THE ANNUAL CHARLES B. HAMMOND, MD RESEARCH DAY

Department of Obstetrics and Gynecology
Duke University Medical Center
Durham, North Carolina

Friday, May 9, 2025

Duke Obstetrics & Gynecology
Duke University School of Medicine

Foreword

Charles B. Hammond, MD, Research Day is a time to celebrate and honor Duke Obstetrics and Gynecology trainees for their exceptional achievements in research and their dedication to impacting the future of women's health. Dr. Hammond was an internationally recognized leader, educator, researcher and advocate for women's health. He was a mentor to many. As Chair and Residency Program Director for more than 20 years, he was committed to ensuring that residents and fellows developed into well rounded academic obstetrician/gynecologists with outstanding clinical skills, a sharp scientific mind and a compassionate heart.

Annually, we commemorate the impressive and tireless research efforts of our residents and fellows, and we honor the legacy of the renowned physician scientist whose commitment to research, education and patient care represents Duke Ob/Gyn's standard of excellence: the late Charles B. Hammond, MD.

Honoring Dr. Charles B. Hammond

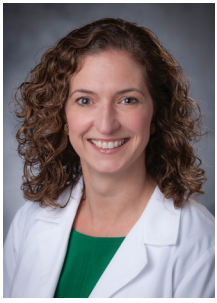
Dr. Hammond was the E.C. Hamblen Distinguished Professor of Reproductive Biology and Family Planning and Chair of the Department of Obstetrics and Gynecology from 1980 to 2002. He received his medical degree from Duke University in 1961. During the next nine years, he completed an internship in surgery, a residency in obstetrics and gynecology, a one-year training interval in the research training program — all at Duke — and two years as a clinical associate in the endocrinology branch at the National Cancer Institute in Bethesda, Maryland.

He joined the faculty at Duke in 1969 and had enormous impact on ob/gyn and women's health over more than 40 years in academia. A nationally recognized expert in menopause and hormone replacement therapy, Dr. Hammond was also a pioneer in the treatment of gestational trophoblastic disease and founded the Southeast Regional Trophoblastic Disease Center. Countless lives were saved because of his innovative research and the development of treatment regimens for this once life-threatening condition.

Dr. Hammond served as President of the North Carolina Society of Obstetricians and Gynecologists, the American Fertility Society (now ASRM), the American Association of Obstetricians and Gynecologists Foundation, the American Gynecological and Obstetrical Society, and the American College of Obstetrics and Gynecology. He received many honors throughout his career, including being named a National Association for Women's Health Lifetime Achievement Award recipient, a fellow of the Royal College of Obstetricians and Gynaecologists, and a member of the Institute of Medicine, now the Academy of Medicine. He was granted a Lifetime Achievement Award from the American College of Obstetrics and Gynecology in 2015.

Charles B. Hammond, MD, was honored by Duke Medicine in June 2011 as a Professor and Chairman Emeritus in the Department of Obstetrics and Gynecology. Scan the QR code below to watch a brief video about his legacy.

Hammond Research Day is a significant and impactful opportunity for our residents and fellows to demonstrate their accomplishments and dedication to their research in obstetrics and gynecology and is intended to advance medical knowledge, education and research in reproductive medicine. We are proud to present this event once again, and to honor the legacy of Dr. Hammond. Thank you for joining us.



Sincerely,

Brenna Hughes, MD, MSc
Interim Chair
Department of Obstetrics and Gynecology
Duke University Medical Center

GRADUATING FELLOWS 2024-2025

Miriam L. Estin, MD, PhD

Medical School:	University of Colorado School of Medicine
Graduate School:	University of Colorado
Residency:	Duke University Medical Center
Fellowship:	Duke University Medical Center Division of Maternal-Fetal Medicine
Future Plans:	Obstetrix Medical Group Denver, Colorado

Virginia Y. Watkins, MD

Medical School:	Virginia Commonwealth University School of Medicine
Residency:	Barnes-Jewish Hospital/Washington University in St. Louis
Fellowship:	Duke University Medical Center Division of Maternal-Fetal Medicine
Future Plans:	Commonwealth Perinatal Services Richmond, Virginia

Angela C. Nolin, MD

Medical School:	Boston University School of Medicine
Residency:	Inova Fairfax Hospital
Fellowship:	Duke University Medical Center Division of Gynecologic Oncology
Future Plans:	Hartford HealthCare New Britain, Connecticut

Hilary S. Friedlander, MD

Medical School:	Albert Einstein College of Medicine
Residency:	New York University Langone Medical Center
Fellowship:	Duke University Medical Center Division of Reproductive Endocrinology and Infertility
Future Plans:	Atlantic Reproductive Medicine Raleigh, North Carolina

Abbigail K. Woll, MD

Medical School:	Geisinger Commonwealth School of Medicine
Residency:	The Medical University of South Carolina
Fellowship:	Duke University Medical Center Division of Female Pelvic Medicine and Reconstructive Surgery
Future Plans:	Eastern Virginia Medical Center Norfolk, Virginia

Stephanie L. Lim, MD

Medical School:	Duke University School of Medicine
Residency:	Duke University Medical Center
Fellowship:	Duke University Medical Center Division of Minimally Invasive Gynecologic Surgery
Future Plans:	Duke University Medical Center Durham, North Carolina

Joseph W. Lafferty, MD

Medical School:	Drexel University College of Medicine
Residency:	Pennsylvania Hospital
Fellowship:	Duke University Medical Center Quality and Safety in Women's Health
Future Plans:	Fellowship in Gynecologic Oncology Cedars-Sinai Medical Center Los Angeles, California

GRADUATING RESIDENTS 2024-2025

Susan M. Carlson, MD
Medical School: University of Michigan Medical School
Future Plans: Ob/Gyn Generalist
Durham Women's Clinic, Durham, North Carolina

Alice J. Darling, MD
Medical School: Duke University School of Medicine
Future Plans: Fellowship in Gynecologic Oncology
Memorial Sloan Kettering Cancer Center, New York, New York

Dayana M. Hernandez Calderon, MD
Medical School: Washington University School of Medicine
Future Plans: Assistant Professor
Harris & Smith Ob/Gyn, Durham, North Carolina

Colleen P. Judge-Golden, MD, PhD
Medical School: University of Pittsburgh School of Medicine
Graduate School: University of Pittsburgh School of Medicine
Future Plans: Fellowship in Maternal-Fetal Medicine
Northwestern University, Chicago, Illinois

Bobby L. May Jr., MD
Medical School: University of Mississippi School of Medicine
Future Plans: Fellowship in Surgical Breast Oncology
Georgetown University Hospital, Washington, District of Columbia

Thao Nguyen, MD
Medical School: Duke University School of Medicine
Future Plans: Ob/Gyn Generalist
Novant Health Brunswick Medical Center, Bolivia, North Carolina

Anna Shvygin, MD
Medical School: Virginia Tech Carilion School of Medicine
Future Plans: Fellowship in Gynecologic Oncology
Memorial Sloan Kettering Cancer Center, New York, New York

Janice Wong, MD, MS
Medical School: Duke University School of Medicine
Graduate School: University of Southern California Keck School of Medicine
Future Plans: Fellowship in Urogynecology and Reconstructive Pelvic Surgery
University of California San Diego – Kaiser Permanente, San Diego, California

Jenny Wu, MD
Medical School: Duke University School of Medicine
Future Plans: Assistant Professor
Columbia University Medical Center, New York, New York

2025-2026 FELLOWS

Urogynecology and Reconstructive Pelvic Surgery

Annika Sinha, MD (2026)
Elizabeth P. Howell, MD (2027)
Rodrigo D. Muñoz Dayaa, MD (2028)

Gynecologic Oncology

Mary K. Anastasio, MD (2026)
Katherine C. Fitch, MD (2027)
Morgan D. Brown, MD (2028)

Maternal-Fetal Medicine

Osinakachukwu C. Mbata, MD (2026)
Anthony E. Melendez Torres, MD (2026)
Lillian B. Boettcher, MD (2027)
Sara I. Jones, MD (2027)
Rachel A. DeSpenza, MD, MSHSC (2028)
Maryam Zeinomar, MD (2028)

Minimally Invasive Gynecologic Surgery

Tam D. Nguyen, MD (2027)

Quality and Safety in Women's Health

Mary J. Sims, MD, MA (2026)

Reproductive Endocrinology and Infertility

Abigail L. Bernard, MD (2026)
Sloane A. Mebane, MD (2027)
Damla C. Gonullu-Rotman, MD (2027)
Matthew C. H. Rohn, MD (2028)

RESIDENTS

CLASS OF 2026

LaMani D. Adkins, MD

Isabel N. del Canto, MD

Lillian J. Dubiel, MD

Maxwell E. Edmonds, MD, PhD

Dayne L. Filer, MD, PhD

Jessie Y. Li-Barton, MD

Alexandra E. Norton, MD, MPH

Jaxon C. Olsen, MD

Jennifer Talbott, MD, MPH

CLASS OF 2027

Jasmine E. Arrington, MD, MPH

Aya M. Bashi, MD, MPH

Shelby N. Davis-Cooper, MD

Shakira E. Harding, MD, MS

Isabel A. Josephs, MD

Hannah C. Kelly, MD

Tahireh Y. Markert, MD

Kelsey L. McNew, MD, PhD

Natalie E. Wickenheisser, MD

CLASS OF 2028

Ghazal Aghagoli, MD

Edith Amponsah, MD, MPH

Canice L. Dancel, MD

Dana Hazimeh, MD

Benjamin M. Jacobs, MD

Maya K. Nitecki, MD, MPH

Katherine N. Penvose, MD

Alexandra R. Piselli, MD, MS

Madeline J. Thornton, MD, MPH

CLASS OF 2029

Mikayla B. Bowen, MD, PhD

Elana J. Brotkin, MD, MPH

Kelby N. Hunt, MD, MPH

Spoorthi Kamepalli, MD

Siera R. Lunn, MD

Jada M. Phillips, MD

Nishita Pondugula, MD, MS

Angela A. Rutkowski, MD

Dionna N. Thomas, MD

CHARLES B. HAMMOND, MD RESEARCH DAY

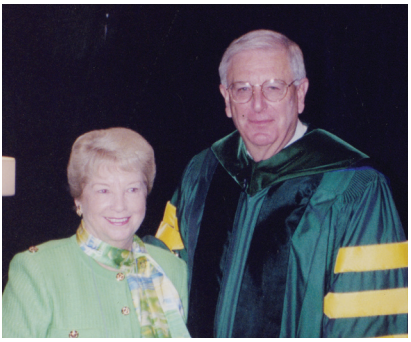
Charles B. Hammond, MD

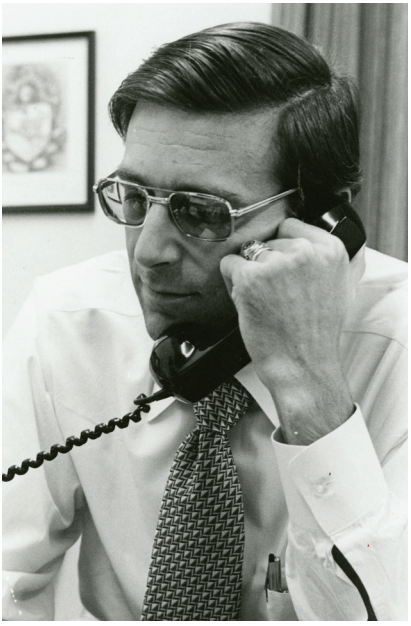
1936-2021

Edwin Crowell Hamblen Distinguished Professor of Reproductive Biology

Chairman Emeritus, Department of Obstetrics and Gynecology
Duke University Medical Center

Dr. Charles Hammond

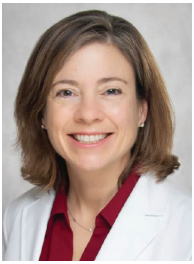




Previous Charles B. Hammond Lecturers

2004	Sterling B. Williams, MD
2005	William N.P. Herbert, MD
2006	David G. Mutch, MD
2007	John T. Queenan, MD
2008	Frank C. Miller, MD
2009	James R. Scott, MD
2010	Jennifer R. Niebyl, MD
2011	Michael T. Mennuti, MD
2012	Matthew D. Barber, MD, MHS
2013	William C. Dodson, MD
2014	William A. Cliby, MD
2015	William T. Creasman, MD
2016	Barbara S. Levy, MD
2017	Alan H. DeCherney, MD
2018	Laura E. Riley, MD
2019	Geoffrey W. Cundiff, MD
2021	Laurel W. Rice, MD
2022	Emily S. Jungheim, MD, MSCI
2023	Courtney A. Schreiber, MD, MPH
2024	Mary E. D'Alton, MD

FEATURED LECTURER AND DISTINGUISHED JUDGE



Catherine S. Bradley, MD, MSCE

Professor in Obstetrics and Gynecology, Urology and Epidemiology
Executive Vice Chair of Faculty Affairs
Division Director of Urogynecology and Reconstructive Pelvic Surgery
University of Iowa Carver College of Medicine

Catherine Bradley, MD, MSCE, is a professor in obstetrics and gynecology at the University of Iowa Carver College of Medicine with secondary appointments as professor in urology and epidemiology. She is the executive vice chair for faculty affairs in obstetrics and gynecology and division director of urogynecology and reconstructive pelvic surgery.

Dr. Bradley is recognized nationally and internationally as a clinical and epidemiologic researcher in female pelvic floor disorders and as an academic leader in urogynecology and reconstructive pelvic surgery. She completed her ob/gyn residency and FPMRS fellowship as well as a master's degree in clinical epidemiology at the University of Pennsylvania before joining Iowa's faculty in 2003.

Dr. Bradley's research interests focus on diagnostic and outcome measures for urinary incontinence in women and on risk factors and symptoms associated with urinary incontinence and other pelvic floor disorders. Her past research funded by the NIH and VA has included developing and testing new patient-reported outcomes for patients with urinary incontinence and other lower urinary tract symptoms and a nationwide longitudinal study of women veterans focused on temporal associations between mental health disorders and overactive bladder/urgency urinary incontinence. She currently co-leads Iowa researchers in a NIH-funded network study of women and men with urinary urgency, which will use longitudinally collected data to better understand phenotypic subgroups of patients with this heterogenous condition.

In addition to her positions at the University of Iowa, Dr. Bradley is the gynecology editor-in-chief of the prestigious *American Journal of Obstetrics and Gynecology* and a recent president of the American Urogynecologic Society.

DISTINGUISHED JUDGE

Brandi L. Vasquez, MD, PhD

Generalist Ob/Gyn
Women's Healthcare Associates, Portland, Oregon
President, F. Bayard Carter Society

Brandi Vasquez, MD, PhD, is an ob/gyn generalist at Women's Healthcare Associates (WHA) in Portland, Oregon. She graduated from Duke University's ob/gyn residency program in 2008, followed by serving as the first Duke Ob/Gyn Global Health Fellow in Moshi, Tanzania.

In clinical practice, Dr. Vasquez maintains her Duke-trained expertise in minimally-invasive gynecologic surgery. She has also served in several leadership roles within WHA and in the community hospital, and currently acts as the director of gynecologic ultrasound of her organization.

In addition to these roles, Dr. Vasquez is an active educator, teaching nurse practitioners, physician assistants and DO medical students. In 2024, she hosted a (fantastic) Duke Carter Society meeting in Portland, alongside several other Duke graduates who have settled in the area, further strengthening the connection between the Duke Ob/Gyn community and the Pacific Northwest.

DISTINGUISHED JUDGE

Chad A. Grotegut, MD, MBA

Professor, Vice Chair and Section Chief of Maternal-Fetal Medicine
Program Director, Maternal-Fetal Medicine Fellowship
Department of Obstetrics and Gynecology
Wake Forest University

Chad Grotegut, MD, MBA, is a professor of obstetrics and gynecology and division director of Maternal-Fetal Medicine at Wake Forest University in Winston-Salem. There, he also serves as the maternal-fetal medicine fellowship director.

Prior to arriving at Wake Forest just over four years ago, he was on the faculty at Duke University, where he most recently served as the medical director of the Duke University Hospital Labor and Delivery unit. He completed both his obstetrics and gynecology residency and maternal-fetal medicine fellowship at Duke.

His research is funded by the NIH, and he conducts basic and translational research focused on oxytocin receptor signaling and myometrial biology related to abnormal labor.

Dr. Grotegut lives in Chapel Hill and enjoys powder skiing in the Utah mountains with his family, ACC sports and working in the yard. His wife, Dr. Melissa Teitelman-Grotegut, is the clinical chief of gastroenterology at Duke University, and his three kids have all left the house for college.

Duke Obstetrics & Gynecology
Duke University School of Medicine

The Annual Charles B. Hammond, MD, Research Day
Friday, May 9, 2025

ACADEMIC AGENDA

Please take a moment to view the poster displays of research by current medical students, PhD candidates and postdoctoral scholars working with Duke Ob/Gyn faculty members. *Learn more on pages 40-41.*

9:00 am **Opening Remarks**

9:10 am **Jaxon C. Olsen, MD**
Racial and ethnic disparities in cesarean complication rates using NSQIP database

9:25 am **Abbigail K. Woll, MD**
AUGS-PERFORM: Assessing responsiveness to change

9:40 am **Alexandra E. Norton, MD, MPH**
Effect of education tools on trainee competence in caring for patients affected by female genital cutting: a quasi-experimental study

9:55 am **Virginia Y. Watkins, MD**
Postpartum aspirin use and NT-proBNP levels as a marker for maternal cardiac health: a randomized-controlled trial

10:10 am **Jessie Y. Li-Barton, MD**
Sexual function after pelvic floor physical therapy among female cancer survivors who have undergone pelvic radiation therapy

10:25 am **Angela C. Nolin, MD**
Performance of ultrasound and guideline-concordant care in a diverse postmenopausal bleeding cohort

10:40 am **Break**

10:50 am **Dayne L. Filer, MD, PhD**
Deep targeted sequencing of maternal plasma for non-invasive fetal genotyping

11:05 am **Stephanie L. Lim, MD**
Predicting gynecologic post-operative opioid use: Expansion and validation of an opioid use predictive calculator

11:20 am **Maxwell E. Edmonds, MD, PhD**
Photoacoustic imaging of the mouse uterus and placenta after uterine injury: development of a placenta accreta spectrum murine model

11:35 am **Joseph W. Lafferty, MD**
Reducing single-use plastic in obstetrics and gynecology to confront healthcare's carbon footprint

11:50 am **Department Photo**

12:10 pm **Lunch**

12:45 pm **Afternoon Session Begins**

12:55 pm **Catherine S. Bradley, MD, MSCE**
Featured Lecturer and Distinguished Judge
How to get your research published in 2025

1:45 pm **Lillian J. Dubiel, MD**
Human Papillomavirus (HPV) vaccination rates among U.S. military veteran females and males and non-veterans in the National Health Interview Survey

2:00 pm **Hilary S. Friedlander, MD**
Putting the cart before the horse: Is intended transfer plan associated with differences in ovarian stimulation characteristics in in vitro fertilization?

2:15 pm **LaMani D. Adkins, MD**
A nationwide analysis of adverse delivery outcomes among adolescents pre- and post-Dobbs decision

2:30 pm **Miriam L. Estin, MD, PhD**
Investigating the relationship between preeclampsia and intrahepatic cholestasis of pregnancy: Can a canonical serum bile acid help us to model preeclampsia pathogenesis?

2:45 pm **Closing Remarks**

3:00 pm **Awards Presentation and Reception**

ABSTRACTS

Title: Racial and ethnic disparities in cesarean complication rates using NSQIP database

Resident: Jaxon C. Olsen, MD

Faculty Mentor: Brittany A. Davidson, MD

Objective(s): This study aims to examine the relationship between patient race and ethnicity and complication rates in cesarean sections while controlling for general surgical risk using the National Surgical Quality Improvement Program (NSQIP) database from the American College of Surgeons (ACS).

Methods: Women ages 18 and older with a CPT code for cesarean delivery recorded in 2019-2022 in the NSQIP database were included in the analysis. The primary variables were self-reported race and ethnicity. Outcomes of interest were surgical complications reported in the NSQIP database. The association between race (and separately for ethnicity) and complications was assessed using linear regression with robust standard errors for continuous outcomes and modified Poisson regression for binary outcomes. Models were adjusted for age, body mass index, diabetes, hypertension requiring medication, American Society of Anesthesiologist physical status (ASAPS) class, chronic steroid use, and current smoker within one year.

Results: After controlling for covariates, the major complication rate was significantly higher among all race groups compared to White, and Unknown group had a significantly lower major complication rate. Black patients had 43% higher risk of a major complication compared to White patients (95% CI = 1.28, 1.59). Hispanic patients had a 20% higher risk of major complications compared to non-Hispanic patients (95% CI = 1.09, 1.33). Patients with Unknown or unreported race had 45% higher risk of a minor complication compared to White patients (95% CI = 1.33, 1.59).

Conclusion: Self-identified race is associated with significantly higher rates of surgical complications following cesarean delivery even after controlling for surgical risk factors. More comprehensive obstetrics data is needed to measure and improve maternal morbidity and mortality nationwide.

Title: AUGS-PERFORM: Assessing responsiveness to change

Fellow: Abbigail K. Woll, MD

Faculty Mentor: Nazema Y. Siddiqui, MD, MHSc

Objective(s): To test The **A**merican **U**ro**G**ynecologic **S**ociety's **P**rolapse p**ERFOR**mance **M**easure's (AUGS-PERFORM) responsiveness to change and determine the score that correlates with the minimal important difference (MID) in order to fully validate the questionnaire and to allow for use in benchmarking quality of care.

Methods: This was a prospective validation study of a patient reported outcome (PRO) questionnaire. We included English-speaking adult females, at a single academic institution, seeking evaluation for pelvic organ prolapse (POP). Participants electing observation, pessary, or surgery completed AUGS-PERFORM and several other validated questionnaires at baseline and 3 months. At the 3 month visit, participants also completed the patient global impression of improvement (PGI-I). PGI-I is a 7-point scale with response options ranging from "very much better" to "no change" and "very much worse". AUGS-PERFORM scores were compared against PGI-I responses to assess responsiveness to change. We hypothesized that AUGS-PERFORM would be responsive, with a 7-point difference indicating a meaningful change in clinical status.

Results: We enrolled 172 participants including 135 who received surgery,17 that were treated with pessary, and 20 that were observed. AUGS-PERFORM scores demonstrated responsiveness to change only for those that demonstrated improvement in symptoms, not in those that experienced worsening symptoms.

Conclusion: AUGS-PERFORM was not responsive in our population due to a large proportion of patients with improvement in symptoms and a large floor effect. The questionnaire needs to be studied in a broader population of patients where more patients are experiencing worsening symptoms to fully assess the questionnaires responsiveness to change.

Title: Effect of education tools on trainee competence in caring for patients affected by female genital cutting: a quasi-experimental study

Resident: Alexandra E. Norton, MD, MPH

Faculty Mentor: Sarah K. Dotters-Katz, MD, MMHPE

Objective(s): Patients affected by female genital cutting (FGC) require specialized care. However, healthcare providers report a lack of FGC education as a barrier to providing these services. Our primary objective was to demonstrate the impact of a training on trainee competence for providing FGC-related care.

Methods: This quasi-experimental study compared the impact of training on participants' FGC knowledge as well as screening and counseling competencies. The two-hour training was derived from the World Health Organization's FGC guidance, and all participants were Ob/Gyn residents or medical students. Only participants in the exposure group took part in the training. All participants completed a knowledge assessment and an Objective Structured Clinical Exam (OSCE) assessing FGC screening and counseling skills, scored by two reviewers. The primary outcome was difference in score between exposure and control participants on the knowledge assessment and the OSCE, and data were analyzed using Mann-Whitney U tests with standardized mean difference.

Results: Participants in the two groups did not differ by training level, age, or prior related experience. Standardized mean difference between groups on the knowledge assessment was 0.842, indicating a higher knowledge score in the exposure group. However, this difference was not consistent across training levels and prior relevant experiences. Median OSCE screening score was 9.5/13 vs 1/13 among exposure and control (SMD=2.43), and median OSCE counseling score was 3.3/5 vs 0/5 among exposure and control (SMD=3.75). No control participants received any points for counseling.

Conclusion: The training did not consistently affect FGC-related knowledge after stratifying by participant characteristics. It did, however, positively impact screening and counseling competencies. These findings demonstrate that there is a larger gap in FGC-related competence than in foundational knowledge. These findings suggest that experiential learning opportunities are critical to ensuring providers have competencies to provide evidence-based, equitable care to this patient population.

Title: Postpartum aspirin use and NT-proBNP levels as a marker for maternal cardiac health: a randomized-controlled trial

Fellow: Virginia Y. Watkins, MD

Faculty Mentor: Brenna L. Hughes, MD, MSc

Objective(s): To compare levels of N-terminal pro-brain natriuretic peptide (NT-proBNP), a marker of cardiac dysfunction, and clinical outcomes in patients at risk of preeclampsia randomized to continuation of low-dose aspirin (LDA) or placebo for 6 weeks postpartum.

Methods: This double-blinded randomized-controlled trial included patients at risk of preeclampsia randomized in a 1:1 fashion to LDA (81 mg) versus placebo for 6 weeks postpartum. The primary outcome was NT-proBNP levels at the postpartum visit. A sample size of 90 was required to detect a clinically significant difference in NT-proBNP between LDA and placebo with 80% power. A sample size of 110 subjects was planned due to anticipated loss to follow-up in the postpartum period. Pre-specified secondary outcomes were postpartum preeclampsia, eclampsia, hospital readmission, initiation or titration of blood pressure medications, and blood transfusion. The primary outcome was compared using the Wilcoxon rank sum test. Secondary outcomes are reported as counts (%) and were compared using Fisher's exact test after adjusting for multiple testing using Bonferroni correction.

Results: From July 2023 to May 2024, 110 participants were randomly assigned to LDA (n=55) or placebo (n=55). Baseline demographics were similar between groups. There was no difference in the primary outcome of NT-proBNP levels between groups (median (IQR), 36.5 ng/mL (36.0, 61.0) vs. 39.5 ng/mL (36.0, 74.0), p=0.49). Rates of postpartum preeclampsia in patients randomized to LDA vs. placebo (5.6% vs. 12.7%, p=0.32) were numerically but not statistically significantly lower, with similar rates of hospital readmission and bleeding complications. There were no cases of postpartum eclampsia or blood transfusion.

Conclusion: Continuation of LDA after delivery was not associated with decreased NT-proBNP levels compared to placebo. Additional studies powered to detect differences in maternal outcomes are needed to evaluate the role of LDA in the postpartum period.

Title: Sexual function after pelvic floor physical therapy among female cancer survivors who have undergone pelvic radiation therapy

Resident: Jessie Y. Li-Barton, MD

Faculty Mentor: Laura J. Havrilesky, MD, MHSc

Objective(s): To examine changes in pelvic floor assessment and sexual function after pelvic floor physical therapy (PFPT) among cancer survivors who have undergone pelvic radiation.

Methods: We performed a prospective pilot study of patients with gynecologic or lower gastrointestinal (GI) malignancies who had undergone pelvic radiotherapy (RT) and were referred to PFPT for sexual dysfunction. The primary outcome was change in Patient-Reported Outcomes Measurement Information System (PROMIS) Sexual Function and Satisfaction and PROMIS Global Health surveys completed at baseline. An additional retrospective cohort study was performed of all patients who were referred to PFPT for sexual dysfunction after pelvic radiation between 1/2012-3/2024. Study outcomes for both retrospective and prospective cohorts were changes from baseline to last PFPT session in Marinoff dyspareunia score, PERFECT scheme, and dilator sizing. All analyses were performed in SAS 9.4 (SAS Institute Inc., Cary, NC) at a two-tailed 0.05 level of significance.

Results: In the prospective cohort (n=7), improvement in Marinoff dyspareunia score was reported in 4/7 patients, and improvement in dilator sizing was reported in 6/7 patients. PROMIS scores for interest in sexual activity improved for 4 of 5 subjects completing pre- and post-PFPT surveys; scores for global physical health and mental health improved for 3 of 5 subjects. The average satisfaction with PFPT score was 8.8/10. Within the retrospective cohort (n=64), PT was associated with significant improvements in mean Marinoff dyspareunia score from 2.6 to 1.9 ($p<0.0001$), pelvic floor endurance ($p=0.01$), pelvic floor contraction repetitions ($p=0.0053$), and dilator sizing from mean of 2.4 (XS+/S) to mean of 5.1 (M/M+) ($p<0.0001$).

Conclusion: For patients who have undergone pelvic radiation, PFPT is a reasonable, non-invasive intervention that likely provides some benefit for sexual dysfunction. Further prospective pilot study accrual planned during 2025 may allow more robust comparisons in PROMIS sexual function scores.

Title: Performance of ultrasound and guideline-concordant care in a diverse postmenopausal bleeding cohort

Fellow: Angela C. Nolin, MD

Faculty Mentor: Laura J. Havrilesky, MD, MHSc

Objective(s): Professional society guidelines endorse the use of ultrasound to evaluate an initial episode of postmenopausal bleeding, with endometrial sampling reserved for patients with an endometrial thickness >4 mm. However, the data supporting this ultrasound-based approach are derived from cohort studies with minimal racial and ethnic diversity. We aimed to evaluate rates of adequate endometrial visualization and prompt guideline-concordant care and to identify risk factors for lack of timely indicated sampling in a multi-institutional cohort of patients who underwent ultrasound to evaluate postmenopausal bleeding.

Methods: Patients aged ≥ 45 years who underwent transvaginal ultrasound for an initial coding-based diagnosis of postmenopausal bleeding were eligible for this retrospective study. Ultrasound findings were classified as thin (endometrium ≤4 mm), thick (endometrium >4 mm), or inadequate (endometrium not completely visualized). Associations between clinicodemographic factors, ultrasound findings and follow-up patterns were analyzed. We defined guideline-concordant care as either having a thin endometrium or receiving indicated endometrial sampling within 3 months of index ultrasound.

Results: Among 3614 patients, rates of inadequate ultrasound varied between racial/ethnic cohorts (non-Hispanic White 5.9%, non-Hispanic Black 18.8%, Hispanic 12.7%, Asian 9.2%). Uterine fibroids were present in 71.5% (737/1031) non-Hispanic Black compared to 43.3% (757/1750) non-Hispanic White and were strongly associated with lower odds of adequate ultrasound (OR 0.29 [95% CI 0.23-0.38] p<0.001). Rates of endometrial sampling were 54.2% (212/391) after an inadequate ultrasound and 75.5% (1336/1765) after a thickened endometrium. Guideline-concordant care rates were 85.9% for non-Hispanic White (1504/1750), 78.3% non-Hispanic Black (802/1031), 84.1% Hispanic (292/347), and 82.9% Other/Unknown (403/83). Compared to non-Hispanic White patients, non-Hispanic Black patients were less likely to receive guideline-concordant care (aOR 0.64 [95% CI 0.52-0.79]).

Conclusion: Non-Hispanic Black patients with postmenopausal bleeding have a higher rate of inadequate ultrasound due to fibroids and are less likely to receive prompt guideline-concordant care.

Title: Deep targeted sequencing of maternal plasma for non-invasive fetal genotyping

Resident: Dayne L. Filer, MD, PhD

Faculty Mentor: Jerome J. Federspiel, MD, PhD

Objective(s): Non-invasive prenatal screening (NIPS) leverages the cell-free DNA with next-generation sequencing to predict fetal presence of large chromosomal abnormalities and a select number of single-gene disorders. Expanding NIPS to cover more conditions will lead to better neonatal outcomes and less bias.

Methods: In theory, if we know the proportion of fetal to maternal DNA (fetal fraction), exact estimates of the minor allele frequency define maternal and fetal genotypes. To test this approach, we employed two genotyping panels to interrogate selectively specific genetic variants: (1) a 7,341-variant panel with even density throughout the genome to estimate the fetal fraction; (2) a 71-variant panel covering common variants across diverse populations to test maternal-fetal genotyping accuracy. We sequenced 60 mother/newborn duos, comparing our estimates to maternal and newborn genotypes.

Results: Out of 3,086 predicted genotypes, we achieved maternal and fetal genotyping accuracies of 97% and 80%, respectively. Sample-specific fetal accuracies ranged from 44.1% to 100%. The accuracy of both maternal and fetal genotype estimates increased with sequencing depth.

Conclusion: Our proof-of-concept study concluded mixed results. Without increased cell-free DNA yield, or more efficient sequencing chemistry, a maternal-only plasma sequencing approach will not likely provide clinically-meaningful accuracy.

Title: Predicting gynecologic post-operative opioid use: Expansion and validation of an opioid use predictive calculator

Fellow: Stephanie L. Lim, MD

Faculty Mentor: Brittany A. Davidson, MD

Objective(s): To expand and validate a post-operative opioid use prediction calculator, validated in a largely gynecologic oncology population, in a diverse gynecologic population and to evaluate if this calculator could be modified for pre-operative prescribing.

Methods: Patients who underwent gynecologic surgery within an academic health system from November 1, 2023 to November 1, 2024 were eligible for inclusion. Patients completed standard pre-operative surveys to obtain predictors and post-operative assessments to determine opioid use and pain scores. The original model used seven predictors: age, educational attainment, smoking history, anticipated pain medication use, anxiety regarding surgery, operative time, and pregabalin administration. The following modifications were evaluated: anticipated instead of actual operating time and pregabalin removal. The outcome variable used in model evaluation was the number of pills used. The primary outcome was model performance.

Results: Data from 616 patients who underwent gynecologic surgery were included: 137 gynecology (22.2%), 154 gynecologic oncology (25.0%), 163 minimally invasive gynecologic surgery (26.4%), 163 urogynecology (26.4%). Two hundred and twenty-six patients (37%) used zero pills after hospital discharge, and the median was 2 [interquartile range 0, 8] pills. The ordinal concordance index (95% confidence interval) of the original model in the new cohort was 0.70(0.65-0.74) for predicting ≥2 pills (Brier score, 0.22), 0.72(0.68-0.76) for predicting ≥5 pills (Brier score, 0.21), and 0.74(0.7-0.79) for predicting ≥10 pills (Brier score, 0.16). The ordinal concordance index (95% confidence interval) of the adjusted model was 0.66(0.64-0.69) for predicting ≥2 pills (Brier score, 0.21), 0.66(0.64-0.69) for predicting ≥5 pills (Brier score, 0.20), and 0.66(0.64-0.69) for predicting ≥10 pills (Brier score, 0.15).

Conclusion: The original model performance maintained stability and appears valid in a diverse patient population following gynecologic surgery by both generalists and subspecialists. The modified model for pre-operative prescribing also demonstrates validity. Widespread use of this calculator could decrease the number of unused pills prescribed.

Title: Photoacoustic imaging of the mouse uterus and placenta after uterine injury: development of a placenta accreta spectrum murine model

Resident: Maxwell E. Edmonds, MD, PhD

Faculty Mentor: Liping Feng, MD, MS

Objective(s): Placenta accreta spectrum (PAS) is a challenging cause of postpartum hemorrhage and hysterectomy. Best screened for through patient risk-factors (e.g. uterine surgery) and ultrasonography (e.g. disordered vasculature), progress in PAS management is challenged by late identification and underdiagnosis, perhaps in part due to gaps in our understanding of uterine wound healing and placentation. The objective of the current study was to develop an in vivo platform for studying uterine wound healing and placentation through creating a PAS-mimetic mouse model.

Methods: The origin hypothesis of PAS presumes that endometrial defects (i.e. uterine scar), enable trophoblast to access the sub-decidual myometrium, leading to aberrant placentation. In this study, multiple surgical protocols were compared: (a) non-pregnant uterine incision, (b) cesarean by unilateral horn incision, and (c) cesarean by bilateral uterine horn incision. Wound healing studies were conducted with pregnant term mice delivered via cesarean, followed by two experimental arms: (1) a healing analysis over 1 to 4 weeks, and (2) post-operative breeding for PAS-establishment. Samples were live-imaged using photoacoustic microscopy, a contrast-free technique for functional and anatomic vasculature labeling. After imaging, mice were collected for necropsy and histology.

Results: Placentation perturbation was observed in both uterine horns, regardless of the surgical incision location or number; therefore, cesarean by bilateral hysterotomy was selected for subsequent experiments. Uterine wound healing progressed from 1 to 4 weeks post-operatively, evidenced by gross morphology, collagen scar deposition, and vascular growth. PAS mice exhibited perturbed maternal vasculature at the placental bed and excessive trophoblast invasion near scar tissues during early placental development (E9.5), and altered junctional versus labyrinth zone sizes in late development (E14.5).

Conclusion: Murine cesarean delivery produced a PAS-mimetic mouse model highlighting multiple hallmarks of human disease including scar deposition and disordered vasculature. Future work will further explore the use of photoacoustics for functional measurements of PAS placenta.

Title: Reducing single-use plastic in obstetrics and gynecology to confront healthcare's carbon footprint

Fellow: Joseph W. Lafferty, MD

Faculty Mentor: Laura J. Havrilesky, MD, MHSc

Objective(s): To evaluate a quality improvement (QI) initiative with the aim to reduce the use of disposable plastic speculums in outpatient obstetrics and gynecology (Ob/Gyn) clinics as part of a department-wide sustainability initiative.

Methods: Our SMART Aim was to reduce the quantity of disposable plastic speculums ordered monthly in Duke outpatient Ob/Gyn clinics from 950 to 300 by January 1, 2026. Metal speculums provide an eco-friendly alternative to single-use plastics. A multidisciplinary team of stakeholders including physicians, nurses, medical assistants, infection prevention, and sterile processing leadership established standardized procedures for the use and reprocessing of metal speculums in the outpatient setting. A system failure mode and effect analysis (sFMEA) was conducted to identify flaws in the current state of instrument processing. We utilized the IHI Model for Improvement and conducted Plan-Do-Study-Act (PDSA) cycles to optimize the standard workflow for participating clinics. Key drivers included creating efficient JCAHO and Infection Prevention compliant standard work, dispelling misconceptions regarding the environmental impact of instrument processing, and ensuring adequate staffing and supplies in each clinic.

Results: Our primary outcome measure is the net reduction in CO2 equivalents calculated by monthly reduction in plastic speculum use from baseline. In 2024, Duke Ob/Gyn outpatient clinics ordered 7,275 disposable plastic speculums (6,402 kg CO2 equivalents). Three PDSA cycles indicated that Joint Commission and Infection Prevention compliant standard work for the use and reprocessing of metal speculums could be implemented in Ob/Gyn clinics with minimal disruption to current workflows. After accounting for purchase price of metal and plastic speculums ($78.99, $1.29) and reprocessing cost of metal speculums ($0.84), sensitivity analysis revealed metal speculums "break even" in cost at 175 uses.

Conclusion: Establishing a protocol for the reuse of metal speculums in Duke Ob/Gyn outpatient clinics is environmentally friendly, economical, and maintains standards for safe patient care.

Title: Human Papillomavirus (HPV) vaccination rates among U.S. military veteran females and males and non-veterans in the National Health Interview Survey

Resident: Lillian J. Dubiel, MD

Faculty Mentor: Elisheva R. Danan, MD, MPH (Minneapolis VAMC, University of Minnesota)

Objective(s): HPV is a major risk factor for the development of multiple cancers. Active-duty service members have higher rates of HPV infection than civilians, while Veterans are diagnosed with a disproportionately high burden of HPV-associated cancers compared to civilians. While a highly effective HPV vaccine has been available for nearly 2 decades, vaccination rates in the United States remain suboptimal. Our objective was to investigate HPV vaccination rates among Veterans compared with non-Veterans.

Methods: We used cross-sectional National Health Interview Survey (NHIS) data pooled from 2015 to 2018 to analyze HPV vaccination rates for respondents aged 18-45. We used multivariable logistic regression to compare HPV vaccination rates between Veterans and non-Veterans stratified by sex while controlling for sociodemographic factors including age, race/ethnicity, education level, income, insurance coverage, and VA coverage. All analyses used NHIS survey weights to produce national estimates.

Results: Among 45,493 respondents ages 18 to 45, vaccination rates were low across all groups: 9.6% of male Veterans and 8.4% of male non-Veterans (p=0.21) had received at least one HPV immunization, while 32.0% of female Veterans and 25.1% of female non-Veterans (p=0.02) were immunized. After controlling for socio-demographics, both male Veterans (AOR 1.79; 95%CI 1.31, 2.44) and female Veterans (AOR 1.56; 95%CI 1.1, 2.21) exhibited higher odds of HPV vaccination compared to their non-Veteran counterparts. VA coverage was also independently associated with higher odds of HPV vaccination among female Veterans (AOR 2.39; 95%CI 1.10, 5.21).

Conclusion: Veterans of both sexes are more likely to be vaccinated than their non-Veteran civilian counterparts; vaccination rates overall remain low. To our knowledge, ours is the first study of its kind to establish HPV vaccination rates among female Veterans. These findings underscore the important role of Department of Defense and VA healthcare systems in improving HPV vaccine uptake and mitigating HPV-associated cancer risk among Veterans.

Title: Putting the cart before the horse: Is intended transfer plan associated with differences in ovarian stimulation characteristics in in vitro fertilization?

Fellow: Hilary S. Friedlander, MD

Faculty Mentor: Kelly S. Acharya, MD

Objective(s): To determine how controlled ovarian stimulation (OS) characteristics (follicle stimulating hormone (FSH) dose, days of stimulation) differ by intended transfer plan: fresh embryo transfer (ET), freeze-all without preimplantation genetic testing (PGT), freeze-all for PGT for aneuploidy (PGT-A) with or without PGT for monogenic disease (PGT-M).

Methods: Retrospective cohort study of patients aged 21-44 years undergoing first, autologous retrieval cycle from 2016-2020 using the Society for Assisted Reproductive Technology database. Cycles using donor oocytes, gestational carriers, or missing FSH dose or days of stimulation were excluded. Cycles were categorized by intent for fresh ET or freeze-all. Freeze-all cycles were divided into freeze-all no PGT, freeze-all PGT-A and freeze-all PGT-M. Linear and negative binomial models were used adjusting for age and anti-Müllerian hormone (AMH) level.

Results: 193,298 cycles comprising 142,897 intended fresh ET and 50,401 intended freeze-all were included. Mean patient age (years) was 34.1 (fresh ET), 33.9 (freeze-all no PGT), 35.4 (freeze-all PGT-A) and 33.0 (freeze-all PGT-M). Mean AMH (ng/mL) was 3.5 (fresh ET), 3.9 (freeze-all no PGT), 3.4 (freeze-all PGT-A), and 3.7 (freeze-all PGT-M). After adjusting for age and AMH, patients intending for fresh ET had lower total FSH doses over longer stimulation periods, with fewer oocytes retrieved and blastocysts created ($p<0.001$). Patients intending for freeze-all PGT-M had lower total FSH doses compared to freeze-all no PGT ($p<0.001$). Freeze-all PGT-A and PGT-M cycles were shorter than freeze-all no PGT cycles ($p<0.001$). Freeze-all PGT-A and PGT-M cycles were associated with higher rates of oocytes retrieved (15% and 18%, respectively) and blastocysts cryopreserved (41% and 50%, respectively) compared to freeze-all no PGT ($p<0.001$).

Conclusion: The increased number of oocytes retrieved and blastocysts cryopreserved in cycles with planned frozen ET were not associated with more aggressive OS. Thus, it does not appear that more aggressive OS is employed when PGT is intended.

Title: A nationwide analysis of adverse delivery outcomes among adolescents pre- and post-Dobbs decision

Resident: LaMani D. Adkins, MD

Faculty Mentor: Rachel L. Wood, MD

Objective(s): Adolescents make up approximately 10% of all elective terminations in the United States. In June 2022, the Dobbs decision eliminated federal abortion protections, and abortion access became severely limited in many states. We evaluated the impact of abortion restrictions on delivery outcomes in adolescent births based on state level abortion access.

Methods: We conducted an interrupted time series analysis (ITS) of U.S. adolescent (age <20 years) births using birth certificate data in two groups of states: those with statutory abortion protection(SAP)- CA, CO, CT, DE, IL, MA, MD, ME, NJ, NV, NY, OR, and VT versus those with trigger bans(TB) restricting abortion access- AR, ID, KY, LA, MS, MO, ND, OK, SD, TN, and UT. Primary outcomes were rates of preterm birth (PTB) (<37 weeks) and low birth weight (LBW) (<2500g) across two time periods: pre-Dobbs (January 1, 2021 – May 31, 2022) and post-Dobbs (December 1, 2022 – December 31, 2023).

Results: 142,859 births were included: 78,682 in states with SAP and 64,177 in TB states. Overall, average maternal age was 18.1+1.2 years, with most births occurring in white, non-smoking individuals with no meaningful differences in BMI, insurance status, or prenatal care between groups. In both the pre- and post-Dobbs periods, rates of PTB and LBW were significantly higher in TB states (11.9% vs 10.3%; 11.5% vs 10.5%, respectively). There were no statistical differences in the rate changes within or between groups in the pre- or post-Dobbs period.

Conclusion: The rates of preterm birth and low birth weight were higher in states with abortion trigger bans; however, our analysis revealed no change in these trends between groups following the Dobbs decision.

Title: Investigating the relationship between preeclampsia and intrahepatic cholestasis of pregnancy: Can a canonical serum bile acid help us to model preeclampsia pathogenesis?

Fellow: Miriam L. Estin, MD, PhD

Faculty Mentor: Danny J. Schust, MD

Objective(s): Building from the clinical association between intrahepatic cholestasis of pregnancy (ICP) and preeclampsia, we explored whether bile acid exposure could serve as a model for a mid-pregnancy insult that triggers the development of clinically evident pre-eclampsia in patients with dysfunctional placentation. We specifically hypothesized that combining hypoxic culture conditions with TCA exposure would produce a dramatic increase in production of sFlt1 and other common preeclampsia serum biomarkers by syncitiotrophoblast (STB)cells.

Methods: STB cells were differentiated from CT27 trophoblast stem cells and cultured under normoxic and hypoxic conditions with varying concentrations of the canonical bile acid taurocholic acid (TCA).

Results: Our results demonstrated that neither hypoxic cell culture conditions nor treatment with TCA alone was sufficient to alter Sflt1 and PlGF production. However, the combination of prolonged low-dose TCA treatment and hypoxic conditions resulted in a robust and statistically significant increase in Sflt1 expression. PlGF expression was also increased under these conditions, although hypoxia appeared to blunt the TCA-stimulated increase in PlGF rather than exaggerate it, as with Sflt1.

Conclusion: Taken together, our data further elucidate the association between ICP and preeclampsia, and provide preliminary support for the notion that bile acid exposure may be useful as a model for the type of environmental factors that precipitate development of clinically apparent preeclampsia.

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PGY2 Research

Project Title: The Pregnancy Care Journey for low-risk pregnancy quality improvement project

Resident: Jasmine E. Arrington, MD, MPH

Faculty Mentor: Jerome J. Federspiel, MD, PhD

Research Question: The primary objective of our study is to determine the average number of per capita in-person obstetric visits in the Duke Women's Health Associates (DWHA) practice before and after implementation of the new digital Pregnancy Care Journey for low-risk pregnancies.

Methods: The Institute for Healthcare Improvement Model for Improvement framework will be utilized, which includes iterative Plan-Do-Study-Act cycles. First, we have planned data collection modalities, time intervals for data collection, and designed a survey to assess balancing measures. Presently, we are collecting data pre- and post- implementation. We then plan to analyze data and compare key outcomes to predictions. Recommendations will then be made for potential changes in the next cycle. Summary statistics (mean, standard deviation) will be used to describe outcomes preceding and following adoption of the new care model. Simple statistics (t-tests and chi-squared tests as appropriate) will be used to describe the primary and secondary outcomes. As appropriate, run charts and control charts will be utilized to assess and visualize outcome and process measures over time.

Progress Made: IRB exemption obtained and patient recruitment for pre-implementation patient surveys is in progress. Data extraction methods for primary and secondary objectives have been determined and data is being extracted monthly.

Anticipated Challenges: Recruitment of 104 patients pre- and post-implementation of the new care model (total 208) patients will be a challenge. We are recruiting at all three DWHA clinic sites to maximize patient recruitment volume.

Project Title: Cost-effectiveness of biomarker-based and universal strategies for the treatment of advanced stage uterine cancer

Resident: Aya M. Bashi, MD, MPH

Faculty Mentor: Laura J. Havrilesky, MD, MHSc

Research Question: Are concurrent and maintenance biomarker-based therapies targeting human epidermal growth factor receptor [HER-2] and mismatch repair deficient [MMRd] biomarkers in advanced-stage uterine cancer cost-effective, and do these therapies reduce survival disparities between Black and White patients?

Methods: We developed a decision model using TreeAge Pro Software to compare five approaches to concurrent and maintenance biomarker-based therapies with trastuzumab (TZ) or dostarlimab (DS) administered in addition to standard postoperative chemotherapy for individuals with newly diagnosed, stage III-IV uterine carcinomas. Race- and histology-specific 10-year overall survival (OS) for 3 specific histologic types (serous carcinoma, endometrioid endometrial cancer, and carcinosarcoma) were modeled from National Cancer Database (NCDB) . The model was designed from a third-party payer perspective, has a Markov structure with a 1-week cycle length, and includes four health states: On treatment, Progressed, Long-term survivor, and Dead. To estimate the number of patients occupying each health state, we applied hazard ratios from randomized clinical trials of DS and TZ to the baseline OS data. Clinical probabilities of histologic distribution and histology-specific biomarker expression were obtained from published literature. Costs were adjusted for inflation to 2024 U.S. dollars. Effectiveness was estimated as quality-adjusted life years (QALYs). Costs and QALYs were discounted at 3% annually. Incremental cost-effectiveness ratios will be presented for all patients as well as for Black and White populations, separately.

Progress Made: Preliminary results were presented at the CISNET national meeting. We are finalizing our model and preparing final data.

Anticipated Challenges: None.

Project Title: #birthcontroltok: An analysis of popular hormonal and non-hormonal contraception videos and user comments on TikTok

Resident: Shelby N. Davis-Cooper, MD

Faculty Mentor: Jonas J. Swartz, MD, MPH

Research Question: How do TikTok videos about hormonal and non-hormonal contraception videos compare in terms of their content, creator characteristics, sentiment, and user comments?

Methods: We utilized TikTok scraping software to obtain videos for screening using the hashtags "#birthcontrol" and "#contraception" and the search terms "birth control" and "contraception." We created a dataset including the most-viewed 500 videos with a minimum of 500,000 views. We created a coding spreadsheet that assesses content, sentiment, creator characteristics, and information quality. Videos will be double-coded by six medical student abstractors, with any discrepancies between coders to be adjudicated by the PI. For descriptive analysis of videos, they will be divided into three categories: 1) discuss non-hormonal contraception; 2) discuss hormonal contraception; 3) discuss both types. We plan comparison of content, creator characteristics, and sentiment between these three categories. For analysis of comments, we will use natural language processing to characterize comments on eligible videos, again comparing by video type.

Progress Made: We have obtained our final dataset and finalized a coding spreadsheet. We conducted training with six medical student abstractors to norm the video review and data collection process. Students have completed coding of the 500-video dataset.

Anticipated Challenges: Preliminary review of coding results suggests our scraping search terms have yielded relatively few videos on nonhormonal birth control which may limit comparisons. We may attempt to re-scrape or focus our descriptive analysis instead on healthcare provider- versus non-healthcare provider-created content.

Project Title: A cost-conscious approach to neovaginal creation

Resident: Shakira E. Harding, MD, MS

Faculty Mentor: Cassandra K. Kisby, MD, MS

Research Question: What is the preferred route of neovaginal creation for congenital vaginal agenesis as defined by cumulative health cost incurred based on age of initial surgery and prevention of future reoperation?

Methods: This study will conduct a clinical decision analysis to estimate the cumulative healthcare costs of four surgical procedures for vaginal agenesis: Davydov, McIndoe, sigmoid neovagina, and Vecchietti. The study population will include female patients diagnosed with vaginal agenesis who have undergone one of these procedures, identified using ICD-10 and CPT codes. A comprehensive literature review will gather data on surgical outcomes, costs, complication rates, and reoperation rates. Costs will be abstracted from the Pediatric Health Information System and governmental data, including intraoperative, postoperative, complication-related, and reoperation costs. The analysis will use TreeAge Healthcare Pro (2025) software to compare cumulative healthcare costs of each procedure, adjusting for age, surgery cost, and reoperation rates. Sensitivity analysis will assess the impact of uncertainty in model parameters.

Progress Made: We have used Covidence software to identify relevant articles for the literature review. Our research is currently in the data abstraction phase.

Anticipated Challenges: Accessing comprehensive and accurate cost data from the Pediatric Health Information System and governmental sources may be difficult. Incomplete or missing data on key parameters, such as post-discharge follow-up costs or complication rates, could hinder analysis. Ensuring consistency in data abstracted from the literature and database is crucial. Variability in how costs and complications are reported across studies and settings could introduce bias or error, particularly if large series are published by specialists reporting their own outcomes.

Project Title: Patient, family, and provider views of fertility preservation in pediatric patients with cancer before and after implementation of an Ovarian Tissue Cryopreservation (OTC) program at Duke Health System

Resident: Isabel A. Josephs, MD

Faculty Mentor: Kelly H. Acharya, MD

Research Question: Cancer is a leading cause of morbidity and mortality in children and adolescents. Advancements in treatment have increased survival rates but can cause primary ovarian insufficiency (POI) and infertility. Ovarian tissue cryopreservation (OTC) is a cutting-edge technique to preserve ovarian tissue that can be later reimplanted to restore ovarian function and reproductive capability. Duke is establishing an OTC program, offering the unique opportunity to study patient, caregiver, and provider experiences longitudinally before and after implementation. The purpose of this project is to study trends in beliefs, knowledge, barriers to care, accessibility, and the pursuit of fertility preservation in real time as this cutting-edge technology is newly offered to patients at Duke.

Methods: This is a mixed-methods prospective cohort study using surveys and semi-structured interviews to evaluate the experiences of biologically female patients who have cancer, aged 0-18 years old, and have chemotherapy or radiation treatment planned or ongoing at Duke. There are three participant arms: patients (>10 years old), family caregivers, and providers. There will be pre- and post- surveys and interviews surrounding the implementation of OTC at Duke.

Progress Made: We have secured Hammond funding, developed surveys and interview guides with the expertise of the Behavioral Health Survey and Research Core (BHSRC), received initial PRMC approval, and are pending full IRB approval.

Anticipated Challenges: We anticipate a small sample size due to this study's narrow inclusion criteria and the typical low accrual rates in adolescent and young adult research. Additionally, generalizability may be challenging due to low power and being in a high-resource, academic setting.

Project Title: Timing of physician rounds on hospital experience for high-risk antepartum patients: A randomized controlled trial

Resident: Hannah C. Kelly, MD

Faculty Mentor: Rachel L. Wood, MD

Research Question: This study investigates whether the timing of physician rounds influences high-risk antepartum patients' perceptions of their hospital experience, focusing on patient–physician communication. It compares standard early morning rounding (including pre-7am bedside visits) to a "discovery rounding" model, which delays in-person encounters until after an attending-led team discussion (called "consolidated rounding"). This model aims to reduce early morning disruptions and improve the clarity and consistency of communication. The hypothesis is that consolidated rounding will enhance patient satisfaction without compromising maternal or neonatal safety.

Methods: Designed as a minimal-risk quality improvement initiative, this randomized controlled trial may qualify for expedited IRB review. Conducted at Duke University Hospital, the trial builds on findings from a prior study in a postpartum population at McGovern Hospital, where delayed rounding was associated with increased patient satisfaction. Up to 200 eligible antepartum patients will be randomized to either standard or consolidated rounding. Patient experience will be assessed using a modified HCAHPS survey, focusing on physician communication, interdisciplinary care, hospital environment, and overall hospital rating. The primary outcome is the physician communication score, with secondary outcomes and subgroup analyses based on sociodemographic and clinical factors.

Progress Made: In collaboration with the BERD Methods Core, the research team is currently pursuing funding through the Hammond Research Fund (Summer 2025) and preparing for IRB submission. The study is scheduled to begin in Fall 2025.

Anticipated Challenges: Anticipated challenges include maintaining group assignments during extended hospitalizations, ensuring patient safety with strict exclusion criteria, and managing rounding logistics.

Project Title: ETAA1 expression effect on ATR activation signaling in high grade serous ovarian cancer cells

Resident: Tahireh Y. Markert, MD

Faculty Mentor: Andrew Berchuck, MD

Research Questions: Is there an association of ETAA1 expression with BRCA1 status in patient tissue high grade serous ovarian cancer (HGSOC) tissue samples?

Methods: The ATR pathway is a cellular response pathway involved in DNA damage repair that is being investigated as a potential target for anti-cancer drugs, some of which are already in clinical trial. Determining the best patient population for these drugs is a topic of ongoing research. ETAA1 is one molecule known to participate in activation of this pathway, and it is the focus of this study.

This project consists of immunohistochemistry experiments on BRCA1 mutant vs. BRCA1 wild type formalin-fixed paraffin-embedded HGSOC tissue samples. Staining will be done in these two sample sets with ETAA1 as well as known downstream markers of ETAA1. This allows us to confirm that any increased expression of ETAA1 is affecting ETAA1 activation of ATR pathway.

Progress Made: IRB exemption to utilize samples from both the Berchuck lab and the Duke Biorepository Bank was approved. Known BRCA1 wild type and BRCA1 mutant case slides have been requested for staining, and proof of concept staining with BRCA1 antibody is beginning.

Anticipated Challenges: The primary challenge we anticipate is verifying each antibody's efficacy in our tissue samples prior to beginning experiments. Companies verify their antibodies' effectiveness and reproducibility in standardized tissue samples rather than patient samples. For antibodies commonly used in HGSOC research such a BRCA1, there is more data available, but for more uncommonly stained antibodies like ETAA1 this may prove more difficult.

Project Title: Identifying optimal timing for cesarean delivery consent on labor and delivery

Resident: Kelsey L. McNew, MD, PhD

Faculty Mentor: Sarahn M. Wheeler, MD, MHSc

Research Question: At the Duke Birthing Center, patients admitted for induction of labor are consented for cesarean delivery selectively based on their clinical course; at some of our peer institutions, all patients are consented for possible cesarean delivery on admission to labor and delivery. This study aims to determine if consenting patients for possible cesarean delivery upon admission impacts their childbirth experience.

Methods: We will randomize 200 patients who are scheduled to undergo induction of labor to be consented for cesarean section at time of admission to the hospital versus current standard of care (consented if there is concern a cesarean delivery may be warranted). All participants, regardless of whether they were consented for cesarean delivery, will receive a survey on postpartum day 1 about their childbirth experience. Participants who were consented during the induction process will receive additional survey questions assessing their satisfaction with the consent process and their perception and understanding of the consent.

Progress Made: We have constructed a REDCap with validated survey instruments. Our IRB has been submitted. We hope to begin enrollment as soon as we have IRB approval.

Anticipated Challenges: The primary anticipated challenge is patient recruitment and reaching the desired sample size. While many patients will be eligible for the study, we anticipate a few iterations will be required to optimize the process of identifying and recruiting eligible participants and to streamline communication with the inpatient team to ensure patients are consented per study randomization.

Project Title: Evaluation of a novel perioperative text messaging strategy for patients undergoing benign gynecologic procedures

Resident: Natalie E. Wickenheisser, MD

Faculty Mentor: Nicole P. Kerner, MD

Research Question: Does the Duke Ob/Gyn Care Coach (CC) perioperative text messaging program reduce the number of unscheduled hospital visits or triage call volume for patients undergoing benign gynecologic procedures in the perioperative period?

Methods: This prospective pilot study will assess a small cohort of patients trialing CC. Retrospective data will be collected for 12 months before and after CC implementation with a 3-month grace period between cohorts. During the initial clinic visit, patients must sign a consent form to be contacted via text and participate in research. To receive CC messages, patients must opt in via text. For eligible procedures (hysteroscopy and cervical excisional procedures), staff will discuss study participation and explain the CC platform. If a patient opts in, their details are entered into the RevelAi platform, and they will receive educational texts and videos relevant to their procedure. Emergency Department visits, unscheduled office visits, and phone call volume will be reviewed manually from gynecology clinic records and recorded in REDCap. Patient satisfaction survey results will be collected during the postoperative visit (2-6 weeks after surgery) which will involve a brief satisfaction survey via QR code in REDCap.

Progress Made: The study has been approved by the IRB, pre-intervention cohort has been identified and data collection has begun in REDCap. Our team is scheduled to implement the CC Pilot in Duke 1J Clinic in April 2025, after which post-intervention data collection will commence.

Anticipated Challenges: There may be variable participant compliance with CC and participation in survey at post-operative visit.

Research Posters

Please take a moment to view the poster displays of research by current medical students, PhD candidates and postdoctoral scholars working with Duke Ob/Gyn faculty members.

Presenter: Adwoa A. Baffoe-Bonnie, BS
Project Title: Maternal and neonatal substance testing discordance after implementation of an obstetric substance use screening protocol
Mentor: Sarahn M. Wheeler, MD, MHSc

Presenter: Jaye C. Boissiere, MS
Project Title: Association between abnormal p53 expression in endometrial cancers and living in proximity to hog concentrated animal feeding operations in North Carolina
Mentor: Angeles Alvarez Secord, MD, MHSc

Presenter: Samuel M. Cripps, PhD
Project Title: Electronic cigarettes induce morphological changes of the mouse penis concomitant with erectile dysfunction
Mentor: Margeaux W. Marbrey, PhD

Presenter: Katherine R. Freedy, BS
Project Title: Impact of the Dobbs decision on pregnancy and prenatal care in adolescents
Mentor: Rachel L. Wood, MD

Presenter: Sally J. Kuehn, BS
Project Title: Gender representation in Ob/Gyn fellowship leadership: A cross-sectional analysis
Mentor: Sarah K. Dotters-Katz, MD, MMHPE

Presenter: Melissa J. Marchese, MSc
Project Title: HIV antiretroviral therapy and drinking water contaminant exposures induce cardiovascular changes in women of childbearing age
Mentor: Liping Feng, MD, MS

Presenter: Namya Mellouk, PhD
Project Title: Perinatal per- and poly-fluoroalkyl exposure impoverishes maternal care and emotional behaviors
Mentor: Liping Feng, MD, MS

Presenter: Isabella A. Mendieta, BS
Project Title: Lipid metabolism in the aged tumor microenvironment and the therapeutic potential of punicic acid in ovarian cancer
Mentor: Zhiqing Huang, MD, PhD

Presenter: Jingjia Mo, MS
Project Title: Regulation of age-related lipid metabolism in ovarian cancer
Mentor: Zhiqing Huang, MD, PhD

Presenter: Morgan F. Orsolini, MS
Project Title: RNA seq uncovers potential mechanisms of preimplantation embryotoxicity post-exposure to low level volatile organic compounds
Mentor: Danny J. Schust, MD

Presenter: Sarah L. Provencher, BS
Project Title: The relationship between chemotherapy response score and molecular subtyping of advanced endometrial cancer
Mentor: Emma C. Rossi, MD

Presenter: Sydney M. Sheffield, BSPH
Project Title: "I just didn't see the need": A mixed methods analysis of patients' contraception decision-making during gestational trophoblastic disease monitoring
Mentor: Brittany A. Davidson, MD

Presenter: Lila C. Teitle, BS
Project Title: Peritoneal fluid protects against ferroptosis induced by lipid control agents
Mentor: Zhiqing Huang, MD, PhD

Presenter: Gurugowtham Ulaganathan, BS
Project Title: Modeling gestational neurotoxicity using a hiPSC-derived mini-brain model
Mentor: Susan K. Murphy, PhD

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CHARLES B. HAMMOND, MD
RESEARCH DAY

Friday, May 9, 2025

Duke Obstetrics & Gynecology
Duke University School of Medicine