914. doi: 10.1016/j.jmig.2021.01.004. Epub 2021 Jan 9. No abstract available. PubMed [citation] PMID: 33434696

93. Hagemann IS, Deng W, Zaino RJ, Powell MA, Gunderson C, Cosgrove C, Mathews C, Pearl ML, Waggoner S, Ghebre R, Lele S, Guntupalli S, Secord AA, Ioffe O, Park K, Rasty G, Singh M, Soslow R, Creasman W, Mutch DG. The presence of an endometrioid component does not alter the clinicopathologic profile or survival of patients with uterine serous cancer: A gynecologic oncology group (GOG/NRG) study of 934 women. *Gynecol Oncol.* 2021 Mar;160(3):660-668. doi: 10.1016/j.ygyno.2020.12.040. Epub 2021 Jan 8. PubMed [citation] PMID: 33423806, PMCID: PMC8188294

94. Hickman LC, Paraiso MFR, Goldman HB, Propst K, Ferrando CA. Same-Day Discharge After Minimally Invasive Sacrocolpopexy Is Feasible, Safe, and Associated With High Patient Satisfaction. *Female Pelvic Med Reconstr Surg*. 2021 Aug 1;27(8):e614-e619. doi: 10.1097/SPV.0000000000000998. PubMed [citation] PMID: 33411456

95. Smith T, Batur P. Prescribing testosterone and DHEA: The role of androgens in women. *Cleve Clin J Med.* 2021 Jan 1;88(1):35-43. doi: 10.3949/ccjm.88a.20030. Review. PubMed [citation] PMID: 33384313

96. Michener CM, Lampert E, Yao M, Harnegie MP, Chalif J, Chambers LM. Meta-analysis of Laparoendoscopic Single-site and Vaginal Natural Orifice Transluminal Endoscopic Hysterectomy Compared with Multiport Hysterectomy: Real Benefits or Diminishing Returns? *J Minim Invasive Gynecol.* 2021 Mar;28(3):698-709.e1. doi: 10.1016/j.jmig.2020.11.029. Epub 2020 Dec 17. PubMed [citation] PMID: 33346073

97. Ricci S, Bennett C, Falcone T. Uterine Transplantation: Evolving Data, Success, and Clinical Importance. *J Minim Invasive Gynecol*. 2021 Mar;28(3):502-512. doi: 10.1016/j.jmig.2020.12.015. Epub 2020 Dec 24. PubMed [citation] PMID: 33348011

98. Uccella S, Zorzato PC, Kho RM. Incidence and Prevention of Vaginal Cuff Dehiscence after Laparoscopic and Robotic Hysterectomy: A Systematic Review and Meta-analysis. *J Minim Invasive Gynecol.* 2021 Mar;28(3):710-720. doi: 10.1016/j.jmig.2020.12.016. Epub 2021 Jan 5. PubMed [citation] PMID: 33348012

99. Johannesson L, Wall A, Tzakis A, Quintini C, Richards EG, O'Neill K, Porrett PM, Testa G. Life underneath the VCA umbrella: Perspectives from the US Uterus Transplant Consortium. *Am J Transplant.* 2021 May;21(5):1699-1704. doi: 10.1111/ajt.16445. Epub 2021 Feb 19. PubMed [citation] PMID: 33314584

100. Tough DeSapri K, Batur P. Contraception Update: Prevention of Gynecologic Malignancies and Mood Benefits. *J Womens Health* (Larchmt). 2021 May;30(5):642-645. doi: 10.1089/jwh.2020.8883. Epub 2020 Dec 3. No abstract available. PubMed [citation] PMID: 33275520

101. Propst K, Ferrando CA. Outcomes of labiaplasty in women with labial hypertrophy. *Int Urogynecol J*. 2021 May;32(5):1247-1251. doi: 10.1007/s00192-020-04621-w. Epub 2020 Nov 27. PubMed [citation] PMID: 33245385

102. Kuznicki ML, Chambers LM, Morton M, Son J, Horowitz M, Crean-Tate KK, Hackett L, Rose PG. Fertility-Sparing Surgery for Early-Stage Cervical Cancer: A Systematic Review of the Literature. *J Minim Invasive Gynecol.* 2021 Mar;28(3):513-526.e1. doi: 10.1016/j.jmig.2020.10.013. Epub 2020 Oct 24. PubMed [citation] PMID: 33223017

103. Chambers LM, Jia X, Rose PG, AlHilli M. Impact of treatment modality on overall survival in women with advanced endometrial cancer: A National Cancer Database analysis. *Gynecol Oncol*. 2021 Feb;160(2):405-412. doi: 10.1016/j.ygyno.2020.11.012. Epub 2020 Nov 19. PubMed [citation] PMID: 33221023

104. D'Amico G, Quintini C, Eghtesad B, Hashimoto K, Ricci S, Flyckt R, Del Prete L, Miller C, Falcone T, Tzakis A. Uterus Recovery from Deceased Donor: Simple Technique Securing Safety of Vital Organs and Uterus Graft. *J Am Coll Surg.* 2021 Mar;232(3):e1-e6. doi: 10.1016/j.jamcollsurg.2020.11.007. Epub 2020 Nov 17. No abstract available. PubMed [citation] PMID: 33217551

105. Propst K, Hickman LC. Peripartum pelvic floor disorder clinics inform obstetric provider practices. *Int Urogynecol J.* 2021 Jul;32(7):1793-1799. doi: 10.1007/s00192-020-04564-2. Epub 2020 Oct 31. PubMed [citation] PMID: 33128569

106. Chang OH, Davidson ERW, Thomas TN, Paraiso MFR, Ferrando CA. Correction to: Does concurrent posterior repair for an asymptomatic rectocele reduce the risk of surgical failure in patients undergoing sacrocolpopexy? *Int Urogynecol J.* 2021 Jan;32(1):233. doi: 10.1007/s00192-020-04584-y. No abstract available. PubMed [citation] PMID: 33108488

107. Peregrin-Alvarez I, Fletcher NM, Saed GM, Roman RA, Detti L. Anti-Müllerian Hormone (AMH) regulates BRCA1 and BRCA2 gene expression after ovarian cortex transplantation. *Gynecol Endocrinol.* 2021 Apr;37(4):349-352. doi: 10.1080/09513590.2020.1828328. Epub 2020 Oct 21. PubMed [citation] PMID: 33084436

108. Morton M, Chambers LM, Costales AB, Chichura A, Gruner M, Horowitz MP, Rose PG, Yao M, Debernardo R, Michener C. 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. *Gynecol Oncol.* 2021 Jan;160(1):45-50. doi: 10.1016/j.ygyno.2020.09.052. Epub 2020 Oct 14. PubMed [citation] PMID: 33067001, PMCID: PMC7553874

109. Orlando M, Kollikonda S, Hackett L, Kho R. Non-hysteroscopic Myomectomy and Fertility Outcomes: A Systematic Review. *J Minim Invasive Gynecol*. 2021 Mar;28(3):598-618.e1. doi: 10.1016/j.jmig.2020.10.006. Epub 2020 Oct 14. PubMed [citation] PMID: 33065260

110. Royce CS, Everett EN, Craig LB, Fleming A, Forstein DA, Graziano SC, Hampton BS, Hopkins L, McKenzie ML, Morgan HK, Sims SM, Morosky C. To the Point: advising students applying to Obstetrics and Gynecology residency in 2020 and beyond. *Am J Obstet Gynecol.* 2021 Feb;224(2):148-157. doi: 10.1016/j.ajog.2020.10.006.

Epub 2020 Oct 7. Review. PubMed [citation] PMID: 33038302, PMCID: PMC7539929

111. Goje O, Markwei M, Kollikonda S, Chavan M, Soper DE. Outcomes of Minimally Invasive Management of Tubo-ovarian Abscess: A Systematic Review. *J Minim Invasive Gynecol.* 2021 Mar;28(3):556-564. doi: 10.1016/j.jmig.2020.09.014. Epub 2020 Sep 28. Review. PubMed [citation] PMID: 32992023

112. Richards EG, Falcone T, Farrell RM. Reply. *Am J Obstet Gynecol.* 2021 Jan;224(1):133-134. doi: 10.1016/j.ajog.2020.09.028. Epub 2020 Oct 22. No abstract available. PubMed [citation] PMID: 32979376

113. Luna Russo M, Dassel M, Raymond D, Richards E, Falcone T, King C. Considerations for the Surgical Management of Diaphragmatic Endometriosis. *J Minim Invasive Gynecol.* 2021 Jul;28(7):1282. doi: 10.1016/j.jmig.2020.09.011. Epub 2020 Sep 20. PubMed [citation] PMID: 32966891

114. Carr CE, Chambers L, Jernigan AM, Freeman L, Escobar PF, Michener CM. Short- and long-term outcomes for single-port risk-reducing salpingo-oophorectomy with and without hysterectomy for women at risk for gynecologic cancer. *Int J Gynecol Cancer.* 2021 Feb;31(2):215-221. doi: 10.1136/ijgc-2020-001405. Epub 2020 Sep 18. PubMed [citation] PMID: 32948638

115. Bretschneider CE, Sheyn D, Mahajan S, Propst K, Ridgeway B. Complications following vaginal colpopexy for the repair of pelvic organ prolapse. *Int Urogynecol J.* 2021 Apr;32(4):993-999. doi: 10.1007/s00192-020-04521-z. Epub 2020 Sep 17. PubMed [citation] PMID: 32940729

116. Slopnick EA, Roberts K, Sheyn DD, Chapman GC, El-Nashar S, Mahajan ST. Factors Influencing Selection of Concomitant Total Versus Supracervical Hysterectomy at the Time of Sacrocolpopexy and Associated Perioperative Outcomes. *Female Pelvic Med Reconstr Surg.* 2021 Jul 1;27(7):415-420. doi: 10.1097/SPV.0000000000000950. PubMed [citation] PMID: 32941316

117. Das D, Sinha A, Yao M, Michener CM. Trends and Risk Factors for Vaginal Cuff Dehiscence after Laparoscopic Hysterectomy. *J Minim Invasive Gynecol.* 2021 May;28(5):991-999.e1. doi: 10.1016/j.jmig.2020.09.005. Epub 2020 Sep 11. PubMed [citation] PMID: 32920145

118. Gingold JA, Janmey I, Gemmell L, Mei L, Falcone T. Effect of Methotrexate on Salpingostomy Completion Rate for Tubal Ectopic Pregnancy: A Retrospective Cohort Study. *J Minim Invasive Gynecol.* 2021 Jul;28(7):1334-1342.e3. doi: 10.1016/j.jmig.2020.09.003. Epub 2020 Sep 7. PubMed [citation] PMID: 32911090

119. Moalli PA, Bowen ST, Abramowitch SD, Lockhart ME, Ham M, Hahn M, Weidner AC, Richter HE, Rardin CR, Komesu YM, Harvie HS, Ridgeway BM, Mazloomdoost D, Shaffer A, Gantz MG; NICHD Pelvic Floor Disorders Network. Methods for the defining mechanisms of anterior vaginal wall descent (DEMAND) study. *Int Urogynecol J.* 2021 Apr;32(4):809-818. doi: 10.1007/s00192-020-04511-1. Epub 2020 Sep 1. PubMed [citation] PMID: 32870340, PMCID: PMC7917148

120. Stone R, Carey E, Fader AN, Fitzgerald J, Hammons L, Nensi A, Park AJ, Ricci S, Rosenfield R, Scheib S, Weston E. Enhanced Recovery and Surgical Optimization Protocol for Minimally Invasive Gynecologic Surgery: An AAGL White Paper. *J Minim Invasive Gynecol.* 2021 Feb;28(2):179-203. doi: 10.1016/j.jmig.2020.08.006. Epub 2020 Aug 20. PubMed [citation] PMID: 32827721

121. Propst K, Harnegie MP, Ridgeway B. Evaluation of Strategies to Prevent Urinary Tract Injury in Minimally Invasive Gynecologic Surgery: A Systematic Review. *J Minim Invasive Gynecol.* 2021 Mar;28(3):684-691.e2. doi: 10.1016/j.jmig.2020.07.020. Epub 2020 Jul 27. PubMed [citation] PMID: 32730987

122. Hur C, Falcone T. Robotic treatment of bowel endometriosis. *Best Pract Res Clin Obstet Gynaecol.* 2021 Mar;71:129-143. doi: 10.1016/j.bpobgyn.2020.05.012. Epub 2020 Jun 12. Review. PubMed [citation] PMID: 32684433

123. Rehmer JM, Ferrando CA, Flyckt R, Falcone T. Techniques for successful vaginal anastomosis in the uterine transplantation patient. *Fertil Steril.* 2021 Mar;115(3):802-803. doi: 10.1016/j.fertnstert.2020.05.017. Epub 2020 Jul 16. PubMed [citation] PMID: 32682518

124. Chang OH, Ferrando CA. Occult Uterine Malignancy at the Time of Sacrocolpopexy in the Context of the Safety Communication on Power Morcellation by the FDA. *J Minim Invasive Gynecol*. 2021 Apr;28(4):788-793. doi: 10.1016/j.jmig.2020.07.006. Epub 2020 Jul 15. PubMed [citation] PMID: 32681994

125. Darvish R, Davenport A, Dao A, Slopnick E, Chapman G, Sheyn D. Evaluation of 30-day complication rates following vaginal anterior compartment repair with and without graft augmentation in a propensity score matched cohort. *World J Urol.* 2021 Jun;39(6):2191-2196. doi: 10.1007/s00345-020-03360-3. Epub 2020 Jul 15. PubMed [citation] PMID: 32671606

126. Costales AB, Chambers L, Chichura A, Rose PG, Mahdi H, Michener CM, Yao M, Debernardo R. Effect of platinum sensitivity on the efficacy of hyperthermic intraperitoneal chemotherapy (HIPEC) in recurrent epithelial ovarian cancer. *J Gynecol Obstet Hum Reprod.* 2021 May;50(5):101844. doi: 10.1016/j.jogoh.2020.101844. Epub 2020 Jun 23. PubMed [citation] PMID: 32590110

127. Chang OH, Shepherd JP, Ridgeway BM, Cadish LA. Hysterectomy Versus Hysteropexy at the Time of Native Tissue Pelvic Organ Prolapse Repair: A Cost-Effectiveness Analysis. *Female Pelvic Med Reconstr Surg.* 2021 Feb 1;27(2):e277-e281. doi: 10.1097/SPV.0000000000000902. PubMed [citation] PMID: 32576734

128. Slopnick EA, Chapman GC, Roberts K, Sheyn DD, El-Nashar S, Mahajan ST. Apical suspension is underutilized for repair of stage IV pelvic organ prolapse: an analysis of national practice patterns in the United States. *Int Urogynecol J.* 2021 Apr;32(4):791-797. doi: 10.1007/s00192-020-04342-0. Epub 2020 Jun 8. PubMed [citation] PMID: 32507910

129. 131. Chapman GC, Slopnick EA, Roberts K, Sheyn D, Wherley S, Mahajan

ST, Pollard RR. National Analysis of Perioperative Morbidity of Vaginal Versus Laparoscopic Hysterectomy at the Time of Uterosacral Ligament Suspension. *J Minim Invasive Gynecol.* 2021 Feb;28(2):275-281. doi: 10.1016/j.jmig.2020.05.015. Epub 2020 May 22. PubMed [citation] PMID: 32450226

130. Hirsch H, Batur P, Spencer AL, McNamara M. Using Video Modules and Simulation Learning to Improve IUD Counseling Among Internal Medicine Residents-a Randomized Controlled Educational Trial. *J Gen Intern Med.* 2021 May;36(5):1446-1447. doi: 10.1007/s11606-020-05832-z. Epub 2020 May 11. No abstract available. PubMed [citation] PMID: 32394139, PMCID: PMC8131480

131. Chang OH, Davidson ERW, Thomas TN, Paraiso MFR, Ferrando CA. Predictors for Pelvic Organ Prolapse Recurrence After Sacrocolpopexy: A Matched Case-Control Study. *Female Pelvic Med Reconstr Surg.* 2021 Jan 1;27(1):e165-e170. doi: 10.1097/SPV.0000000000000874. PubMed [citation] PMID: 32282526

132. Erekson E, Menefee S, Whitworth RE, Amundsen CL, Arya LA, Komesu YM, Ferrando CA, Zyczynski HM, Sung VW, Rahn DD, Tan-Kim J, Mazloomdoost D, Gantz MG, Richter HE; Eunice Kennedy Shriver NICHD Pelvic Floor Disorders Network (PFDN). The Design of a Prospective Trial to Evaluate the Role of Preoperative Frailty Assessment in Older Women Undergoing Surgery for the Treatment of Pelvic Organ Prolapse: The FASt Supplemental Trial. *Female Pelvic Med Reconstr Surg.* 2021 Jan 1;27(1):e106-e111. doi: 10.1097/SPV.0000000000000833. PubMed [citation] PMID: 32217922, PMCID: PMC7381379

133. Woodburn KL, Tran MC, Casas-Puig V, Ninivaggio CS, Ferrando CA. Compliance With Pelvic Floor Physical Therapy in Patients Diagnosed With High-Tone Pelvic Floor Disorders. *Female Pelvic Med Reconstr Surg.* 2021 Feb 1;27(2):94-97. doi: 10.1097/SPV.0000000000000732. PubMed [citation] PMID: 31045618

134. Holthaus EA, Ferrando CA, Jelovsek JE, Barber MD. Reliability of Symptoms and Dipstick for Postoperative Catheter-Associated Urinary Tract Infections. *Female Pelvic Med Reconstr Surg*. 2021 Jun 1;27(6):398-402. doi: 10.1097/SPV.0000000000000739. PubMed [citation] PMID: 31045619

Cleveland Clinic