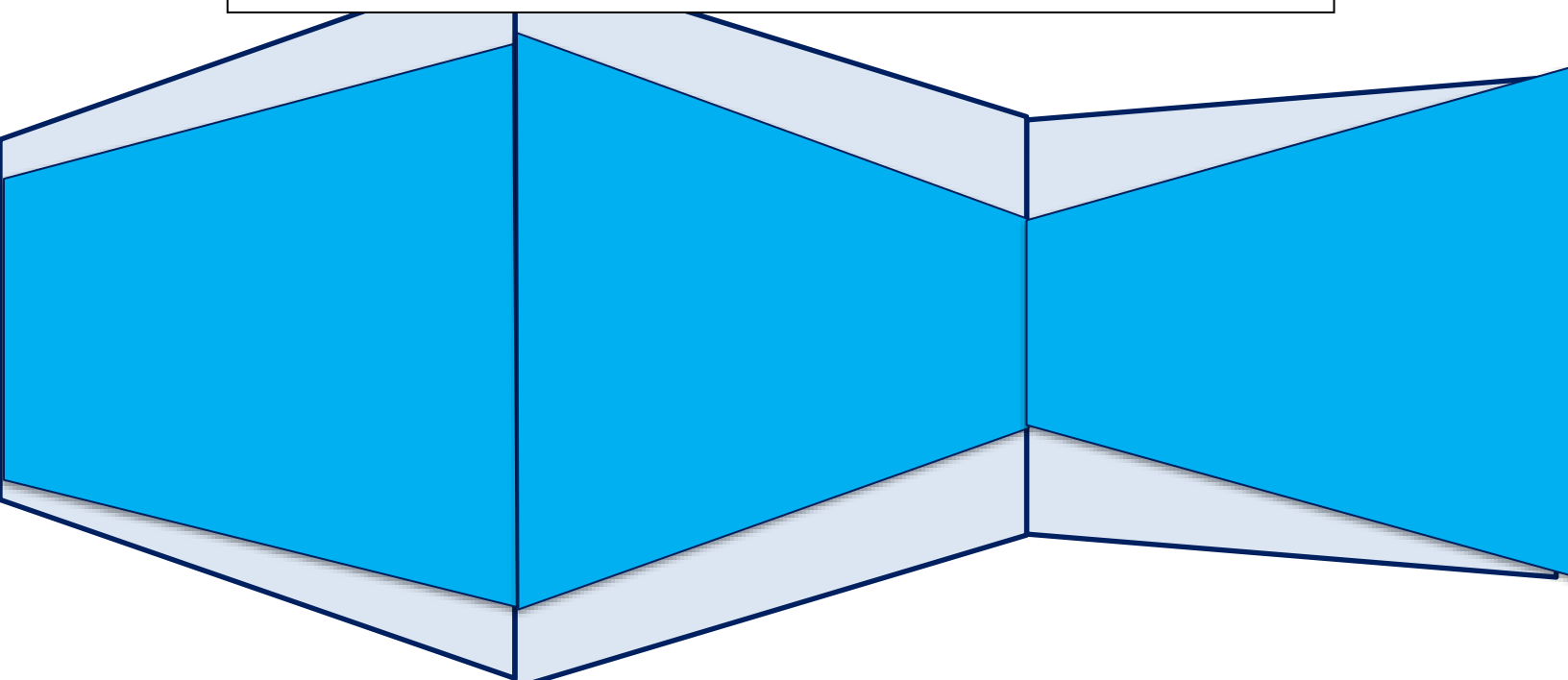
University of Pittsburgh School of Medicine

DEPARTMENT OF OBSTETRICS, GYNECOLOGY, AND REPRODUCTIVE SCIENCES

ANNUAL REPORT – ACADEMIC YEAR 2019

Tatomir, Shannon



DEPARTMENT OF OBSTETRICS,
GYNECOLOGY,
AND REPRODUCTIVE SCIENCES

UNIVERSITY OF PITTSBURGH
SCHOOL OF MEDICINE

ANNUAL REPORT

Academic Year 2019
July 1, 2018 – June 30, 2019

300 Halket Street
Pittsburgh, PA 15213
412.641.4212

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MISSION STATEMENT

The mission of the Department of Obstetrics, Gynecology and Reproductive Sciences is to improve the lives of women through:

- The provision of the highest quality of clinical care for women with complications in pregnancy; gynecologic problems, gynecologic malignancies, infectious disease consultation, infertility and endocrine disorders, genetics consultation and diagnostic ultrasound services.

- The conduct of clinical and basic science research devoted to investigation of the full spectrum of diseases associated with the health of women and infants and the ability to successfully translate these clinical and basic scientific findings into new clinical applications.

- To provide the highest level of education and training to medical students, interns, residents, postgraduate physicians, faculty, private practitioners, and other healthcare providers that is an open-ended continuum with integration of all the subspecialties and to create a highly satisfied professional environment for faculty, staff, and students.

CHAIR'S ADDRESS



Robert P. Edwards, MD

I am happy to report the refinement of UPMC and the Women's Health Service Line across the state of Pennsylvania. We continue to improve our value-driven clinical care and pathway models, as well as, our outcomes reporting system and the development of our physician metrics around cost and quality. Now we are preparing for an alternative payment system in Women's Health.

In addition, we are exploring new ways to use simulation to educate and refresh the skills of our providers from the level of medical students to residents and fellows and to our more senior surgeons who have been out of training for many years. We are investing heavily in population genetics and genomics toward providing genetic services across the Women's Health Service Line.

Expanding Clinical Care

We are actively involved in expanding UPMC quality initiatives across this region and we look forward to working with our colleagues in central and eastern Pennsylvania and surround state partners to further improve the health of women across the commonwealth.

In addition to our expanding clinical role we are renewing our commitment to academic medicine including reinvigorating our career development track and identifying new and promising young medical students and fellows who will be the academic leaders of tomorrow.

We are also exploring new ways to provide care in rural Pennsylvania and looking at advanced practice provider models and specialized training for role of physicians on the challenges of dealing with an under resourced local environment. The department continues to emphasize

the impact our community faculty provide to the quality of care in the state, including the overall patient experience.

Excelling in Research

Our research programs continue to receive national recognition. We are building our spoke and hub model with academic excellence in the core of our department. We have numerous career development junior faculty tracks which we are pursuing to expanding our workforce. New clinical research initiatives around endometriosis and family caregiver support highlight our research portfolio.

We continue to look at the applications of telemedicine and patient home monitoring and telecommunications that will improve patient engagement while studying these initiatives and putting our experiences in developing these cutting-edge technologies into the literature. We are quickly becoming recognized for our excellence in alternative payment models, physician metrics and embracing new technologies to deliver care to patients.

Best regards,



Robert P. Edwards, MD
Milton Lawrence McCall Professor and Chair
Department of Obstetrics, Gynecology and Reproductive Sciences

RECRUITMENTS

FACULTY MEMBER	HIRED
Christine Foley, MD	7/1/2018
Shereen Singer, MD	7/1/2018
Laura Newcomb, MD	7/1/2018
Jennifer Makin, MD	7/1/2018
Hannah Berry, CNM	7/1/2018
Kavita Vani, MD	7/1/2018
Kathleen Ober, MD	7/1/2018
Kavita Vinekar, MD	7/1/2018
Catherine Beecher, MD	8/1/2018
Ali McGregor, MD	8/1/2018
Amaris Yandel, DO	8/1/2018
Allison Serra, MD	9/1/2018
Maureen Hamel, MD	9/1/2018
Spyridon Marinis, MD	9/1/2018
Samia Lopa, PhD	9/1/2018
Lindsay Mastrine, MD	10/1/2018
Meredith Snook, MD	10/1/2018
Judith Albert, MD	10/1/2018
Michael Bashford, MD	11/1/2018
Ralph Aldinger, MD	11/1/2018
Sandra Cascio, PhD	1/1/2019
Diane Adams, DO	1/1/2019
Miguel Brieno-Enriquez, MD, PhD	1/1/2019
Melanie Babcock, PhD	1/1/2019
Marina Opida, MD	4/1/2019
Ronni Getz, CNMW	5/1/2019
Susan Schmidt, CNMW	5/1/2019
Mainpal Rana, PhD	5/1/2019

DEPARTURES

FACULTY MEMBER	DEPARTURE
Ronald Cypher, MD	7/19/2018
Sheila Ramgopal, MD	8/31/2018
Lakshmi Vemulapalli, MD	9/3/2018
Audrey Lance, MD	9/7/2018
Nichole Carlson, MD	9/28/2018
Diane Ichikawa, MD	9/28/2018
Thomas Abraham, DO	9/30/2018
William Dundore, MD	9/30/2018
Kristie Blake, CNMW	10/1/2018
Stephen Corey, MD	12/21/2018
Venkata Dasari, MD	12/22/2018
Mark McCormick, MD	1/31/2019
Neely Nelson, MD	4/30/2019
Joseph Kelley, MD	4/30/2019
Jennifer Stull, MD	5/10/2019
Carey Andrew-JaJa, MD	6/30/2019
Rand Himes, MD	6/30/2019
Renu Joshi, MD	6/30/2019
John Myers, MD	6/30/2019
Daniel Nahhas, MD	6/30/2019
Deborah Pike, MD	6/30/2019
George Rosenberg, MD	6/30/2019
Grace Ferguson, MD	6/30/2019

Department Professional Members

PROFESSORS

Steve Caritis, MD
John Chaillet, MD
Robert Edwards, MD
James Roberts, MD
Richard Guido, MD
Tony Zeleznik, PhD
Sharon Hillier, PhD
Gerald Schatten, PhD
Joseph Kelley, MD
Kathleen McIntyre-Seltman, MD
Halina Zyczynski, MD
Richard Beigi, MD, MSc
Kyle Orwig, PhD
Pam Moalli, MD, PhD
Isabelle Wilkins, MD
Yoel Sadovsky, MD
Devereux Saller, MD
Joseph Sanfilippo, MD
Hyagriv Simhan, MD
Harold Wiesenfeld, MD, CM
Gabriella Gosman, MD

ASSOCIATE PROFESSORS

Yaacov Barak, PhD
Arundhathi Jeyabalan, MD
Suketu Mansuria, MD
Daniel Bellissimo, PhD
Michael Bonidie, MD
Janet Catov, PhD
Timothy Canavan, MD
Tianjiao Chu, PhD
John Comerci, MD
Judy Chang, MD, MPH
Beatrice Chen, MD
Stephen Emery, MD
William Walker, PhD
Beatrice Chen, MD
Carl Hubel, PhD
Jie Hu, MD, PhD
Faina Linkov, PhD
Mellissa Mann, PhD
Phuong Mai, MD
Anda Vlad, PhD
Francesmary Modguno, PhD
Alexander Olawaiye, MD
Dave Peters, PhD
Robert Powers, PhD
Paniti Sukumvanich, MD
Margaret Watt-Morse, MD
Judith Yanowitz, PhD
Alexander Yatsenko, MD, PhD

ASSISTANT PROFESSORS

Sharon Achilles, MD, PhD
Mary Ackenbom, MD
Stacy Beck, MD
Jessica Berger, MD
Katherine Bunge, MD
Serena Chan, MD
Sami Makaroun, MD
Noedahn Copley-Woods, MD
Madeleine Courtney-Brooks, MD
Bonnie Coyne, MD
Judith Albert, MD
Michelle Boisen, MD
Melanie Babcock, PhD
Audrey Lance, MD
Jacob Larkin, MD
Daniel Lattanzi, MD
Megan Bradley, MD
Marie Menke, MD
Jean Francois Mouillet, PhD
Michael Bashford, MD

Nicole Donnellan, MD
Francesca Facco, MD
Maisa Feghali, MD
Sara Sakamoto, MD
Robert Gedekoh, MD
John Harris, MD
Stephen Hasley, MD
Katherine Himes, MD, MS
Heather Hohmann, MD
Xin Huang, PhD
Arundhathi Jeyabalan, MD
Rebecca Waltner-Towes, MD
Colleen Krajewski, MD
Maureen Hamel, MD
Dennis Krivinko, MD
Jennifer Makin, MD
Jennifer Rowland, MD
Carolyn Kubik, MD
Kristiina Parviainen-Yang, MD
Erin Rheinhart, MD
Noah Rindos, MD
Miguel Brieno-Enriquez, PhD
Catherine Chappell, MD
Katherine Scruggs, MD
David Streitman, MD
Paniti Sukumvanich, MD
Sarah Taylor, MD
Glenn Updike, MD
Judith Volkar, MD
Elizabeth Krans, MD
Rosemary Froehlich, MD
Brian Orr, MD
Allison Serra, MD
Meredith Snook,
Meredith Snook, MD

RESEARCH ASSOCIATE PROFESSORS

Bernard Moncla, PhD
Calvin Simerly, PhD

RESEARCH ASSISTANT PROFESSORS

Judith Brands, PhD
Leslie Meyn, PhD
Lara Lemon, PhD, PharmD
Tali Shalom Barak, PhD
Yi Sheng, PhD
Robin Gandley, PhD
Hanna Pulaski, PhD
Sandra Cascio, PhD
Shoumei Bai, PhD
Samia Lopa, PhD

RESEARCH INSTRUCTORS

Carlos Castro, DVM
Mainpal Rana, PhD
Rui Liang, MD

Department Professional Members

CLINICAL FACULTY

Thomas Abraham, MD
Ira Abramowitz, MD
Diane Adams, DO
Janice Agnew, CNM
Judith Albert, MD
Ralph Aldinger, DO
Amy Anderson, MD
Carey Andrew-Jaja, MD
Saima Ashraf, MD
David Badway, MD
Sharon Baer, DO
Linda Barnhart, DO
Francis Bassani, MD
Tiffany Beck, MD
Catherine Beecher, MD
Hanna Berry, CNM
Kristie Blake, CNM
Sandra Blaser, CNM
Draion Burch, DO
Katie Caldwell, CNM
Stacey Jill Carlitz, DO
Kathleen Carroll, MD
Nicole Carlson, MD
Donald Carson, MD
Margaret Chory, MD
Alice Cline, CNM
Robert Collins, MD
Sandra Cooper, CNM
Stephen Corey MD
Melissa Deicas, CNM
Julianne De Martino, MD
Venkata Desari, MD
Preeta Divekar, MD
April Dunmyre DO
Michael England, MD
Eric Fackler, MD
John Fisch, MD
Rocco Fulciniti, MD
James Garver, MD
Ronni Getz, CNM
Lawrence Glad, MD
Katharine Goetz, MD
Roseanne Gichuru, MD
Renata Hoca, MD
Mary Hollis, CNM
Diane Ichikawa, MD
Amy Imro, MD
Renu Joshi, MD
Amanda Kane, CNM
David Earl Kauffman, MD
Andrew Kellerman, MD
Constantine Kralios, MD
Carol Krupski, MD
Carolyn Kubik, MD
Anupama Kotha, MD
Teh-Min Lee, MD
Christine Burke London, CNM
Michael Lupinetti, MD
Tawsufe Majid, MD
Spyridon Marinis, MD
Lindsay Mastrine, DO
Bart Matson, DO
Shannon McCabe, CNM
Mark McCormick, MD
William McGrail, Jr., MD
Julie McKechnie, CNM
Deborah McKee, CNM
Hilary Miaczynski, CNM
Meghan Minnock, DO
Murhaf Naddour, MD
Christine Nagy, MD
Daniel Nahhas, DO
Stephanie Nicholas, MD
Anand Noticewala, MD
Kathleen Ober, MD
Ashley O'Keefe, MD
Marina Opida, MD
Mary Peterson, MD
Dean Pollack, MD
Carla Picardo, MD
Rachel Poerschke, CNM
George Poutous, MD
Raj Rathod, MD
Sheila Ramgopal, MD
Christine Rause, MSN, CRNP
Nicole Rawson, CNM
Gretchen Reinhart, MD
Ira M Rock, MD
Zenaida Rosado, MD
George Rosenberg, MD
Sandra Rygg, MD
Honroe Satcho, MD
Susan Schmidt, CNM
Lydia Schmittell, CNM
Samuel Seiavitch, MD
Elizabeth Seiders, MD
Anne Shaheen, MD
Evan Shikora, MD
Pamela Shirey, CNM
Rachel Sieman, CNM
Suzanne Shores, CNM
Robert Simmonds, MD
Deborah Sommer, MD
Kenneth Spisso, MD
Jacoby Spittler, DO
Jennifer Stull, MD
John Sunyecz, MD
Barbara Sustang Talamo, MD
Lee Ann Swanson, MD
Harati Tatineni, MD
Robert Thomas, MD
Lakshmi Vemulapalli, MD
Samantha Vilano, MD
Tanya Walter, CNM
Nicole Waltrip, MD
Timothy Weibel, MD
Colleen Wells, DO
Deborah Whiteside, MD
Christine Wilson, CNM
Elizabeth Wirth, MD
Jamie Wright, MD
Michele Wright, DO
Laura Wunderly, CNM
Amaris Yandel, MD
Ekaterina Yatsuba, MD

DIVISION OF GYNECOLOGIC SPECIALTIES



Harold C. Wiesenfeld, MD, CM
Division Director

OVERVIEW

The Gynecologic Specialties Division continues its growth and development to support our missions to provide outstanding care to women with gynecologic disorders, advance the science of reproductive medicine and gynecology, and to educate future leaders in Obstetrics and Gynecology.

Divisional highlights of the past academic year (July 2018-June 2019):

- Research including 33 scientific publications and abstracts at national meetings, and funding from government, foundation, and industry sources totaling $5.1 million.
- Teaching of medical students, residents and fellows.
- Clinical care as both primary providers of obstetrics and gynecology services and referral specialists within our areas of sub-specialty.
    - Division members performed 14,928 office visits in the clinical offices of the University of Pittsburgh Physicians
    - 5841 gynecologic surgical procedures were performed
    - 311 office-based procedures
    - Total charges of $13,838,896

RESEARCH PROGRAM

Our Division continues to be extremely productive in research with funding from government, foundation, and industry sources totaling $ 5.1 million. Division members authored 33 peer-reviewed publications and presented several oral or poster abstracts at national meetings.

Dr. Sharon Achilles is principal investigator and co-investigator for multiple research grants awarded by federal, foundation, and industry sponsors. She is the site co-investigator for the Contraceptive Clinical Trials Network (NIH/NICHD) and the Microbicide Clinical Trials Network

(NIH/NIAID) and she is the site principal investigator for the Abortion Clinical Trials Network (Society of Family Planning). She is also an advisor to both the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) with respect to hormonal contraception in women at high risk of HIV acquisition.

Dr. Judy Chang serves as the Program Director for the Clinical Scientist Training Program (CSTP) with the University of Pittsburgh's Institute for Clinical Research Education (ICRE) and as an Assistant Dean of Medical Student Research and the Longitudinal Research Program. She is also the Director of the Mock Grant Review Programs for the ICRE and for the Leading Emerging and Diverse Scientist to Success (LEADS) Program. She is in her second term as the Vice President of Research for the Academy on Communication in Healthcare (ACH) and serves on ACH Research Committee and the planning committees for the 2019 International Conference on Communication in Healthcare and the 2020 ACH Research Forum. She is a co-awardee (PI Dr. Abdeselam Soudi of Linguistics) of one of the Chancellor's Pitt Seed Award intending to expand inter- and cross-disciplinary scholarly collaborations across the University of Pittsburgh Campus and through this worked as a member of the organizing committee for the 2019 Humanities at Work Conference.

Dr. Beatrice Chen is a clinician researcher who is involved in clinical trials on new contraceptive technologies and HIV prevention, funded by government, foundations, and industry. She is a site Principal Investigator and co-investigator on projects within the NIAID Microbicide Trials Network and the NICHD Contraceptive Clinical Trials Network.

Dr. Nicole Donnellan plays an active role in clinical, translational and medical education research. She has investigated patient perspectives on surgical decision-making, occult risk of leiomyosarcoma with fibroids and vaginal cuff dehiscence. She continues to focus her medical education research on the role of coaching to enhance surgical trainee performance in the OR. In addition, she has also established a large prospective registry of endometriosis tissue and collaborates with MWRI investigators regarding the role of the immune system in the pathophysiology of this common and often debilitating disease.

Dr. John Harris is a general obstetrician-gynecologist in the Gynecologic Specialties division. His research at the Magee-Womens Research Institute examines on the impact of the health care system on the health and health care of women with obesity is or has been funded by the Agency for Healthcare Research and Quality, the National Institute on Aging and the National Institute of Child Health and Human Development. He is the works at the Magee-Womens Hospital Center for Women with Disabilities and is Co-Director of Magee-Womens Hospital Ob/Gyn Residency Research.

Dr. Richard Guido has directed groundbreaking clinical research in cervical cancer screening, HPV, and colposcopy. Dr. Guido is also the PI on the Adnexal Cytology Study an intramural NCI-funded study to begin looking for a new early marker for ovarian cancer. His current research activities also include studies and novel therapies for uterine fibroids. He is the director of the Fibroid Treatment Center. He is past President of ASCCP, and is actively involved in developing the next round of management guidelines for abnormal cervical cancer screening tests.

Dr. Harold Wiesenfeld leads several clinical trials on reproductive tract infections in women. He is the Principal Investigator of a Centers for Disease Control and Prevention-funded study examining novel approaches to increasing chlamydia screening in primary care settings. He recently completed a study funded by the Centers for Disease Control and Prevention evaluating the role of *Chlamydia trachomatis* in infertility among U.S. women, and was the Project and Core Leader on a NIH- funded U-19 grant entitled "The UPMC Sexually Transmitted Infections Cooperative Research Center" evaluating the pathogenesis and treatment of acute PID. He has recently completed, as principal investigator, a NIH-funded R01 grant on subclinical PID comparing the impact on fertility of two antibiotic regimens for subclinical PID. Dr. Wiesenfeld is site Principal Investigator of the NIH-funded Sexually Transmitted Infections Clinical Trials Group, and is the site PI of an NIH-funded project evaluating rapid screening of Herpes Simplex Virus in pregnancy to reduce neonatal herpes simplex infections.

Study Sections/Advisory Committee Memberships (2018-2019)

1. Dr. Achilles
    - National Medical Committee, Planned Parenthood Federation of America
    - Faculty Advisor for Magee-Womens Research Institute's CTRC
    - Advisor to the World Health Organization (WHO) regarding hormonal contraception and HIV acquisition risk and Voting Member of the Guidelines Development Group
    - Advisor to the Centers for Disease Control and Prevention (CDC) regarding update to the US Medical Eligibility for Contraceptive Use, 2016: Use of hormonal contraception among women at high risk for HIV infection
    - USAID Project Advisory Committee member for Multipurpose Prevention Technology implant development project
    - Board of Directors – Fellowship in Family Planning (founding member)
    - Nominating Committee Chair for Fellowship in Family Planning Board of Directors
    - Reviewer, NIH/NICHD Special Emphasis Panel/Scientific Review Group (U54 Contraception Research Centers Program)
2. Dr. Chan
    - Education Committee, North American Society for Pediatric & Adolescent Gynecology (NASPAG)
    - Children's Hospital of Pittsburgh Transitional Care Task Force
    - Children's Hospital of Pittsburgh Point-of-care US Standards Committee
3. Dr. Chang
    - Academy for Communication in Healthcare (ACH) Executive Board Member: Vice-President of Research (nominated as President-Elect for 2020)
    - ACH Research Committee
    - Planning Committee for the International Conference on Communication in Healthcare 2019
    - Planning Committee for the ACH Research Forum 2020
    - Advisory Board member for the Kentucky Conference on Health Communication/District of Columbia Conference on Health Communication
    - Planning Committee for the 2019 Humanities at Work Conference

- Poster judge, University of Pittsburgh School of Medicine Medical Scientist Training Program Research Day
- Consultant, Adagio Health Prenatal Smoking Cessation Campaign
- Consultant, Adagio Health Opioid Use During Pregnancy Patient Education Material Development

4. Dr. Chen
   - Scientific Abstract Working Group: Society of Family Planning Annual Meeting
   - Forum Planning Committee and Scientific Abstract Review Committee, North American Forum on Family Planning
   - Committee Member, University of Pittsburgh Institutional Review Board
   - ACOG eModule Advisory Committee Member
   - Merck Contraception Global Advisory Board
5. Dr. Donnellan
   - Social Media Committee, Society of Gynecologic Surgeons
   - ACOG Benign Hysterectomy Episode Grouper Working Group Member
   - MWH Endometriosis Center of Excellence Working Group
6. Dr. Guido
   - Chair, Institutional Review Board, University of Pittsburgh
   - Past President ASCCP
   - Chair, ASCCP Research Committee
   - ASCCP Consensus Guideline Mobile App Developer
7. Dr. Krajewski
   - Board Member, National Campaign to Prevent Teen and Unplanned Pregnancy
8. Dr. Lance
   - Emmi Solutions Medical Advisory Board
9. Dr. Lee
   - American Association of Gynecologic Laparoscopists (AAGL) CME Advisory Committee
   - AAGL Abstract Committee member
   - Executive Committee of Society of Gynecologic Surgeons
10. Dr. Mansuria
    - Member, Education Committee of AAGL
    - Physician Champion for the Patient and Family Centered Care (PFCC) initiative for laparoscopic hysterectomy and same day discharge
    - UPMC Payer Provider Programs Working Group for laparoscopic hysterectomy
    - UPMC Surgeon Reporting Task Force Member
11. Dr. McIntyre-Seltman
    - Advisory Dean, University of Pittsburgh School of Medicine
12. Dr. Peterson
    - Education Committee, North American Menopause Society
    - Scientific Committee, North American Menopause Society
13. Dr. Rindos
    - ACOG National Young Physician at Large
    - ACOG Western PA Young Fellow Representative
    - FMIGS-YAN Co-founder and ex-officio board member
14. Dr. Scruggs
    - Education Committee, North American Menopause Society

15. Dr. Volkar
    - ACOG Committee Coding and Healthcare Economics
    - ACOG Representative to AMA CPT Advisory Committee
    - Co-chair ACOG Benign Hysterectomy Episode Grouper Committee
    - North American Menopause Society Abstract Committee
16. Dr. Wiesenfeld
    - Consultant, 2015 STD Treatment Guidelines, Centers for Disease Control and Prevention
    - Executive Committee- Sexually Transmitted Infections Clinical Trials Group- NIH
    - Executive Committee – AIDS Free Pittsburgh

Editorships

1. Dr. Achilles
    - Editorial Board: *Contraception*
2. Dr. Guido
    - Editorial Board: *Journal of Lower Genital Tract Diseases*
3. Dr. Lee
    - Editorial Board: *Journal of American Association of Gynecologic Laparoscopists*
4. Dr. Mansuria
    - Editor-in-Chief: *SurgeryU (*the online journal for the American Association of Gynecologic Laparoscopists
    - Editorial Board: *Journal of Minimally Invasive Gynecologic Surgery*
4. Dr. McIntyre-Seltman
    - Editor: *Journal of Lower Genital Tract Diseases*
5. Dr. Wiesenfeld
    - Editorial Board: *Sexually Transmitted Diseases*
    - Associate Editor: *Infectious Diseases in Obstetrics and Gynecology*

TEACHING ACTIVITIES

Our Division members maintain a position in academic medicine because of their continued commitment to teaching. All surgically active division members rotate as the Resident Service Attending. We are the primary providers of gynecologic and obstetric teaching in resident continuity clinics.

Dr. Lance, in her role as the Director of the Outpatient Clinic at Magee-Womens Hospital of UPMC, continues to update clinical programming and expand services. Continuity Clinics are a major provider of OB/GYN care in the Western Pennsylvania region, and all members of the Division participate in staffing these clinics. Our faculty devote their clinical time to staffing the Continuity Clinics and are dedicated to providing the highest quality of care to patients in the Outpatient Clinic while providing an excellent learning experience for residents and medical students. In addition to Continuity Clinics, the Division runs specialty clinics in colposcopy (2 sessions weekly), family planning (2 sessions weekly), urgent care (9 sessions weekly), vulvar disease (1 session weekly) and perioperative management (2 sessions weekly).

Our division teaching conferences include:

- Gynecology Conference—Monday morning 0715-0815: a two-segment conference with alternating weeks:
  - A 30 minute evidenced-base 3rd year resident presentation with assigned topics based on a weekly curriculum followed by a 30 minute clinical presentation of patients and treatment decisions by the Senior resident on the University Gynecology service.
  - A 45 minute lectures by a Family Planning fellow, a Minimally Invasive Surgery fellow or a Reproductive Infectious Disease fellow followed by a 15 minute clinical presentation of patients and treatment decisions by the Senior resident on the University Gynecology service.
- Colposcopy Conference—Monday morning 0815-0900: weekly review of colposcopic pattern recognition and cytology-histology-colposcopy correlation.
- Teaching rounds: the attending on service provides teaching rounds every Monday, Wednesday and Friday morning at 0630. Monday am is focused on cases or issues from the weekend or left over from the prior week. Wednesday and Friday am sessions focus on the topic of the week.

Residency Rotations

	PGY
University Gynecology	4th, 3rd, 2nd, 1st
Family Planning	4th
Special Clinics (colposcopy and pre-op clinics)*	4th
Minimally Invasive Surgery	4th
Gynecology Consultation	2nd
Urgent Care Gynecology	1st
Ambulatory Gynecology	4th, 1st

* also attends private office hours in Midlife Health Center for teaching related to the care of menopausal patients

Medical Student Education

Medical Student education is also a priority. All division members participate as faculty preceptors for Problem Based Learning sessions during the 3rd year Clerkship in Obstetrics and Gynecology which is directed by Dr. Heather Hohmann. Our faculty, led by educational leaders Drs. Hohmann and Lance, ensure a high-quality learning experience to medical students assigned to the Outpatient Clinic. Students also rotate in the faculty practice (University of Pittsburgh Physicians) working one on one with faculty. Many of the faculty participate in courses throughout the main medical school curricula and special programs such as the Clinical Scholars Training Program.

Medical Student Education leadership

2nd year Reproductive Biology Course: Nicole Donnellan, MD, course co-director

4th year Obstetrics and Gynecology electives: Richard Guido, MD, director

→ Electives offered within our division: research, Independent private practice, University Gynecology, Minimally Invasive Surgery, Family Planning

4th year Reproductive Infectious Disease ILS Course: Harold Wiesenfeld, MD, CM, course director
4th year Pelvic Anatomy ILS Course: Suketu Mansuria, MD, course director
4th year Women's Health Elective: Kathleen McIntyre-Seltman, MD, clerkship co-director
4th year Family Planning Elective: Beatrice Chen, MD, director
4th year Minimally Invasive Gynecologic Surgery Elective: Ted Lee, MD, director
4th year Ambulatory Gynecology Elective: Harold Wiesenfeld, MD, director

Dr. Judy Chang is an Associate Dean of medical student research recognizing her many years of dedication and commitment to medical student research.

Dr. McIntyre-Seltman is an elected member of the University of Pittsburgh Academy of Master Educators, and an Advisory Dean in the Student Affairs Department of the Medical School, overseeing advancement of medical students throughout their curriculum.

Professional Affiliations

1. **Dr. Achilles**
   - Member, European Society of Contraception and Reproductive Health
   - Member, American Society for Reproductive Immunology
   - Member, Society of Family Planning
   - Member, National Abortion Federation
   - Member, American Sexually Transmitted Diseases Association
   - Member, Association of Reproductive Health Professionals
   - Member, International Union Against Sexually Transmitted Infections
   - Fellow, American College of Obstetricians and Gynecologists (ACOG)
   - Member, Infectious Disease Society of Obstetrics & Gynecology (IDSOG)
   - Member, National Peace Corps Society
   - Mentor, National Research Mentoring Network
2. **Dr. Chan**
   - Fellow, ACOG
   - Member, North American Society for Pediatric & Adolescent Gynecology
   - Member, American Society for Reproductive Medicine
   - Member, American Association of Gynecologic Laparoscopists
3. **Dr. Chang**
   - Fellow, ACOG
   - Member, American Professors of Obstetrics & Gynecology
   - Member, Academy Health
   - Member, American Public Health Association
   - Member, American Academy on Communication in Health Care
   - Member, Society of Gynecologic Investigation
   - Member, American Balint Association

4. **Dr. Chen**
   - Fellow, ACOG
   - Fellow, Society of Family Planning
   - Member, Association of Reproductive Health Professionals
   - Member, National Abortion Federation
5. **Dr. Donnellan**
   - Fellow, ACOG
   - Member, American Association of Gynecologic Laparoscopists
   - Member, Association of Professors of Obstetrics and Gynecology
   - Member, Society of Gynecologic Surgeons
   - Member, ACOG Benign Hysterectomy Episode Grouper Working Group Member
   - MWH Endometriosis Center of Excellence Working Group
6. **Dr. Guido**
   - Fellow, ACOG
   - Member, Association of American Gynecologic Laparoscopists
   - Fellow, American Society for Colposcopy & Cervical Pathology
7. **Dr. Harris**
   - The Obesity Society
   - Academy Health
8. **Dr. Hohmann**
   - Fellow, ACOG
   - Member, APGO
9. **Dr. Imro**
   - Fellow, ACOG
   - Member, North American Menopause Society
10. **Dr. Krajewski**
    - Member, ARSM
    - Member, National Abortion Federation
    - Fellow, ACOG
11. **Dr. Lance**
    - Member, Society for Family Planning
    - Fellow, ACOG
    - Member, ASRM
    - Member, National Abortion Federation
    - Member, Physicians for Reproductive Health
    - Member, Forum on Family Planning Scientific Review committee
12. **Dr. Lee**
    - Fellow, ACOG
    - Member, American Association of Gynecologic Laparoscopists
    - Member, American Urogynecologic Society
13. **Dr. Mansuria**
    - Fellow, ACOG
    - Member, American Association of Gynecologic Laparoscopists
    - Member, Society of Laparoendoscopic Surgeons
14. **Dr. McIntyre-Seltman**
    - Fellow, ACOG

- Member, Alpha-Omega-Alpha (AOA) Medical Honor Society
- American Society for Colposcopy and Cervical Pathology
- Association of Professors of Gynecology and Obstetrics

15. Dr. Rindos

- Fellow, ACOG
- Member, AAGL
- Member, Gold Humanism Honor Society

16. Dr. Scruggs

- Fellow, ACOG
- Member of North American Menopause Society

17. Dr. Peterson

- Fellow, ACOG
- Member, North American Menopause Society
- Member, NAMS Education Committee
- Member, North American Menopause Society Education Committee

18. Dr. Updike

- Fellow, ACOG
- Member, American Society for Colposcopy and Cervical Pathology
- Member, National Vulvodynia Association

19. Dr. Volkar

- Fellow, ACOG
- Member, North American Menopause Society
- Member International Society for the Study of Women's Sexual Health
- Member American Association for Physician Leadership
- Member AMA

20. Dr. Wiesenfeld

- Fellow, ACOG
- Member, Infectious Diseases Society for Obstetrics and Gynecology (IDSOG)
- Member, American STD Association
- Member, Infectious Diseases Society of America
- Member, Royal College of Physicians and Surgeons of Canada

FELLOWSHIPS

The Division offers fellowships in Family Planning, Minimally Invasive Surgery and Reproductive Infectious Diseases. Our faculty also contributes to the teaching of fellows and junior faculty in other University departments, including the Women's Health fellows from the Department of Medicine. Additionally, Dr. Chang serves as a core faculty member of the Center for Research in Health Care where she has co-developed and co-teaches a fellow/junior faculty level course on Qualitative Research Methods.

The ***Family Planning Fellowship*** is a two-year program designed to include training in family planning clinical care, experience in gynecologic surgery and related family planning procedures, participation in the design and performance of clinical trials and international field work. During

the two years, the fellow is encouraged to complete course work at the Graduate School of Public Health at the University of Pittsburgh to satisfy the requirements of a Master's Degree in Public Health. Course work can involve a multidisciplinary approach or a departmental curriculum including biostatistics, epidemiology and health care administration. The program is intended to foster the pursuit of an academic career by overall emphasis on and preparation for clinical research and teaching. Fellows are specifically trained in contraceptive counseling, contraceptive implant insertion and removal, IUD insertion and removal, and the fitting of diaphragms. Additionally, fellows gain expertise in treating complications of hormonal contraception. Although these procedures may have been learned during residency, a concentrated experience will enable the fellow to be proficient with unusual or complicated cases. Fellows receive specialized training and become very experienced in performing first trimester procedures including manual vacuum aspiration and medical abortions. Fellows will have similar experience with second trimester abortions by dilation and evacuation (D&E). The fellows are an active participant in ongoing trials as well as be expected to design and conduct his/her own research trial. Fellows also gain experience in grant writing, budgeting, contracts, and other administrative aspects of clinical research. Fellows are also expected to spend time working in the developing world on advances in contraception and access to care. This international experience is designed to further the fellow's understanding of issues related to the impact of high fertility rates and poor access to reproductive health services for contraception and pregnancy care. Three-year programs are available for individuals with an additional interest in Reproductive Genetics or Reproductive Infectious Disease.

The ***Minimally Invasive Surgery Fellowship*** is a two-year intense academic training program which focuses on minimally invasive surgery. The program is designed to provide extensive training in endoscopic surgery from the gynecologic and general surgical perspectives. During the two years, the fellow is encouraged to complete course work at the Graduate School of Public Health at the University of Pittsburgh to satisfy the requirements of a Master's Degree in Public Health. Course work can involve a multidisciplinary approach or a departmental curriculum including biostatistics, epidemiology and health care administration. A research project is an integral part of the program with the expectation that it is submitted at a national level and published in a peer-reviewed journal. Other activities include active participation in resident and student teaching programs and private patient sessions.

The ***Reproductive Infectious Diseases Fellowship*** is a two-year program designed to train obstetrician gynecologists in the clinical care of women with complex infections of the reproductive tract. The fellows receive intensive training on both inpatient units and outpatient settings, mastering the management of common and less-common reproductive tract infections including complex vaginitis, pelvic inflammatory disease, pelvic infections following surgery, hospital-acquired infections, and obstetrical infections. Trainees gain experience in the management of HIV-positive women in collaboration with members if the Division of Infectious Diseases in the Department of Medicine. The fellowship includes training on antimicrobial management and pharmacology. A large proportion of the fellowship is devoted to training in

clinical and translational research, with the goal of designing and completing a research project during the fellowship. Fellows are required to complete postgraduate coursework in research design and methods, statistics, and many fellows successfully complete a Master's degree in Public Health or Clinical Research.

CLINICAL PROGRAMS

The main clinical location is located at Magee-Womens Hospital with an office suite on the zero level that focuses on general and specialty gynecologic services and an office on the 5th floor that focuses on midlife health. We have satellite clinical offices across the region. Dr. Chang primarily sees patients in the Montefiore General Internal Medicine offices. Dr. Guido directs the Fibroid Treatment Center, a collaborative program with Department of Radiology. In addition to gynecologic care, Drs. Wiesenfeld, Harris, Makin and Updike also have a busy obstetric practice. The Midlife Health Center, under the direction of Dr. Mary Beth Peterson, provides comprehensive care to women approaching or within the menopausal transition. Dr. Peterson and her associates Drs. Katherine Scruggs, Amy Imro, and Judith Volkar provide state-of-the-art care to women and offer advanced diagnostic and treatment options with the goal of optimizing women's health in the menopausal transition and beyond. Residents, fellows, medical students and other students of the health sciences are integrated into our offices for subspecialty education.

The Division continues to maintain surgical volumes as we serve as a referral service for women with complex gynecologic disorders. There were 14,928 patient visits to members of the Division in the University of Pittsburgh Physician offices. Our division members performed 5841 surgical procedures in the operating room. In addition, we performed over 311 surgical procedures in our office. We continue to have an open access schedule into our office to maximize the availability of our specialists for new and return problem visits. A new patient with a problem can see a physician in our practice within 3 business days.

We continue to provide specialty and subspecialty consultations for gynecologic services to primary care physicians, specialists and other clinicians in the greater Western Pennsylvania region and beyond. Members of the division are nationally and internationally recognized for their expertise in gynecologic specialties.

Outreach/contracted care:

Veteran's Administration Hospital Women's Health Services: Dr. Colleen Krajewski and Dr. Kathy Scruggs

Planned Parenthood of Western Pennsylvania: Dr. Beatrice Chen (Medical Director), Dr. Sharon Achilles (Laboratory Director), Dr. Colleen Krajewski, Dr. Audrey Lance

Allegheny County Health Department: Dr. Harold Wiesenfeld—Director, STD Program

Magee-Womens Hospital Outpatient Clinical Services: Dr. Audrey Lance – Director (until 9/18, Jennifer Rowland 1/19)

Magee-Womens Hospital Women with Disabilities Clinic: Dr. John Harris
Magee-Womens Hospital Mt. Oliver Clinic: Dr. Heather Hohmann, Dr. Margaret Watt-Morse
General Internal Medicine Comprehensive Women's Health Clinic (Montefiore): Dr. Judy Chang

Specialties:

Sharon Achilles, MD, PhD	Family Planning, Reproductive Infectious Diseases
Serena Chan, MD	Adolescent Gynecology
Judy Chang, MD, MPH	Domestic Violence, Health Services Research
Beatrice Chen, MD, MPH	Family Planning
Nicole Donnellan, MD	Minimally Invasive Surgery
Robert Gedekoh, MD	Ambulatory obstetrics and gynecology
Richard Guido, MD	Minimally Invasive Surgery, Cervical Dysplasia, Pediatric Gynecology
John Harris, MD	Population Health, Health Services Research
Heather Hohmann, MD, MPH	Family Planning
Amy Imro, MD	Menopause and Midlife Health
Colleen Krajewski MD, MPH	Family Planning
Audrey Lance, MD, MS	Family Planning
Jennifer Makin, MD	Global Health
Ted Lee, MD	Minimally Invasive Surgery, Pelvic Pain management
Suketu Mansuria, MD	Minimally Invasive Surgery
Kathy McIntyre-Seltman, MD	Cervical Dysplasia, Vulvar Disease
Mary Beth Peterson, MD	Menopause and Midlife Health
Katherine Scruggs, MD	Menopause and Midlife Health
Glenn Updike, MD	Vulvar Disease, Community Medicine
Judy Volkar, MD	Menopause and Midlife Health
Harold Wiesenfeld, MD, CM	Reproductive Infectious Diseases, Vulvar Disease

Faculty

Harold Wiesenfeld, MD, CM - Director
Sharon Achilles, MD, PhD
Serena Chan, MD
Judy Chang, MD, MPH
Beatrice Chen, MD, MPH
Nicole Donnellan, MD
Robert Gedekoh, MD
Richard Guido, MD
John Harris, MD
Heather Hohmann, MD, MPH
Amy Imro, MD
Colleen Krajewski, MD, MPH
Audrey Lance, MD, MS
Jennifer Makin, MD
Ted Lee, MD
Suketu Mansuria, MD
Kathy McIntyre-Seltman, MD
Mary Beth Peterson, MD
Katherine Scruggs, MD
Glenn Updike, MD
Judy Volkar, MD
Margaret Watt-Morse, MD
Harold Wiesenfeld, MD, CM
Kim Barcaskey, CRNP
Kim Berkhoudt, CRNP

Cindy Kennedy, MSN, RN (Division Administrator)

Fellows

Family Planning
Grace Ferguson, MD
Kavita Vinekar, MD

Minimally Invasive Surgery
Ann Peters, MD
Christine Foley, MD
Laura Newcomb, MD

WEBSITE: http://obgyn.medicine.pitt.edu/gynecology

DIVISION OF GYNECOLOGIC ONCOLOGY



Madeleine Courtney-Brooks, MD
Division Director

Overview

The Division of Gynecologic Oncology continues its development to support our missions to provide compassionate and comprehensive care to women with gynecologic malignancies, enhance the field through basic science, translational and clinical research, and train the next generation of healthcare providers by mentoring medical students, advanced practice providers, residents and fellows in all aspects of patient and family centered care. During the academic year of 2018-2019, there was robust clinical activity, growth of our research agenda and refinements of our educational commitment.

Our core clinical group consists of ten full time gynecologic oncologists, two medical oncologists, three PhDs and a support staff of approximately 40 individuals. We are based at Magee-Womens Hospital of UPMC and provide outreach services throughout southwestern Pennsylvania. Offices and surgical services are offered at Magee Womens Hospital of UPMC, UPMC Passavant Hospital, UPMC Hamot, UPMC Altoona and UPMC Susquehanna. We also offer outpatient appointments at sites throughout western Pennsylvania including at UPMC facilities in Bethel Park, Butler, Cranberry, Johnstown, Shadyside, Uniontown, Farrell and Irwin, Pennsylvania. We continue to adjust our vision to align with the region's health care environment, with future emphasis on increasing our presence in the South Hills region of Pittsburgh.

The research agenda is multi-dimensional and includes, molecular profiling of gynecologic cancers, targeted therapy for treatment of these cancers in the upfront, maintenance and recurrent setting, outcomes and safety directed studies and use of immunotherapy in the treatment of gynecologic malignancies.

Basic science and translation research in women's cancer is enhanced through our collaborative efforts with scientists in the Women's Cancer Research Center, the Magee Womens Research Institute, and the Hillman Cancer Center. Our faculty work closely with the medical oncology group at the Hillman Cancer Center to provide access to cutting edge phase I trials. Phase II and III clinical trials are active throughout

the UPMC Cancer Center network from both the NRG Oncology Cooperative Group as well as industry supported and investigator-initiated trials. Division members are active on committees within the NRG and have raised our national presence.

The Women's Cancer Research Center under the guidance of Dr. Adrian Lee and Steffi Oesterreich has broadened the research efforts in both gynecologic and breast malignancies. Two senior clinician scientists, Drs. Ronald Buckanovich and Lan Coffman, joined our division in 2016, having joint appointments in the divisions of gynecologic oncology and medical oncology and have added a strong basic science research component to the division.

The division remains focused on its academic mission to include the education of the next generation of health care providers. To that end, the division has been active in both didactic and bedside teaching of medical student, residents and fellows. Members of our faculty provide minimally invasive surgery simulation training for the residency program. Our fellowship program is approved by the American Board of Obstetrics and Gynecology. Our educational efforts have been recognized with several of the faculty receiving teaching awards. Emphasis on our educational mission is considered necessary for academic promotion.

RESEARCH PROGRAM

The research program was extremely productive with a wide variety of clinical, translational and basic science studies. The research activities of the division are multifaceted and well funded. The division produced 24 scientific publications and numerous presentations at regional and national meetings.

The division has received a grant for a Specialized Programs of Research Excellence (SPORE) award for ovarian cancer in 2014. This SPORE promotes collaborative, interdisciplinary translational cancer research and the grant involves both basic and clinical/applied scientists and support projects that will result in new and diverse approaches to the prevention, early detection, diagnosis and treatment of this disease. Dr. Edwards serves as Co-PI for this exciting project and coordinates the program with his counterpart at the University of the State of New York, Buffalo. There is a special emphasis on immunologic approaches to this disease entity.

The division faculty has expanded collaborations with our colleagues at the Magee-Womens Research Institute (MWRI) and the University of Pittsburgh Cancer Institute (UPCI). Drs. Buckanovich and Coffman are both physician scientists actively conducting laboratory based and translational research and maintaining a specialized clinical practice focused on the medical treatment of ovarian cancer. Their addition has greatly enhanced the mentorship efforts within the division for our residents, fellows and junior faculty.

The division is a principle member of the Gynecologic Oncology Group division of NRG Oncology, a national non-profit organization dedicated to clinical and translational research in the field of gynecologic cancers. Dr. Alexander Olaiwaye serves as the Principle Investigator for these trials within our network. The mission of the GOG division is to enhance the treatment of gynecologic cancer through research encompassing surgery, chemotherapeutic intervention, radiation therapy, pathology, immunology, outcomes research, and gynecologic nursing. The organization receives support from the National Cancer

Institute. The Gynecologic Oncology Group has a long history of establishing treatment standards for ovarian and endometrial cancer. Currently, over 3,300 patients are registered per year on its research trials. In the academic year 2018-2019 the division had an average of 23 clinical trials open and available for patient accrual. The disease sites include ovarian, uterine, cervical, vaginal and vulvar carcinomas and gestational trophoblastic disease.

An active tissue procurement program exists on site at Magee Womens Hospital. This has been matched with an active informatics base and serves as a resource for investigators with the University of Pittsburgh Medical Center.

Research interests of our faculty are listed below:

Dr. Jessica Berger's research interests include the impact of chemotherapy on reproductive health and fertility-preservation options for reproductive age women undergoing gynecologic cancer treatment. She is also interested in clinical outcomes research in vulvar cancer patients and is collaborating to create a multi-institutional database to facilitate clinical investigation for this rare cancer.

Dr. Michelle Boisen is a clinician educator who was instrumental in the creation and implementation of Enhanced Recovery After Surgery (ERAS) protocols for Gynecologic Oncology patients throughout the system. She also participated in the ASCO Quality Training Program and in collaboration with colleagues in the school of nursing and has recently presented data regarding integrating family caregiver support into a gynecologic oncology practice.

Dr. Ronald Buckanovich's research focuses on the study of cancer stem-like cells (CSCs) which may be responsible for ovarian cancer metastasis, chemotherapy resistance and ultimately disease recurrence. His laboratory is now studying the factors which regulate these CSCs including regulators of asymmetric division and quiescence. His laboratory has identified two novel compounds which directly target cancer stem cells; one which blocks the ability of these cells to metastasize, and a second which selectively kills the cancer stem-like cells. Both of these drugs are now being developed for first in human clinical trials

Dr. Lan Coffman's research focuses on understanding and targeting the cancer supporting stromal tissues which are critical to the survival, growth and spread of ovarian cancer. Specifically, Dr, Coffman's lab studies a critical non-malignant component of the ovarian cancer microenvironment, the carcinoma-associated mesenchymal stem cell (CA-MSC). CA-MSCs are stromal progenitor cells which significantly increase cancer growth, enrich the cancer stem cell pool and increase chemotherapy resistance. The lab studies how CA-MSCs are formed and develop tumor supporting properties. The lab also focuses on identifying important tumor cell:CA-MSC interactions which mediate CA-MSC's pro-tumorigenic functions and have potential for translation into new therapeutic targets. Additionally, the lab studies how CA-MSCs impact the development of ovarian cancer metastasis and the metastatic microenvironment. The ultimate goal of this research is to translate novel laboratory findings into powerful therapeutic approaches for the prevention and treatment of ovarian cancer.

Dr. John Comerci's research interests include optimizing use of healthcare resources and efficiency within large healthcare systems. Recent projects include an examination of super-utilization of healthcare resources among gynecologic oncology patients.

Dr. Madeleine Courtney-Brooks' research includes optimizing care for elderly gynecologic oncology patients and quality improvement projects examining optimization of the peri-operative care of gynecologic oncology patients. In the past several years, she has helped design and implement Enhanced Recovery After Surgery (ERAS) programs for gynecologic oncology patients undergoing both minimally invasive and open surgeries. Multiple studies examining the impact of these initiatives are now underway.

Dr. Robert Edwards research interests include cervical and ovarian malignancies and three specific targets of his research are vaccine therapies for cervical and ovarian cancer, combining biologic and immunologic therapies with traditional therapies in the treatment of women's cancer and intraperitoneal therapy. He has an active translational science lab and is also the PI of several investigator initiated clinical trials including one examining systemic immune checkpoint blockade and intraperitoneal chemo-immunotherapy in recurrent ovarian cancer.

Dr. Faina Linkov is an epidemiologist whose research focus is the identification of blood-based and tissue-based biomarkers associated with the development of endometrial cancer. Her group is examining premalignant endometrial changes associated with obesity in conjunction with weight loss through bariatric surgery or behavioral means to determine if there is a correlation with the normalization of tissue-based or blood-based biomarkers associated with obesity linked cancers. In addition to the biological basis of obesity and its link to cancer, her group is also exploring the contribution of biobehavioral factors (including depression, sleep, and quality of life) to cancer risk. Current research activities also include investigation of tumor microenviroment, including evaluation of adipose derived stem cells in endometrial cancer patients.

Dr. Francesmary Modugno is a molecular epidemiologist whose research focuses on the relationship between host factors and the molecular mechanisms underlying risk and survival in ovarian, endometrial and breast cancers. The goal of her work is to 1) identify individuals at an increased risk for these cancers, and among women with these cancers, identify those at an increased risk for recurrence or poor prognosis; 2) identify targets for prevention/screening efforts for both primary prevention and prevention of recurrence; and 3) provide feedback to basic scientists to further elucidate the underlying molecular mechanisms of disease.

Dr. Alexander Olawaiye has multiple clinical research interests and is currently investigating novel therapies for advanced ovarian, endometrial and cervical cancers. He serves as the site PI for our national cooperative clinical trials and serves as the primary investigator for several industry sponsored trials as well. He is active in numerous national and international organizations including the Society for Gynecologic Oncology and the International Federation of Gynecology and Obstetrics. In 2018, he served on the steering committee for the SGO Annual Meeting on Womens Cancer.

Dr. Brian Orr is an early career Gynecologic Oncology faculty who is active in research and clinical trial development. Drs. Edwards, Vlad, and Orr co-developed and opened earlier this year, a phase II investigator initiated clinical trial with clinical and translational investigation of incorporating immunotherapy in ovarian cancer. He has also become active this year in our cooperative group trials and is the site PI on one trial with 2 more in regulatory stages. He is the PI on joint venture with the UPMC Immune Transplant and Therapy Center (ITTC) and Helomics Company investigating machine learning artificial intelligence to build prediction models in ovarian cancer using clinical data and genomic profiling. He is in his last year of study for a Master of Science in Clinical and Translational Science at the University of Pittsburgh Institute for Clinical Research Education where his thesis involves translational ovarian cancer work on the tumor immunologic microenvironment that has been investigating the tumor reactivity and profile of patient-derived and expanded ovarian cancer tumor infiltrating lymphocytes.

Dr. Paniti Sukumvanich's research interests' focuses on outcomes based research utilizing large national databases to examine the role of surgery and chemotherapy in various types of gynecologic cancers. Other areas of interest include the role of chemotherapy in low-grade ovarian cancers, sequencing of radiation and surgery in endometrial cancer as well as finding factors that may improve quality of care in gynecologic oncology patients. He also has a special interest in development of an electronic database infrastructure for clinical research in gynecologic oncology.

Dr. Sarah Taylor's interests center on the development and implantation of early phase gynecologic oncology clinical trials. During the most recent academic year, she has been awarded an American Society of Clinical Oncology (ASCO) Conquer Cancer Career Development Award and has also been accepted into the Women's Reproductive Health Research (WRHR) Training Program at Magee Womens Research Institute at the University of Pittsburgh. She is responsible for multiple investigator initiated clinical trials including a Phase IIA trial of delayed initiation of olaparib maintenance therapy in platinum sensitive recurrent ovarian cancer

Dr. Anda Vlad's research explores mechanisms of disease pathogenesis and immune surveillance in ovarian cancer and precursor lesions, and tests novel preventive and therapeutic approaches using a combination of highly versatile preclinical models and clinical specimens. Her investigations have focused on have focused on immuno-oncology using either vaccines (MUC1), immune biologics (Interleukin-2) or immune checkpoint blockade (anti-PD-L1). Results from our phase II trial of intraperitoneal IL-2 in patients with platinum-resistant or platinum-refractory ovarian cancer show positive correlation between IFNγ- secreting CD8 T cells at early time points and survival. Our work provides important evidence for IP IL-2 in platinum-resistant ovarian cancer and identifies several immune correlates of survival. Via collaborations with clinicians at Magee-Womens Hospital of UPMC, the lab is working on identifying mechanisms of early ovarian carcinogenesis from cancer precursor lesions.

Select examples of funding obtained by division members in the last year:

Bob Edwards and Anda Vlad received a 2-year, $998,000 grant from Merck entitled, "Systemic Immune Checkpoint Blockade and Intraperitoneal Chemo-Immunotherapy in Recurrent Ovarian Cancer"

Anda Vlad received a 2-year, $385,000 grant from the Dept of Defense (DOD) entitled, “Ovarian Cancer Therapy via Conditional STING Pathway Activation”

Ron Buckanovich and Anda Vlad received a 2-year, $140,000 grant from the UPMC Hillman Developmental Funding Program entitled, “ALDH Inhibition as Modulator of Tumor Immunobiology”

Ron Buckanovich received a 3-year, $900,000 grant from the Ovarian Cancer Research Alliance entitled, “Targeting Tumor Desmoplasia to Enhance Immunotherapy”

Alexander Cole in Ron Buckanovich’s lab also received a 1-year, $75,000 grant from the Ovarian Cancer Research Alliance entitled, ““Investigating Regulators of Quiescence in Epithelial Ovarian Cancer”

TEACHING ACTIVITIES

The division members are dedicated to the education of health care providers. Teaching for the division includes the following group of individuals:

- Gynecologic Oncology fellows
- Residents in Obstetrics, Gynecology and Women’s Health Sciences
- University of Pittsburgh and Chatham College Physician Assistant and Nurse Practitioner Programs
- Medical students of the University of Pittsburgh
- Visiting Surgical Oncology Fellows
- Visiting Medical Oncology Fellows

Teaching activities occur in didactic lecture setting, in small problem-based learning groups, in outpatient offices, the inpatient wards, and in the operating room. Education centers around the pathophysiology, diagnosis and therapeutic interventions of gynecologic malignancies. The faculty members emphasize preoperative and postoperative management as well as surgical technique. Special attention is taken to expose the trainees to the nuances of patient-physician communication with an emphasis on discussing the delivery of difficult and unexpected news.

Formal educational events include:

Tumor Board - weekly multi-disciplinary conference focusing on patient management issues and current trends in gynecologic oncology. Individuals within the subspecialties of gynecologic oncology, medical oncology, radiation oncology, radiology, and pathology attend. Clinical dilemmas, controversial, and unusual patient cases are selected by the oncology team and discussed by the participants. Radiographic and pathologic findings are correlated with the clinical findings. The attendees discuss plans of management and correlate this with published recommendations, available pathways from the National Comprehensive Cancer Network and review available evidence to support the chosen approach. This conference allows for discussion of different approaches to the diagnostic dilemmas and challenging management questions encountered in gynecologic oncology. Representatives from our clinical trials program are in attendance and each presented case is assessed for availability of possible clinical trials.

Didactic Lecture Series - weekly lecture series covering topics in the field. Presentations are given by the attending staff and colleagues in other subspecialties to enhance the educational experience of the attendees. The lecture series has been designed to meet the needs of both the residency and fellowship program expectations. The Guideline to Learning in Gynecologic Oncology, published by the American Board of Obstetrics and Gynecology, serves as a reference for core knowledge for our fellows in the field. The Gynecology and Gynecologic Oncology Prolog series published by the American College of Obstetrics and Gynecology and the Council on Resident Education in Obstetrics and Gynecology (CREOG) tests serve as a frame of reference for expected knowledge for our residents.

Journal Club – Held every six to eight weeks to discuss timely and controversial topics in the field of Gynecologic Oncology. An attending physician and the senior fellow moderate the session. A PowerPoint® presentation comparing the outcomes of the studies presented provides a quick reference for all attendees.

Gynecologic Oncology Patient Safety Conference - Occurs every six to eight weeks on Friday morning. All available residents, fellows and attendings participate as adverse and challenging outcomes are discussed. Patient safety initiatives are among the outcomes of this session.

VitalTalk© Workshop – held every few years as needed to ensure all of the faculty, fellows in gynecologic oncology and advanced practice providers who had not previously participated, completed a 2-day intensive practice-based communication skills training workshop in the VitalTalk© model. It was developed and facilitated by a team of palliative care and gynecologic oncology providers from across the country and is the first of its kind focused on gynecology oncology providers to our knowledge. The content focused on skill development in giving serious news, responding to emotion, handling conflict, and discussing goals of care with patients and families.

Residency Rotations	PGY
Magee Gynecologic Oncology Service	4th, 3rd, 2nd, 1st
Passavant Gynecologic Oncology Service	2nd
Ambulatory Gynecology	2nd – as needed based on res. interest
Career Development	4th – as needed based on res. interest

Fellowship Program

The division has an American Board of Obstetrics and Gynecology (ABOG) as well as an ACGME approved fellowship in gynecologic oncology. The program is 3 years in duration. The program admits two candidates per year with a yearly total complement of 6 individuals. Fellows have research training to include participation in the core Clinical Research Training Program. Fellows will gain exposure to NIH-funded trials through the NRG Oncology Group (GOG), the SPORE initiatives and many other ongoing clinical and basic research projects. Clinical training is enhanced by active multidisciplinary collaboration

with the Departments of Obstetrics and Gynecology, General Surgery, Radiology, Critical Care Medicine, Internal Medicine, Radiation Oncology, Supportive and Palliative Care and Surgical Oncology. The fellowship underwent an ACGME site review in the fall of 2018 and was granted continue accreditation for four years.

Recent additions to our education program include Chemotherapy School, Surgery School and a Stump the Professor program. Dr. Sukumvanich has been instrumental in the development of both the Chemotherapy and Surgery School. Chemotherapy school has been added to the didactic lecture series whereby a faculty member presents a specific disease site and reviews the chemotherapy options for both primary and recurrent disease. Sentinel studies are cited, and the program is recorded for review.

Surgery School uses a combination of didactic lectures and cadaver dissections to emphasis surgical anatomy and technique. Senior faculty are involved in the program at the Wiser Simulation Center.

The Stump the Professor series has been developed by the Junior Faculty and involve case presentations disseminated by email and then discussed before our weekly tumor board. During the discussion, the faculty discuss their individual approaches to the situation with the goal of the session to prepare our fellows for their oral boards.

CLINICAL PROGRAM

The clinical division is now composed of 10 gynecologic oncologists and two medical oncologists. This rapid expansion has allowed us to improve access to care for women of Western Pennsylvania for treatment of gynecologic malignancies. The faculty is energized and dedicated to its mission. In the academic year 2018-2019, approximately 1,300 new patients were seen with greater than 9,000 return patient visits. In the most recent fiscal year, UPMC accounts for roughly 63 % of the gynecologic oncology market share in Allegheny County and 58% of the market share in the surrounding 29 counties.

Our main clinical locations are located at Magee Womens Hospital of UPMC and UPMC Passavant Hospital. At each location we have a bustling outpatient office, regular operating room schedule and inpatient service, and a consistent presence in the infusion center. In addition to the above we also provide consultation services at additional hospitals in Oakland including – UPMC Presby/Montefiore, UPMC Shadyside and UPMC Mercy. Our division provides regular surgical coverage and outpatient services at UPMC Hamot, UPMC Altoona and UPMC Susquehanna. Finally, we provide regular outreach outpatient appointments at the following locations as well: Bethel Park, Butler, Cranberry, Horizon, Irwin, Johnston, and Uniontown.

Faculty members strive to innovate in the management of patients afflicted with gynecologic cancers. The application of minimally invasive surgical techniques has been embraced by all the members of the division. Traditional laparoscopy and robotic assisted surgery is now widely used for the majority of patients with endometrial cancer. These approaches are now being applied to patients with early stage ovarian cancer. Sentinel mapping pioneered in melanoma has replaced traditional inguino-femoral node dissection for vulvar cancer and is also employed in the majority of patients with apparent uterine limited endometrial cancer.

To provide consistent care within our core facilities, members of our faculty developed clinical pathways of care. Uterine and Ovarian cancer pathways have been established with colleagues within UPMC and are now universally available to all UPMC cancer center sites. In addition, these pathways were made available to other centers in the country through Via Oncology, an affiliate of UPMC and UPCI.

FACULTY LISTING

Joseph L. Kelley, MD, MS – retired April 30, 2019
Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
Director, Division of Gynecologic Oncology

Madeleine Courtney-Brooks, MD, MPH
Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Gynecologic Oncology
Director, Division of Gynecologic Oncology as of March 1st, 2019

Jessica Berger, MD
Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Gynecologic Oncology

Michelle Boisen, MD
Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Gynecologic Oncology

Ronald C. Buckanovich MD, PhD
Professor of Medicine, Director of the Ovarian Cancer Center of Excellence, Co-Director of the Womens Cancer Research Center, Department of Medicine, Division of Hematology/Oncology and Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Gynecologic Oncology

Lan Coffman MD, PhD
Assistant Professor, Department of Medicine, Division of Hematology/Oncology, Assistant Professor of Obstetrics, Gynecology and Reproductive Science, Division of Gynecologic Oncology

John T. Comerci, MD, MHCDS
Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Gynecologic Oncology.
Vice Chair, Women's Health Service Line Specialty Services & Referral Physician Relations

Robert P. Edwards, MD
Milton McCall Professor and Chairman, Department of Obstetrics, Gynecology, and Reproductive Sciences

Alexander Olaiwaye, MD
Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Gynecologic Oncology
Principle Investigator for GOG division of the NRG Oncology Group

Dr. Brian Orr, MD
Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Gynecologic Oncology

Paniti Sukumvanich, MD
Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Gynecologic Oncology
Director of the Gynecologic Oncology Fellowship

Sarah Taylor, MD
Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Division of Gynecologic Oncology

Kristin K. Zorn, MD
Adjunct Assistant Professor, Department of Obstetrics and Gynecology, Division of Gynecologic Oncology, University of Arkansas

RESEARCH:

Faina Linkov, PhD
Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
Secondary appointment in the Graduate School of Public Health in the Department of Epidemiology

Francesmary Modugno, PhD, MPH
Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
Gynecologic Cancer Biospecimen and Data Bank Site Co-Leader, RPCI/UPCI Ovarian Cancer SPORE

Anda M. Vlad, MD, PhD
Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Department of Immunology, University of Pittsburgh, School of Medicine
Director, MWRI Flow Cytometry Core
Director, MWRI Summer Undergraduate Research Program

Current Gynecologic Oncology Fellowship Trainees:

Lauren Hand, MD
Adria Suarz Mora, MD
Daniel Chan, MD
Chelsea Chandler, MD
Michael Cohen, MD
Alyssa Wield, MD

DIVISION OF MATERNAL FETAL MEDICINE



Arun Jeybalan, MD, MS
Division Director

OVERVIEW

The Maternal-Fetal Medicine (MFM) Division has continued its tradition of high-level scholarly and academic contributions and productivity. MFM faculty have authored more than 162 publications in the past three years with over 44 as first- or senior-author. Our publications include important, high-impact papers on perinatal issues as diverse as impact of sleep-disordered breathing in pregnancy, preeclampsia pathogenesis, diabetes in pregnancy, development of standards of fetal growth, neonatal abstinence syndrome with methadone compared with buprenorphine, and stress contributors to preterm birth. The Division continues to be successful in securing federal research funding, with NIH -funded projects on preeclampsia, preterm birth prevention, developmental origins of health and disease, and pharmacology in pregnancy representing the key funded areas in our portfolio. We continue our participation in prestigious federally-funded multi-center consortia, such as the MFM Units Network, the Obstetric Pharmacology Centers, and the ECHO collaborative.

From a clinical perspective, the division continues its long tradition of excellence in inpatient high-risk antepartum care and outpatient consultative services. We have expanded our offering of MFM services through an innovative Telemedicine program, bringing outpatient MFM consultation to seven outreach communities that would otherwise not have access to this degree of subspecialty service. We render inpatient and outpatient teleMFM services throughout the region and plan even further expansion in the coming year.

The MFM Division continues its excellence and commitment to education of the next generation of health care providers. Both didactic and bedside teaching is provided at all levels – medical students, residents, fellows as well as undergraduate and post-graduate students. We also provide high risk pregnancy education and support to other clinicians across the spectrum of specialties as well as advanced practice providers, nurses and staff.

RESEARCH PROGRAM

As outlined above, the MFM Division has a diverse portfolio of clinical, translation and basic research and has been successful in securing funding for various projects. While the majority of studies are NIH-funded, investigators have also received support from other sources including the American Heart Association, Gates Foundation, Society of Maternal-Fetal Medicine and Society of Reproductive Investigation. The Division fosters a robust collaborative research program through multi-center studies as well as partnerships across disciplines within and outside of the University of Pittsburgh. Our portfolio has also extended to international collaborations through the Global Pregnancy Collaboration (CoLab) coordinating a clinical trial in Brazil for the risk assessment for adverse outcomes in preeclampsia as well as establishing a bio-repository to facilitate collaborations between high and low/middle income countries.

Importantly, many of the ongoing projects address high impact societal issues such as opioid use disorder in pregnancy and the pharmacology of buprenorphine in pregnancy, optimization of gestational diabetes treatment by phenotyping sub-groups, pregnancy as a window for long term cardiovascular and metabolic disease, interventions for sleep-disordered breathing, to name a few. Three ongoing grant-funded projects (2 RO1s and a UH3 award) address developmental origins of offspring phenotypes. This is a series of multi-center projects investigating how pre-pregnancy and pregnancy experiences and environmental exposures transduce biologically to the fetus and influence the development of offspring brain and neurocognitive development, as well as the predisposition to chronic diseases and aging.

We are one of 12-based university based clinical centers participating in the Maternal-Fetal Medicine Units Network coordinated by the Pregnancy and Perinatology Branch of NICHD. The MFMU Network continues its tradition of important and influential clinical research in pregnancy. More than 50 randomized clinical trials, cohort studies, and registries have been completed or are in progress. We are in the midst of a diverse range of ongoing trials on Hepatitis C in pregnancy, preterm birth prevention among twins and singletons with short cervix, and tranexamic acid for the prevention of hemorrhage at Cesarean. We are particularly excited about the change in clinical care as result of the randomized trial of induction of labor vs expectant management among low risk nulliparas (the ARRIVE trial), which showed that induction of labor reduces the risk of Cesarean as well as improving several key outcomes for maternal and newborn health (published in NEJM). Dr Simhan is the site PI with Dr. Facco serving as site co-PI. In addition, Magee is one of three centers participating in the Obstetric Pharmacology Research Centers Network.

Two of our junior faculty are K-grant awardees with innovative projects focused on phenotyping gestational diabetes profile to tailor therapy and mechanisms leading to cardiovascular disease after preeclampsia. The MFM division continues to contribute to the academic research mission by serving as manuscript reviewers and NIH study section participants. Faculty-mentored research project has led to resident and fellow presentations at national conferences and publications. Over the past two years, Division members were invited to serve in influential NIH workshops including “Opioid Use in Pregnancy, Neonatal Abstinence Syndrome and Childhood Outcomes Workshop sponsored by the NICHD, CDC, March of Dimes, American College of Obstetricians and Gynecologists as well as the Society of Maternal-Fetal Medicine as well as the “Workshop on Predicting, Preventing, and Treating Preeclampsia” co-sponsored by the NICHD and NHLBI.

The MFM division also plays a key role in building research infrastructure and optimizing participation of pregnant women through leadership roles as Medical Director of the Magee Clinical and Translational Center and Obstetric Specimen Procurement Unit on Labor and Delivery.

Moving into the future, in addition to continuing our robust portfolio of research in preterm birth, preeclampsia, pharmacology, and placental function, the Division anticipates growth and development in the areas of fetal therapy and the developmental origins of adult diseases, and pregnancy as a window into women's health over the life course. We have been funded by NHLBI to study how pregnancy exposures and experiences can predispose women to later life cardiovascular disease and diabetes. We also received funding from NIMH to study how a woman's own personal exposure to traumatic events in her childhood can influence the development of the structure and function of her child's brain. These areas are scientifically cutting edge and hold great promise for improving public health over the next 10+ years.

Please refer to Individual MFM faculty list for summary of funding and research interests.

A complete listing of publications is provided at the end of the Report.

CLINICAL PROGRAMS

The Division of Maternal-Fetal Medicine is proud to offer state of the art care from national and international experts in the research and clinical management of high risk pregnancies. Our clinical services span the entirety of high risk pregnancy care including women with underlying chronic medical conditions, mothers with unexpected pregnancy complications, and fetal abnormalities such as growth problems, birth defects, or babies that need fetal intervention/surgery during pregnancy. The MFM team offers a multi-disciplinary, collaborative, and patient-centered approach along with general obstetricians and other specialists working together towards the goal of a healthy mother and baby/babies.

Our primary outpatient clinical site is on the zero level of MWH. The core clinical team include 15 clinical faculty, 9 MFM fellows, 5 advanced practice providers, 5 certified diabetes educators, 7 nurses and 8 additional support staff. We continue to have an open access schedule to maximize the availability of our specialists for new and return visits. A new patient can see a physician in our practice within 3 business days or more urgently if indicated. **Dr. Arun Jeyabalan** serves as the Medical Director of MFM outpatient services. We also provide direct supervision of residents caring for high risk pregnant women in the Magee Outpatient Clinic. Over the past year, we have performed approximately 15,000 direct outpatient visits including consultations, co-management of complicated pregnancies, and continuity care for obstetric patients. This has been a steady increase from approximately 4,500 office visits in 2005 and 8,000 visits in 2011. Our physicians continue to receive superior patient ratings. In addition, we have provided almost 1,000 telemedicine consults at 7 different sites over the past year alone reaching a population that would otherwise not have access to subspecialty MFM care.

On the inpatient side, we provide 24/7 Maternal-Fetal Medicine services including Labor and Delivery coverage, supervision of the busy high-risk antepartum inpatient service as well as the 6-bed OB ICU. We have received over 830 maternal transports in the past 18 months with a significant proportion resulting in preterm births requiring Neonatal Intensive Care Admission at MWH. We are dedicated to obstetric safety at MWH and serve as first responders to obstetric codes, "Condition O" system. In addition, our

group plays a major role in providing guidelines and policies for obstetric care at multiple sites across the UPMC system. **Dr. Jacob Larkin** is the Medical Director of Inpatient Obstetric Services and **Dr. Simhan** plays a key role in expanding MFM reach across the Women's Health Service Line. We have recently implemented remote monitoring of post-partum hypertension in collaboration with Vivify Health, aiming to optimize blood pressure control, minimize readmission, and ensure handoff to appropriate cardiovascular disease risk prevention.

Major clinical initiatives over the past year have been expanding our inpatient and outpatient consultative services to provide high level and quality of care for women at outlying facilities. Our catchment area extends to Eastern Ohio, West Virginia, Erie, and continues to grow in the eastward direction. We have accomplished this largely through our telemedicine consultation services which have been very well-received by physicians and patients alike, thereby improving access to high risk obstetric care. In addition, we provide immediate 24/7 guidance to referring physicians by phone through the UPMC Med Call system and our MFM office. Since the closure of UPMC Mercy Hospital Labor and Delivery, MFM has played a key role in multi-disciplinary care coordination for pregnant trauma patients who are transported to UPMC Presbyterian Hospital.

Over the next few years, we anticipate further expansion of our outpatient and inpatient MFM telemedicine service across Pennsylvania. In addition, we plan to expand innovative approaches and harness wireless technologies to institute remote monitoring and reporting of blood sugars to optimize diabetes management in pregnancy.

EDUCATIONAL/TEACHING ACTIVITIES

Our Division members are committed to the academic mission of excellence in education. We are actively involved in direct teaching and mentorship at multiple levels of trainees including fellows, residents, medical students, and undergraduate observers. We are the primary providers of high risk obstetric teaching in resident clinics.

Fellowship Program

The Maternal-Fetal Medicine fellowship is a three-year ACGME- and ABOG-accredited program designed to provide a rich mix of hands-on clinical experience and quality investigative exposure. **Dr. Katherine Himes and Dr. Steve Caritis are the Fellowship Director and Associate Fellowship Director**, respectively for this highly sought after MFM fellowship. We are currently approved to accept three fellows per year. We have a demonstrated track record in training expert sub-specialists who can care for and provide consultation to women with complicated pregnancies. We provide the tools and background to achieve a successful career in academic medicine and leadership skills for the next step in their career. Our fellows are provided a formal faculty mentoring program and opportunities through our division and the Magee-Womens Research Institute for research in basic science, clinical trials, as well as qualitative and education arenas. Our fellows have clinical opportunities in Genetics, Center for Advanced Fetal Diagnosis, Center for Innovative Fetal Intervention and Critical Care Medicine as well as electives in Infectious Diseases and Fetal Echocardiography to name a few. Formal biostatistics and research methodology training is provided through the University of Pittsburgh Institute for Clinical Research Education (ICRE) program and fellows have the opportunity to pursue a Certificate or Masters in Clinical Research or Education. All MFM faculty are closely involved in the clinical and research aspects of MFM fellowship training.

Our fellows are highly productive with 14 abstracts presented at national and international meetings as well as 15 publications in the past academic year.

Residency

Residents work closely with MFM faculty and are involved in all aspects of high risk obstetric care. Teaching activities occur in the didactic setting, outpatient office setting, inpatient units, and in the operating room. Members of our Division play key leadership roles in resident education:

Dr. Kristiina Parviainen served as the Associate Program Director for Obstetrics and Gynecology and has transitioned to Program Director. This is one of the largest OB/GYN residency programs which includes a total of 36 residents (9 residents per year, 4-year residency). She also leads the residency interview process, provides career-development mentorship during and beyond the residency years. She will be taking over as Program Director in the next academic year.

Dr. Sara Sakamoto is the Director of the Obstetric Simulation program providing novel and innovative approaches for practical resident and fellow education. Her team works closely with the WISER center. Specialized drills such as for cardiac arrest in pregnancy have been beneficial for residents and nursing staff. Her team is in the process of developing other obstetric drills for other obstetric situations such as shoulder dystocia and operative vaginal delivery.

Dr. Rosemary Froelich has newly taken responsibility as **director for resident ultrasound education in Obstetrics.**

Members of the MFM division play an active role in the residency interview process as well as mentorship. MFM faculty serve as individual mentors for eight residents over their 4 years of residency. All MFM faculty participate in the Resident Core didactic session.

Resident rotations with direct MFM supervision (Note: Each rotation is 5-6 weeks):

PGY-1: Two Labor and Delivery rotations, Obstetric Night Float

PGY-2: Labor and Delivery, Antepartum – High Risk Obstetrics, Obstetric Night Float

PGY-2: Labor and Delivery, Special Clinics including High Risk Obstetrics Clinic, Obstetric Night Float

PGY-4: Labor and Delivery, Antepartum – High Risk Obstetrics, Obstetric Night Float, Special Clinics including High Risk Obstetrics Clinic

In addition, our faculty serve as research mentors with over 5 residents presenting MFM research at national research meetings in the past academic year.

Medical Student

MFM faculty play a role in all levels of medical education at the University of Pittsburgh School of Medicine. The MFM division has contributed 500 ECUs to UPSOM over the past academic year.

The **Reproductive and Developmental Biology Course (MED 5222) for the second-year medical students** is a three-week course in the Organ Systems Block focusing on the normal processes of human reproduction, development and correlative pathology of the breast, prostate and reproductive organs. Kristiina Parviainen serves as a Co-Director of this course with 5 additional MFM faculty members

lecturing on an annual basis and 6 faculty participating in the Problem-Based Learning Sessions. Dr. Sara Sakamoto will be taking over this co-Director role in the upcoming academic year.

Dr. Allison Serra serves as the Assistant Director of the UPSOM OB/Gyn clerkship (OBGYN5321) and co-Director of the 4th year "Boot Camp" course for graduating seniors entering residency in Obstetrics and Gynecology.

At the third-year medical student level, all MFM clinical faculty are involved in patient-centered teaching during the clinical rotation on Obstetrics and Gynecology. In addition, the majority of faculty participate in the Problem-Based Learning Sessions. Dr. Arun Jeyabalan gives a Case-based presentation to highlight the Maternal Adaptations to pregnancy at the beginning of each third-year clinical rotation. Our faculty also serve as members of the UPSOM curriculum committee, advisors in the "FAST" (Faculty and Students Together) program and are small group facilitators in several first and second year medical school courses.

Dr. Parviainen serves as the Coordinator for all 4th year medical student electives in Obstetrics and Gynecology and serves as the rotation director for the highly sought after High-Risk Pregnancy sub-internship (OBGYN 5420). Dr. Serra will be taking over this role in the next academic year.

Undergraduate

Dr. Sami Makaroun coordinates Obstetrics shadowing for undergraduate and biomedical masters' students participating in the University of Pittsburgh School of Medicine shadowing program. These students get exposure to obstetrics by shadowing a MFM faculty and their team.

Other Graduate and Post-graduate

Our faculty are frequently invited by various departments to provide education on high risk pregnancy issues including Emergency Medicine, Trauma Surgery, Critical Care Medicine, Rheumatology, Pulmonology, Nephrology, Cardiology, to name a few. Drs Himes and Jeyabalan give annual lectures at the Graduate School of Public Health, Reproductive Epidemiology (EPID 2720) course. Drs. Jeyabalan, Himes, Parviainen and Sakamoto lecture to the Obstetric Anesthesia Fellows on an annual basis.

Faculty list including titles and career interests (in alphabetical order):

Stacy Beck MD – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. Her main research interests are severe maternal morbidity and mortality as well as racial disparities in adverse pregnancy outcomes. She is Co-Chairperson of the Pennsylvania Maternal Mortality Review Committee and a UPMC representative for the Pennsylvania Perinatal Quality Collaborative. She is actively involved in multi-disciplinary research with our Anesthesiology department studying ways to minimize post-operative opioid use after cesarean section as well as evaluating prediction models for postpartum hemorrhage. She is also collaborating with members of the Neonatology Division in a multi-center randomized trial evaluating antibiotic use in very preterm infants.

Steve Caritis MD – Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. He is the site principal investigator of a NIH U54 grant that focuses on Obstetrical Pharmacology. The NIH focus on Obstetrical Pharmacology has resulted in establishment of the Obstetrical-Fetal Pharmacology Research Centers. Currently only three centers are funded as part of this consortium. Dr Caritis has been part of the OPRC for 43 years. He currently directs projects studying buprenorphine in pregnancy and

evaluating the relationship between plasma concentrations of 17-hydroxyprogesterone caproate and risk of spontaneous preterm birth. He is also the principal investigator on an NIH-funded R01 project to determine how to best detoxify women on buprenorphine. Dr Caritis was also the Co-PI of the only T32 in Obstetrical Pharmacology in the US which focused on training MDs., PharmDs and PhDs in obstetrical pharmacology. Dr Caritis also served as the co-PI of NIH-funded Maternal-Fetal Medicine Units Network for 25 years. He is the author of a high impact clinical opinion paper summarizing the adverse neuroanatomic effects of opioids on the fetal brain. Dr Caritis is the associate program director for the MFM fellowship before which he served as the Program Director for over 25 years.

Francesca Facco MD – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. She is the principal investigator of an NIH R01 grant focused on understanding the impact of sleep apnea and obesity on pregnancy outcomes. She is a key investigator of the Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-Be, also known as, "nuMoM2b," study, a multicenter, prospective observational study of over 10,000 nulliparous women. Dr. Facco serves as the co-Principal Investigator for the MFM Units Network University of Pittsburgh site. Through this network Dr. Facco now serves as the Principal Investigator of the SLEEP trial, a multicenter randomized trial of CPAP therapy for sleep apnea in pregnancy.

Maisa Feghali MD – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. She is a K-23 scholar in the Clinical and Translational Science Institute's Clinical and Translational Scholar's funded by the National Center for Advancing Translational Sciences. She has a secondary appointment at University of Pittsburgh School of Medicine, Clinical and Translational Science Institute. She received a pilot grant from AMAG pharmaceuticals to investigate the use of metformin to prevent preeclampsia in women with type 1 diabetes. Her research interests focus on transforming diabetes care during pregnancy using individualized treatment strategies. She developed a remote monitoring pathway with Vivify Health to advance the care of women with diabetes in pregnancy and improve patient satisfaction. Dr. Feghali also serves as the co-Director of Resident Research and the Medical Director of the Women's Health Practice-Based Research Network. In this capacity, she has expanded her research experience to facilitate resident research and expand the recruitment base for research studies focused on Women's Health.

Rosemary Froehlich MD – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. As part of the divisions of Maternal-Fetal Medicine and Ultrasound, Dr. Froehlichplays an active active role in graduate medical education, serving as the clinical director of the resident ultrasound rotation, and providing mentorship to physicians in training for career development and research. Her clinical and academic interests include management of acute hypertension in pregnancy, sonographic prenatal diagnosis, fetal growth disturbances, and the development of quality and safety protocols to improve clinical care.

Maureen Hamel MD - Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences.

She joined the divisions of Maternal-Fetal Medicine and Ultrasound in the fall of 2018 after completing her Maternal-Fetal Medicine fellowship at Brown University. She recently published the results of a

randomized controlled trial to evaluate optimal intrapartum glucose management among women with gestational diabetes. She will be expanding on this topic at Magee-Womens Hospital of UPMC. She has taken on the role of MFM Education Director and will work closely with the Residency Program Director in optimizing the training of highly skilled residents.

Alisse Hauspurg MD -- Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. She joined the division of Maternal-Fetal Medicine in July 2019. She is currently a K12 Scholar in the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program funded by the NIH/Office of Research on Women's Health. She is also pursuing a Masters of Science in Clinical Research at the University of Pittsburgh Institute for Clinical Research Education. Along with collaborators in the Division of Cardiology, she recently received the Magee Medical Staff Fund award to establish a multi-disciplinary postpartum hypertension follow up clinic. Her research interests focus on studying mechanisms leading to cardiovascular disease after preeclampsia.

Katherine Himes MD MS – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. She is a clinician-investigator whose current research seeks to 1) inform patient provider communication to support quality decision making in obstetrics and 2) develop decisional support tools for both preference sensitive and preference insensitive decisions. She is the principal investigator (PI) of an on-going project to develop a support tool for patients facing periviable birth as well as the PI of a NIH funded R56 that is conducting a randomized controlled trial of an intervention designed to increase patient engagement in postpartum care. She is also Co-investigator on a NIH R01 that aims to develop evidence based guidelines to inform gestational weight gain counseling. Dr. Himes serves as the medical director for the resident's high risk obstetrical clinic. She is also the Program Director for the Maternal Fetal Medicine fellowship.

Arun Jeyabalan MD MS – Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences and Clinical and Translational Sciences Institute, Division Director of Maternal-Fetal Medicine. She is a clinician-investigator with research interests that include vascular adaptations to pregnancy and hypertensive and renal disorders including preeclampsia. She serves as the Medical director for the Obstetric Specimen Procurement Unit and Clinical and Translational Research Center at Magee-Womens Hospital building clinical research infrastructure for efficient and quality clinical pregnancy research. She is a Co-Investigator of a Gates funded Grand Challenges award conducting a multi-center stepped wedge clinical trial in Brazil testing the use of clinical and bio-markers for risk stratification of preeclampsia. She is the site-PI of the Global Pregnancy Collaboration and in this role has helped develop a standardized pregnancy database, COLLECT, which is currently being used in multiple sites including in Brazil where she is assisting co-investigators in developing a robust database and biorepository of pregnancy samples. She also is a member of the Pregnancy Adaptations Group at the MWRI and is a co-investigator on an American Heart Association Go Red Award titled "Women's Cardiovascular Health and Microvascular Mechanisms: Novel Insights from Pregnancy". She served on the 16-member American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy developing updated guidelines for hypertensive disorders of pregnancy

Jacob Larkin MD – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. He is a physician-scientist with a research focus on clinical and mechanistic determinants of

fetal growth abnormalities. His research is focused on epidemiologic outcomes analysis to identify optimal thresholds for classifying fetuses as growth-restricted or overgrown. He is an Associate Editor for the journal *Placenta* and serves as the Medical Director for Inpatient Obstetric Services at Magee-Womens Hospital.

Sami Makaroun, MD – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, Director of the Center for Advanced Fetal Diagnostics. As Director of the Center for Advanced Fetal Diagnostics at Magee-Women's Hospital, he seeks to optimize the multidisciplinary care necessary to provide the best outcomes for pregnant women and their babies with antenatally diagnosed congenital anomalies. He is interested in further developing institutional research in obstetric ultrasound and fetal diagnosis. He has active teaching roles for University of Pittsburgh medical students, Obstetrics and Gynecology residents, and Maternal Fetal Medicine fellows. In addition, he is the Faculty Shadowing Director for Obstetrics for undergraduate and biomedical masters' students through the Office of Medical Education shadowing program.

Kristiina Parviainen MD – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. After serving as Associate Residency Program Director, Dr. Parviainen was promoted to Residency Program Director for Obstetrics and Gynecology. She assumed primary administrative responsibility for the highly-respected residency training program at Magee-Womens Hospital. The program with 9 residents/year provides rigorous clinical experience and didactics, with the goal of excellence in general obstetrics and gynecology and opportunities for individualized training as a foundation for a productive and fulfilling career. Dr. Parviainen also participated in the University of Pittsburgh School of Medicine faculty development program at the Nazarbayev University School of Medicine in Kazakhstan, leading interactive sessions on oral presentations and providing feedback.

Sara Sakamoto MD – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. She is a clinician-educator with an interest in medical education as well as patient safety and

quality improvement. She has investigated complications of cesarean section through creation of a cesarean section database and has been instrumental in designing and implementing interventions throughout the hospital system to improve preparation for, as well as identification and management of obstetrical hemorrhage. Sara has taken a lead role in the multicenter PEARLE trial of a device to manage postpartum hemorrhage. She serves as the Director of Simulation for Magee-Womens Hospital where she facilitates multi-disciplinary OB crisis team training, obstetric skill development programs, and fosters utilization of simulation in multiple areas and levels of Ob/Gyn training. She is on the Education Committee for the Society of Maternal-Fetal Medicine, is a Co-Course Director of the second-year medical student Reproductive Biology course, and is an advocate for women's health issues as an Advisory Council Member of PA-ACOG.

Allison Serra MD, MPH – Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. She joined the divisions of Maternal-Fetal Medicine and Ultrasound in the fall of 2018. She is a clinician-educator with a primary focus on undergraduate medical education. She serves as a small group facilitator in several first and second year medical student courses, as Assistant Director of the OB/GYN

clerkship (OBGYN 5341), as Director of the Obstetrical Sub-Internship in Obstetrics (OBGYN 5420), and as co-Director of the fourth year "boot camp" course for graduating seniors entering residency in Obstetrics and Gynecology. She also serves as an advisor in the "FAST" (Faculty and Students Together) program. She is a member of the Curriculum Committee and chairs the Continue Curriculum Quality Improvement subcommittee within the School of Medicine. Her academic interests include mentoring and advising, curriculum development, and program evaluation.

Hyagriv Simhan MD MS. Professor, **Department of Obstetrics, Gynecology and Reproductive Sciences**, **Executive Vice Chair of Obstetrical Services, Director of Patient Care Delivery Innovation and Technology, UPMC**. He is the Principal Investigator of the MFM Units Network (described in detail of the MFM research section). He is the PI of an RO1 and UH3 award as well as Co-PI on NIH awards to study Developmental origins of offspring phenotypes. He and his team are investigating how pre-pregnancy and pregnancy experiences and environmental exposures transduce biologically to the fetus and influence the development of offspring brain and neurocognitive development, and the predisposition to chronic diseases and aging. Through partnerships and collaborations with our data analytics colleagues at the *Donald D. Wolff, Jr. Center for Quality Improvement and Innovation at UPMC*, in UPMC Health Services Division, in UPMC Corporate Finance, and at data warehousing and WI partners at Health Catalyst, we are excited in the UPMC Women's Health Service Line to bring rigorous QI methodology, novel patient and provider engagement strategies, and smooth technological solutions to the management of gestational diabetes. This set of partnerships enables us to move forward the development and implementation of interventions to identify and treat GSM in a timely and effective fashion to improve patient outcomes, reduce health care costs, and optimize the hand-off to appropriate postpartum diabetes prevention. Additional program development includes a collaboration with Vivify Health for remote monitoring of post-partum hypertension, aiming to optimize blood pressure control, minimize readmission, and ensure handoff to appropriate cardiovascular disease risk prevention.

Maternal-Fetal Medicine Fellows

Jacqueline Atlass, MD
Anna Binstock, MD
Lauren Carlos, MD
Tiffany Deihl, MD
Francis Hacker, MD
Christina Megli, MD
Mitchell Onslow, MD
Jaclyn Phillips, MD
Sarah Rogan, MD

Advanced Practice Providers

Emily Bauder, PA-C
Jillian Grove, CRNP
Mary Lee, PA-C
Gabrielle Storino, PA-C
Carrie Weaver, PA-C

Diabetes educators

Diane Heidingfelder, MS, RD, CDE
Rachel Kinsley MBA, RD, LDN, CDE
LeaAnn Ostergaard, MS, RD, CDE
Mary Beth Caputo, MS, RD, LDN, CDE
Caroline Zariwala MS, RD, CDE

Clinical Nurse Specialists

Cindy Kennedy, RN - Practice Manager
Jeanette Boyce, MSN, RNC
Tricia Cioffi-Droeder, RNC
Lynne Hill, RN
Nikki Sutton, MSN, RN, CNS
Jan Buys, BSN, RNC, BSBA
Angela Rothhaar, BSN, RN
Lisa Stein, BSN, RN

DIVISION OF REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY



Overview

The Division of Reproductive Endocrinology and Infertility (REI) continues its commitment to excellence in the academic and clinical growth of this dynamic field. The division is the largest provider of infertility services in Western Pennsylvania. An experienced team of reproductive endocrinologists offer full-service care for basic infertility, IVF, as well as fertility preservation (embryo, oocyte, and semen). Third-party reproduction services provide the ability for patients to use donor oocytes, donor embryos, donor sperm and gestational surrogacy to build their families. Telemedicine opportunities improves access for patients throughout the region. The division has a robust multi-disciplinary presence with collaboration for care for transgender patients, adolescent and pediatric reproductive endocrinology, and fertility preservation with gynecologic oncology, oncology, pediatric endocrinology and adolescent medicine.

<u>Faculty</u>
Judith Albert, MD, IVF Lab Director and Medical Director
of Ambulatory Surgery Center
Robert Collins, MD
Gabriella Gosman, Vice President, Magee-Womens Hospital, Medical Affairs, Vice Chair, Education
Sunita Katari, MD
Carolyn Kubik, MD, Clinical Practice Director
Marie Menke, MD, MPH, Division Director
Kyle Orwig, PhD, Research Director
Joseph Sanfilippo, MD, MBA, Fellowship Director
Meredith Snook, MD, Associate Fellowship Director
Hanna Valli, PhD, Fertility Preservation Program
Coordinator
Anthony Zeleznik, PhD

Clinical

Clinical programs at the Center for Fertility and Reproductive Endocrinology include:

- Ovulation induction
- Intrauterine insemination
- Assisted reproductive technology (e.g. in vitro fertilization)
- Preimplantation genetic testing
- Fertility preservation
- Third party reproduction
- LGBTQI family planning
- Acupuncture

Clinical Practice

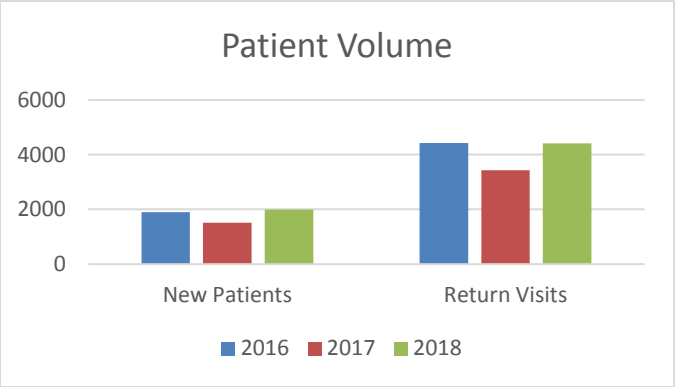
The practice has three primary sites of office-based care in Oakland, Penn Hills and Hermitage, Pennsylvania. Additional sites for patient care are staffed in multispecialty clinics in Cranberry, Erie, and Bethel Park, Pennsylvania. Our clinical team of 8 core faculty, 3 REI fellows, and 2 advanced practice providers manages approximately 2000 new patient visits and 4500 return visits annually. Our core geographic presence includes the northwest sector of Pennsylvania as well eastern Ohio and western New York State. This is enhanced through use of telemedicine and tele-to-home technology.

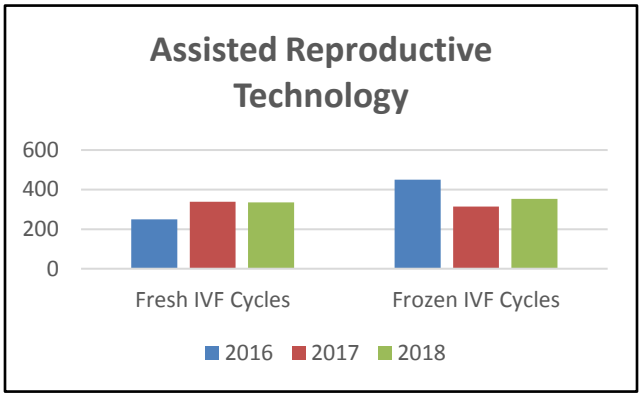
We maintain multispecialty collaborations and ancillary services to provide complete care to the patients seeking options and treatment for fertility and reproductive health. Acupuncture and licensed clinical social work support are provided through the Oakland site at Magee-Womens Hospital. Fertility preservation services are offered to both female and male patients and range from standard of care approaches (oocyte and embryo cryopreservation) to experimental models (ovarian and testicular tissue cryopreservation). As part of the Oncofertility Consortium Network, we are integrated into the National Physicians Cooperative and Global Partner Network, a national, interdisciplinary initiative designed to explore reproductive futures for cancer patients. Clinicians from the division provide outpatient and inpatient for reproductive concerns among pediatric and adolescent gynecologic patients. Finally, patients transitioning from male-to-female and female-to-male receive counseling regarding current and future fertility concerns as well as options they might wish to pursue.

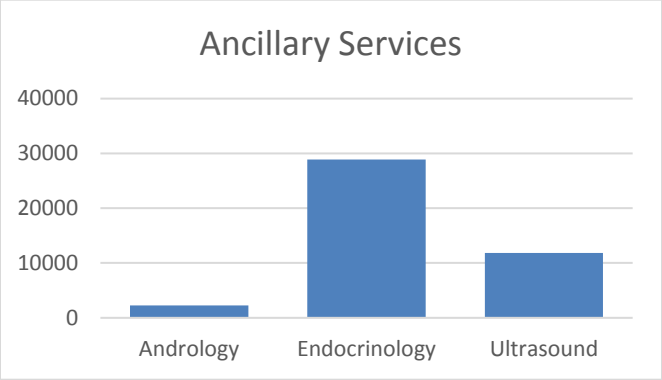
Assisted Reproductive Technology

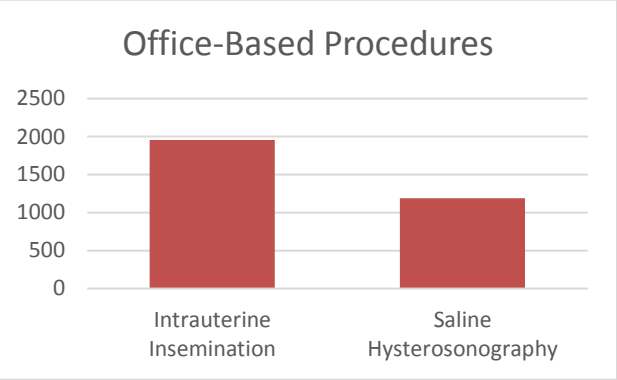
The Center for Reproductive Endocrinology Infertility continues to maintain its present as the largest provider of assisted reproductive technology in Western Pennsylvania. In addition to the 600-700 procedures related to assisted reproductive technology, over 1500 insemination procedures are performed annually.

Relative distribution of fresh IVF cycles (oocyte retrieval and embryo transfer) and frozen IVF cycles (embryo transfer) continues to reflect nationwide practice patterns in infertility with an equal distribution between the 2 types of clinical care.









Research

The spectrum of research conducted in the division includes fertility preservation, transgender health, stem cell research, genetic basis of infertility, polycystic ovary syndrome and obesity. Dr. Kyle Orwig, director of REI research, continues to lead the field in fertility preservation research and development of translational models. Collaboration with faculty at Magee-Womens Hospital and the Magee-Womens Research Institute has expanded the division's research scope to include investigation of technologies that will predict embryo quality and/or provide insight in age-relate changes in oocytes.

Grants Awarded

5R01HD092084-02 (Orwig)	04/01/2017 – 03/31/2020
National Institutes of Health	$341,896
Improving Fertility Preservation in Boys with Cancer	
5T32HD087194-02 (Orwig)	05/09/2017 – 04/30/2022
National Institutes of Health	$201,340
Reproductive Development from Gonads to Fetuses	
1R43HD090888-01A1 (Taylor) NCE	*09/21/2017 – 03/31/2019*
NIH/Subaward from Sylvatica Biotech, Inc	*$93,736*
Isochoric Pressure Assisted Vitrification of Testicular Tissue and Whole Testes	
American Society of Reproductive Medicine (Valli-Pulaski)	07/01/2018 – 06/30/2019
The effects of chemotherapy on sperm DNA quality after short-term exposure	$50,000

Selected Publications (Faculty authors are listed in bold, trainees are underlined and bolded)

- **Barnard EP**, Dhar CP, **Rothenberg SS**, **Menke MN**, Witchel SF, Montano GT, **Orwig KE**, **Valli-Pulaski H**. Fertility Preservation Outcomes in Adolescent and Young Adult Feminizing Transgender Patients. Pediatrics. 2019 Sep;144(3).
- **Menke MN**, King WC, White GE, **Gosman GG**, Courcoulas AP, Dakin GF, Flum DR, Orcutt MJ, Pomp A, Pories WJ, Purnell JQ, Steffen KJ, Wolfe BM, Yanovski SZ. Conception rates and contraceptive use after bariatric surgery among women with infertility: Evidence from a prospective multicenter cohort study. Surg Obes Relat Dis. 2019 May;15(5):777-785.
- **Rothenberg SS**, Witchel SF, **Menke MN**. Oocyte Cryopreservation in a Transgender Male Adolescent. N Engl J Med. 2019 Feb 28;380(9):886-887.
- **Katari S**, Aarabi M, Kintigh A, Mann S, Yatsenko SA, **Sanfilippo JS**, **Zeleznik AJ**, Rajkovic A. Chromosomal instability in women with primary ovarian insufficiency. Hum Reprod. 2018 Feb 7.
- Ren Y, Diao F, **Katari S**, Yatsenko S, Jiang H, Wood-Trageser MA, Rajkovic A. Functional study of a novel missense single-nucleotide variant of NUP107 in two daughters of Mexican origin with premature ovarian insufficiency. Mol Genet Genomic Med. 2018 Mar.

- Algarroba GN, **Sanfilippo JS**, **Valli-Pulaski H**. Female fertility preservation in the pediatric and adolescent cancer patient population.Best Pract Res Clin Obstet Gynaecol. 2018 Apr;48:147-157.
- **Rothenberg SS**, **Beverley R**, **Barnard E**, Baradaran-Shoraka M, **Sanfilippo JS**. Polycystic ovary syndrome in adolescents. Best Pract Res Clin Obstet Gynaecol. 2018 Apr;48:103-114.
- Fayomi AP, **Orwig KE**. Spermatogonial stem cells and spermatogenesis in mice, monkeys and men. Stem Cell Res. 2018 May;29:207-214.
- Clark AT, **Orwig KE**. Stem Cell Res. 2018 May;29:179.
- Fang F, Angulo B, Xia N, Sukhwani M, Wang Z, Carey CC, Mazurie A, Cui J, Wilkinson R, Wiedenheft B, Irie N, Surani MA, **Orwig KE**, Reijo Pera RA. A PAX5-OCT4-PRDM1 developmental switch specifies human primordial germ cells.Nat Cell Biol. 2018 Jun;20(6):655-665.
- Garbuzov A, Pech MF, Hasegawa K, Sukhwani M, Zhang RJ, **Orwig KE**, Artandi SE. Purification of GFRα1+ and GFRα1- Spermatogonial Stem Cells Reveals a Niche-Dependent Mechanism for Fate Determination. Stem Cell Reports. 2018 Feb 13;10(2):553-567.
- **Menke MN**, King WC, White GE, **Gosman GG**, Courcoulas AP, Dakin GF, Flum DR, Orcutt MJ, Pomp A, Pories WJ, Purnell JQ, Steffen KJ, Wolfe BM, Yanovski SZ. Contraception and Conception After Bariatric Surgery. Obstet Gynecol. 2017 Nov;130(5):979-987.
- **Snook ML**, Henry LC, **Sanfilippo JS**, **Zeleznik AJ**, Kontos AP. Association of Concussion With Abnormal Menstrual Patterns in Adolescent and Young Women. JAMA Pediatr. 2017 Sep 1;171(9):879-886
- Jakus AE, Laronda MM, Rashedi AS, Robinson CM, Lee C, Jordan SW, **Orwig KE**, Woodruff TK, Shah RN. "Tissue Papers" from Organ-Specific Decellularized Extracellular Matrices. Adv Funct Mater. 2017 Sep 13;27(3).
- Clark AT, Gkountela S, Chen D, Liu W, Sosa E, Sukhwani M, Hennebold JD, **Orwig KE**. Primate Primordial Germ Cells Acquire Transplantation Potential by Carnegie Stage 23. Stem Cell Reports. 2017 Jul 11;9(1):329-341.
- Johnson EK, Finlayson C, Rowell EE, Gosiengfiao Y, Pavone ME, Lockart B, **Orwig KE**, Brannigan RE, Woodruff TK. Fertility Preservation for Pediatric Patients: Current State and Future Possibilities. J Urol. 2017 Jul;198(1):186-194.
- Harris JA, **Menke MN**, Haefner JK, Moniz MH, Perumalswami CR. Geographic access to assisted reproductive technology health care in the United States: a population-based cross-sectional study. Fertil Steril. 2017 Apr;107(4):1023-1027.

Education

Under the direction of Drs Joseph Sanfilippo and Meredith Snook, the division continues its accredited 3-year fellowship program that aims to train future leadership in the field of Reproductive Endocrinology and Infertility. Studies completed during fellowship have been accepted to highly respected journals such as The New England Journal of Medicine, Human Reproduction, the Journal of the American Association Pediatrics, and Pediatrics.

Graduates of the program have pursued both academic and clinical careers. Residents are exposed to the office-based management and surgical care through regular rotation. Elective sub-internships are available for medical students in their fourth year of medical school. REI fellows maintain academic rigor through their efforts in basic, translational and clinical research.

DIVISION OF REPRODUCTIVE GENETICS



Michael Bashford, MD
Division Director

OVERVIEW

The Division of Reproductive Genetics and Genomics provides clinical evaluation and genetic counseling to men and women with genetic/genomic disorders in the areas of preconception, prenatal, adult genetics and cancer. In addition, the division is involved in the diagnosis and management of fetal structural birth defects through the Center for Advanced Fetal Diagnostics. The division offers cutting edge genetic/genomic testing and results interpretation and harbors or participates in training programs for medical genetic residents, laboratory genetics and genomics fellows, and medical biochemical genetics fellows. The division provides education to medical students, residents, and fellows including OB/GYN, pathology, reproductive endocrinology, and maternal fetal-medicine trainees. Research within the division encompasses topics including: non-invasive methods for fetal genomic diagnoses, development of algorithms for whole exome and genome analyses, mechanisms of cancer predisposition, the etiology of recurrent pregnancy loss and aneuploidies, genetics of premature ovarian failure, menopause, male infertility and leiomyomas, as well as the utility and design of chromosomal microarrays for use on constitutional and cancer genetics. The Division is a part of the Center for Clinical Genetics and Genomics (pittgenomics.org), which encompasses clinical genetic and genomic services across the UPMC system.

FACULTY/RESEARCH PROGRAMS

Dr. Michael Bashford serves as the medical director for the Clinical Genomics Laboratory at Magee-Womens Hospital, the prenatal genetics clinic, and the adult genetics clinic. His primary interest is in educating providers and expanding the use of genetic information into primary care and other specialties. He collaborates with other departments on research focused on the clinical utility of genomic testing in neonatal intensive care unit patients and during pregnancy. He further collaborates with the department of Family Medicine on the Primary Care Precision Medicine initiative and with the UPMC Genome Center. He also is a member of the UPMC Health Plan Governance Committee on Genetic

Testing and is the vice-chair of the American College of Medical Genetics and Genomics Committee on Professional Practice Guidelines which authors the professional society's guidelines in genetics.

Dr. Daniel Bellissimo serves as laboratory director of the Clinical Genomics Laboratory at Magee-Womens Hospital of UPMC. His work focuses on development of the next generation sequencing technology and bioinformatics for the sequencing of exomes and large gene panels for clinical diagnosis as well as research studies. He collaborates with various departments and research groups at the University of Pittsburgh to develop relevant testing for hereditary cancer syndromes, pharmacogenetics, pulmonary fibrosis, hereditary hemorrhagic telangiectasia, cardiomyopathy and other genetic disorders. Dr. Bellissimo is also involved in research studies to improve the diagnosis of rare inherited bleeding, thrombotic and platelet disorders. Von Willebrand Disease is a focus of the research. In addition to the discovery of numerous new pathogenic variants in the *VWF* gene, he showed that new sequence variations identified in healthy controls are more frequent in the African-American population and that many mutations reported in the *VWF* mutation database were common sequence variants in the African-American population.

Dr. Tianjiao Chu is interested in the development of statistical tools for non-invasive prenatal diagnosis using next generation sequencing data. Dr. Chu developed two statistical algorithms to determine, based on the DNA sequencing data of a maternal plasma, whether abnormal copy number variations occur in the fetal genome. In collaboration with Dr. Peters, Dr. Chu is developing new algorithms for non-invasive diagnosis for other pregnancy related diseases. Dr. Chu also collaborates with Drs. Sadovsky and Mouillet, through NIH funded grants, to develop computational/statistical tools to study the function of microRNAs and lncRNAs in human placenta, and to discover the comprehensive genomic regulatory network in human placenta involving miRNAs, lncRNAs, mRNAs, and proteins.

Dr. Jie Hu's research expertise is in use of CGH_SNP microarray technology combined with the conventional chromosome analysis and fluorescence in situ hybridization, to study genomic alterations linked to certain traits, which can effectively investigate candidate genes in a large cohort of individuals with specific alterations. Her current research in this area has revealed a number of new findings related to contiguous gene abnormalities that result in developmental delay, autism, seizures, and intellectual disabilities.

Dr. Phuong L. Mai is the medical director of the cancer genetics clinic. She is interested in epidemiologic and clinical research studies aimed at better understanding familial cancer syndromes, cancer risks, and early detection and interventions to formulate the most effective, individualized risk management strategy for patients with a cancer predisposition. Another of Dr. Mai's interest is the effort to expand cancer genetic services to underserved populations. She is also involved in research exploring the psychological and social impact that having a hereditary cancer syndrome has on the individual as well as the family. Dr. Mai participates in the Pennsylvania Cancer Coalition, contributing to the Commonwealth's effort to increase access to cancer genetic care. Dr. Mai is also the Director of the Breast/Ovarian Cancer Risk Assessment and Prevention Program, where she provides care to patients at increased risk of developing cancer. As part of this program, she is conducting research looking into how to better evaluate subsequent breast cancer risk for patients diagnosed with benign breast lesions

Dr. David Peters Dr. Peters developed the first non-invasive prenatal test for aneuploidy at MWRI and collaborated with clinical staff at MWH to demonstrate clinical utility of this approach. He has more recently expanded on these efforts to explore the development of non-invasive phenotyping and diagnostic approaches for a variety of complex diseases. Current areas of focus are in Necrotizing Enterocolitis, Endometriosis, Ovarian Cancer and Preeclampsia. These efforts, which involve collaborations with neonatologists, psychiatrists and gynecologists are aimed at developing new clinical tools for the diagnosis and management of complex disease.

Dr. Devereux N. Saller, Jr. has a long-standing interest in prenatal diagnosis and management of fetal structural birth defects. In addition to providing clinical care via telemedicine in the CAFD clinic, he is interested in the applications of non-invasive prenatal testing to high risk and low risk pregnancies, and establishing new guidelines for prenatal genetic screening.

Dr. Judith Yanowitz is specifically interested in meiotic crossover recombination as a major determinant of chromosome mis-segregation during the formation of eggs and sperm. Her research is directly relevant to the etiology of aneuploidy in humans as well as the age of menopause. The Yanowitz lab is funded by NIH to study a novel checkpoint system that monitors whether each chromosome receives the crossover and delays progression through meiosis to allow more time for crossovers to be made. Dr. Yanowitz also focuses efforts on the relationship between meiotic crossover formation and the repair of normal double strand breaks, and this work has a strong potential to extend beyond germ line development into mechanistic studies of processes that underlie cancer progression.

Dr. Alex Yatsenko focuses on the genetics of male infertility. He is utilizing genomic approaches such as array comparative genome hybridization and whole exome/genome sequencing to understand causes of male infertility and subfertility. He closely collaborates with members of the Division of Reproductive Endocrinology and Infertility as well as members of the Department of Urology. Dr. Yatsenko discovered multiple novel genetic defects responsible for male infertility. One of the most significant findings was an X-linked gene responsible for azoospermia. He also works on sperm RNA biomarkers that could be utilized in predicting fertilization outcomes in infertile men. He was recently awarded an NIH/NICHD five-year grant entitled, “Genetics of Male Infertility: A Marker of Overall Health .”

Dr. Svetlana Yatsenko studies the utility of chromosomal microarrays in perinatal disorders, disorders of sexual differentiation, and oncology. Her laboratory is focused on developing improved microarray assays for better detection of clinically significant copy-number abnormalities and single cell isolations and genomic analysis of individual cell populations in clinical diagnosis and research.

TEACHING PROGRAMS

The Division is active in resident, medical student and graduate student teaching. Second year residents in obstetrics and gynecology rotate through the division for one week. A 4th year clinical elective is also available to medical students. Dr. Bashford is the course director for these programs. Dr. Bashford also provides a lecture series to Maternal-Fetal Medicine fellows, as well as lectures to pathology residents and genetic counseling students at the School of Public Health. Dr. Yanowitz is co-Director of the Reproductive Development course which is offered every other year to undergraduate, graduate

students and clinical fellows. Dr. S. Yatsenko provides frequent lectures to Genetic Counselors, graduate students and fellows in the Human Genetics course and reproductive endocrinology, and pathology residents, as does Dr. Bellissimo.

Clinical Genomics Case Conference is offered monthly for CME credits and broadcast by video link to Children's Hospital of Pittsburgh. Cases of interest are discussed in depth to an audience consisting of physicians, genetic counselors, laboratory personnel, residents, medical students and fellows.

Magee Clinical Genetic Meetings occur weekly in which patient care, cases, and pertinent publications are reviewed and discussed in depth. This includes prenatal, cancer, and CAFD meetings. In addition to educating trainees, these weekly conferences coordinate patient care in a multidisciplinary setting.

LABORATORY GENETICS & GENOMICS FELLOWSHIP (LGG)

The division offer a 2-year fellowship program in Laboratory Genetics and Genomics to qualified MD and PHD candidates. This is a new specialty accredited by the American Board of Medical Genetics and Genomics (ABMGG) that combines the previously separate fellowships in Molecular Genetics and Cytogenetics. The program trains individuals to develop and interpret clinical laboratory testing in both cytogenetic and molecular techniques. The program is currently undergoing a transition to accreditation under the American Board of Medical Specialties (ABMS).

MEDICAL GENETIC RESIDENCY

The Division of Genetics at Children's Hospital of Pittsburgh offers one position per year in an ACGME accredited medical genetics residency training program in collaboration with the faculty of the Division of Reproductive Genetics. Magee-Womens Hospital is also a training site for this program. This 2-year fellowship prepares physicians to be exceptional clinical geneticists, training them how to evaluate, manage, treat, and counsel patients in prenatal, pediatric, adult, cancer, and reproductive disciplines. There is also an opportunity for special focus on fetal diagnosis and therapy or the role of heredity in cancer.

CLINICAL PROGRAMS

Clinical programs within the Division encompass both direct patient care and laboratory evaluation. The direct patient care services are as follows:

The Center for Advanced Fetal Diagnostics (CAFD) coordinates the efforts of various specialties, including genetics, ultrasound, maternal-fetal medicine, neonatology, and pediatric subspecialty services to evaluate and manage pregnancies complicated by fetal birth defects. In FY19 there were 651 patient visits through the CAFD, down slightly from 665 in FY18. The fetal therapy program (Center for Innovative Fetal Intervention, CIFI) continues to be a leader in the region in performing a complete complement of *in utero* procedures from ultrasound-guided fetal interventions such as intrauterine transfusion, to fetoscopic procedures such as laser photocoagulation for twin-twin transfusion syndrome. In January 2019, the CIFI coordinated an interdisciplinary team of maternal-fetal medicine, obstetric anesthesiology, neonatology and pediatric neurosurgery specialists from both UPMC Magee and UPMC Children's to

perform UPMC's first in-utero surgery to successfully repair an open neural tube defect at 25 weeks gestation (http://www.neurosurgery.pitt.edu/news/utero-surgery-treats-spina-bifida). Weekly multidisciplinary meetings coordinate care for these complicated patients.

Genetic Counseling and Clinical Genetics Consultation (Prenatal/Adult /Cancer). Consults are accepted for genetic counseling and clinical evaluation from care providers throughout the UPMC system. These include OB/GYN and Maternal-Fetal medicine, oncologists, rheumatologists, primary care providers and other physicians. Patients can be seen in person or through a robust telegenetics network. In addition, genetic counselors from the division support the cardiac genetics clinic within the Heart-Vascular Institute at Presbyterian Hospital and the high-risk breast clinic within the Hillman Cancer Center. In FY19, a total of 8,495 patient visits were completed, representing a 4.3% decrease from the previous year. This total includes the coordination efforts of 3,898 First Trimester Screens, 2,139 Prenatal Genetics consults, 1,778 Cancer Genetics consults and 29 Adult Genetics consults.

Laboratory services include:

Pregnancy Screening Laboratory (PSL): Performs on-site routine pregnancy screening for aneuploidy and neural tube defects through the quad screen, first-trimester screen, and amniotic fluid AFP and acetylcholinesterase tests. From July 2018 – June 2019, a total of 6,301 tests were performed in-house. Additionally, the laboratory coordinates cell-free fetal DNA screening (non-invasive prenatal screening) for send-out to other reference laboratories. Routine clinical practice is evolving away from serum screening and toward non-invasive screening as the screening methodology of choice. As such the volume of testing in-house is decreasing as the send-out service increases. The laboratory is currently developing an in-house version of the non-invasive prenatal screen.

Pittsburgh Cytogenetics Laboratory (PCL): Serves as the cytogenetics reference laboratory for the UPMC system and for several hospitals in the tri-state area. Services include: 1) high quality chromosomal analysis, molecular cytogenetic analyses by fluorescence *in situ* hybridization (FISH), and microarray analyses (CGH+SNP,X-HR). Sample types accepted include amniotic fluid, chorionic villus samples (CVS), peripheral blood, cord blood, bone marrow, lymph node, skin biopsy, malignant tumors and products of conception. In addition, the PCL is a key part of the LGG fellowship training program. In FY19, a total of 17,997 tests were performed, which represents a 2.2% increase over the previous year. The PCL continues to work closely with the Pittsburgh Clinical Genomics Laboratory (PCGL) to coordinate testing when both cytogenetic and molecular methods are required to fully evaluate a sample.

Pittsburgh Clinical Genomics Laboratory (PCGL): Serves as a germline genetics molecular testing laboratory for the UPMC system. Services include prenatal carrier screening, pharmacogenomic CYP2C19 genotyping, and cancer risk assessment through next-generation sequencing of common cancer risk genes such as BRCA1 and BRCA2. During this year, the laboratory developed carrier screening for spinal muscular atrophy and expanded the gene-sequencing options for cancer risk assessment. The laboratory is finalizing the development of a comprehensive whole exome sequencing test which will be available in late 2019. A large group of disease-specific gene panels is also under current development. From July 2018 through June 2019, a total of 3,214 were performed by the PCGL; an increase of 25.4% over the previous year.

Selected Publications:

Diploid/triploid mixoploidy: A consequence of asymmetric zygotic segregation of parental genomes. Carson JC, Hoffner L, Conlin L, Parks WT, Fisher RA, Spinner N, **Yatsenko SA**, Bonadio J, Surti U.Am J Med Genet A. 2018 Dec;176(12):2720-2732. doi: 10.1002/ajmg.a.40646. Epub 2018 Oct 10. PMID: 30302900

Partial 5p Deletion and Partial 5q Duplication in a Patient with Multiple Congenital Anomalies: A Two-Step Mechanism in Chromosomal Rearrangement Mediated by Non-Allelic Homologous Recombination. Ou ZZ, Kochmar S, **Yatsenko SA**, Woerner AC, Acquaro R, Ortiz D, Surti U, **Hu J**. Cytogenet Genome Res. 2018 Oct 5. doi: 10.1159/000493381. [Epub ahead of print] PMID: 30286452

Autism spectrum disorder in females with ARHGEF9 alterations and a random pattern of X chromosome inactivation. Aarabi M, Kessler E, Madan-Khetarpal S, Surti U, **Bellissimo D**, Rajkovic A, **Yatsenko SA**. Eur J Med Genet. 2019 Apr;62(4):239-242. doi: 10.1016/j.ejmg.2018.07.021. Epub 2018 Jul 23. PMID: 30048823

Syndromic congenital myelofibrosis associated with a loss-of-function variant in RBSN. Magoulas PL, Shchelochkov OA, Bainbridge MN, Ben-Shachar S, **Yatsenko S**, Potocki L, Lewis RA, Searby C, Marcogliese AN, Elghetany MT, Zapata G, Hernández PP, Gadkari M, Einhaus D, Muzny DM, Gibbs RA, Bertuch AA, Scott DA, Corvera S, Franco LM. Blood. 2018 Aug 9;132(6):658-662. doi: 10.1182/blood-2017-12-824433. Epub 2018 May 21. No abstract available. PMID: 29784638

Genome-wide association and transcriptome studies identify target genes and risk loci for breast cancer. Ferreira MA, Gamazon ER, Al-Ejeh F, Aittomäki K,Andrulis IL, Anton-Culver H, Arason A,…**Thull DL**,...et al. Nat Commun.2019 April 15;10(1):1741. PMID:30988301

Investigating Pregnancy Outcomes After Abnormal Cell-Free DNA Test Results. Lu J, **Saller DN**, **Fraer LM**, Chen BA. J Genet Couns. 2018 Aug;27(4):902-908. doi: 10.1007/s10897-018-0219-7. Epub 2018 Jan 24. PMID: 29368276

A high-resolution X chromosome copy-number variation map in fertile females and women with primary ovarian insufficiency. **Yatsenko SA**, Wood-Trageser M, **Chu T**, Jiang H, Rajkovic A. Genet Med. 2019 Oct;21(10):2275-2284. doi: 10.1038/s41436-019-0505-2. Epub 2019 Apr 5. PMID: 30948856

Distinct communication patterns of trophoblastic miRNA among the maternal-placental-fetal compartments. Paquette AG, **Chu T**, Wu X, Wang K, Price ND, Sadovsky Y. Placenta. 2018 Dec;72-73:28-35. doi: 10.1016/j.placenta.2018.10.004. Epub 2018 Oct 22. PMID: 30501878

PLIN2 Is Essential for Trophoblastic Lipid Droplet Accumulation and Cell Survival During Hypoxia. Bildirici I, Schaiff WT, Chen B, Morizane M, Oh SY, O'Brien M, Sonnenberg-Hirche C, **Chu T**, Barak Y, Nelson DM,

Sadovsky Y. Endocrinology. 2018 Dec 1;159(12):3937-3949. doi: 10.1210/en.2018-00752. PMID: 30351430

Partial 5p Deletion and Partial 5q Duplication in a Patient with Multiple Congenital Anomalies: A Two-Step Mechanism in Chromosomal Rearrangement Mediated by Non-Allelic Homologous Recombination. Ou ZZ, Kochmar S, **Yatsenko SA**, Woerner AC, Acquaro R, Ortiz D, Surti U, **Hu J**. Cytogenet Genome Res. 2018 Oct 5.

A DNA repair protein and histone methyltransferase interact to promote genome stability in the Caenorhabditis elegans germ line. Yang B, Xu X, Russell L, Sullenberger MT, **Yanowitz JL**, Maine EM. PLoS Genet. 2019 Feb 22;15(2): e1007992. doi: 10.1371/journal.pgen.1007992. eCollection 2019 Feb. PMCID: PMC6402707

ATM and ATR influence meiotic crossover formation through antagonistic and overlapping function in Caenorhabditis elegans. Li W and **Yanowitz JL**. Genetics. 2019 Jun;212(2):431-443. doi: 10.1534/genetics.119.302193. Epub 2019 Apr 23. PMCID: PMC6553820

The longevity-promoting factor, TCER-1, widely represses stress resistance and innate immunity. Amrit FRG, Naim N, Ratnappan R, Loose J, Mason C, Steenberge L, McClendon BT, Wang G, Driscoll M, **Yanowitz JL**, Ghazi A. Nat Commun. 2019 Jul 17;10(1):3042. doi: 10.1038/s41467-019-10759-z. PMCID: PMC6637209

GCNA protects genome integrity and fertility across species. Bhargava V, Goldstein CD, Russell L, Xu L, Ahmed M, Li W, Casey A, Servage K, Kollipara R, Picciarelli Z, Kittler R, **Yatsenko A**, Carmell M, Orth K, Amatruda JF*, **Yanowitz JL***, and Buszczak M*. 2019. Dev Cell., in press. bioRxiv 570804; doi: https://doi.org/10.1101/570804 *co-corresponding authors

Genomic study of severe form of male infertility, non-obstructive azoospermia. **Yatsenko AN**, Pollock, N, Jiang H, Olszewska M, Jaffe T, **Yatsenko S**, Sanfilippo J, Rajkovic A, Kurpisz M (2019). 44rd Annual ASA Meeting, April 2019. Chicago, IL.

Grant Funding

Grant Number (Funded)	Grant Title	Years	Faculty Member
1R01GM125800-01	Role of Chromosomally Tethered Proteasome in Chromosome Pairing and Meiotic Recombination	2018-2022	Judith Yanowitz, PhD
1R01GM127569	Role of GCNA in preserving genome integrity and fertility	2019-2023	Judith Yanowitz, PhD
1R21HD091548-01	Fluorescently Tagged C. elegans to Probe Meiotic Recombination	2017-2020	Judith Yanowitz, PhD
2R01GM104007-06	Characterization of Meiotic Crossover Surveillance System	2013-2022	Judith Yanowitz, PhD
NIH/NICHD P50 HD096723	Genetics of Male Infertility: A Marker of Overall Health	2019-2024	Alexander Yatsenko, MD, PhD

FACULTY LISTING
Michael Bashford, MD
Daniel Bellissimo, PhD
Tianjiao Chu, PhD
Jie Hu, MD, PhD

Phuong L. Mai, MD, MS
David Peters, PhD
Devereux N. Saller, Jr., MD
Judith Yanowitz, PhD
Alexander Yatsenko, MD, PhD
Svetlana Yatsenko, MD

CLINICAL RESIDENTS
Jacob Wesley Ulm, MD (Medical Genetics & Genomics)
Laura Duque Lasio, MD (Medical Biochemical Genetics)

LABORATORY GENETICS & GENOMICS FELLOWSHIP (LGG)
Angela Verdoni, PhD

GENETIC COUNSELORS
Christina Bittner, MS, LCGC
Melissa Bourdius, MS, LCGC
Abigail Byrnes Peffer, MS, LCGC
Michele Clemens, MS, LCGC
Shenin Dettwyler, MS, LCGC
Luanne Fraer, MS, LCGC
Rachel Huziak, MS, LCGC
Meredith Jones, MS
Maureen May, MS, LCGC
Marianne McGuire, MS, LCGC
Elizabeth Sheehan, MS, LCGC
Julia Stone, MS, LCGC
Darcy Thull, MS, LCGC

GENETIC COUNSELOR ASSISTANTS
Rachel Elias
Andrew Fazenbaker
Kaylynn McKinney

WEBSITE: https://www.obgyn.pitt.edu/our-divisions/reproductive-genetics-and-genomics

DIVISION OF ULTRASOUND



Timothy P. Canavan, MD
Division Director

OVERVIEW

The Division of Ultrasound is a unique obstetric and gynecologic ultrasound service provided by specially trained Obstetrician/Gynecologists targeting clinical expertise with diagnostic ultrasound imaging. This is a high quality, elite service which provides unequaled ultrasound expertise to the women of western Pennsylvania and Eastern Ohio. There are only four such service models in the United States.

The mission of the ultrasound division is to:

- Provide quality obstetric and gynecologic ultrasound services in a timely and cost-effective manner;
- To provide robust resident/fellow ultrasound rotations to nurture the development of future obstetric and gynecologic sonologists;
- Stimulate a collaborative research program that contributes to the global knowledge of the specialty and provide a stimulus for the academic growth of young faculty;
- Develop new and innovative clinical services to expand the use of ultrasound in the assessment of women.

Members of the division are recognized locally, nationally and internationally for their expertise in obstetric and gynecologic sonography. The Division has established itself as a benchmark for expert ultrasound evaluation in Obstetrics and Gynecology. Hence, patients with complicated or abnormal ultrasound examinations are frequently referred for consultation.

The major success of the ultrasound division is its acknowledged quality in performing obstetric and gynecologic ultrasound examinations. The goals of the division are to improve our services so that patient and referral physician satisfaction and convenience are commensurate with the quality of the service provided.

In 1996, the division was among the first ultrasound facilities to be accredited by the American Institute of Ultrasound in Medicine for obstetrical and gynecologic ultrasound. The accrediting process evaluates equipment use and maintenance; report generation; storage of images; and sonographer and physician

qualifications. In general, the accreditation process will improve the quality of ultrasound services. The number of private practices choosing to perform ultrasound examinations in their offices will inevitably decline. If we can continue to recruit staff as needed, we will be well positioned to take advantage of this natural centralization of ultrasound services.

The challenges in medical practice have provided the division with the opportunity to develop a new model for patient care that seeks to expand our patient base, while improving ultrasound services in the Community. This model has six critical components:

1. A program of sonographer training, whether at Magee or on-site at facilities, with one on one training, Web based uLearn instruction, Real-time, hands on tele-conference instruction and monthly teleconferenced grand rounds.
2. Establishment of specific sonographer protocols for each ultrasound examination.
3. Implementation of evidence based clinical guidelines.
4. Instillation and training in our web-based, evidence-based Ultrasound Information System.
5. Transmission of images to Magee iSite PACs for interpretation.
6. Around-the-clock availability for the interpretation and report generation by our staff.

This model is active at all of our 37 sites.

We have continued our goal to further improve patient care and satisfaction by increasing services at distant satellites which save patient's travel time through implementation of cutting edge real-time tele-ultrasound and telemedical services in the exam rooms of the distant sites. This allows the Physician to guide the local sonographer in the ultrasound examination and allow the patient to ask questions of the Physician. The Physician can review the ultrasound findings with the patient in real-time.

CLINICAL PROGRAM

The ultrasound division performed 112,894 procedures in FY2019. Forty-three percent were performed at telemedicine sites which are increased from 40% in FY2016.

Drs. Timothy P. Canavan and Sami Makaroun co-Directors of the Center for Advanced Fetal Diagnostics and Dr. Devereux Saller, a board certified Reproductive Geneticist, continue to enhance patient access to the Center by expanding telemedical consults to patients in distance locations. This has improved compliance and patient satisfaction. Genetic testing is now available at many of our satellite locations to improve patient access. Weekly case conferences are now accessible through teleconference increasing clinician access to the expertise of Genetics, Ultrasound, Maternal Fetal Medicine, Neonatology and Pediatric Surgery to enhance our collaborative individualized treatment for each patient.

Dr. Stephen Emery as Director of the Center for Innovative Fetal Interventions provides around the clock access to fetal therapy for patients referred locally and across Pennsylvania, Southern New York state and Eastern Ohio. Placental laser for twin-to-twin transfusion, radio frequency ablations, urinary bladder stenting for obstruction and fetal thoracentesis are being offered at Magee-Womens Hospital and Magee performed its first open in-utero fetal open neural tube defect repair in 2019. The fetus delivered at 33 weeks gestational and after a short NICU stay did very well with improved neuromuscular function. Dr.

Emery continues to expand the program to include animal research, developing a sheep model to investigate the in-utero treatment of fetal aqueductal stenosis.

Dr. Timothy P. Canavan has expanded the transperineal pelvic floor diagnostic service to include ultrasound evaluation of pelvic floor mesh and assessment of patients suspected to have complications from mesh surgery such as mesh erosion and migration. The service continues to use 3-dimensional ultrasound to assess the pelvic floor in patients with pelvic floor prolapse and to evaluate the pelvic floor prior to urethral slings surgery. The service has been expanded to provide innovative 3D assessment of the anal sphincter for detailed evaluation of patients who experienced obstetrical trauma. The patient can then be referred for a multi-disciplinary evaluation and treatment through the Division of Urogynecology. This service is unique in Pennsylvania and one of only a few in the US. Using real time imaging and patient maneuvers, the activity of the pelvic floor muscles is visualized and measured, providing unique clinical data to guide treatment of pelvic floor disorders. The service is involved in multiple research studies including studies by the Pelvic Floor Network of the National Institute of Health.

TEACHING PROGRAM

The training of residents and fellows is a major commitment of the division. In addition to obstetric and radiology residents, fellows in Maternal-Fetal Medicine, Genetics, Reproductive Endocrinology and Fetal Imaging rotate through the division.

The Maternal-Fetal Medicine fellowship rotation is increased to 8 months of hands-on scanning, evaluation of interesting cases and weekly conferences on fetal anomaly detection. Fellows spend 2 days a week with the Ultrasound physician and are given their own panel of exams to review the images, develop a comprehensive report and provide a diagnosis. These cases are then presented to the attending for discussion of the pertinent findings and review of proper reporting. In addition, a web site has been developed that incorporates clips and images of fetal anomalies for the fellows to review. There is the opportunity for 3 – 6 weeks of focused elective time in the second year.

A Pitt Med Navigator site for residents and fellows who rotate through the division is available with teaching modules in obstetrics and gynecology ultrasound combined with online testing. Additional modules have been added to enhance education.

The obstetric residency training program is an integral part of the Division of Ultrasound teaching program. The 1st and 2nd year resident training includes a combination of hands-on training, ultrasound simulation training, didactic lectures on specific ultrasound examinations and procedures and the opportunity to plan, collect data, analyze and publish original research. This year, two residents are working on ultrasound research projects.

We have expanded our career development rotation within the division to include 4th year medical students from the University of Pittsburgh. The goal is to mentor residents and medical students in ultrasound through career focused learning with instruction in image acquisition, one on one teaching sessions with an ultrasound physician and problem-based learning.

The Ultrasound division has partnered with SonoSim, an ultrasound simulation company, to provide ultrasound simulation education. Sonosim uses real-time ultrasound video clips to provide a unique simulation experience for review of normal and abnormal obstetrical and gynecological ultrasound examinations by both transabdominal and transvaginal scanning. The division is working with Sonosim to build additional content and expand their educational library for our students, residents and fellows.

The department continues to be very active in the training of ultrasound technicians from two local sonography programs. Sonographer students work one on one with senior sonographers learning hands on skills in image acquisition. They rotate through Magee Womens hospital as well as our local satellite centers.

Three full-time experienced sonographers are active in the screening of ultrasound images and the training and education of Ob/Gyn ultrasonography students, Ob/Gyn and Radiology residents as well as Maternal-Fetal Medicine fellows. They support the division in its clinical, research and educational activities.

The Division has mentored several Physicians from China in 2019 in an ongoing international program to provide education and training to international Physicians in Ob/Gyn ultrasound.

RESEARCH PROGRAM

The research interests of the division span the field of obstetrics and gynecologic ultrasound. Recent publications include:

1. The association of fetal congenital heart disease and placental development.
2. Histochemical expression of FLT1 and VEGF in placentas of fetuses with hypoplastic left heart syndrome.
3. The accuracy of fetal limb volume in the prediction of estimated fetal weight.
4. Development of biometric growth curves in fetuses with trisomy 21 and Gastroschisis.
5. The influence of cardiac defects on the biometric growth patterns of fetuses with trisomy 21.
6. Neonatal outcome in fetuses with a persistent right umbilical vein.
7. Subsequent pregnancy outcomes after open maternal-fetal surgery for myelomeningocele.
8. Histologic appearance of iatrogenic hydrocephalus in the fetal lamb model.
9. Fetal aqueductal stenosis: Prenatal diagnosis and intervention.
10. The impact of mode of delivery on infant neurologic outcomes in myelomeningocele.
11. North American Fetal Therapy Network: Intervention versus expectant management for stage I twin-twin transfusion syndrome.
12. Clinical outcomes of congenital Aqueductal stenosis.
13. A novel low-profile ventriculoamniotic shunt for fetal aqueductal stenosis.
14. International Fetal Cardiac Intervention Registry: A worldwide collaborative description and preliminary outcomes.
15. Ultrasound assessment of congenital lung masses and neonatal respiratory outcomes.
16. The North American Fetal Therapy Network Consensus Statement: management of complicated monochorionic gestations.
17. Large for gestational age ultrasound diagnosis and risk for cesarean delivery in women with gestational diabetes mellitus.

18. Early pregnancy failure by first trimester ultrasound.
19. The impact of pregnancy and parturition on the vaginal angle.
20. Prevalence and predictors of stress urinary incontinence.
21. The effects of obesity on the nuchal translucency measurement in the first trimester.
22. Expansion of phenotype and genotype data in CRB2-related syndrome.
23. Genotype-phenotype correlation and pregnancy outcome of partial trisomy 14q
24. Post-partum remote hypertension monitoring

Division faculty has published several book chapters on early pregnancy loss, fetal cleft lip and palate and fetal hydrops. The Division has taken over the publication of a popular and highly valued text on fetal anomalies entitled Structured Fetal Anomalies. The 3rd edition was completed by the Division in 2016 and published by Springer. It will continue to be a Magee Womens Hospital Division of Ultrasound text.

Over 25 web-based education programs spanning topics from the biophysical profile score and oligohydramnios to ectopic pregnancy and the sonographic evaluation of adenomyosis have been produced in association with the Institute of Advanced Medical Education.

The Division has several active grants:

1. 5D Limb Volume International Multicenter Trial Sponsored by Samsung Medison Co., Ltd.
2. Coulter Foundation grant for fetal hydrocephalus research
3. University of Pittsburgh Seed project grant for fetal hydrocephalus research
4. Noah Angelica Hope grant for Twin Twin Transfusion Syndrome program
5. The Tina Smith Cardiology Research Fund
6. The Frederick Sherman MD Perinatal Fund

FACULTY LISTING

Timothy P. Canavan, MD, MS	Associate Professor of Obstetrics, Gynecology and Reproductive Sciences, Division Director of Ultrasound and co-Director, Center for Advanced Fetal Diagnostics
David Kauffman, MD	Clinical Professor of Obstetrics, Gynecology and Reproductive Sciences
Bonnie Coyne, MD	Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences
Stephen Emery, MD	Associate Professor of Obstetrics, Gynecology and Reproductive Sciences and Director, Center for Innovative Fetal Intervention
Rosemary Froehlich, MD	Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences
Sami Makaroun, MD	Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences, co-Director, Center for Advanced Fetal Diagnosis
Jake Larkin, MD	Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences and Director of Inpatient Obstetrical Services, Magee Womens Hospital, University of Pittsburgh School of Medicine

Noe Copley-Woods, MD	Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences
Devereux Saller, MD	Professor of Obstetrics, Gynecology and Reproductive Sciences
Isabelle Wilkins, MD	Professor of Obstetrics, Gynecology and Reproductive Sciences, Vice Chair of Clinical Affairs
Tonya Lightcap, ARDMS	Sonographer
Carina Norris, ARDMS	Sonographer
Ashleigh Dine, ARDMS	Sonographer

WEBSITE: http://obgyn.medicine.pitt.edu/ultrasound

COMMUNITY PRACTICES SERVICE LINE
(Outside Allegheny County)



David Badway, MD
Vice Chair of Community Practices

OVERVIEW

During the academic year, 2018-2019, the Community Practice Service Line, in Western Pennsylvania, remained faithful to its mission of providing compassionate, quality-integrated care. The core clinical program continues to be general obstetrical and gynecologic care. The closure of the Uniontown practice resulted in a slight decline of overall clinical volume for obstetrical and gynecologic visits, deliveries, and procedures; however, our providers continue to provide dedicated, efficient quality care at UPMC Horizon, UPMC Northwest, UPMC Altoona, and UPMC Hamot in Erie and Butler. Our core services continue to strengthen by the addition of new providers and programs.

The Service Line continues to develop our subspecialty service with our community practices. Gynecologic Oncology, Urogynecology, Reproductive Medicine and Magee Ultrasound have dedicated personnel and resources for UPMC Hamot, UPMC Altoona, and UPMC Horizon. Maternal Fetal Medicine and Reproductive Genetics continue to effectively utilize telemedicine to provide consultative services to many of our community practice sites.

The community practices continue to participate in the educational and research missions of the department by providing access to medical students and residents and participation in clinical research projects. These providers have embraced departmental quality and value initiatives such as the obstetrical bundle and hysterectomy pathways. These service line practices outside of Allegheny County will continue to appropriately expand and integrate services necessary to meet the needs of the department.

Clinical Program

The service line has seen an expansion in patient care, development of new clinical programs and continuing quality and patient safety activities. The core clinical program is general OB/GYN care, including routine and complex obstetrics, benign gynecology including minimally invasive surgical techniques and office surgery, contraception, mid-life and well-woman care.

The challenges of FY 2018 continued into FY 2019. The impact of changing health plan paradigms shifting a higher cost burden onto patients for medical services via increasing deductible and co-insurance requirements remains. UPMC's decision to renew its relationship with Highmark, the regional Blue Cross Blue Shield product and the major insurer in the region, will continue to offer access to these patients throughout Western Pennsylvania.

COMMUNITY PRACTICES IN WESTERN PENNSYLVANIA

Service	FY 2016-2017	FY 2017-2018	FY 2018-2019
Total OB Visits	25,944	39,276	34,211
Total GYN Visits	62,886	86,094	68,530
Total Outpatient and Inpatient Procedures	10,002	15,234	12,663
Total Deliveries	2,607	3,724	3,225

The service line continues to develop and refine our departmental objective of integrating academic and subspecialty services with our communities. The work will become even more important as we develop a Department-wide answer to the changing market condition. Maternal-Fetal Medicine continues to make significant progress with telemedicine consultation at several sites, and now provides inpatient consultations for several community hospitals. Reproductive Genetics has also started a telemedicine service in the communities Magee Ultrasound reaches into every community site via teleradiology, providing a consistent, high quality platform for community providers and subspecialists to utilize during telemedicine consultations. GYN Oncology, Reproductive Medicine, and Urogynecology continue their strong presence by providing consultation, outpatient, and some inpatient surgical services at many of our community sites.

Educational Program

As Clinical Faculty, the members of the service line take seriously their commitment to the education of future providers. Members of the service line provide teaching for the following groups:

1. Medical students of University of Pittsburgh School of Medicine
2. Visiting students from other institutions
3. Residents in Obstetrics, Gynecology and Reproductive Sciences

Teaching activities take place in community practice offices, inpatient units including Labor and Delivery and the operating room. Some members also lead problem-based learning groups, and many provide instruction in the second-year Breast and Pelvic Examination sessions. The goal of these efforts is to provide a "real world" environment to experience the presentation and management of OB/GYN issues. Clinical issues in the community setting often require a different approach than that of an academic medical center, and the faculty provides myriad examples of surgical technique, case management and physician interaction with patients, colleagues and staff.

Strategic Planning

The rapid growth of the service line required thoughtful examination of both the assets and direction of the practices. In the Fall 2010 the service line partnered with the Lowder School of Business at Auburn University to develop a strategic analysis. Their recommendations included:

1. Maximize the use of analytics.
2. Attract and retain highly qualified physicians and staff to help build long-term relationships with patients.
3. Address demographic shifts with new offerings.
4. Adopt a process improvement focus.
5. Improve the office and clinic environment to provide more comfort for patients.
6. Achieve greater integration with Department and affiliated UPMC facilities and services.
7. Greater expansion outside of the Pittsburgh Metropolitan Area.

These topics and others were addressed at the first Community Practices Strategic Planning Session held in April of 2011. During this one-day session, led by faculty from the Katz School of Business, University of Pittsburgh, the thought leaders of the service line gathered with the leaders of the department to consider these goals and how they integrate with the strategic goals of the department and UPMC.

The service line's four broad strategic goals are:

1. Community Practices will develop and maintain a satisfied and engaged workforce.
2. Community Practices will successfully integrate with their partners in the Department of OB/GYN/RS and UPMC.
3. Community Practices will continuously improve organizational quality
4. Community Practices will continuously improve clinical quality and safety.

These strategic goals, directly coupled with the goals of the Department and UPMC, continue to guide the activities of the Service Line.

Future Growth and Development

The service line will continue to acquire practices and develop practices as opportunities present, keeping focus on the goal developing a premier OB/GYN integrated delivery system. The integration of subspecialty services, especially maternal-fetal medicine, urogynecology, and gynecologic oncology, will continue. Aware of the coming changes in health care delivery and the need for appropriate resource utilization, the service line is in a continuing process of evaluation of all clinical site utilization, working toward appropriate, analytics-driven consolidation or expansion, as appropriate. Further, more effort will be placed on utilization of Advanced Practice Providers, as well as the development and implementation of bundles and protocols to enhance and standardize care management. Enhancement of resident and student opportunities will remain a priority. Patient safety and quality programs will continue to expand, and the electronic medical record has been implemented in all our practices. Increased provider financial risks for episodes of patient care will directly affect our practices as a paradigm shift in provider reimbursement evolves.

MAGEE-WOMENS RESEARCH INSTITUTE



Yoel Sadovsky, MD
MWRI Executive Director

OVERVIEW

Magee-Womens Research Institute (MWRI) is home to University of Pittsburgh scientists engaged in research in reproductive biology and women's health. Unique to MWRI is the multidimensionality of its reproductive biology research, spanning approaches from molecular biology to epidemiology and community outreach, research systems from worms to humans, and processes from early embryonic development to reproductive aging. MWRI's researchers use diverse basic, translational, and clinical investigative tools that support our central mission to:

- Advance knowledge in the field of reproductive biology and medicine
- Translate discoveries into improved health for women and their infants
- Train current and future scholars in the reproductive sciences
- Foster community investment and involvement in women's health research

MWRI houses all the research pursuits of the Department of Obstetrics, Gynecology and Reproductive Sciences (OBGYN-RS), including basic, translational, clinical, behavioral, and outcomes investigations, all taking place at MWRI's research building on Craft Avenue, at Magee-Womens Hospital, or at the Isaly building across the street from Magee-Womens Hospital. Our 105 investigators include 71 primary faculty members (see data on gender equality below.) Of these, 60 are from the OBGYN-RS department. A little more than half of the primary faculty members are engaged primarily in basic and translational research, and the remaining faculty are engaged primarily in clinical and outcomes research. In addition, 34 University of Pittsburgh researchers with primary appointments in other University departments hold affiliate faculty appointments at MWRI. These include representatives from the Departments of Microbiology and Molecular Genetics, Cell Biology, Pharmacology and Chemical Biology, Medicine, Surgery, Pediatrics, and Psychiatry in the School of Medicine; Epidemiology, Human Genetics, Environmental and Occupational Health, and Behavioral and Community Health Sciences in the Graduate School of Public Health; Bioengineering in the Swanson School of Engineering; and representatives from the Schools of Pharmacy and Nursing. MWRI's collaborative, transdisciplinary approach to research, affiliation with the University of Pittsburgh and Magee-Womens Hospital of UPMC, and location

immediately adjacent to Magee's large clinical patient care center further buttress our research programs.

Despite continuing challenges in NIH funding, MWRI continues to excel in securing financial support for new and ongoing initiatives. As the research arm of the Department of OBGYN-RS, MWRI remains a leader in NIH-funded research among obstetrics and gynecology departments in the United States. In fiscal year 2018-2019, funding from all grants and contracts was $50.1 million, of which 84% ($41.9 million) was from Federal sources, primarily from the NIH, and including entities such as the FDA and the Department of Defense.

Key new grants this year include:

- *Lisa Rohan, PhD,* received a $3.96M, 3-year R61 from NIH/NIAID entitled, "Long Acting Film Technology for Contraception and HIV Prevention (LATCH)"
- *Steve Caritis, MD,* received a $3.5M, 5-year R01 grant from NICHD entitled, "Pharmacologically-based strategies for buprenorphine treatment during pregnancy"
- *Liz Krans, MD,* received a $3M, 5-year R01 grant from NICHD entitled, "Availability, accessibility, and structure of opioid use disorder treatment and maternal and child health outcomes"
- *Pam Moalli, MD, PhD,* received a $2.57M, 5-year R01 from NIH/NICHD entitled, "Overcoming complications of polypropylene prolapse meshes: development of novel elastomeric auxetic devices"
- *Steffi Oesterreich, PhD,* received a $2.4M, 5-year R01 grant from NIH/NCI entitled, "Mechanism-based strategies to target ER-mutant breast cancer"
- *Jerry Schatten, PhD,* received a $1.9M, 5-year R25 grant from NIH/NIA entitled, "Frontiers in Alzheimer's and Aging Research (FrA2R)"
- *Judy Yanowitz, PhD,* received a $1.2M, 4-year R01 grant from NIH/NIGMS entitled, "Characterization of a meiotic crossover surveillance system"
- *Yaki Barak, PhD,* received a $1M, 2-3 year Magee Summit Grant entitled, "Placental origin of congenital heart defects – A paradigm coming of age"
- *Bob Edwards, MD, and Anda Vlad, MD, PhD,* received a $998K, 2-year grant from Merck entitled, "Systemic immune checkpoint blockade and intraperitoneal chemo-immunotherapy in recurrent ovarian cancer"
- *Ron Buckanovich, MD, PhD,* received a $900K, 3-year grant from the Ovarian Cancer Research Alliance entitled, "Targeting Tumor Desmoplasia to Enhance Immunotherapy"
- *Sharon Hillier, PhD, Sharon Achilles, MD, PhD, and Lisa Rohan, PhD,* received a $890K, 2-year grant from the FDA entitled, "Physiologically-based model of the female reproductive tract: vaginal and intrauterine delivery components—Support new approaches to improve product manufacturing and quality"
- *Maisa Feghali, MD,* received a $540K, 4-year K23 grant from NIH/NICHD entitled, "Metabolic analysis for treatment choice in gestational diabetes mellitus"
- *Anda Vlad, MD, PhD,* received a $385K, 2-year DOD grant entitled, "Ovarian cancer therapy via conditional STING pathway activation"

- *Janet Catov, PhD,* received a $272K, 2-year R21 from NIH/NHLBI entitled, "Shared antecedents to pre-term birth and cardiovascular disease in women"
- *Janet Catov, PhD,* also received a $200K, 2-year American Heart Association entitled, "Mechanisms for early and late postpartum hypertension in human preeclampsia"
- *Ron Buckanovich, MD, PhD, and Anda Vlad, MD, PhD,* received a $140K, 2-year UPMC Hillman Development Grant entitled, "ALDH inhibition as modulator of tumor immunobiology"
- *Steve Emery, MD,* received a $100K, 1-year Coulter Translational Research Program grant entitled, "Ventriculo-amniotic shunt for fetal aqueductal stenosis"

GENDER EQUALITY IN RESEARCH

In UNESCO's 2016 report, "Science Report Towards 2030", it was noted that women only make up ~30% of the global researcher pool. While MWRI is centered on advancing research in women's health, and cognizant of its impact of health worldwide, we are also excited by the gender representation in our environment. At MWRI, 53% of our 105 faculty investigators are women, and our 71 primary faculty members are almost equally divided (35 women, 36 men). Our 2018 publication data reflect similar equality in productivity: of our 272 publications, 167 were contributed by female faculty members, and 174 by male faculty (the overlap represents 69 publications in which both women and men contributed); women contributed as senior authors to 52 publications versus men contributing to 43 publications; and women contributed as any author to publications 205 times vs men contributing 218 times. These data are further reinforced in salary equality between women and men, with the women's average 2018 salary 1% higher than men at the associate professor level.

RESEARCH AREAS

Research programs at MWRI center on diverse aspects of reproductive biology and women's and infant's health. These include the following main areas:

Reproductive development

Research in this general area centers on early embryonic development, gonadal and germ cell genetics and epigenetics, development and differentiation, reproductive aging, and meiotic crossover recombination. Key researchers include Yaacov Barak, PhD, Miguel Brieno-Enriquez, MD, PhD, Tianjiao Chu, PhD, Mellissa Mann, PhD, Kyle Orwig, PhD, David Peters, PhD, Gerald Schatten, PhD, Urvashi Surti, PhD, and Judith Yanowitz, PhD.

Overview

Research studies in this area encompass differentiation of human and nonhuman embryonic stem cells into germ cells; mechanisms of germ cell formation and differentiation, including centriole biology; adipogenesis, and the novel role of key transcription factors in this process; and mechanisms of meiotic recombination and aneuploidy. Initiatives also include genetics; epigenetics; genomic imprinting; the molecular biology of gametes, embryos, and stem cells; the origins of developmental diseases; and the potential of stem cells and genome editing for treating human disease. The studies utilize diverse animal models, from worms to mice and nonhuman primates. Translational efforts emanating from such studies

promote better understanding of male and female infertility; genetic determinants of reproductive aging; regeneration of gonadal and reproductive tract tissues; origin of aneuploidy; genomic imbalances; early embryonic development; and antecedents of chronic diseases.

Selected publications

1. Sachani SS, Landschoot LS, Zhang L, White CR, MacDonald WA, Golding MC, Mann MRW. Nucleoporin 107, 62 and 153 mediate Kcnq1ot1 imprinted domain regulation in extraembryonic endoderm stem cells. *Nat Commun* 2018;9(1):2795. PMID: 30022050; PMC6052020.
2. Simerly C, Manil-Segalen M, Castro C, Hartnett C, Kong D, Verlhac MH, Loncarek J, Schatten G. Separation and loss of centrioles from primordidal germ cells to mature oocytes in the mouse. *Sci Rep* 2018;8(1):12791. PMID: 30143724; PMC6109097.
3. Macaisne N, Kessler Z, Yanowitz JL. Meiotic double-strand break proteins influence repair pathway utilization. *Genetics* 2018;210(3):843-56. PMID: 30242011; PMC6218235.
4. Brieno-Enriquez MA, Moak SL, Abud-Flores A, Cohen PE. Characterization of telomeric repeat-containing RNA (TERRA) localization and protein interactions in primordial germ cells of the mouse. *Biol Reprod* 2018;100(4):950-62. PMID: 30423030; PMC6483056.
5. Gyanchandani R, Kvam E, Heller R, Finehout E, Smith N, Kota K, Nelson JR, Griffin W, Puhalla S, Brufsky AM, Davidson NE, Lee AV. Whole genome amplification of cell-free DNA enables detection of circulating tumor DNA mutations from fingerstick capillary blood. *Sci Rep* 2018;8(1):17313. PMID: 30470782.
6. Sakib S, Uchida A, Valenzuela-Leon P, Yu Y, Valli-Pulaski H, Orwig K, Ungrin M, Dobrinski I. Formation of organotypic testicular organoids in microwell culture. *Biol Reprod* 2019;100(6):1648-60. PMID: 30927418.
7. Li W, Yanowitz J. ATM and ATR influence meiotic crossover formation through antagonistic and overlapping functions in Caenorhabditis elegans. *Genetics* 2019;212(2):431-43. PMID: 31015193; PMC6553820.
8. Harper JC, Schatten G. Are we ready for genome editing in human embryos for clinical purposes? *Eur J Med Genet* 2019:103682. PMID: 31150829.

Pregnancy and newborn medicine

Research in this general area centers on prenatal genetics, feto-placental growth and development, abnormal fetal growth, preterm birth, maternal diseases during pregnancy, preeclampsia, obstetrical pharmacology, and newborn medicine. Key researchers include Yaacov Barak, PhD, Timothy Canavan, MD, Steve Caritis, MD, Janet Catov, PhD, Tianjiao Chu, PhD, Francesca Facco, MD, Maisa Feghali, MD, Kata Himes, MD, Carl Hubel, PhD, Elizabeth Krans, MD, Jacob Larkin, MD, Mellissa Mann, PhD, Jean-Francois Mouillet, PhD, Yingshi Ouyang, PhD, David Peters, PhD, Robert Powers, PhD, James Roberts, MD, Yoel Sadovsky, MD, and Hyagriv Simhan, MD.

Overview

Research in the areas of embryogenesis, pregnancy, and pregnancy outcomes centers on normal and abnormal processes that shape maternal-fetal health. Investigators analyze diverse influences on the feto-placental genome and epigenome and on gene expression, including genomic imprinting, gene-environment interactions, nutrition, and the effect of drugs and medications during pregnancy. Building on these fundamental research trajectories, MWRI scientists collaborate with other scientists worldwide

to study key pregnancy complications, such as preeclampsia, fetal growth restriction, preterm birth, and the neonatal, childhood, and lifelong complications stemming from these gestational diseases. Major initiatives include (a) the use of next-generation sequencing of first trimester maternal plasma DNA to provide improved diagnostic sensitivity and specificity over existing technologies; (b) the mechanistic link between placental development and the fetal heart; (c) preterm birth, including the long-term risk for cardiovascular disease of women who have had preterm birth; (d) cellular and molecular mechanisms of preeclampsia, as well as behavioral, epidemiological, and clinical components leading to the disorder; (e) the pathways by which preeclampsia may inform the unique pathophysiology of later life cardiovascular disease in women; (f) molecular mechanisms, including genomic and microRNA pathways, underlying early and late placental development, differentiation, and adaptation to cellular injury and the metabolic processes that are essential for micronutrient supply to the developing embryo; (g) nanovesicle (exosome)-based fetal-placental-maternal interaction to maintain homeostasis and deliver miRNAs that attenuate viral infections; (h) substance use disorders during pregnancy and post-partum; and (i) deep phenotyping in pregnancy, pregnancy outcome and infant mortality.

We continue to advance our "9 months to 90 years" (9-90) research initiative, a collaboration with Richard King Mellon Foundation leadership and investigators at Pitt, University of Pennsylvania, Stanford University, and RAND Corporation to address pertinent questions related to infant mortality in our region. Drs. Sadovsky and Catov also partnered with University of Pittsburgh's Clinical and Translational Science Institute leadership on special populations and a women's health – practice-based research network. This collaboration involves special populations across the lifespan and provides key support for our Magee Obstetrical Maternal-Infant (MOMI) database and biobank.

Recent discoveries, patents, and IND applications

- An invention discovery by David Peters, PhD, David Finegold, MD, and Tianjiao Chu, PhD, entitled, "Tissue to liquid biopsy differential methylation in NEC"
- An invention discovery by David Peters, PhD, Tianjiao Chu, PhD, and Lisa Ann Pan, MD, entitled, "Non-invasive molecular phenotyping of the human brain via epigenomic liquid biopsy of cerebrospinal fluid"
- An invention discovery by Young Jae Chun, PhD, Stephen Emery, MD, Stephanie Greene, MD, and Joseph Sukinik, BS, entitled, "Ventriculoamniotic shunt for fetal aqueductal stenosis (v2)"
- An invention discovery by Janet Catov, PhD, entitled, "Placenta database: Linking pathology to clinical data"
- An invention discovery by Janet Catov, PhD, Liron Pantanowitz, MD, Philip LeDuc, PhD, Jonathan Cagan, PhD (CMU) and Daniel Clymer, BS entitled, "Identification of placenta abnormalities using a structure- based neural network"
- Invention discovery by Katherine Lim, MD, Raman Venkataramanan, PhD, Steve Caritis, MD, and Stacy Beck, MD entitled, "Ketamine in pregnancy, postpartum and breastfeeding"

Selected publications

1. Catov JM, Snyder GG, Fraser A, Lewis CE, Liu K, Althouse AD, Bertolet M, Gunderson EP. Blood pressure patterns and subsequent coronary artery calcification in women who delivered preterm births. *Hypertension* 2018;72(1):159-66. PMID: 29792302; PMC6002920.
2. Hauspurg A, Sutton EF, Catov JM, Caritis SN. Aspirin effect on adverse pregnancy outcomes associated with stage 1 hypertension in a high-risk cohort. *Hypertension* 2018;72(1):202-7. PMID: 29802215; PMC6002947.
3. Feghali MN, Scifres CM. Novel therapies for diabetes mellitus in pregnancy. *Bmj* 2018;362:k2034. PMID: 30012851.
4. Grobman WA, Rice MM, Reddy UM, Tita ATN, Silver RM, Mallett G, Hill K, Thom EA, El-Sayed YY, Perez-Delboy A, Rouse DJ, Saade GR, Boggess KA, Chauhan SP, Iams JD, Chien EK, Casey BM, Gibbs RS, Srinivas SK, Swamy GK, Simhan HN, Macones GA. Labor induction versus expectant management in low-risk nulliparous women. *N Engl J Med* 2018;379(6):513-23. PMID: 30089070; PMC6186292.
5. Caritis SN, Hauspurg A, Venkataramanan R, Lemon L. Defining the clinical response to 17-alpha hydroxyprogesterone caproate. *Am J Obstet Gynecol* 2018;219(6):623-5. PMID: 30171841.
6. Catov JM, Countouris M, Hauspurg A. Hypertensive disorders of pregnancy and CVD prediction: accounting for risk accrual during the reproductive years. *J Am Coll Cardiol* 2018;72(11):1264-6. PMID: 30190004.
7. Chauhan SP, Weiner SJ, Saade GR, Belfort MA, Reddy UM, Thorp JM, Jr., Tita ATN, Miller RS, Dinsmoor MJ, McKenna DS, Stetzer B, Rouse DJ, Gibbs RS, El-Sayed YY, Sorokin Y, Caritis SN. Intrapartum fetal heart rate tracing among small-for-gestational age compared with appropriate-for-gestational-age neonates. *Obstet Gynecol* 2018;132(4):1019-25. PMID: 30204687; PMC6247114.
8. Sutton EF, Hauspurg A, Caritis SN, Powers RW, Catov JM. Maternal outcomes associated with lower range stage 1 hypertension. *Obstet Gynecol* 2018;132(4):843-9. PMID: 30204698; PMC6331002.
9. Bildirici I, Schaiff WT, Chen B, Morizane M, Oh SY, O'Brien M, Sonnenberg-Hirche C, Chu T, Barak Y, Nelson DM, Sadovsky Y. PLIN2 is essential for trophoblastic lipid droplet accumulation and cell survival during hypoxia. *Endocrinology* 2018. PMID: 30351430.
10. Facco FL, Parker CB, Hunter S, Reid KJ, Zee PC, Silver RM, Haas DM, Chung JH, Pien GW, Nhan-Chang CL, Simhan HN, Parry S, Wapner RJ, Saade GR, Mercer BM, Torres C, Knight J, Reddy UM, Grobman WA. Association of adverse pregnancy outcomes with self-reported measures of sleep duration and timing in women who are nulliparous. *J Clin Sleep Med* 2018;14(12):2047-56. PMID: 30518449; PMC6287730.
11. Benschop L, Schalekamp-Timmermans S, Broere-Brown ZA, Roeters van Lennep JE, Jaddoe VWV, Roos-Hesselink JW, Ikram MK, Steegers EAP, Roberts JM, Gandley RE. Placental growth factor as an indicator of maternal cardiovascular risk after pregnancy. *Circulation* 2019. PMID: 30760000.
12. Roberts JM, Assibey-Mensah V. The challenge of measuring blood pressure in low-resource settings. *Lancet Glob Health* 2019;7(3):e290-e1. PMID: 30784622.
13. Feghali MN, Catov JM, Zantow E, Mission J, Caritis SN, Scifres CM. Timing of gestational weight gain and adverse perinatal outcomes in overweight and obese women. *Obstet Gynecol* 2019;133(5):962-70. PMID: 30969214.

Infectious diseases

Research in this general area centers on vaginal microbicides, sexually transmitted HIV infections, reproductive tract infections, pharmaceutics, and novel drug delivery technologies. Key researchers

include Sharon Achilles, MD, PhD, Richard Beigi, MD, Rhonda Brand, PhD, Catherine Chappell, MD, Beatrice Chen, MD, Sharon Hillier, PhD, Lisa Rohan, PhD, and Harold Wiesenfeld, MD.

Overview

The study of reproductive infectious disease includes common infections, such as vaginitis, and sexually transmitted diseases, such as HIV. This research includes infections that occur during pregnancy and those that affect adolescents, women of reproductive age, and postmenopausal women. Current research ranges from basic studies into host-pathogen interactions, the impact of sexually transmitted diseases and other lower genital tract infections on the development of pelvic inflammatory disease, infertility, and identification of drug delivery systems designed to protect women or men from acquisition of sexually transmitted infections. A unique focus is the development of topical microbicides to prevent HIV in women and in men. Major initiatives include the *Microbicide Trials Network*, an HIV/AIDS clinical trials network, jointly sponsored by NICHD and NIAID, that brings together international investigators and community and industry partners devoted to preventing or reducing the sexual transmission of HIV through the development and evaluation of products applied topically to mucosal surfaces or administered orally. Many of these studies have been also supported by private foundations such as the Bill and Melinda Gates Foundation. In addition, the pharmaceutics laboratory is dedicated to developing safe and effective products and identifying essential criteria for drug delivery systems, with a focus on the design of drug delivery systems targeted for prevention of HIV/AIDs.

Recent discoveries, patents, and IND applications

- An invention discovery by Lisa Rohan, PhD, James MacPherson, PhD, Vinayak Sant, PhD, and Sravan Kumar Patel, PhD, entitled, “Small volume continuous flow device for dissolution evaluation of periodontal microparticles”

Selected publications

1. Bunge KE, Dezzutti CS, Hendrix CW, Marzinke MA, Spiegel HML, Moncla BJ, Schwartz JL, Meyn LA, Richardson-Harman N, Rohan LC, Hillier SL. FAME-04: A Phase 1 trial to assess the safety, acceptability, pharmacokinetics and pharmacodynamics of film and gel formulations of tenofovir. *J Int AIDS Soc* 2018;21(8):e25156. PMID: 30101439; PMC6088248.
2. Brand RM, Biswas N, Siegel A, Myerski A, Engstrom J, Jeffrey Metter E, Brand RE, Cranston RD, McGowan I. Immunological responsiveness of intestinal tissue explants and mucosal mononuclear cells to Ex Vivo stimulation. *J Immunol Methods* 2018;463:39-46. PMID: 30218652.
3. Hillier SL, Ferrieri P, Edwards MS, Ewell M, Ferris D, Fine P, Carey V, Meyn L, Hoagland D, Kasper DL, Paoletti LC, Hill H, Baker CJ. A phase ii randomized, control trial of Group B Streptococcus (GBS) Type III Capsular Polysaccharide -Tetanus Toxoid (GBS III-TT) vaccine to prevent vaginal colonization with GBS III. *Clin Infect Dis* 2018;68(12):2079-86. PMID: 30281066.
4. Cranston RD, Carballo-Dieguez A, Gundacker H, Richardson BA, Giguere R, Dolezal C, Siegel A, KunjaraNaAyudhya RP, Gomez K, Piper JM, Lama JR, McGowan I. Prevalence and determinants of anal human papillomavirus infection in men who have sex with men and transgender women. *Int J STD AIDS* 2018:956462418797864. PMID: 30336747.
5. McGowan I, Wilkin T, Landovitz RJ, Wu C, Chen Y, Marzinke MA, Hendrix CW, Richardson P, Eshleman SH, Andrade A, Chege W, Anderson PL, McCauley M, Farley J, Mayer KH, Anton P, Brand

RM, Cranston RD, Gulick R. The pharmacokinetics, pharmacodynamics, and mucosal responses to maraviroc-containing PrEP Regimens in Men who have Sex with Men. *Aids* 2018. PMID: 30570571.
6. Noguchi LM, Hoesley C, Kelly C, Scheckter R, Bunge K, Nel A, Marzinke MA, Hendrix CW, Dezzutti CS, Hillier SL, Bogen DL, Piper JM, Beigi RH. Pharmacokinetics of Dapivirine transfer into blood plasma, breast milk, and cervicovaginal fluid of lactating women using the Dapivirine vaginal ring. *Antimicrob Agents Chemother* 2019;63(3). PMID: 30602513; PMC6395928.
7. Marrazzo JM, Rabe L, Kelly C, Richardson B, Deal C, Schwartz JL, Chirenje ZM, Piper J, Morrow RA, Hendrix CW, Marzinke MA, Hillier SL. Tenofovir gel for prevention of herpes simplex virus type-2 acquisition: Findings from the VOICE Trial. *J Infect Dis* 2019;219(12):1940-7. PMID: 30753642; PMC6534189.
8. Petrina MAB, Cosentino LA, Wiesenfeld HC, Darville T, Hillier SL. Susceptibility of endometrial isolates recovered from women with clinical pelvic inflammatory disease or histological endometritis to antimicrobial agents. *Anaerobe* 2019;56:61-5. PMID: 30753898; PMC6559736.
9. Rogan SC, Beigi RH. Treatment of Viral Infections During Pregnancy. *Clin Perinatol* 2019;46(2):235-56. PMID: 31010558.

Gynecology

Research in this area centers on family planning, benign gynecological disorders, urogynecology, and pelvic floor dysfunction. Key researchers include Sharon Achilles, MD, PhD, Mary Ackenbom, MD, Beatrice Chen, MD, Nicole Donnellan, MD, Richard Guido, MD, John Harris, MD, Rui Liang, PhD, Faina Linkov, PhD, Pamela Moalli, MD, PhD, Harold Wiesenfeld, MD, and Halina Zyczynski, MD.

Overview

Gynecology research focuses on women's health from the earliest reproductive age through maturity. MWRI is one of the few research institutes in the country with a dedicated research center for family planning and the development of new contraceptive methods. Research is also intended to impact the use and availability of contraceptives worldwide. Pelvic floor biology and medicine is a key area of basic, translational, and clinical research, and includes the identification of mechanisms that lead to pelvic floor health and dysfunction, the testing of synthetic meshes used for pelvic floor surgery, and the assessment of means to prevent pelvic floor injury. These studies target molecular, cellular, immunological, and biomechanical approaches to the decipherment of mechanisms of pelvic floor disorders. Studies are also designed to shed light on treatment and quality of life among women who suffer from pelvic floor disorders and the long-term outcomes of commonly used interventions to correct urinary and fecal incontinence. Clinical trials in neuromodulation of visceral function and uterine suspension as an alternative to hysterectomy for prolapse address patient preferences and gaps in informed consent. New initiatives target novel molecular mechanisms underlying the development of fibroids and surgical techniques for the treatment of fibroids using radiofrequency ablation.

Selected publications

1. Bell KN, Meyn LA, Chen BA. Long-acting reversible contraceptive uptake before and after the Affordable Care Act contraceptive mandate in women undergoing first trimester surgical abortion. *Womens Health Issues* 2018;28(4):301-5. PMID: 29853173.

2. Carter-Brooks CM, Du AL, Ruppert KM, Romanova AL, Zyczynski HM. Implementation of an urogynecology-specific enhanced recovery after surgery (ERAS) pathway. *Am J Obstet Gynecol* 2018;219(5):495 e1- e10. PMID: 29913175.
3. Ecker AM, Chamsy D, Austin RM, Guido RS, Lee TTM, Mansuria SM, Rindos NB, Donnellan NM. Use of uterine characteristics to improve fertility-sparing diagnosis of adenomyosis. *J Gynecol Surg* 2018;34(4):183-9. PMID: 30087549; PMC6080113.
4. Chen BA, Zhang J, Gundacker HM, Hendrix CW, Hoesley CJ, Salata RA, Dezzutti CS, van der Straten A, Hall WB, Jacobson CE, Johnson S, McGowan I, Nel AM, Soto-Torres L, Marzinke MA. Phase 2a safety, pharmacokinetics, and acceptability of Dapivirine vaginal rings in US postmenopausal women. *Clin Infect Dis* 2018;68(7):1144-51. PMID: 30289485; PMC6424088.
5. Barone W, Knight K, Moalli P, Abramowitch SD. Deformation of transvaginal mesh in response to multiaxial loading. *J Biomech Eng* 2018. PMID: 30347035.
6. Tennyson L, Rytel M, Palcsey S, Meyn L, Liang R, Moalli P. Characterization of the T cell response to polypropylene mesh in women with complications. *Am J Obstet Gynecol* 2018;220(2):187 e1- e8. PMID: 30419195; PMC6557122.
7. Guido R, Perkins RB, Smith KM. Should We Always Look Before We LEEP? A Discussion of the pros and cons of colposcopic biopsy prior to treatment. *J Low Genit Tract Dis* 2019. PMID: 30817690.
8. Chen BA, Blithe DL, Muraguri GR, Lance AA, Carr BR, Jensen JT, Kimble TD, Murthy AS, Schreiber CA, Thomas MA, Walsh TL, Westhoff C, Burke AE. Acceptability of the woman's condom in a phase III multicenter open-label study. *Contraception* 2019;99(6):357-62. PMID: 30849305.
9. Ross JH, Carter-Brooks CM, Ruppert KM, Giugale LE, Shepherd JP, Zyczynski HM. Assessing the performance of the de novo postoperative stress urinary incontinence calculator. *Female Pelvic Med Reconstr Surg* 2019. PMID: 30921082.
10. Ackenbom MF, Littleton EB, Mahmud F, Sutkin G. The complexity of the retropubic midurethral sling: A cognitive task analysis. *Female Pelvic Med Reconstr Surg* 2019. PMID: 31083019.
11. Shaffer RM, Liang R, Knight K, Carter-Brooks CM, Abramowitch S, Moalli PA. Impact of polypropylene prolapse mesh on vaginal smooth muscle in rhesus macaque. *Am J Obstet Gynecol* 2019. PMID: 31102587.

Reproductive endocrinology and fertility

Research in this general area centers on female and male germ cell development, infertility, ovarian aging, fertility preservation, the hypothalamic-pituitary-gonadal axis, and gonadal biology. Key researchers include Marie Menke, MD, Kyle Orwig, PhD, Hanna Valli, PhD, William Walker, PhD, Alexander Yatsenko, MD, PhD, and Anthony Zeleznik, PhD.

Overview

MWRI researchers from this group interrogate the fundamental mechanisms that govern germ cell development and reproduction in mammalian species. Research ranges from the biochemical to the genetic and from *in vitro* cell biology to *in vivo* systems biology that spans mammalian evolution from rodents, through nonhuman primates, to humans. Inquiries include the developmental and molecular mechanisms that give rise to oogenesis and spermatogenesis in postnatal mammals. This includes a focus on spermatogonial stem cells in order to gain insight into how these cells maintain male fertility and how they might be exploited to regenerate spermatogenesis in cases of male infertility. It also inludes an investigation into normal and premature ovarian aging. Researchers from this group are actively investigating the genetics of infertility and use high-throughput genetic screens of patient tissues

designed to identify genetic lesions associated with infertile phenotypes. Current studies are designed to characterize the effects of cancer treatments on the germ cell and somatic/endocrine environments of ovaries and testes and to develop means to protect or restore fertility. Kyle Orwig and his group continues to advance the Fertility Preservation Program, a collaborative effort that provides new options for preserving fertility in boys who may lose fertility because of treatments for cancer or other diseases, and the assessment of genome editing tools for correction of mutations that are associated with male infertility discovered by Alex Yatsenko.

Recent discoveries, patents, and IND applications

- An invention discovery by Michael Buckenmeyer, MS, Kyle Orwig, PhD, Bryan Brown, PhD, and Meena Sukhwani entitled, "Ovarian ECM derivatives for women's health applications"
- A patent filed by Kyle Orwig, PhD, and Hanna Valli-Pulaski, PhD entitled, "Ultrasound-guided rete testis injection/aspiration device"
- A patent filed by Kyle Orwig, PhD, Alex Yatsenko, PhD, Aleks Rajkovic, MD, PhD, and Chatchanan Doungkamchan, MD entitled, "Gene therapy for treatment of infertility"

Selected publications

1. Zielen AC, Khan MJ, Pollock N, Jiang H, Ahmed J, Nazli R, Jabeen M, Yatsenko A, Rajkovic A. A novel homozygous frame-shift variant in the LHCGR gene is associated with primary ovarian insufficiency in a Pakistani family. *Clin Genet* 2018;94(3-4):396-7. PMID: 30016538; PMC6456337.
2. Aarabi M, Kessler E, Madan-Khetarpal S, Surti U, Bellissimo D, Rajkovic A, Yatsenko SA. Autism spectrum disorder in females with ARHGEF9 alterations and a random pattern of X chromosome inactivation. *Eur J Med Genet* 2019;62(4):239-42. PMID: 30048823.
3. Sahu M, Anamthathmakula P, Sahu A. Hypothalamic PDE3B deficiency alters body weight and glucose homeostasis in mouse. *J Endocrinol* 2018;239(1):93-105. PMID: 30307157; PMC6190684.
4. Khan MJ, Pollock N, Jiang H, Castro C, Nazli R, Ahmed J, Basit S, Rajkovic A, Yatsenko AN. X-linked ADGRG2 mutation and obstructive azoospermia in a large Pakistani family. *Sci Rep* 2018;8(1):16280. PMID: 30389958; PMC6214919.
5. Aliberti P, Sethi R, Belgorosky A, Chandran UR, Plant TM, Walker WH. Gonadotrophin-mediated miRNA expression in testis at onset of puberty in rhesus monkey: predictions on regulation of thyroid hormone activity and DLK1-DIO3 locus. *Mol Hum Reprod* 2019;25(3):124-36. PMID: 30590698; PMC6396851.
6. Fayomi AP, Peters K, Sukhwani M, Valli-Pulaski H, Shetty G, Meistrich ML, Houser L, Robertson N, Roberts V, Ramsey C, Hanna C, Hennebold JD, Dobrinski I, Orwig KE. Autologous grafting of cryopreserved prepubertal rhesus testis produces sperm and offspring. *Science* 2019;363(6433):1314-9. PMID: 30898927.
7. Yatsenko SA, Wood-Trageser M, Chu T, Jiang H, Rajkovic A. A high-resolution X chromosome copy-number variation map in fertile females and women with primary ovarian insufficiency. *Genet Med* 2019. PMID: 30948856.
8. Yatsenko SA, Rajkovic A. Genetics of human female infertility. *Biol Reprod* 2019. PMID: 31077289.
9. Valli-Pulaski H, Peters KA, Gassei K, Steimer SR, Sukhwani M, Hermann BP, Dwomor L, David S, Fayomi AP, Munyoki SK, Chu T, Chaudhry R, Cannon GM, Fox PJ, Jaffe TM, Sanfilippo JS, Menke MN, Lunenfeld E, Abofoul-Azab M, Sender LS, Messina J, Klimpel LM, Gosiengfiao Y, Rowell EE, Hsieh MH, Granberg CF, Reddy PP, Sandlow JI, Huleihel M, Orwig KE. Testicular tissue cryopreservation: 8

years of experience from a coordinated network of academic centers. *Hum Reprod* 2019. PMID: 31111889.
10. Nagle AM, Levine KM, Tasdemir N, Scott JA, Burlbaugh K, Kehm JW, Katz TA, Boone DN, Jacobsen BM, Atkinson JM, Oesterreich S, Lee AV. Loss of E-cadherin enhances IGF1-IGF1R pathway activation and sensitizes breast cancers to anti-IGF1R/InsR inhibitors. *Clin Cancer Res* 2018;24(20):5165-77. PMID: 29941485.
11. Qin Y, Vasilatos SN, Chen L, Wu H, Cao Z, Fu Y, Huang M, Vlad AM, Lu B, Oesterreich S, Davidson NE, Huang Y. Inhibition of histone lysine-specific demethylase 1 elicits breast tumor immunity and enhances antitumor efficacy of immune checkpoint blockade. *Oncogene* 2018;38(3):390-405. PMID: 30111819; PMC6336685.

Women's cancer

Research in this general area, under the umbrella of the Women's Cancer Research Center (a joint initiative of the University of Pittsburgh Cancer Institute and MWRI, housed in MWRI's research building), includes reproductive tract cancers and breast cancer. Key researchers include Ron Buckanovich, MD, PhD, Lan Coffman, MD, PhD, Robert Edwards, MD, Faina Linkov, PhD, Adrian Lee, PhD, Francesmary Modugno, PhD, Carola Neumann, PhD, Steffi Oesterreich, PhD, Anda Vlad, MD, PhD, Jennifer Xavier, PhD, and Mei Zhang, PhD.

Overview

MWRI's cancer biology team of basic, translational, and clinical researchers investigates the fundamental processes that lead to carcinogenesis in the female pelvic organs and the breast. The group includes fundamental research labs, gynecologic oncology academics, and surgeons whose collaborative work focuses on the identification of biomarkers for pre-invasive or early-stage disease as predictors of severity, prognosis, and response to therapy. The group seeks to advance our understanding of disease pathogenesis in breast and gynecologic malignancies and to improve disease treatments through novel, integrated therapies. The Women's Cancer Research Center is designed to foster new research collaboration, technical and thematic synergy, education, and enhancement of community awareness. Major initiatives include the development of transgenic mouse models to study the pathogenesis of ovarian cancer; the unique role of steroid hormones and growth factors in the initiation and progression of breast and ovarian cancer; miRNA pathways that contribute to cancer, particularly in the context of tumor hypoxia; the role of host cells in promoting tumor growth and enhancing resistance to chemotherapy; the ability of the immune system to target cancer cells to prevent disease or induce disease regression; and the role of stem cells in origin of cancer and cancer therapeutic resistance and metastasis.

A multicenter study, with investigators from Roswell Park Cancer Institute, Dana Farber Cancer Center, Memorial Sloan-Kettering Cancer Center, and others, continues to investigate factors associated with molecular signatures in female cancers. This and other initiatives enabled our researchers to participate in large, international studies such as the Cancer Genome Atlas and other cooperative research projects. Additionally, a Special Project of Research Excellence in Ovarian Cancer in collaboration with the Roswell Park Cancer Institute is focused on identifying novel immunologic approaches for the treatment of

ovarian cancer. Two new investigator-initiated clinical trials, testing two new combination immune therapies, are currently ongoing.

Selected publications

1. Olawaiye AB, Java JJ, Krivak TC, Friedlander M, Mutch DG, Glaser G, Geller M, O'Malley DM, Wenham RM, Lee RB, Bodurka DC, Herzog TJ, Bookman MA. Does adjuvant chemotherapy dose modification have an impact on the outcome of patients diagnosed with advanced stage ovarian cancer? An NRG Oncology/Gynecologic Oncology Group study. *Gynecol Oncol* 2018;151(1):18-23. PMID: 30135020; PMC6151871.
2. Du T, Sikora MJ, Levine KM, Tasdemir N, Riggins RB, Wendell SG, Van Houten B, Oesterreich S. Key regulators of lipid metabolism drive endocrine resistance in invasive lobular breast cancer. *Breast Cancer Res* 2018;20(1):106. PMID: 30180878; PMC6124012.
3. Tasdemir N, Bossart EA, Li Z, Zhu L, Sikora MJ, Levine KM, Jacobsen BM, Tseng GC, Davidson NE, Oesterreich S. Comprehensive phenotypic characterization of human invasive lobular carcinoma cell lines in 2D and 3D cultures. *Cancer Res* 2018;78(21):6209-22. PMID: 30228172; PMC6507416.
4. McLean K, Tan L, Bolland DE, Coffman LG, Peterson LF, Talpaz M, Neamati N, Buckanovich RJ. Leukemia inhibitory factor functions in parallel with interleukin-6 to promote ovarian cancer growth. *Oncogene* 2018;38(9):1576-84. PMID: 30305729; PMC6374186.
5. Coffman LG, Pearson AT, Frisbie LG, Freeman Z, Christie E, Bowtell DD, Buckanovich RJ. Ovarian carcinoma-associated mesenchymal stem cells arise from tissue-specific normal stroma. *Stem Cells* 2018. PMID: 30353617.
6. Orr B, Edwards RP. Diagnosis and treatment of ovarian cancer. *Hematol Oncol Clin North Am* 2018;32(6):943-64. PMID: 30390767.
7. Sokol ES, Feng YX, Jin DX, Basudan A, Lee AV, Atkinson JM, Chen J, Stephens PJ, Frampton GM, Gupta PB, Ross JS, Chung J, Oesterreich S, Ali S, Hartmaier RJ. Loss of function of NF1 is a mechanism of acquired resistance to endocrine therapy in lobular breast cancer. *Ann Oncol* 2018;30(1):115-23. PMID: 30423024; PMC6336006.
8. Asan A, Skoko JJ, Woodcock CC, Wingert BM, Woodcock SR, Normolle D, Huang Y, Stark JM, Camacho CJ, Freeman BA, Neumann CA. Electrophilic fatty acids impair RAD51 function and potentiate the effects of DNA- damaging agents on growth of triple-negative breast cells. *J Biol Chem* 2018. PMID: 30478172.
9. Grabosch S, Bulatovic M, Zeng F, Ma T, Zhang L, Ross M, Brozick J, Fang Y, Tseng G, Kim E, Gambotto A, Elishaev E, R PE, Vlad AM. Cisplatin-induced immune modulation in ovarian cancer mouse models with distinct inflammation profiles. *Oncogene* 2018. PMID: 30518877.
10. Modugno F, Goughnour SL, Wallack D, Edwards RP, Odunsi K, Kelley JL, Moysich K, Ness RB, Brooks MM. Breastfeeding factors and risk of epithelial ovarian cancer. *Gynecol Oncol* 2019;153(1):116-22. PMID: 30686553; PMC6558958.
11. Chefetz I, Grimley E, Yang K, Hong L, Vinogradova EV, Suciu R, Kovalenko I, Karnak D, Morgan CA, Chtcherbinine M, Buchman C, Huddle B, Barraza S, Morgan M, Bernstein KA, Yoon E, Lombard DB, Bild A, Mehta G, Romero I, Chiang CY, Landen C, Cravatt B, Hurley TD, Larsen SD, Buckanovich RJ. A Pan-ALDH1A inhibitor induces necroptosis in ovarian cancer stem-like cells. *Cell Rep* 2019;26(11):3061-75.e6. PMID: 30865894.

Women's health services

Research in this general area centers on health services outcomes, patient-provider communication, behavioral health, quality-of-life measures, medical decision making, and community-based participatory

research. Key investigators include Judy Chang, MD, Beatrice Chen, MD, John Harris, MD, Elizabeth Krans, MD, and Faina Linkov, PhD.

Overview

MWRI investigators perform health services and behavioral health research in the context of women's health. Health services research uses multidisciplinary approaches to examine the interaction of health care services and the populations and individuals affected by those services. This includes substance use among pregnant women, with a special focus on the current opioid epidemic, and the evaluations of best practices for improving the quality and cost-effectiveness of women's care and health services delivery, with special emphasis on development and testing of care models for nursing home residents with obesity. Ongoing projects include studies of intimate-partner violence, obesity, substance use, adolescent sexual health decision-making, parent-child communication about sexual health education, and the relationship between body weight and sexual risk behaviors. Patient-provider communication studies are designed to facilitate understanding of the communication approaches, elements, and styles that contribute to better patient health understanding, positive behavior change, informed medical decision-making, and improved health outcomes.

Recent discoveries, patents, and IND applications

- Invention discovery by Faina Linkov, PhD, and Robert Edwards, MD, entitled, “Metformin prescribing decision support tool for diabetic and non-diabetic patients”

Selected publications

1. Krans EE, Bobby S, England M, Gedekoh RH, Chang JC, Maguire B, Genday P, English DH. The Pregnancy Recovery Center: A women-centered treatment program for pregnant and postpartum women with opioid use disorder. *Addict Behav* 2018;86:124-9. PMID: 29884421.
2. Harris JA, Garrett AA, Akers AY. Obesity and disparities in human papillomavirus vaccination for U.S. adolescent girls and young women. *Womens Health Issues* 2018;29(1):31-7. PMID: 30446328; PMC6295283.
3. Morrison PK, Hawker L, Cluss PA, Miller E, Fleming R, Bicehouse T, George D, Burke J, Wright K, Chang JC. The challenges of working with men who perpetrate partner violence: Perspectives and observations of experts who work with batterer intervention programs. *J Interpers Violence* 2018:886260518778258. PMID: 29897001.
4. Kotha A, Chen BA, Lewis L, Dunn S, Himes KP, Krans E. Prenatal intent and postpartum receipt of long-acting reversible contraception among women receiving medication-assisted treatment for opioid use disorder. *Contraception* 2018;99(1):36-41. PMID: 30114393; PMC6289834.
5. Jarlenski M, Minney S, Hogan C, Chang JC. Obstetric and pediatric provider perspectives on mandatory reporting of prenatal substance use. *J Addict Med* 2018. PMID: 30550393.
6. Chang JC, Tarr JA, Holland CL, De Genna NM, Richardson GA, Rodriguez KL, Sheeder J, Kraemer KL, Day NL, Rubio D, Jarlenski M, Arnold RM. Beliefs and attitudes regarding prenatal marijuana use: Perspectives of pregnant women who report use. *Drug Alcohol Depend* 2019;196:14-20. PMID: 30658220.
7. Morrison PK, George D, Cluss PA, Miller E, Hawker L, Fleming R, Bicehouse T, Burke J, Chang JC. Male intimate partner violence perpetrators' perceptions of the positives and negatives of peer

interactions in group batterer intervention programs. *Violence Against Women* 2019:1077801218824053. PMID: 30666903.
8. Hollander MAG, Jarlenski MP, Donohue JM, Cole ES, Kelley D, Krans EE. Medical specialty of buprenorphine prescribers for pregnant women with opioid use disorder. *Am J Obstet Gynecol* 2019;220(5):502-3. PMID: 30703340; PMC6518408.
9. Krans EE, Kim JY, James AE, 3rd, Kelley D, Jarlenski MP. Medication-assisted treatment use among pregnant women with opioid use disorder. *Obstet Gynecol* 2019;133(5):943-51. PMID: 30969219; PMC6483844.
10. Harris JA, Engberg J, Castle NG. Organizational and geographic nursing home characteristics associated with increasing prevalence of resident obesity in the united states. *J Appl Gerontol* 2019:733464819843045. PMID: 31018750.

EDUCATION

The field of reproductive biology is in need of bright, creative, productive and energetic new scholars who can advance knowledge in the areas of reproductive development, physiology, and reproductive diseases. These scholars can capitalize on genomics, informatics, and "big data" technologies to illuminate unsolved questions in basic, translational, and clinical women's health sciences. As one of the largest academic institutions in our field, we seek to capture the imagination of young scholars and train the next generation of researchers in the area of reproductive sciences and women's health. This year we have bolstered our training programs at all levels of academic development, as detailed below.

Faculty training

We have two NIH K12-funded programs which center on early faculty career development. The first program, Building Interdisciplinary Research Careers in Women's Health (BIRCWH), is a University of Pittsburgh program that supports the development of young faculty members as independent investigators in translational, clinical, epidemiologic, or health services research along a woman's lifespan. The program, directed by Yoel Sadovsky, MD, is designed for faculty with appointments within the University of Pittsburgh's six schools of the health sciences, whether MDs or PhDs, and has been a tremendous success. This year, the program hosted three scholars: Catherine Chappell, MD (OBGYN Infectious Diseases), and Katherine Grace Lim, MD (Anesthesiology) and Marian Jarlenski, PhD (Epidemiology) who transitioned from the program in May 2019. BIRCWH looks forward to welcoming Dr Alisse Hauspurg in the FY20.

The second K12 program, the Women's Reproductive Health Research (WRHR) program, led by Robert Edwards, MD, and Janet Catov, PhD, is designed to prepare outstanding OBGYN junior MD faculty for productive and exciting investigative careers in reproductive biology and biomedical research, emphasizing basic or translational research that is directly relevant to reproductive biology. This year, the program hosted Mary Ackenborn, MD, and also John Harris, MD, who completed his WRHR appointment, making way for incoming FY20 scholar, Dr Sarah Taylor. Additional faculty supported via training or early investigator awards include Miguel Brieno-Enriquez, PhD, supported by the Magee Auxiliary Research Scholar (MARS) Award, Maisa Feghali, MD, supported by the University of Pittsburgh's Clinical and Translational Scholars Program (NIH KL2) and a bridge award from the Foundation for SMFM/ABOG, and

Elizabeth Krans, MD, supported by an NIH K23 mentored patient-oriented research career development award.

Postdoctoral training

MWRI hosts two programs for postdoctoral training, where both MD and PhD trainees participate in highly focused research projects that impact a number of problems related to reproductive biology, reproductive development, and women's and infants' health. These programs prepare individuals for independent and productive careers as research scientists by providing them with the environment necessary for an intensive research experience. Kyle Orwig, PhD's NIH T32 training program titled, "Reproductive Development Training Program: From Gonads to Fetuses", supported two predoctoral trainees and two postdoctoral trainees this year.

The MWRI Fellowship Program, which typically supports 2 scholars per year, looks to expanding during the coming year with the support of new funding streams. Thanks to a generous donation by Tony Zeleznik, PhD, this year MWRI established a Faculty Fellowship Fund, which will provide funding for a third scholar in the MWRI Postdoctoral Fellowship. Additionally, the Magee-Womens Hospital Auxiliary provided funding for two fellows. These new scholars will initiate their training in the academic year 2020 (July 2019)

MWRI scholars were supported by competitive training awards. Alexander Cole (postdoctoral fellow, Ron Buckanovich's lab) received a new 1-year, $75,000 grant from the Ovarian Cancer Research Alliance entitled "Investigating Regulators of Quiescence in Epithelial Ovarian Cancer". Other trainees supported by continuing external grants included Kelley Lynne Baumgartel, (postdoctoral fellow mentored by Francesca Facco, supported by a $57,000 1-year F32 grant from NIH/NINR), Alison Nagle**,** (graduate student, Adrian Lee's lab, supported by a NIH F31 grant), and Audrey Kindsfather (postdoctoral fellow, Mellissa Mann's lab, supported by a Howard Hughes Medical Institute training grant).

Resident and clinical fellows training

Our Clinical Trainee Research Award provides financial support for the research activities of residents and clinical fellows based at Magee-Womens Hospital. It promotes research education by training them to prepare and write grant applications that include a hypothesis, a study design (including sample size), a budget, and a method for protecting research subjects. This year, the program funded three projects: Linda Burkett, MD, (Female Pelvic Medicine and Reconstructive Surgery Fellow), "Protecting Pelvic Floor Injury by Induction of Labor"; Christina Megli, MD, (Maternal Fetal Medicine Fellow), "Characterization of the Microphage Transcriptional Response to the Mid-Gestation Placenta"; and Julia Tasset, MD (OBGYN-RS Resident), "Internet Users' Ability to Identify and Assess Information About Safe and Effective Self-Managed Abortion Methods".

Graduate training

MWRI graduate students have a unique opportunity to take part in the process of translating fundamental laboratory bench discoveries in the field of reproductive sciences to the bedside. MWRI researchers have become members of several graduate programs within the University of Pittsburgh.

Judy Yanowitz, PhD, is the coursemaster for the University's Interdisciplinary Biomedical Graduate Program's *Reproductive Development* course, Mei Zhang, PhD, directs the Molecular Genetics and Developmental Biology Program's *Developmental Mechanisms of Human Disease* course, and several MWRI investigators lecture in these courses. Nineteen of MWRI's 71 primary investigators are members of graduate programs within the University of Pittsburgh.

College and high school programs

The College Student Summer Internship Program provides students with the opportunity to participate in basic, translational, or clinical scientific research, with the goal of stimulating them to engage in reproductive sciences research. This highly successful 8-week program continues to attract students from western Pennsylvania and beyond. Similarly, our 4-week high school program provides current high school juniors and seniors with early education in science related to women's and infants' health. In addition to research, trainees in the two programs enjoy informal lunch meetings, at which investigators discuss biomedical science as a career. MWRI Investigators also serve as internship mentors to students from Pittsburgh's City Charter High School.

MWRI's national training programs

Sponsored through three R25 grants from the NIH's National Cancer Institute and National Institute on Aging, MWRI's Gerald Schatten, PhD, has engaged in national programs designed to train promising scientists, including physician-scientists, from predominately underrepresented communities in sophisticated technologies using pluripotent stem cells for clinically relevant discoveries in aging and cancer. The programs, entitled "Frontiers in Alzheimer's and Aging Research", "Frontiers in Stem Cells in Cancer", and "Frontiers in Addiction Research and Pregnancy", include advanced dynamic training courses that provide a fresh series of daily lecturers on emerging concepts, followed by extended discussion, laboratory research, technologically intense workshops, and informal seminars over week-long periods. The newest program "Frontiers in Addiction Research and Pregnancy", held its first course in October 2018 at Morehouse School of Medicine in Atlanta, GA.

MWRI Research Day in Reproductive Biology and Women's Health

The Annual Research Day was instituted to provide our trainees with the opportunity to present their research to faculty and staff from MWRI, Magee-Womens Hospital, and University of Pittsburgh and to raise the level of awareness, within the broader academic community, of our programs in women's and infants' health research. At this year's Research Day on May 17, 2019, the program's theme was opioid and substance abuse, and two outstanding keynote lecturers in this field: Elizabeth Byrnes, PhD, Associate Professor of Biomedical Sciences at Tufts, gave the Margaret Prine Joy Lecture in Reproductive Sciences, entitled "Modeling the Intergenerational Impact of Female Opioid Use". Dace Svikis, PhD, Professor in the Departments of Psychology, Psychiatry and Obstetrics/Gynecology at VCU, and Deputy Director, VCU Institute for Women's Health, gave the Celebration of Life, A Lecture Honoring Mothers (named after Dr and Mrs Hogge), entitled, "Translational Research in Perinatal Addiction". MWRI investigators Elizabeth Krans, MD, Judy Chang, MD, and Raman Venkataramanan, PhD, and BIRCWH Scholars, Catherine Chappell MD, and Marian Jarlenski, PhD, added a unique perspective on research in

this field. Finally, there was a special presentation by Jane Liebschutz, head of Pitt's Division of General Internal Medicine on identifying substance abuse in the workplace.

MAGEE SUMMIT

Dr Sadovsky and MWRI researchers work together with MWRIF on special events designed to disseminate knowledge and promote Magee-Womens' prominence regionally, nationally and globally. Our most important even this year was our Magee Summit, which was initiated, orchestrated and administered jointly by Dr Sadovsky and Mr Annichine. This inaugural Magee-Womens Research Summit took place on October 9-10, 2018 at the David L Lawrence Convention Center in downtown Pittsburgh. The unique event, supported primarily by the Richard King Mellon Foundation and a number of other entities (e.g., Bill and Melinda Gates Foundation, March of Dimes, and others), was designed to serve as a premier forum for scientific exchange, stimulate junior scholars to pursue research in this area, and promote community engagement. We also sought to establish Magee-Womens as a centerpiece in the international agenda on development, reproductive genetics, and women's health issues for the coming generations, and on strategies designed to harness the power of scientific investigation to enhance the

health and wellness of women and infants, and consequently, of humankind. By engaging top scientists and thought-leaders in the fields of early human development, gender-based biology and their implications to personalized medicine, and creating a forum for exchange with foundations, policy-makers and the community at large, we hoped to promote a transdisciplinary approach to women's health.

Our summit included 540 attendees from the US and from 16 countries across the world. These attendees included scientists, clinicians, trainees at all levels, funders, policymakers, hospital administrators, public health advocates and members of our regional community. Researchers included 14 members of the National Academy of Sciences, National Academy of Medicine and National Academy of Engineers, 8 current and former Deans, and 20 current of former Department Chairs. Interactions included keynote lectures, spotlight talks, panel discussions, scientific and advocacy breakout sessions, and informal interactions at a poster session, breaks and a celebratory dinner. The three main themes included (a) *9-90 – the Origins of Wellness & Disease*, which examined the, complex determinants of early human development and their impact on health, wellness, and disease risk throughout the lifespan; (b) *Sex Differences Beyond X and Y*, exploring sex and gender differences beyond the sex chromosomes, and their implications for diverse biological systems; and (c) *Aging Reimagined*, illuminating the component of precision medicine and the role of women's health in determining personalized wellness as we age.

An important component of our summit was the engagement of Pittsburgh and regional STEM scholars in our initiatives. Through our presentations and discussions, and especially in our hands-on mini-lab demonstrations to high school students, we shared with junior scholars the role of reproductive sciences and women's health issues in the broader context of human health.

A pinnacle event at our summit was the inaugural Magee Prize competition, where a $1 million grant, funded by the Richard King Mellon Foundation, was awarded to the best research proposal in our field. After two selection rounds among 25 applications from across the world, the three best proposals were

presented by the researchers to the summit attendees. Selection of the winning project included a vote by all summit participants. The winning proposal was led by *Yaki Barak, PhD,* of MWRI, who collaborates with *Myriam Hemberger, PhD*, of the University of Calgary and *Henry Sucov, PhD*, of the Medical University of South Carolina. Their research focuses on the mechanistic links between placental lesions and congenital heart disease, the most common birth defect.

Overall, we received numerous positive comments from participants, who felt intellectually stimulated and personally inspired. Many attendees felt that the event would change the way they think about their own research and about the science underlying reproductive sciences and women's health, particularly early human development.

FINAL NOTE

Looking ahead to FY20, we are already working on plans for the next Magee Summit, to be held May 26-27, 2021 at the Pittsburgh David L. Lawrence Convention Center. Other key initiatives include Dr Janet Catov's work with Mr Annichine and Dr Edwards to promote new collaborative research interactions with UPMC-Hamot, designed to extend the MOMI Database and Biobank to this region. Drs Catov and Sadovsky are also leading our initiative to bolster our Women's Health Practice-Based Research Network (WH-PBRN) and expand a network of practices that are available for research by Pitt researchers. Additionally, through funding by the Richard King Mellon Foundation and others, MWRI collaborates with researchers from Children's Hospital in Philadelphia, Stanford University and Rand Corporation, in the use of our MOMI-based information, electronic health records and patients reports to build a health profile that may allow the identification of pregnancies at risk of diseases that impact infant mortality and morbidity.

MWRI's research themes provide a unique platform where fundamental questions relevant to reproductive biology and women's health are pursued using basic, translational, and clinical research tools. We strive to develop robust transdisciplinary research programs that further our understanding of diseases that affect women and their newborns and to train the next generation of scholars in our rapidly developing field. For more information, please view our website at www.mageewomens.org.

Grant Funding Awarded in FY19				
Principal Investigator	**Grant Title**	**Funding Type**	**Direct Funds**	**Indirect Funds**
Achilles	Estera E 4 Freedom	Industry	12,137	1,565
Achilles	Phase 2B/3 double-blinded placebo-controlled efficacy trial of Amphora gel for the prevention of acquisition of urogenital chlamydia trachomatis infection	Industry	263,459	119,764
Achilles	Developing and testing a decision support tool for women making tubal sterilization decisions	Federal	4,514	2,550
Ackenbom	Postoperative Cognitive Disfunction in Older Women Undergoing Pelvic Organ Prolapse Surgery	Foundation	5,085	0
Barak	Placental Origin of Congenital Heart Defects - A Paradigm Coming of Age	Foundation	390,414	7,440
Beigi	Preparedness for Pandemic Influenza	Federal	1,835	1,165
Boisen	Prospective Collection of Samples for Development of the Natera Ovarian Cancer Detection Assay	Industry	116,272	19,603
Boisen	Identification of Unique Drivers of ILC Progression	Foundation	1,916	479
Brand	Development of a Urine Based Point of Care Test for Adherence to Antiretroviral Drugs	Federal	245,131	17,181
Brand	A Phase I, multicompartmental pharmacokinetic study of cabotegravir long-acting in healthy adult volunteers.	Non Federal	26,183	6,546
Brand	Subcutaneous Contraceptive and HIV Implant Engineered for Long-acting Delivery (SCHIELD) Program	Federal	65,254	41,436
Brand	Assess Colonic Inflammation Regulatory Pathways in Healthy Donors and Crohn's Disease Patients	Industry	60,818	38,619
Brand	Preclinical Studies to Support Assessment of the BTM portfolio	Industry	41,820	28,180
Brand/Rohan	Griffithsin-based Rectal Microbicides for PREvention of Viral ENTry	Federal	244,845	143,278

Brand/Rohan	Development of Rectal Enema as Microbicide	Federal	158,532	111,320
Brieno-Enriquez	NIMA-like Kinase NEK1 as a Regulator of Mammalian Gametogenesis	Federal	198,371	73,755
Buckanovich	Developing a Human in Mouse Cancer Model with a Completely Humanized Stroma	Federal	551,048	42,247
Buckanovich	Isozyme-selective ALDH Inhibitors for Sensitizing Ovarian Cancer Stem-like Cells to Chemotherapy	Federal	173,609	17,763
Buckanovich	Using microfluidic single cell culture to characterize cancer cell asymmetric division	Federal	554,973	46,919
Buckanovich	Targeting Tumor Desmoplasia to Enhance Immunotherapy	Foundation	272,727	27,273
Buckanovich	The Function of EGFL6 in Ovarian Cancer Cell Biology, Tumor Initiation, and Therapy	Federal	297,058	72,242
Buckanovich	Development of a Novel ALDH Inhibitor as an Adjunct to Immunotherapy	Foundation	125,000	0
Buckanovich	ALDH inhibition as modulator of tumor immunobiology	Non Federal	140,000	0
Buckanovich	New Approach to Block Ovarian Cancer Metastases	Foundation	40,000	0
Buckanovich	High Throughput Platform for Patient Derived Small Cell Number Three-Dimensional Ovarian Cancer Spheroids	Federal	16,315	9,218
Canavan	Automated Fetal Weight Estimation: A Multicenter Validation Using Fractional Limb Volume	Industry	8,784	5,358
Caritis	Optimization of Drug Dosing in Pregnant Women through Research and Education	Federal	774,374	202,113
Caritis	Pharmacologically-based Strategies for Buprenorphine Treatment During Pregnancy	Federal	545,293	171,388
Caritis	Selective Glucocorticoid Action in the Developing Brain	PITT	20,195	0
Catov	Pregnancy-Related Risk Factors and Glucose Intolerance in Women During Midlife	Federal	24,262	15,285
Catov	Women's Health Research and Policy Partnership or Cardiovascular Disease in Pregnancy	Foundation	75,000	0

Catov	Mechanisms for Early and Late Postpartum Hypertension in Human Preeclampsia	Foundation	103,360	6,940
Catov	Shared Antecedents to Pre-term Birth and Cardiovascular Disease in Women	Federal	99,728	51,986
Catov	Deep Learning for Placental Pathology	Non Federal	32,948	20,263
Catov	Pregnancy-related risk factors and glucose intolerance in women during midlife	Federal	27,045	15,285
Chang	A rapid-cycle assessment strategy for understanding the opioid epidemic in local communities	Foundation	74,934	3,746
Chappell	A Phase 1 Pharmacokinetic Trial of Ledipasvir/Sofosbuvir (LDV/SOF) Fixed Dose Combination in Pregnant Women with Chronic Hepatitis C Virus Infection	Federal	134,840	26,680
Chappell	HCV Genotypes amount incarcerated pregnant women	Federal	6,815	0
Chen	A Phase 3, Multicenter, Open-Label Study of a Levonorgestrel 52 mg Intrauterine System for the Treatment of Heavy Menstrual Bleeding	Industry	105,942	21,188
Chen	A Phase 3, Prospective, Multi-Center, Single-Arm, Open-Label Study to Evaluate VeraCeptTM, a Long-Acting Reversible Intrauterine Contraceptive for Contraceptive Efficacy, Safety, and Tolerability	Industry	355,996	104,856
Chen	Family Health International 360 Copper IUD trial	Foundation	75,106	11,266
Chen	Fellowship in Family Planning and Contraception	Foundation	312,586	0
Chen	Core Functions Activities	Federal	13,417	1,450
Chen	Pitt-Ohio State-Georgetown Clinical Trials Unit	Federal	62,862	33,924
Cole	Investigating Regulators of Quiescence in Epithlial Ovarian Cancer	Foundation	70,347	4,653
Donnellan	The evaluation of diagnostic accuracy of the Mitomic® Endometriosis Test (MET™) for	Industry	116,587	27,788

	females between menarche and menopause presenting with symptoms of endometriosis.			
Edwards	Magee-Womens Basic and Translational Reproductive Health Training Program	Federal	332,783	7,417
Edwards	NCI NCTN-Network Lead Academic Participating Site at UPMC Hillman Cancer Center	Federal	27,329	15,441
Edwards	Systemic Immune Checkpoint Blockade and Intraperitoneal Chemo-Immunotherapy in Recurrent Ovarian Cancer	Industry	494,889	79,292
Facco	Sleep Disordered Breathing, Obesity, and Pregnancy Study	Federal	407,355	54,740
Feghali	Metabolic Analysis for Treatment Choice in Gestational Diabetes Mellitus	Foundation	50,000	0
Feghali	Foundation for SMFM/ABOG Bridge Funding Award	Foundation	75,000	0
Feghali	Metabolic Analysis for Treatment Choice in Gestational Diabetes Mellitus	Federal	132,999	4,000
Feghali	Metformin for Prevention of Hypertensive Disorders of Pregnancy in Women with Type 1 Diabetes Mellitus	Industry	26,188	0
Guido	Intra-Operative Sampling of Fallopian Tubes	Federal	54,440	29,007
Hillier	A Multi-Center, Open-Label Study to Evaluate the Safety of a Single Oral Dose of Solosec (secnidazole) 2g Oral Granules for the Treatment of Adolescent Girls with Bacterial Vaginosis.	Industry	4,220	2,679
Hillier	Film Antirotroviral Microbicide Evaluation	Federal	2,215,456	573,417
Hillier	Conrad A15-138 TFV/LNG 90 IVR Evaluation	Federal	29,025	17,705
Hillier	Hormones, Immunity and HIV Risk	Federal	338,112	106,027
Hillier	MTN - Leadership and Operations Center (LOC): Microbicide Trials Network	Federal	7,465,809	1,261,430
Himes	Innovative approaches to inform evidence-based pregnancy weight gain guidelines	Federal	47,590	26,888

Hubel/Catov/Powers	Women's Cardiovascular Health: Novel Insights from Pregnancy on Microvascular Mechanisms	Foundation	857,450	29,938
Jeyabalan	Relating Pregnancy Phenotype with Chromosome Copy Number in Placentation Cells from the Endocervix	Federal	11,897	6,722
Knight	Evaluation of the Mechanical Strength and Porosity of Poly-4-hydroxybutyrate (P4HB) Mesh	Industry	28,079	3,175
Knight	Desara Sling System: Cold cut vs Heat cut	Industry	12,500	0
Krans	Buprenorphine Assignment in Pregnancy: Objective Criteria	Federal	151,674	2,585
Krans	Optimizing Pregnancy and Treatment Interventions for Moms 2.0 (OPTI-Mom 2.0)	Federal	175,479	77,571
Krans	Availability, accessibility, and structure of opioid use disorder treatment and maternal and child health outcomes	Federal	115,856	43,462
Krans	Pennsylvania Opioid Data Dashboard and Data Analytics	Non Federal	9,190	1,379
Linkov	Factors influencing biopsy choices: Implications for Endometrial Cancer Screening	Foundation	60,178	0
Mann	ICR-Independent Establishment of Domain Imprinting	Federal	155,000	45,658
Moalli	Porosity and tensioning: Critical factors to consider when choosing a prolapse mesh	Federal	401,314	112,666
Moalli	Overcoming Complications of Polypropylene Prolapse Meshes: Development of Novel Elastomeric Auxetic Devices	Federal	463,633	78,638
Moalli	Assessing the Impact of Macrophage Polarization Upon the Success of Biomaterials Implants	Federal	9,518	5,378
Modugno	Novel Immunological Biomarkers in Ovarian Cancer Prognosis	Federal	71,496	28,613
Orwig	Cellular Mechanisms of Chemotherapy-induced Male Infertility: Stem Cell or Niche?	Federal	484,432	138,604
Orwig	Preserving Male Fertility after Cancer Therapy	Federal	1,181,113	159,590

Orwig	Improving Fertility Preservation in Boys with Cancer	Federal	337,774	13,295
Orwig	Molecular and functional hierarchy of male germline stem cell differentiation	Federal	18,083	11,483
Orwig	Fertility Preservation for Transgender Females	Foundation	125,000	0
Orwig	Towards In vitro Gametogenesis: A game-changer for infertile men and women	Foundation	178,467	0
Orwig	Reproductive Development from Gonads to Fetuses	Federal	207,084	14,599
Parikh	PD analysis, anti-HIV for cv fluid and rectal fluid for Phase I 90-Day Pharmacokinetic, Pharmacodynamic, Safety and Acceptability Study of Intravaginal Rings Releasing Tenofovir and Levonorgestrel, Protocol (A15-138)	Federal	21,726	13,796
Peters	Metabolomics of Treatment-Refractory Depression and Suicidal Behavior	Non Federal	155,892	0
Powers	Relating Pregnancy Phenotype with Chromosome Copy Number in Placentation Cells from the Endocervix	Federal	6,906	3,902
Powers	Teen Mothers' Prenatal Cannabis Use and Co-Use with Tobacco	Federal	25,879	14,622
Pulaski	The effects of chemotherapy on sperm DNA quality after short-term exposure	Foundation	45,455	4,545
Rohan	In vitro dissolution studies of Microparticles containing minocycli	Industry	3,200	800
Rohan	Pharmaceutical Laboratory Formulation of TAF	Foundation	57,730	4,901
Rohan	Studies to Assess Interactions Between Dapivirine & Vaginally-Applied, OTC Products	Federal	255,763	99,237
Rohan	Physiologically-based Model of the Female Reproductive Tract: Vaginal and Intrauterine Delivery Components Support New Approaches to Improve Product Manufacturing and Quality	Federal	215,851	60,973
Rohan	Long Acting Film Technology for Contraception (LATCH)	Federal	1,101,895	248,998

Rohan	Plant-derived Molecular Condom as an On-demand Nonhormonal Female Contraceptive	Federal	47,458	26,791
Rohan	Biorelevant Dissolution Study	Industry	14,692	9,329
Rohan	Laboratory Center (LC): Microbicide Trials Network	Federal	3,020,180	945,193
Sadovsky	Zika Research	Foundation	12,500	0
Sadovsky	Exosome Based Placental Maternal Communication	Federal	288,929	17,323
Sadovsky	Placental miRNA Profiles Associated with Maternal Insulin Resistance and Fetal Adiposity: Maternal-placental crosstalk	Federal	39,687	22,423
Sadovsky	Extracellular Vesicles and Their ncRNA Cargo as Markers of Trophoblast Injury	Federal	639,659	24,827
Sadovsky	March of Dimes Center for Prematurity Research at University of Pennsylvania	Non Federal	90,909	9,091
Sadovsky	Adaptive Signals Emanating from the Injured Placenta	Foundation	100,000	0
Sadovsky	Building Interdisiplinary Research Careers in Women's Health in Pittsburgh	Federal	531,711	6,851
Sadovsky	Maternal-Fetal Environment, Epigenetics and Complex Congenital Heart Disease	Foundation	8,521	0
Sadovsky/Hubel	Preeclampsia Research	Foundation	12,500	0
Sadovsky	University of Pittsburgh Clinical and Translational Science Institute	Federal	60,397	
Schatten	Frontiers in Addiction Research and Pregnancy	Federal	359,443	16,355
Schatten	Frontiers in Alzheimer's and Aging Research (FrA2R)	Federal	363,957	21,436
Schatten	Frontiers in Stem Cells in Cancer (FriSC2)	Federal	298,825	14,915
Simhan	Intergenerational Effects of Maternal Childhood Trauma on the Fetal Brain	Federal	209,630	57,979
Simhan	Social Disadvantage and Fetal Programming of Newborn-Infant Telomere Biology	Federal	511,633	108,044

Simhan	Pre and Postnatal Exposure Periods for Child Health: Common Risks and Shared Mechanisms (ECHO)	Federal	234,192	148,712
Simhan	Prospective Phase III Evaluation of Fetal Fibronectin in a High Risk Asymptomatic Population for the Prediction of Spontaneous Preterm Birth – Extension Study	Industry	2,115	635
Simhan	NICHD Maternal-Fetal Medicine Units (MFMU) Network	Federal	467,924	238,392
Simhan	Chronic Hypertension and Pregnancy - CHAP Clinical Coordinating Center	Federal	19,579	8,625
Simhan	Prospective, Single Arm, Pivotal Clinical Trial Designed to Assess the Safety and Effectiveness of the InPress Device In Treating Primary Postpartum Hemorrhage (PPH-02)	Industry	6,575	4,175
Simhan	Leveraging Big Data Science to Link Genomics, Epigenetics and the Family to Improve the Health of Children with CHD	Foundation	11,904	1,190
Simhan	Pregnancy as a Window to Future Cardiovascular Health: Adverse Pregnancy	Federal	68,827	26,078
Simhan	Pre and Postnatal Exposure Periods for Child Health: Common Risk and Shared Mechanisms	Federal	49,585	26,888
Simhan	Optimizing health from pregnancy through one year postpartum: A sequential multiple assignment randomized trial (SMART) of perinatal lifestyle intervention	Federal	23,795	13,444
Simhan	Placental origins of phthalate-induced changes in fetal reproductive development	Federal	118,835	35,517
Simhan	Preconception Stress Exposure: Impact on Pregnancy and Child Health Outcomes	Federal	11,897	6,722
Vinekar	CRiSIS: CPC Regulations in States - Implications for Services A Spatial Analysis and Mystery Caller Study	Foundation	14,998	0
Walker	Mutant Mouse Knockout - UoF	Non Federal	4,000	0
Wiesenfeld	STD Testing in Outpatient Practices - The STOP STDs Study	Foundation	107,529	8,603

Wiesenfeld	Prospective, Multi-Site, Method Comparison Clinical Study of the ResistancePlus MG Diagnostic Accuracy in Detecting M. genitalium and Mutations Associated with Azithromycin Resistance	Industry	51,199	10,800
Wiesenfeld	A randomized, placebo-controlled trial of TOL-463 for suppression of bacterial vaginosis (BV)	Federal	42,206	16,140
Wiesenfeld	Adaptive Sequential Study Evaluating Prevention of Neonatal HSV: Detection of Maternal Shedding at Delivery Followed by Preemptive Antiviral Therapy in Exposed Neonates	Federal	80,444	0
Wiesenfeld	Mycoplasma genitalium among men with urethritis attending STD clinics in the US	Federal	23,019	15,387
Wiesenfeld	Overall administrative support activities for the STI CTG to include procedures to identify, discuss, and develop scientific concepts	Federal	11,307	6,339
Wiesenfeld	Performance of Nucleic Acid Amplification Tests for the Detection of Neisseria gonorrhoeae and Chlamydia trachomatis in Extragenital Sites (pNAAT)	Federal	152,021	23,140
Wiesenfeld	STI CTG TA2 TO8 - A Phase III Comparative Trial of Benzathine Penicillin G, 2.4 Million units administered as a Single Dose versus three Successive Weekly Doses for Treatment of Early Syphilis in Persons With and Without HIV	Federal	84,817	14,059
Yanowitz	Role of Chromosomally Tethered Proteasome in Meiotic Pairing and Recombination	Federal	151,946	13,790
Yanowitz	Characterization of a Meiotic Crossover Surveillance System	Federal	246,000	59,414
Zyczynski	Pelvic Floor Disorders Network PFDN Capitation Funding	Federal	207,079	323,629
Zyczynski	Pittsburgh Pelvic Floor Research Program	Federal	198,209	122,177

Department of OB/GYN Funded Research Activities

FY 2014 – 2019 (in thousands)

DIRECTS	FY14	FY15	FY16	FY17	FY18	FY19
Federal	30,223	39,432	35,504	34,634	36,473	34,010
Non Federal	5,509	6,457	6,287	7,298	7,669	7,366
Total	**35,733**	**45,890**	**41,791**	**41,932**	**44,142**	**41,377**

INDIRECTS	FY14	FY15	FY16	FY17	FY18	FY19
Federal	8,803	8,415	7,216	8,059	7,678	7,901
Non Federal	557	822	825	835	920	815
Total	**9,360**	**9,237**	**8,041**	**8,894**	**8,597**	**8,716**

Department Publications

Developmental Biology

Yatsenko SA, Witchel SF, Genetic approach to ambiguous genitalia and disorders of sex development: What clinicians need to know. Semin Perinatol. 2017 May 22; PMID: 28545654

Genetics

Desai S, Wood-Trageser M, Matic J, Chipkin J, Jiang H, Bachelot A, Dulon J, Sala C, Barbieri C, Cocca M, Toniolo D, Philippe T, Witchel S, Rajkovic A MCM8 and MCM9 Nucleotide Variants in Women with Primary Ovarian Insufficiency. J Clin Endocrinol Metab. 2016 Nov 01;: jc20162565 PMID: 27802094

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RESIDENCY TRAINING PROGRAM

Residency Training Program in Obstetrics & Gynecology

The mission of the UPMC Medical Education Residency in Obstetrics and Gynecology is to train future specialist & subspecialist practitioners who will serve society by providing outstanding patient-centered care, contributing to knowledge and scholarship in women's health, advocating and promoting excellence in obstetrics and gynecology and serving as local, regional, national & international leaders. The program aims to provide residents with rigorous clinical experience and didactics with the goal of excellence in general Ob/Gyn with opportunities for individualized training as a foundation for a fulfilling career in medicine.

We continue to attract the very top candidates from medical schools nationally and had another successful NRMP Match. During the 2019 interview season, we screened 843 applicants with 732 from LCME schools and 111 international medical graduates. Of these applicants, 128 were invited and interviewed. interviewed. The 2019-2020 intern class filled the 9 offered PGY1 positions.

Residency Curriculum and Major Changes

1. Clinical Curriculum
    a. Work Hours: Specific initiatives on high clinical volume rotations, including Antepartum, Gynecologic Oncology, and R2 L&D rotations.
        i. 2 APPs were added to Antepartum Team
        ii. Dedicated resident workspace on Antepartum-renovation completed
        iii. Gynecologic Oncology Faculty excusing residents from O.R. if not essential for late case
        iv. Night R1 and R2 starting shift earlier at 5:30pm on LS to limit Dayshift team hours
        v. FP resident integration to Labor Suite team
        vi. Ongoing advocacy for adequate resident workspace in Triage
        vii. Non-resident swing shift (11a-9p) added to triage to match clinical volume
    b. Low TAH and TVH volume:
        i. TAH minimum numbers revised by ACGME to align with practice pattern promoting minimally invasive routes (LH and TVH)
        ii. Residency permits residents to miss didactics for TAH and TVH .
        iii. Longitudinal simulation and didactic curriculum for TVH developed by Dr. Megan Bradley
        iv. Passavant rotation preserved during R2 year
        v. UPMC-NW rotation continues to provide valuable gynecologic surgery experience.
        vi. 2A senior booking clinic cases via a route that is in the scope of a generalist. Booking with a different supervising attending encouraged, if the Attending of the week is not an appropriate supervisor for the case.

c. Rotation changes to accommodate the decrease in residents from 10 to 9: extensive work by REC to plan and implement this.
d. Clinic Chief (Dr. James Ross) peer-selected and OPC worked on clinic patient flow issues.
e. Dr. Rowland assumed role of Medical Director for the Clinic
f. L&D: discussions with leadership and senior residents about maximizing participation and R3/R4 education in operative vaginal delivery. Operative vaginal delivery curriculum being developed by Dr. Waltner-Toews.
g. Gyn Oncology: Continued efforts to promote resident participation in level appropriate surgeries
h. Clinic: regular email updates, inclduding distribution of data on # of patients seen by each resident
i. FM integrated into the LS OB team
j. Resident OB trauma exposure increased with closure of Mercy L&D

2. Didactic Curriculum
    a. Dr. Waltner -Toews (APD) assuming primary role in curriculum development and oversight
    b. Increased number of level-specific sessions, with medical students no longer attending resident Core Didactics.
    c. Expanding longitudinal curriculum for open surgery and vaginal surgery, modeled on the program's experience with longitudinal laparoscopic simulation (FLS) curriculum.

3. Transfer of care:
    a. Postpartum rounds in am promoting communication and patient care.
    b. TRAC lists adopted by postpartum team

4. Recruitment
    a. Visiting 4th year students offered interview during rotation.
    b. Efforts to enhance residency diversity initiated including changes in applicant screening, applicant ranking, and mentorship in residency
    c. UPMC and School of Medicine both enhanced community building activities and infrastructure to support a diverse physician workforce
    d. Successful recruitment of 10th PGY2 to replace PGY2 member leaving the residency and medicine

5. Research:
    a. Drs. John Harris and Maisa Feghali as Directors of Resident Research leading practical sessions during Intern Ed and Core didactics.
    b. Resident Research Day transitioned to stand alone event to highlight resident scholarship. Alumni Speaker and Career Panel for mentorship.

6. Wellbeing
    a. Wellness committee: props and community building events
    b. Personal day to allow travel to big events without taking vacation
    c. Grand Rounds 2-part series on promoting a healthy learning environment
    d. Wellness days in Core integrated into the curriculum

Awards

During the past academic year, our residents were the recipients of the awards listed below. Highlights of their accomplishments include prize papers at national meetings, and School of Medicine teaching awards.

Gold Foundation Humanism and Excellence in Teaching / "Little Apple" Award

Since the inception of the University of Pittsburgh Medical School's Gold Foundation Humanism and Excellence in Teaching / "Little Apple" Award in 2003, a resident or intern in Obstetrics and Gynecology has been a recipient. This is a remarkable accomplishment, as University of Pittsburgh third-year medical students grant this award to the 6 best resident teachers encountered during their third-year, in all specialties that host core clerkships. The "Little Apple Award" is given to recognize the outstanding residents and interns with whom the senior class has worked with during their third-year clinical rotations and who they believe have demonstrated excellence in student teaching, team leadership, fund of knowledge, compassionate and humanistic patient care, and service as a mentor and role model. The winners of the award are commended for their hard work and dedication to student learning and patient care. They are residents and interns who best reflect the highest standards of the medical profession. Dr. Aaron Campbell, a second-year resident, and Dr. Alexandra Buffe, a first-year resident, were the recipients of this prestigious award this year.

2004	Michelle Odrobina, MD
2005	Amanda Nickles-Fader, MD
2005	Michelle Odrobina, MD
2006	Michelle Odrobina, MD
2007	Susan Lareau, MD
2007	Michelle Odrobina, MD
2008	Melanie Ochalski, MD
2008	Amber Samuel, MD
2009	Deborah Landis Lewis, MD
2009	Michelle Moniz, MD
2009	Melanie Ochalski, MD
2010	Meredith Snook, MD
2010	Lindsay Turner, MD
2011	Megan Bradley, MD
2012	Sheila Ramgopal, MD
2013	Margaret Schramm, MD
2014	Erin Rhinehart, MD
2015	Chelsea Chandler, MD
2016	Tiffany Deihl, MD
2017	Tiffany Deihl, MD
2018	Aaron Campbell, MD
2019	Aaron Campbell, MD
2019	Alexandra Buffie, MD

National Awards

Nina Ragunanthan, MD (R2)

- North American Society for Pediatric and Adolescent Gynecology Outstanding Resident Award

Elizabeth Pronesti, MD (R4)

- Society of Laparoscopic Surgeons - Outstanding Resident Award

Kristen Venuti, MD (R3)

- Society for Academic Specialists in General Obstetrics and Gynecology

Nina Ragunanthan, MD (R2)

- Society of Maternal-Fetal Medicine – Resident Award for Excellence in Obstetrics

Susan Lang, MD (R2)

- Society of Gynecologic Oncology Annual Residency Award

Kathryn Peticca, MD (R4)

- Ryan Program Resident Award for Excellence in Family Planning

Kristie Charek, MD (R3)

- American Urogynecologic Society - Award for Excellence in Female Pelvic Medicine and Reconstructive Medicine

Alexandra Melnyk, MD MEd (R3)

- American Association of Gynecologic Laparoscopists - Special Excellence in Endoscopic Procedures Award

Institutional Awards

Alexandra Buffie, MD

- University of Pittsburgh School of Medicine, Best First-Year Ob/Gyn Resident Teacher as selected by Third-Year Medical Students

Jennifer Anhut, MD

- University of Pittsburgh School of Medicine, Best Second-Year Ob/Gyn Resident Teacher as selected by Third-Year Medical Students

Kristen Venuti, MD

- University of Pittsburgh School of Medicine, Best Third-Year Ob/Gyn Resident Teacher as selected by Third-Year Medical Students

Jason Riccuit, MD

- University of Pittsburgh School of Medicine, Best Senior Ob/Gyn Resident Teacher as selected by Third-Year Medical Students

Program Awards

Alexandra Buffie, MD (R1)

- Best General Obstetrical Skills by an Intern

Julia Tasset, MD, MPH (R1)

- Magee-Womens Hospital Junior Resident Award for Excellence in Family Planning

Alayna Butcher, MD (R4)

- The Dr. Morris Turner Procedural Teaching and Guidance Award

Latima Collins, MD (R1)

- The Margaret Scearce Compassionate Care Award

Published Articles - Peer Review Articles

Ross MS, Burriss ME, Winger DG, Edwards RP, Courtney-Brooks M, Boisen MM. Unplanned postoperative intensive care unit admission for ovarian cancer cytoreduction is associated with significant decrease in overall survival. Gynecol Oncol. 2018 Aug;150(2):306-310. PMID: 29929924.

Elbaum C, Beam KS, Dammann, Dammann CEL. Antecedents and outcomes of hypothermia at admission to the neonatal intensive care unit. Matern Fetal Neonatal Med. 2019 Mar 27:1-6. PMID: 30885030.

Harris, JA, Garrett AA, Akers A. Obesity and disparities in human papillomavirus vaccination for U.S. adolescent girls and young women. Womens Health Issues. 2019 Jan - Feb;29(1):31-37. PMID: 30446328.

Melnyk A, Vani K, Rindos N. Post-uterine fibroid embolization sepsis: A case report and review of the literature. Journal of Gynecologic Surgery, Vol. 34, No. 6, December 2018. PMID: 2018.0042.

Hay CM, Kelley JL, Edwards RP, Pombier KM, Comerci JT. Super-utilization of health care resources among gynecologic oncology patients. Am J Med Qual. 2018 Sep/Oct;33(5):509-513. PMD: 29463092.

Ciardulli A, D'Antonio F, Magro-Malosso ER, Saccone G, Manzoli L, Radolec M, Berghella V. Maternal steroid therapy for fetuses with immune-mediated complete atrioventricular block: a systematic review and meta-analysis. J Matern Fetal Neonatal Med. 2019 Jun;32(11):1884-1892. PMID: 29251180

Nichols EK, Ragunanthan NW, Ragunanthan B, Gebrehiwet H, Kamara K. A systematic review of vital events tracking by community health agents. Glob Health Action. 2019;12(1):1597452. PMID: 31179875

Hauspurg A, Redman EK, Assibey-Mensah V, Tony Parks W, Jeyabalan A, Roberts JM, Catov JM. Placental findings in non-hypertensive term pregnancies and association with future adverse pregnancy outcomes: a cohort study. Placenta. 2018 Dec 15;74:14-19. doi: 10.1016/j.placenta.2018.12.008. Epub 2018 Dec 21 PMID: 30594310

Carter-Brooks CM, Du AL, Ruppert KM, Romanova AL, Zyczynski HM. Implementation of a urogynecology-specific enhanced recovery after surgery (ERAS) pathway. Am J Obstet Gynecol. 2018 Nov;219(5):495.e1-495.e10. doi: 10.1016/j.ajog.2018.06.009. Epub 2018 Jun 18. PMID: 29913175.

Sassani JC, Stork A, Ruppert K, Bradley MS. Variables associated with an inability to learn clean intermittent self-catheterization after urogynecologic surgery. Int Urogynecol J. 2019 May 23. PMID: 31123797.

Rosen MW, Tasset J, Kobernik EK, Smith YR, Johnston C, Quint EH. Risk Factors for Endometrial Cancer or Hyperplasia in Adolescents and Women 25 Years Old or Younger. J Pediatr Adolesc Gynecol. 2019 Jun 18. PMID: 31226466.

Tasset J, Rosen MW, Bell S, Smith YR, Quint EH. Ovarian Torsion in Premenarchal Girls. Pediatr Adolesc Gynecol. 2019 Jun;32(3):254-258. doi: 10.1016/j.jpag.2018.10.003. Epub 2018 Oct 25. PMID: 30367984.

Nammalwar B, Bunce RA, Berlin KD, Benbrook DM, Toal C. Synthesis and biological evaluation of SHetA2 (NSC-721689) analogs against the ovarian cancer cell line A2780. Eur J Med Chem. 2019 May 15;170:16-27. doi: 10.1016/j.ejmech.2019.03.010. Epub 2019 Mar 7. 30878829.

Abstract Presentations

Poster Presentations

Anhut J, Barnard E, Steimer S, Orwig KE, Valli-Pulaski H. Access and barriers to fertility preservation for women prior to gonadotoxic or sterilizing treatment. American College of Obstetricians and Gynecologists Annual Clinical and Scientific Meeting, May 3-6, 2019, Nashville, Tennessee.

Atlass JL, Feghali M. Subtypes of Gestational Diabetes Mellitus Based on Mechanisms of Hyperglycemia. The Society for Maternal-Fetal Medicine 39th Annual Meeting, February 11-16, 2019, Las Vegas, Nevada.

Garrett A, Mackenzy R, Hand L, Hartnett E, Orr B, et al. Lymph node micrometastases in endometrial cancer: Treatment patterns and prognosis. Winter Society of Gynecologic Oncologists, January 17-19, 2019, Olympic Valley, California.

Hacker FM, Serra AE, Petticord V, Sakamoto S. Impact of implementing an obstetric hemorrhage consensus bundle in a large health system. The Society for Maternal-Fetal Medicine 39th Annual Meeting. February 11-16, 2019, Las Vegas, Nevada.

Peticca KD, Lee JK, Russell MR, Chen BA. Outcomes of hysteroscopic sterilization in an urban academic medical center from 2003-2014. North American Forum on Family Planning, October 20-22, 2018, New Orleans, Louisiana.

Garrett A, Radolec M, Hand L, Hartnett E, Orr B. Lymph node micrometastases in endometrial cancer: Treatment patterns and prognosis. Winter Society of Gynecologic Oncologists, January 17-19, 2019, Olympic Valley, California.

Redman EK, Hauspurg A, Hubel CA, Roberts JM, Jeyabalan A. Increased peripheral vascular resistance and arterial stiffness one year after preeclampsia. The Society for Maternal-Fetal Medicine 39th Annual Meeting. February 11-16, 2019, Las Vegas, Nevada.

Redman EK, Hauspurg A, Hubel CA, Roberts JM, Jeyabalan A. Clinical Predictors of Delayed-Onset Postpartum Preeclampsia. 66th Annual Meeting of the Society for Reproductive Investigation, March 12-16, 2019, Paris, France.

Hauspurg A, Redman EK, Rogan S, Hubel CA, Jeyabalan A. Blood Pressure Profile after Delayed-Onset Postpartum Preeclampsia. 66th Annual Meeting of the Society for Reproductive Investigation, March 12-16, 2019, Paris, France.

Redman EK, Hauspurg A, Hubel CA, Roberts JM, Jeyabalan A. Clinical Course of Delayed-Onset Postpartum Preeclampsia. 66th Annual Meeting of the Society for Reproductive Investigation, March 12-16, 2019, Paris, France.

Jourdan Schmitz, MD, Chinedu Nwabuobi, MD, Anaisy Pargas, MS, Hannah Camisasca-Lopina, Rachel Sinkey, MD, and Anthony Odibo, MD. Risk Factors for Neonatal Intensive Care Unit Admission Among Growth Restricted Fetuses. American College of Obstetricians and Gynecologists Annual Clinical and Scientific Meeting, May 3-6, 2019, Nashville, Tennessee.

Bradley M, Sassani J, Stock A. Variables Associated with Inability to Learn Clean Intermittent Self-Catheterization after Urogynecologic Surgery Scientific Salon Presentation (a combination of poster and oral presentation). American Urogynecology Society, October 9-13, 2018, Chicago, Illinois.
Julia Tasset MD MPH, Monica W. Rosen MD, Sarah Bell MS MPH, Yolanda R. Smith MD, Elisabeth H Quint MD. Characteristics of Premenarchal Girls with and without Ovarian Torsion. American Society for Reproductive Medicine 2018 Scientific Congress and Expo, October 6-10, 2018, Denver, Colorado.

Oral Presentations
Melnyk A, Rindos N, Lee T. Comparison of laparoscopic hysterectomy in patients with endometriosis with and without an obliterated cul-de-sac. American Association of Gynecologic Laparoscopists Global Congress on Minimally Invasive Gynecologic Surgery, November 2018, Las Vegas, Nevada.

Romanova A, Carter-Brooks C, Ruppert K, Zyczynski H. 30-Day unanticipeted healthcare encounters after major prolapse surgery: Does day of discharge matter? American Urogynecologic Society Meeting, October 9-13, 2018, Chicago, Illinois.

Ross JH, Carter-Brooks CM, Ruppert KM, Giugale LE, Shepherd JP, Zyczynski HM. External Validation of De Novo Stress Urinary Incontinence Calculator. American Urogynecologic Society Meeting, October 9-13, 2018, Chicago, Illinois.

Bradley M, Sassani J, Stock A. Variables Associated with Inability to Learn Clean Intermittent Self-Catheterization after Urogynecologic Surgery Scientific Salon Presentation (a combination of poster and oral presentation). American Urogynecology Society, October 9-13, 2018, Chicago, Illinois.

Video Presentation:

Melnyk A, Ramirez C, Lee T. Laparoscopic abdominal cerclage - techniques and troubleshooting a gravid uterus. American Association of Gynecologic Laparoscopists Global Congress on Minimally Invasive Gynecologic Surgery, November 2018, Las Vegas, Nevada.

Melnyk A, Mansuria S. A rare case of epithelioid trophoblastic tumor. Society of Gyneclogic Surgeons 45th Annual Scientific Meeting, March 31-April 3, 2019, Tucson, Arizona.

Annual Residents' Research Day

The annual Residents' Research Day occurred on May 29, 2019. The format for the event was modified to focus on career development in addition to showcasing resident scholarly project presentations. The invited alumni speaker for the day was Brenna Hughes, MD, MSc, a 2003 who shared her perspective on "The Trials and Tribulations of a Career in Clinical Trials." The day also included a career panel discussion with Doctors Hughes, Mary Ackenbom, Madeleine Courtney-Brooks and Elizabeth Krans, moderated by Doctors Feghali and Harris. The first- and second-year residents participated in a research project mentorship-focused working lunch.

The department partnered with UPMC Magee-Womens Hospital to establish an endowment to award to the best resident oral presentation with the Marvin C. Rulin, MD, Resident Research Day Presentation Award. Doctor Marvin C. Rulin was a former Magee Ob/Gyn resident and faculty member who held numerous positions, both at Magee and at the University, before officially retiring in October of 2000. The 2019 award was presented to Dr. Alison Garrett, for her project: "Percutaneous Exposure Incidents in Obstetrics and Gynecology Residents." Doctor Garrett received a monetary and plaque award. Dr. Emily Redman:,"Clinical Course, Predictors and Long-Term Blood Pressure Profile of Delayed-Onset Postpartum Preeclampsia" and Dr. Alayna Butcher: "Laparoscopic Hysterectomy: Improving Cost-Effectiveness of Surgical Trays." were also recognized for outstanding research.

The following was the schedule of oral presentations:

Resident:	Alayna Butcher, MD (R4)
Title:	Laparoscopic Hysterectomy: Improving Cost-Effectiveness of Surgical Trays
Research Advisor:	Nicole Donnellan, MD
Resident:	Kristie Charek, MD (R3)

Title:	Routine Assisted Hatching for Blastocyst Frozen Embryo Transfers: The Effect on Clinical Outcome in a Single Academic Center
Research Advisor:	Stephanie Rothenberg, MD and Anthony Wakim, MD
Resident:	Kelsey Dressen, MD (R4)
Title:	Prophylactic Antibiotics for Obstetrical Anal Sphincter Injuries
Research Advisor:	Pam Fairchild, MD
Resident:	Joanna Evans, MD (R4)
Title:	Outcomes Following Immediate Postpartum Nexplanon Insertion – A Retrospective Chart Review
Research Advisor:	Sharon Achilles, MD
Resident:	Alison Garrett, MD (R3)
Title:	Percutaneous Exposure Incidents in Obstetrics and Gynecology Residents
Research Advisor:	Harold Wiesenfeld, MD
Resident:	Francis Hacker, MD (R4)
Title:	Impact of Implementing an Obstetric Hemmorrhage Concensus Bundle in a Large Health System
Research Advisor:	Sara Sakamoto, MD
Resident:	Alexandra Melnyk, MD (R3)
Title:	Comparison of Laporoscopic Hysterectomy in Patient with Endometrosis With and Without an Obliterated Cul-De-Sac
Research Advisor:	Ted Lee, MD
Resident:	Kathleen Pombier, MD (R3)
Title:	Super-Utilization of Health Care Resources Among Gynecologic Oncology Patients
Research Advisor:	Casey Hay, MD
Resident:	Emily Redman, MD (R3)
Title:	Clinical Course, Predictors and Long-Term Blood Pressure Profile of Delayed Onset Postpartum Preeclampsia
Research Advisor:	Arun Jayabalan, MD
Resident:	Anna Romanova, MD (R3)
Title:	30 Day Unaticipated Healthcare Encounters after Major Prolapse Surgery: Does Day of Discharge Matter?
Research Advisor:	Halina Zyczynski, MD
Resident:	James Ross, MD (R3)
Title:	Assessing the Performance of the De Novo Postoperative Stress Urinary Incontinence Calculator
Research Advisor:	Halina Zyczynski, MD

Resident:	Katie Turgeon, MD (R3)
Title:	Inter-pregnancy Weight Change and Hypertensive Disorders of Pregnancy
Research Advisor:	Alisse Hauspurg, MD and Jacob Larkin, MD

Resident:	Kristen Venuti, MD (R3)
Title:	Does Menopausal Status Affect Uropathogens and Antimicrobial Resistance Patterns in Women?
Research Advisor:	Meghan Bradley, MD

Awards and Accomplishments

Diana Lynn Brucha, GME Project Manager:

- Recipient of the 2019 UPMC Graduate Medical Education Coordinators' Mentor of the Year Award

Katherine Bunge, MD, Division of Gynecologic Specialties:

- SASGOG (Society for Academic Specialists in General Obstetrics and Gynecology) Faculty Teaching Award, 2019.

Tiffany Deihl, MD, Materal-Fetal Medicine Fellow:

- Recipient of the Department's Obstetrical Fellow Teaching Award, 2019.

Nicole M. Donnellan, MD, Division of Gynecologic Specialties, Co-Associate Program Director:

- Promoted to Associate Professor of Obstetrics, Gynecology and Reproductive Sciences, University of Pittsburgh School of Medicine
- Appointed to Academy of Master Educators Office of the Vice Dean, University of Pittsburgh School of Medicine
- First Place Award for Best Video, ACOG District IV & VI Annual Meeting, Savannah, Georgia

Maisa Feghali, MD, Division of Maternal-Fetal Medicine:

- Recipient of the Department's Obstetrics Faculty Teaching Award, 2019.

Heather Hohmann, MD, Division of Gynecologic Specialties:

- APGO (Association of Professors of Gynecology and Obstetrics) Excellence in Teaching Award, 2019.

Jennifer Makin, MD, Division of Gynecologic Specialties:

- Recipient of the Department's Outpatient Clinic Faculty Teaching Award, 2019.

Brian Orr, MD, Gyn Oncology Division Educational Director:

- Recipient of the CREOG (Council on Resident Education in Obstetrics and Gynecology) National Faculty Award for Excellence in Resident Education, 2019.

Kristiina E. Parviainen, MD, MS, Maternal-Fetal Medicine Division Educational Director, Co-Associate Program Director:

- Appointed as Residency Program Director, Obstetrics and Gynecology Residency Training Program.

Ann Peters, MD, Minimally Invasive Gynecology Surgery Fellow:

- Recipient of the Department's Gynecologic Fellow Teaching Award, 2019.

Sara Sakamoto, MD, Division of Maternal-Fetal Medicine:

- ACOG Simulations Working Group, Leadership Team Member - - Develop and validate a variety of OB/GYN simulation-based curricula to promote teaching strategies that improve clinical competence while optimizing patient safety.

Julia Tasset, MD, First-Year Resident:

- Clinical Research Training Award, Magee-Womens Resident Institute, Project: "Internet Users' Ability to Identify and Assess Information About Safe and Effective Self-Managed Abortion Methods"

Rebecca Waltner-Toews, MD, OB Division Educational Director:

- Appointed as Co-Associate Program Director, Obstetrics and Gynecology Residency Training Program.

Doximity Rankings for Residencies and Training Institutions

Doximity's Residency Navigator ranked the Obstetrics and Gynecology Residency fifth among more than 281 Ob/Gyn residencies in the United States! We are grateful to the incredible faculty, talented residents/fellows, supportive alumni, and generous institution that make this possible. Our program has enjoyed very high rankings, placing in the top 5 in all 5 years of their ranking.

Philanthropic Efforts

Magee Ob/Gyn residents undertook their 12th annual fundraiser to benefit Pittsburgh Action Against Rape (PAAR). This is an entirely resident-run philanthropic effort. This year they put on a performance of the *Vagina Monologues which* starred residents, fellows, faculty and staff from the department and UPMC Magee-Womens Hospital.

Department Educational Publications and Presentations:

Boocks JL, Brucha DL, Hilty M, Kramer S, Shacklock H: Real Life GME Scenarios (Panel Discussion), UPMC 13th Annual Coordinator Symposium, March 2019, Pittsburgh, Pennsylvania.

Brucha, DL: A Day in the Life of a Program Manager (Panel Discussion), CREOG & APGO Annual Meeting, March 2019, New Orleans, Louisiana.

Connolly A, Goepfert A, Blanchard A, Buys E, Donnellan N, Amundsen C, Galvin S, Kenton K. myTIPreport and Training for Independent Practice: A Tool for Real-Time Workplace Feedback for Milestones and Procedural Skills. J Grad Med Educ 2018; 10: 70-77. PMID: 29467977.

Canton S, Patel R, Babichenko D, Donnellan N. Expert multi-round survey to inform augmented reality platform development. Poster presentation at 19th International Meeting on Simulation in Healthcare (IMSH 2019). January 26-30, 2019. San Antonio, Texas.

Sakamoto S. Jazzing up your simulation curriculum – Utilizing low tech simulation models in your Ob-Gyn residency curriculum. In collaboration with the ACOG Simulations Working Group, CREOG & APGO Annual Meeting, March 2019, New Orleans, Louisiana.

OBSTETRICS AND GYNECOLOGY RESIDENCY PROGRAM GRADUATES

Jacqueline Atlass, MD	Fellow in Maternal-Fetal Medicine at the UPMC Medical Education, Magee-Womens Hospital of Pittsburgh of UPMC, Pittsburgh, PA
Mary Burriss, MD	Fellow in Gynecologic Oncology at the Medical College of Georgia
Alayna Butcher, MD	Washington OB/GYN Associates, Washington, PA
Kelsey Dressen, MD	Faculty at the University of Pittsburgh School of Medicine, Magee-Womens Hospital of UPMC
Joanna Evans, MD	WakeMed Physicians Practices OBGYN, Raleigh, NC
Francis Hacker, MD	Fellow in Maternal-Fetal Medicine at the UPMC Medical Education, Magee-Womens Hospital of Pittsburgh of UPMC, Pittsburgh, PA
Yasaswi Paruchuri, MD	Fellow in Reproductive Infectious Diseases, University of Pittsburgh School of Medicine, Magee-Womens Hospital of Pittsburgh of UPMC, Pittsburgh, PA
Kathryn D. Peticca, MD	East Suburban OB/GYN Associates, Monroeville, PA
Elizabeth Pronesti, MD (O'Neill)	Zubritzky & Christy Associates, Pittsburgh, PA
Jason Ricciuti, MD	Fellow in Gynecologic Oncology at the University at Biffalo, Roswell Park Cancer Institute, Buffalo, NY

First-Year Residents

Alexandra Buffie, MD	Baylor College of Medicine
Latima Collins, MD	The University of Toledo College of Medicine
Jason Conger, MD	Medical College of Georgia at Augusta University
Eesha Dave, MD	Icahn School of Medicine at Mount Sinai
Caroline Elbaum, MD, MPH	Tufts University School of Medicine
Jourdan Schmitz, MD, MS	USF Health Morsani College of Medicine
Julia Tasset, MD, MPH	University of Michigan Medical School
Coralee Toal, MD	University of Oklahoma College of Medicine
Alison Zeccola, MD	Jacobs School of Medicine, Biomedical Sciences at the University of Baffalo

Second-Year Residents

Camila Cabrera, MD	University of South Florida Morsani College of Medicine
Aaron Campbell, MD	East Tennessee State University James H. Quillen College of Medicine
Jennifer de Groot, MD	Mercer University School of Medicine
Susan Lang, MD	University of Virginia School of Medicine
Mackenzy Radolec, MD	Sidney Kimmel Medical College of Thomas Jefferson University
Nina Ragunanthan, MD	Harvard Medical School
Abby Stork, MD	University of Kansas School of Medicine
Solomiya Teterichko, DO	Western University of Health Sciences College of Osteopathic Medicine of the Pacific
Chelsea Turgeon, MD	University of Alabama School of Medicine

Third-Year Residents

Alison Aunkst Garrett, MD	Pennsylvania State University College of Medicine
Kristie N. Charek, MD	University of Cincinnati College of Medicine
Alexandra I. Melnyk, MD, MEd	University of Illinois at Chicago College of Medicine
Taylor J. Orellana, MD	Medical University of South Carolina College of Medicine
Kathleen M. Pombier, MD	University of South Florida Health Morsani College of Medicine
Emily K. Redman, MD	University of Rochester School of Medicine & Dentistry
Anna L. Romanova, MD	Northwestern University The Feinberg School of Medicine
James H.B. Ross, MD	New York Medical College
Katie Jean Turgeon, MD	University of Pittsburgh School of Medicine
Kristen R. Venuti, MD	Medical College of Georgia at Georgia Regents University

CLINICAL FELLOWSHIP

The department offers fellowship training in the following eight subspecialty areas of obstetrics and gynecology: Female Pelvic Medicine and Reconstructive Surgery, Minimally Invasive Gynecologic Surgery, Gynecologic Oncology, Family Planning, Medical Genetics, Reproductive Infectious Diseases, Maternal-Fetal Medicine, and Reproductive Endocrinology and Infertility.

Female Pelvic Medicine and Reconstructive Surgery

The fellowship in Female Pelvic Medicine and Reconstructive Surgery at Magee-Womens Hospital of the UPMC and the University of Pittsburgh is designed as a three-year curriculum for individuals who have completed residency training in obstetrics and gynecology or urology. The fellowship is an ACGME (Accreditation Counsel for Graduate Medical Education) accredited fellowship. The fellowship offers one position per year. The curriculum is designed to provide broad training and experience in clinical care and research in women with pelvic floor disorders. Clinical rotations include in-patient and out-patient urogynecologic urology, geriatrics, colorectal surgery and gastroenterology. Surgical approaches to pelvic floor disorders include abdominal, vaginal and laparoscopic procedures. Research rotations will include the opportunity to participate in both basic science (laboratory) research and clinical research. Fellows will have the opportunity to apply for a Master's degree and/or obtain a certificate from the Institute for Clinical Research Education. Clinical experience in obstetrics is available but nor required as part of the fellowship. Director: Pamela Moalli, MD

Minimally Invasive Gynecologic Surgery

The Department has a two-year intense academic training program which focuses on minimally invasive gynecologic surgery. The program is designed to provide extensive training in endoscopic surgery from the gynecologic and general surgery perspectives. A research project is an integral part of the program with the expectation that it is submitted at a national level and published in a peer-review journal. Other activities include active participation in resident and student teaching programs and private patient sessions. Director: Ted Lee, MD

Gynecologic Oncology

An ACGME (Accreditation Counsel for Graduate Medical Education) approved fellowship. There are two positions per year for a three-year fellowship in Gynecologic Oncology. Fellows obtain advanced clinical and research training, with participation in the core Clinical Research Training Program. In addition, a variety of tracks are available should the fellow wish to pursue a Master's of Science in Clinical Research. Fellows will gain exposure to NIH- funded trials through the Gynecologic Oncology Group (GOG), Radiation Therapy Oncology Group (RTOG) and many other ongoing clinical and basic research Departments of Obstetrics and Gynecology, Radiation Oncology and Surgical Oncology (at UPMC Shadyside) Director: Paniti Sukumvanich, MD

Family Planning

This fellowship is one of only a few funded fellowships in family planning in the United States. This two-year fellowship is designed to include training in family planning clinical care, experience in gynecologic surgery and related family planning procedures, participation in the design and performance of clinical trials and international field work. During the two years, the fellow is encouraged to complete coursework at the Graduate School of Public Health at the University of Pittsburgh to satisfy the requirements of a Master's degree in Public Health. Coursework can involve a multidisciplinary approach or a departmental curriculum including biostatistics, epidemiology and health care administration. The program is intended to foster the pursuit of an academic career by an overall emphasis on and preparation for clinical research and teaching. The fellow will be specially trained in contraceptive counseling, Nexplanon insertion and removal, IUD insertion and removal and the fitting of diaphragms. Additionally, the fellow will gain expertise in treating complications of hormonal contraception. Although these procedures may have been learned during residency, a concentrated experience will enable the fellow to be proficient with unusual or complicated cases. The fellow will receive specialized training and become very experienced in performing first trimester procedures including manual vacuum aspiration and medical abortions. The fellow will have similar experience with second trimester abortions by dilation and evacuation (D&E). Director: Beatrice Chen, MD, MPH

Medical Genetics

The two year ACGME-accredited graduate medical education program in medical genetics at the University of Pittsburgh provides the formal instruction and appropriately supervised clinical experience necessary for residents to develop the knowledge, skills, and attitudes essential to the practice of clinical medical genetics. This program is for physicians (MD, DO, MD/PhD) who have completed an entire ACGME-accredited residency in another specialty, and who can obtain a medical license in the Commonwealth of Pennsylvania. Director: Michael Bashford,MD

Reproductive Infectious Disease

The ACGME (Accreditation Counsel for gynecologists Graduate Medical Education) Reproductive Infectious Disease fellowship trains obstetrician- to become experts in infections of the reproductive tract. It is a two-year fellowship which offers one position every other year. The program focuses on infectious diseases in obstetric and gynecologic patients but includes exposure to medical infectious disease, STD's and neonatal infections. Exposure to current laboratory techniques in microbiology, molecular biology and immunology is also offered as well as biostatistics and epidemiology. The fellows' efforts in basic science and clinical investigation are also fostered and expected. Director: Harold Wiesenfeld, MD

Maternal-Fetal Medicine

An ACGME (Accreditation Counsel for Graduate Medical Education) fellowship in MFM offers three positions per year. Extensive clinical training is provided using the large obstetrical population of 400+ maternal transport patients per year. Experience in ultrasound, reproductive genetics, neonatology and statistical methodology is part of the training. Basic research in cardiovascular physiology, pharmacology, infectious diseases, and molecular biology are available through the Magee-Womens Research Institute. Areas of clinical research focus include: preterm birth prevention, pharmacologic agents for the inhibition of labor, infectious diseases, preeclampsia and medical complications of pregnancy. Director: Katherine Himes, MD

Reproductive Endocrinology and Infertility

The University of Pittsburgh fellowship program in Reproductive Endocrinology and Infertility addresses all aspects of The ACGME (Accreditation Counsel for Graduate Medical Education) requirements for subspecialty training. This three-year program offers one position per year. Particular emphasis is placed on surgical training spanning from pediatric to adult patients. Issues related to the specialty will be addressed with detailed faculty supervision with regard to didactic, medical surgical and assisted reproductive technology aspects of specialty training. Director: Joseph S. Sanfilippo, MD

FELLOWS AS OF JULY 2019

Female Pelvic Medicine and Reconstructive Surgery Fellows (Urogynecology):

Amanda Artsen, MD
Medical School: Washington University in St. Louis School of Medicine
Residency: University of California, San Diego

Jessica Sassani, MD
Medical School: State University of New York Upstate Medical University
Residency: UPMC Medical Education, Obstetrics & Gynecology

Linda Burkett, MD
Medical School: Virginia Commonwealth University School of Medicine
Residency: Washington Hospital Center/Georgetown University, Obstetrics and Gynecology

Stephanie Glass-Clark, MD
Medical School: University of North Carolina School of Medicine
Residency: Virginia Commonwealth University

Minimally Invasive Surgery Fellows:

Christine Foley, MD
Medical School: University of Massachusetts Medical School
Residency: New York University, Obstetrics and Gynecology

Laura Newcomb, MD
Medical School: University of Michigan Medical School
Residency: Duke University Hospital, Obstetrics and Gynecology

Shana Miles, MD, PhD, USAF, MC, FS
Medical School: National Capital Consortium
Residency: Uniformed Services University
PhD: Uniformed Services University

Gynecologic Oncology Fellows:

Lauren Hand, MD
Medical School: University of Florida College of Medicine
Residency: Thomas Jefferson University Hospital

Adria Suarez Mora, MD
Medical School: Duke University School of Medicine
Residency: McGaw Medical Center of Northwestern University

Daniel Chan, MD
Medical School: University of South Dakota, Sanford School of Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

Chelsea Chandler, MD
Medical School: Medical College of Georgia at Augusta University
Residency: UPMC Medical Education, Obstetrics & Gynecology

Michael Cohen, MD
Medical School: University of Massachusetts Medical School
Residency: Alpert Medical School at Brown University/Women and Infants Hospital

Alyssa Wield, MD
Medical School: Chicago Medical School, Rosalind Franklin University of Medicine and Science
Residency: Cedars-Sinai Medical Center

Family Planning Fellows:

Kavita Vinekar, MD
Medical School: University of Michigan Medical School
Residency: University of Washington, Obstetrics and Gynecology

Samantha Deans, MD
Medical School: Indiana University School of Medicine
Residency: University of Vermont Medical Center

Reproductive Infectious Diseases Fellow:

Yasaswi Kislovskiy (Paruchuri), MD
Medical School: Michigan State University, College of Human Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

Sharlay Butler, MD
Medical School: University of Washington Medical School
Residency: Northwestern University Feinberg School of Medicine

Maternal Fetal Medicine Fellows:

Anna Binstock, MD
Medical School: University of Maryland School of Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

Christina Megli, MD, PhD
Medical School: Geisel School of Medicine at Dartmouth
Residency: Oregon Health and Science University

Sarah Rogan, MD, PhD
Medical School: University of North Carolina at Chapel Hill School of Medicine
Residency: University of Texas Medical Branch

Lauren Carlos, MD
Medical School: Yale University School of Medicine
Residency: Yale New Haven Hospital, Obstetrics and Gynecology

Mitchell Onslow, MD
Medical School: University of Cincinnati College of Medicine
Residency: Indiana University School of Medicine, Obstetrics and Gynecology

Tiffany Deihl, MD
Medical School: Pennsylvania State University College of Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

Jacqueline Atlass, MD
Medical School: Florida International University, Herbert Wertheim College of Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

Francis Hacker, MD
Medical School: Oregon Health & Sciences University
Residency: UPMC Medical Education, Obstetrics & Gynecology

Jaclyn Phillips, MD
Medical School: University of Pittsburgh School of Medicine
Residency: George Washington University School of Medicine & Health Sciences

Reproductive Endocrinology and Infertility Fellows:

Emily Barnard, DO
Medical School: Kansas City University of Medicine and Biosciences
Residency: Mayo Clinical, Rochester MN

Rachel Beverley, MD
Medical School: Temple University School of Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

Priyanka Ghosh, MD
Medical School: University of Connecticut School of Medicine
Residency: New York Presbyterian Hospital, Weill Cornell Medical Center

Medical Genetics Fellowship:

Mahmoud Aarabi, MD, PhD
Medical School: Shaheed Beheshti Medical University, Tehran, Iran

Global Health Fellowship:

N/A

DEPARTING FELLOWS JUNE 30, 2019:

Female Pelvic Medicine and Reconstructive Surgery Fellows:

Lauren Giugale, MD
Current position: Faculty
University of Pittsburgh School of Medicine, Department of OB/GYN/RS, Division of Maternal-Fetal Medicine
Pittsburgh, PA

Minimally Invasive Surgery Fellows:

Ann Peters, MD
Current position: Faculty
Mercy Medical Center
Baltimore, MD

Gynecologic Oncology Fellows:

Erin Hartnett, MD
Current Position: Faculty
Saint Francis Hospital and Medical Center
Hartford, CT

Malcolm Ross, MD
Current position: Faculty
Novant Gynecologic Oncology
Charlotte, NC

Family Planning Fellows:

Grace Ferguson, MD
Current position: Faculty
West Penn Hospital, Family Planning Division
Pittsburgh, PA

Medical Genetics Fellows:

Mahmoud Aarabi, MD, PhD
Current position: Faculty
University of Toronto, Department of Laboratory Medicine and Pathobiology
Toronto, Canada

Reproductive Infectious Diseases Fellow:

N/A

Maternal Fetal Medicine Fellows:

Jennifer Braverman, MD
Current Position: Faculty
University of Colorado
Aurora, CO

Alisse Hauspurg, MD
Current Position: Faculty
University of Pittsburgh School of Medicine, Department of OB/GYN/RS, Division of Maternal-Fetal Medicine
Pittsburgh, PA

Roxanna Twedt, MD
Current Position: Faculty
High Risk Pregnancy Center
Las Vegas, NV

Reproductive Endocrinology and Infertility:

Stephanie Rothenberg, MD
Current Position: Faculty
Pacific Northwest Fertility and IVF Specialists
Seattle, WA

University of Pittsburgh School of Medicine
University of Pittsburgh
Physicians
Department of OB/GYN/RS
Schedule of Revenue and Expenses Fiscal Year 2020 Budget

		University	UPP	TOTAL BUDGET
Revenue				
Patient Care	$	---	76,184,999	76,184,999
Grant:				
Directs	$	6,609,100	---	6,609,100
Indirects	$	2,219,117	---	2,219,117
Hospital Contract				
School of Medicine	$	444,525	39,110,457	39,554,982
VAMC		---	347,108	347,108
Other	$	1,265,926	1,860, 321	3,126,247
Total Revenue	$	**10,538,668**	**117,502,885**	**128,041,553**
Expenses				
Salaries and Fringe Benefits:				
Faculty	$	7,620,948	60,387,264	68,008,212
Non-Faculty	$	1,562,917	33,790,150	35,353,067
Malpractice Insurance				
Space Rental	$	120,000	5,440,820	5,560,820
UPP Overhead		---	4,825,086	4,825,086
University Overhead	$	1,252,270	4,931,630	6,183,900
Other Operating Expenses	$	867,729	13,948,694	14,816,423
Total Operating Expenses	**$**	**11,423,865**	**123,323,644**	**134,747,509**
Excess Revenue over Expenses	$	(885,197)	(5,820,759)	(6,705,956)
Capital Equipment/Improvements	$	---	---	
Fund Balances				
University Restricted Accounts *as of* 6/30/18	$	---	---	
University Endowments *as of* 6/30/19		---	---	
UPP Fund Balance *as of* 6/30/19		---	4,434,269	4,434,269
UPMC Endowments as of 6/30/19		---	10,017,337	10,017,337
UPMC SPF Accounts *as of* 6/30/19		---	60,139	60,139
Total Fund Balances	$	0	$ 14,511,745	$ 14,511,745