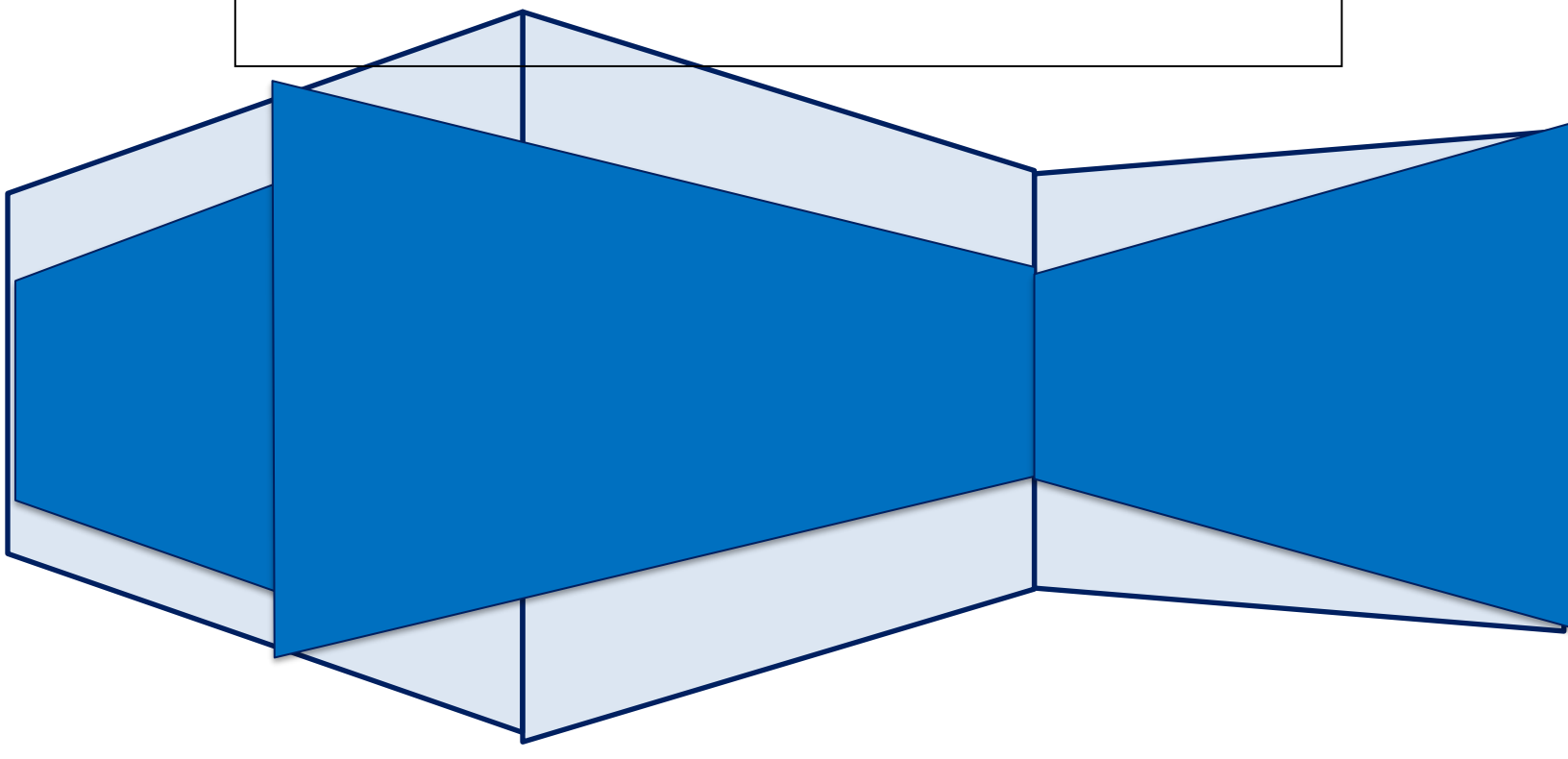
University of Pittsburgh School of Medicine

# DEPARTMENT OF OBSTETRICS, GYNECOLOGY, AND REPRODUCTIVE SCIENCES

## ANNUAL REPORT – ACADEMIC YEAR 2017

**Tatomir, Shannon**



**DEPARTMENT OF OBSTETRICS,**
**GYNECOLOGY,**
**AND REPRODUCTIVE SCIENCES**

UNIVERSITY OF PITTSBURGH
SCHOOL OF MEDICINE

# ANNUAL REPORT

Academic Year 2017
July 1, 2016 – June 30, 2017

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YEAR IN REVIEW

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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**

Once again I am happy to report the expansion of UPMC and the Women's Health Service Line across the state of Pennsylvania. We continue to improve our prospective clinical care and pathway model, as well as our outcomes reporting system and the development of our physician metrics around cost and quality.

In addition, we are exploring new ways by using 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.

**Expanding Clinical Care**

Our expanding clinical care has now reached all the way to the eastern part of the state. 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 to further improve the health of women across the commonwealth.

In addition, we have begun to develop ties to UPMC programs in southern New York and we look forward to expanding our relationship with our community hospital allied partners.

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.

**Excelling in Research**

Our research programs continue to receive national recognition. We recently recruited two cutting edge investigators in ovarian cancer stem cell biology from the University of Michigan. We have numerous career development junior faculty tracks which we are expanding our workforce.

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**

| *PHYSICIAN* | *HIRED* |
|---|---|
| Lisa Chao, MD | 07/1/2016 |
| John Harris, MD | 07/1/2016 |
| Sami Makaroun, MD | 07/1/2016 |
| Honroe Satcho, MD | 07/1/2016 |
| Roseann Gichuru, MD | 07/18/2016 |
| Michelle Boisen, MD | 08/1/2016 |
| Pamela Fairchild, MD | 08/1/2016 |
| Jacoby Spittler, DO | 08/1/2016 |
| Venkata Dasari, MD | 08/22/2016 |
| Amanda Kane, CNM | 08/22/2016 |
| Nancy McBride, MD | 09/1/2016 |
| Gretchen Reinhart, MD | 09/1/2106 |
| Robert Thompson, MD | 09/1/2016 |
| Anand Noticewala, MD | 10/1/2016 |
| Frances Tseng, MD | 10/1/2106 |
| Carla Picardo, MD | 11/1/2016 |
| Alice Cline, CNM | 11/1/2016 |
| Jennifer Ziock Price, MD | 11/15/2016 |
| Lakshmi Vemulapalli, MD | 11/1/2016 |
| Saima Ashraf, MD | 12/23/2016 |
| Tawsufe Majid, MD | 12/23/2016 |
| Hacer Kural, MD | 01/01/2017 |
| Julianne De Martino, MD | 01/09/2017 |
| Melissa Deicas, CNM | 01/15/2017 |
| Kristie Blake, CNM | 04/01/2017 |
| Lydia Schmittell, CNM | 04/01/2017 |
| Colleen Wells, DO | 04/01/2017 |
| Thomas Abraham, MD | 05/01/2017 |
| Jennifer Stull, MD | 05/01/2017 |
| Timothy Weibel, MD | 05/01/2017 |
| Rachel Sieman, CNM | 05/01/2017 |
| Ann Peters, MD | 06/20/2017 |

**DEPARTURES**

| *PHYSICIAN* | *DEPARTED* |
|---|---|
| Pamela Lee, CNM | 07/31/2016 |
| Gretchen McCool, CNM | 08/19/2016 |
| Edward Sandy, MD0 | 09/9/2016 |
| Tony Plant, PhD | 01/31/2017 |
| Meredith Annon, MD | 02/03/2017 |
| Steve Filipek, MD0 | 03/3/2017 |
| Tabitha Delo, MD | 06/30/2017 |
| Rachel Flink-Bochacki, MD | 06/30/2017 |
| Megan Quimper, MD | 06/30/2017 |
| Devon Ramaeker, MD | 06/30/2017 |
| Claver Soriano, MD | 06/30/2017 |
| Mallory Stuparich, MD | 06/30/2017 |
| Tracy Clary, MD | 06/30/2017 |
| Bradley Dennis, MD | 06/30/2017 |
| Jerry Martin, MD | 06/30/2017 |
| Anthony Wakim, MD | 06/30/2017 |

## *Department Professional Members*

### PROFESSORS

Steve Caritis, MD
Daniel Edelstone, MD
Robert Edwards, MD
Richard Guido, MD
Tony Zeleznik, PhD
Sharon Hillier, PhD
Gerald Schatten, PhD
Joseph Kelley, MD
Scott Kauma, MD
Anda Vlad, PhD
Kathleen McIntyre-Seltman, MD
Tony Plant, PhD
Aleksander Rajkovic, MD, PhD
James Roberts, MD
Yoel Sadovsky, MD
Devereux Saller, MD
Joseph Sanfilippo, MD
Hyagriv Simhan, MD
Kyle Orwig, PhD
Isabelle Wilkins, MD
Gabriella Gosman, MD

### ASSOCIATE PROFESSORS

Yaacov Barak, PhD
Richard Beigi, MD, MSc
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
Charlene Dezzutti, PhD
Stephen Emery, MD
William Walker, PhD
Jie Hu, MD, PhD
Carl Hubel, PhD
Arundhathi Jeyabalan, MD
Faina Linkov, PhD
Mellissa Mann, PhD
Phuong Mai, MD
Pamela Moalli, MD, PhD
Francesmary Modguno, PhD
Alexander Olawaiye, MD
Dave Peters, PhD
Robert Powers, PhD
Paul Speer, MD
Margaret Watt-Morse, MD
Judith Yanowitz, PhD

## *Department Professional Members*

### ASSISTANT PROFESSORS

Jessica Berger, MD
Katherine Bunge, MD
Serena Chan, MD
Beatrice Chen, MD
Noedahn Copley-Woods, MD
Madeleine Courtney-Brooks, MD
Bonnie Coyne, MD
Nicole Donnellan, MD
Francesca Facco, MD
Maisa Feghali, MD
Erin Fortenberry, MD
Robert Gedekoh, MD
John Harris, MD
Stephen Hasley, MD
Katerine Himes, MD
Heather Hohmann, MD
Xin Huang, PhD
Arundhathi Jeyabalan, MD
Robert Kaminiski, MD
Colleen Krajewski, MD
Elizabeth Krans, MD
Dennis Krivinko, MD
Audrey Lance, MD
Jacob Larkin, MD
Daniel Lattanzi, MD
Sami Makaroun, MD
Marie Menke, MD
Jean Francois Mouillet, PhD
Sweta Nayak, MD
Kristiina Parviainen-Yang, MD
Devon Ramaeker, MD
Noah Rindos, MD
Sara Sakamoto, MD
Christina Scifres, MD
Katherine Scruggs, MD
David Streitman, MD
Paniti Sukumvanich, MD
Sarah Taylor, MD
Glenn Updike, MD
Judith Volkar, MD
Rebecca Waltner-Towes, MD
Alexander Yatsenko, MD, PhD
Svetlana Yatsenko, MD, PhD
Jennifer Ziock-Price, MD

### INSTRUCTORS

Lisa Chao, MD
Ann Peters, MD
Jessica Tarleton, MD

## *Department Professional Members*

### RESEARCH ASSOCIATE PROFESSORS

Bernard Moncla, PhD

Calvin Simerly, PhD

### RESEARCH ASSISTANT PROFESSORS

Judith Brands, PhD
Leslie Meyn, PhD
Hanna Pulaski, PhD
Tali Shalom Barak, PhD

Robin Gandley, PhD
Zhishuo (Zach) Ou, PhD
Suresh Ramaswamy, PhD
Yi Sheng, PhD

### RESEARCH INSTRUCTORS

Carlos Castro, DVM
Su-Yeon Kim, PhD

Rui Liang, MD

## *Department Professional Members*

### CLINICAL FACULTY

Thomas Abraham, MD
Ira Abramowitz, MD
Janice Agnew, CNM
Judith Albert, MD
Carey Andrew-Jaja, MD
Meredith Annon, CNM
Saima Ashraf, MD
David Badway, MD
Sharon Baer, DO
Linda Barnhart, DO
Rifaat Bassaly, MD
Francis Bassani, MD
Tiffany Beck, MD
Kristie Blake, CNM
Michael Bummer, MD
Draion Burch, DO
Katie Caldwell, CNM
Stacey Jill Carlitz, DO
Kathleen Carroll, MD
Nicole Carlson, MD
Donald Carson, MD
Richard Chalfant, MD
Edwin Cheek, MD
Carol Chesin, MD
Margaret Chory, MD
Tracy Clary, MD
Alice Cline, CNM
Robert Collins, MD
Lisa Cone, CNM
Sandra Cooper, CNM
Stephen Corey MD
James Crozier, MD
Melissa Deicas, CNM
Julianne De Martino, MD
Venkata Desari, MD
Emily Deferrari CNM
Tabitha Delo, MD
Bradley Dennis, MD
Preeta Divekar, MD
William Dundore, MD
April Dunmyre DO
Stephanie Ehland, CNM
Michael England, MD
Dennis English, MD
Eric Fackler, MD
Steele Filipek, MD
John Fisch, MD
Hubert Foka, MD
Rocco Fulciniti, MD
James Garver, MD
Lawrence Glad, MD
Katharine Goetz, MD
Roseanne Gichuru, MD
Shannon McCabe, MD
Elizabeth Hazel, MD
Leonard Hess, MD
Rand Himes, MD
Renata Hoca, MD
Mary Hollis, CNM
Dian Ichikawa, MD
Amy Imro, MD
Renue Joshi, MD
Amanda Kane, CNM
Sunita Katari, MD
David Earl Kauffman, MD
Andrew Kellerman, MD
Constantine Kralios, MD
Charles Kremser, MD
Carol Krupski, MD
Carolyn Kubik, MD
Aliya Ladha, MD
Susan Lareau, MD
Pamela Lee, CNM
Teh-Min Lee, MD
Jamie Lesnock, MD
Leona Logan, CNM
Christine Burke London, CNM
Michael Lupinetti, MD
Carol Manspeaker, CNM
Jerry George Martin, MD
Bart Matson, DO
Shannon McCabe, CNM
Gretchen McCool, CNM
Mark McCormick, MD
William McGrail, Jr., MD
Julie McKechnie, CNM
Kimberly Melen, MD
Michelle Moniz, MD
John Myers, DO
Murhaf Naddour, MD
Christine Nagy, MD
Daniel Nahhas, DO
Stephanie Nicholas, MD
Anand Noticewala, MD
Mary Olson, MD
Murray Osofsky, MD
Robin Ou-Yang, MD
Sonyoung Seo Patel, MD
Mary Peterson, MD
Dean Pollack, MD
Megan Quimper, MD
Carla Picardo, MD
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
Lydia Schmittell, CNM
Samuel Seiavitch, MD
Elizabeth Seiders, MD
Anne Shaheen, MD
Evan Shikora, MD
Pamela Shirey, CNM
Rachel Sieman, CNM
Suzanne Shores, MD
Robert Simmonds, MD
Kitilia Smith, MD
Deborah Sommer, MD
Claver Soriano, MD
Kenneth Spisso, MD
Jacoby Spittler, DO
Michele Straka, MD
Robert Stern, MD
Jennifer Stull, MD
John Sunyecz, MD
Barbara Sustang Talamo, MD
Leeann Swanson, MD
Michele Tate**,** DO
Harati Tatineni, MD
Robert Thomas, MD
Robert Thompson, MD
Robin Torres, MD
Frances Tseng, MD
Lakshmi Vemulapalli, MD
Anthony Wakim, MD
Tanya Walter, CNM
Nicole Waltrip, MD
Timothy Weibel, MC
Colleen Wells, DO
Keith Wharton, MD
Deborah Whiteside, MD
Christine Wilson, CNM
Elizabeth Wirth, MD
Shirley Woo, MD
Jamie Wright, MD
Michele Wright, DO
Laura Wunderly, CNM
Richard Zigrossi, 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 2016-June 2017):

- Research including 42 scientific publications and abstracts at national meetings, and funding from government, foundation, and industry sources totaling $7.5 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 13,314 office visits in the clinical offices of the University of Pittsburgh Physicians
    - 5557 gynecologic surgical procedures were performed
    - 349 office-based procedures
    - Total charges of $12,407,878

### RESEARCH PROGRAM

Our Division continues to be extremely productive in research with funding from government, foundation, and industry sources totaling $ 5.9 million. Division members authored 42 peer-reviewed publications and presented several oral or poster abstracts at national meetings.

**Dr. Sharon Achilles** is principal investigator of an NIH R01 grant quantifying immune cells in women using contraception. She is also the principal investigator on two projects funded by the Bill and Melinda Gates Foundation that will define HIV-target cell response in women initiating contraception in high HIV-incidence areas. 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** accepted the position of Program Director for the Clinical Scientist Training Program (CSTP) with the University of Pittsburgh's Institute for Clinical Research Education (ICRE). She received a secondary appointment at the rank of Associate Professor at the University of Pittsburgh School of Medicine, Clinical and Translational Science Institute (CTSI). She was elected to serve as the Vice President of Research for the American Academy on Communication in Healthcare (AACH). She was also accepted as a Fellow in the prestigious 2017-2018 class of the *Hedwig van Ameringen* Executive Leadership in Academic Medicine (ELAM) *Program for Women* at the Drexel University College of Medicine.

**Dr. Beatrice Chen** is a clinician researcher who is involved in clinical trials on new contraceptive technologies and HIV prevention, funded by government, industry, and foundations. 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 scholar in the Magee-Womens Research Institute Women's Reproductive Health Research Career Development Program funded by the NICHD. He is the principal investigator in several studies examining the impact of the health care system on the health and health care of women with obesity.

**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 (2016-2017)**

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
    - 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
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
    - Abstract reviewer- Society of Gynecologic Investigation
    - Grant reviewer- NICHD- National Institutes of Health
    - Executive Board of American Academy of Communication in Healthcare (AACH)
    - AACH Research Committee
    - Scientific Co-Chair, 2016 Research Forum
    - Vice Chair, Humanities in Health Conference, April 2016
    - ACOG Mental Health Committee
    - Review Committee for DHS Grant
4. Dr. Chen
    - Abstract Reviewer: Forum in Family Planning
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 Comittee
    - 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
    - Chair, American Association of Gynecologic Laparoscopists Video Presentation Committee
    - Member, Residents and Fellows Committee of AAGL
    - Physician Champion for the Patient and Family Centered Care (PFCC) initiative for laparoscopic hysterectomy
    - UPMC Payer Provider Programs Working Group for laparoscopic hysterectomy
11. Dr. McIntyre-Seltman
    - ABOG Senior Examiner
12. Dr. Rindos
    - Board Member, Fellowship of Minimally Invasive Gynecology
    - FMIGS Education Committee
    - FMIGS Assessment Committee
13. 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
14. 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. Audrey Lance has received a third year of funding for the Ryan Residency Training Program. This program aims to enhance and integrate family planning training into the obstetrics and gynecology residency program.

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
   - Committee Member, Institutional Review Board, Univ. of Pgh
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

- Member, Association of Professors of Obstetrics & Gynecology
- Member, American Society of Pediatric and Adolescent Gynecology

7. Dr. Harris
   - The Obesity Society
   - Academy Health
8. Dr. Imro
   - Fellow, ACOG
   - Member, North American Menopause Society
9. Dr. Krajewski
   - Member, ARSM
   - Member, National Abortion Federation
   - Fellow, ACOG
10. 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
11. Dr. Lee
    - Fellow, ACOG
    - Member, American Association of Gynecologic Laparoscopists
    - Member, American Urogynecologic Society
12. Dr. Mansuria
    - Fellow, ACOG
    - Member, American Association of Gynecologic Laparoscopists
    - Member, Society of Laparoendoscopic Surgeons
    - Member, American Society for Reproductive Medicine
13. 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
14. Dr. Rindos
    - Fellow, ACOG
    - Member, AAGL
    - Member, Gold Humanism Honor Society
15. Dr. Scruggs
    - Fellow, ACOG
    - Member of North American Menopause Society
16. Dr. Peterson
    - Fellow, ACOG
    - Member, North American Menopause Society
    - Member, NAMS Consumer Education Committee
    - Member, North American Menopause Society Education Committee

17. Dr. Updike
    - Fellow, ACOG
    - Member, American Society for Colposcopy and Cervical Pathology
    - Member, National Vulvodynia Association
18. 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
19. 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 5$^{th}$ 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 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 13,314 patient visits to members of the Division in the University of Pittsburgh Physician offices. Our division members performed 5557 surgical procedures in the operating room. In addition, we performed over 349 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. Noah Rindos

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

Magee-Womens Hospital Women with Disabilities Clinic: Dr. Glenn Updike

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 |
| 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 |

## *DIVISION OF GYNECOLOGIC ONCOLOGY*

**Joseph Kelley, MD**
**Division Director**

**Overview**

The academic year of 2016-2017 was a successful year for the Division of Gynecologic Oncology as it continued its clinical, research and educational agendas while facing the changing dynamics of the health care market. The division's missions are multi-faceted and include comprehensive and compassionate care of women afflicted with breast and gynecologic malignancies, the enhancement of care by basic science, translational and clinical research, education of future healthcare providers, and advocacy for awareness of women's cancer. To that end, there was robust clinical activity, growth of our research agenda and refinements of our educational commitment.

Our core clinical group consists of 9 full-time gynecologic oncologists, four PhDs and a support staff of approximately 35 individuals. Additional recruitments to expand clinical and research missions have occurred and will be in subsequent reports. We are based at Magee-Women's Hospital of UPMC and provide outreach services throughout South Western Pennsylvania. Offices and surgical services are offered at the UPMC Mercy Hospital, UPMC North Hills Passavant Hospital, Magee-Womens, UPMC Hamot, UPMC Shadyside Hospital, UPMC Susquehanna and Butler Memorial Hospital. Outreach offices are located at UPMC Cancer Centers in Bethel Park, Johnstown, Uniontown and Latrobe, Pennsylvania. Dynamic changes in the region's health care environment will dictate future sites with additional sites in development to include the South Hills region of Pittsburgh and UPMC Altoona.

The research agenda is multi-dimensional and includes breast cancer treatment, application of sentinel node technology to gynecologic malignancies, molecular profiling of breast and gynecologic cancers, targeted therapy for treatment of these cancers, outcomes and safety directed studies and use of both traditional and hyperthermic intraperitoneal chemotherapy for advanced ovarian cancer. 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. NRG Oncology was formed to bring together research areas of the National Surgical Adjuvant Breast and Bowel Project (NSABP), the Radiation Therapy Oncology Group (RTOG), and the Gynecologic Oncology Group (GOG) under one organization. The goal of this merger is to bring together the unique and complementary research areas of these cooperative groups and to enhance efficiency by minimizing duplication of services. 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. In 2016 the successful recruitment of two senior clinician scientists will further our research agenda in women's cancer.
Drs. Ronald Buckanovich and Lan Coffman will have joint appointments in the divisions of gynecology oncology and medical oncology and should lead to expansion of research efforts in both the Magee Womens Research Institute and the Hillman Cancer Center.

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 Laparoscopic and Robotic simulation training for the residency program. Our fellowship program is approved by the American Board of Obstetrics and Gynecology and approved for the next 5 years. 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. Total funding for the division approaches two million dollars. The division produced 46 publications and a total of 10 presentations at regional and national meetings. DEBI get new numbers

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). Currently, four PhD faculty and 1 clinician maintain active laboratories at MWRI. With the recruitment of Drs. Lee and Oesterreich to oversee breast and gynecologic cancer research, the entire fourth floor of MWRI now houses the Women's Cancer Research Center and is supported by both UPCI and MWRI. Further expansion is expected as Drs. Buckanovich and Coffman build out their laboratory space. The Center's purpose is to create a shared resource for women's cancer research across the University of Pittsburgh and UPMC. Dr. Oesterreich was specifically charged with developing mentoring programs for post-doctoral and clinical fellows as well as lectureships and graduate student programs. The recent addition of the two clinician scientists will enhance the mentorship efforts 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. To date the GOG has completed over 300 clinical trials and contributed over 500 manuscripts to peer-reviewed medical literature. In its 35-year history, the organization has been at the forefront in developing new strategies in the management of gynecologic cancers.

The division is one of fifty parent members of GOG. Five division members serve on committees within the GOG. In the academic year 2016-2017 the division had 30 clinical trials available for patient accrual. The disease sites include ovarian, uterine, cervical carcinomas, surgical management of breast cancer 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. Anda Vlad's research explores the human model of endometriosis as a potential cause of cancer, specifically ovarian cancer. Dr. Vlad has mouse models that recapitulate the human disease in a mouse model system developing endometriosis and frank invasive ovarian cancer. Dr. Vlad also has an interest expression of MUC-I tumor antigens in ovarian cancer and

investigates with her Murine preclinical model as well as with human specimens the role of MUC-1 in ovarian cancer development. Dr. Vlad was one of 8 applicants selected for the prestigious DOD mentored career development award in the DOD ovarian cancer academy. In addition, Dr. Vlad with the assistance of Dr. Yoel Sadovsky and Dr. Edwards developed the core facility for flow cytometry at MWRI funded through philanthropy.

Dr. Xin Huang focuses his research on epigenetic regulation through micro-RNA on hypoxia in solid tumors. His current focus is on ovarian cancer biology in primary disease and recurrence.

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. Faina Linkov's research interests revolve around the impact of a patient's body weight and impact on their health. She has made significant contributions to the emerging view that intentional weight loss through bariatric surgery may play a significant role in the prevention of obesity associated endometrial pathologies like endometrial cancer. Dr. Linkov is one of a handful of investigators to successfully demonstrate that women who undergo intentional weight loss experience changes with systemic and endometrial tissue markers associated with cancer development, research that has recently been presented at the American Association of Cancer Researchers (AACR) annual meeting and published in Gynecologic Oncology and Surgery for Obesity and Related Diseases. The newest direction of investigation is the obesity-gynecologic malignancy link and work on identifying novel biomarkers associated with endometrial cancer development in subcutaneous and visceral adipose tissues with the idea that adipose tissue may provide additional information about endometrial cancer detection beyond traditional blood or tissue based markers.

Dr. Joseph Kelley's research interests include novel therapies for ovarian cancer, fertility options and preservation for patients undergoing therapy for both gynecologic and breast malignancies, application of sentinel node technology to gynecologic cancers and enhancement of the role of supportive care, palliative care and hospice care in the gynecologic oncology patient population. Outcomes analysis of the integration of supportive care services implementation in our outpatient and inpatient settings has led to several presentations and publications.

Dr. Alexander Olawaiye has multiple clinical research interests and is currently investigating novel therapies for advanced endometrial cancer. Other areas of interest include the psychosocial impact of disease and the roles of educators in the development of our resident physicians. In his administrative role, he oversees the review and implementation of NRG clinical trials at the University of Pittsburgh Cancer Institute.

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. John Comerci's research interests include the treatment of cervical dysplasia and invasive carcinoma with photodynamic therapy utilizing nanoparticles for drug delivery. He was awarded three grants this past year to support the research proposal: Silicon Phthalocyanine 4 (Pc 4) EGFR-Targeted Photodynamic Therapy Using Cerenkov Luminescence from Beta-emitting 18F-deoxyglucose (FDG): A Nanotheranostic Approach to the Treatment of Cervical Cancer.

Dr. Sarah Taylor's interests center in the development and implantation of early phase gynecologic oncology clinical trials. As part of this clinical trial development, Dr. Taylor is collaborating with translational scientists to bring novel agents first into human studies. She is also interested in development of diagnostic correlative biomarkers that will better define the patient populations that will benefit most from these novel agents. Additionally, Dr. Taylor has an interest in screening and early detection of gynecologic cancers, particularly focused on development of an effective screening strategy for ovarian cancer.

Dr. Madeleine Courtney-Brooks' research includes optimizing care for elderly gynecologic oncology patients and improving patient satisfaction with pre-operative education. Current projects include a prospective study attempting to validate a frailty index for identification of older women at increased risk for post-operative complications as well as a patient survey evaluating the current pre-operative teaching tools used in the gynecologic oncology office. She is also currently developing an Enhanced Recovery Program after Surgery along with colleagues in the Department of Anesthesia.

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. Brian Orr (joined 7/1/2017) Orr is an early career clinical faculty member that is investing time and efforts into clinical research and career development with planned trajectory toward independent clinical investigator. He is currently enrolled in the Master of Translational and Clinical Research program through the University of Pittsburgh's Institute of Clinical Research and Education.

**Examples of current investigator research studies:**

Faculty: **Robert P. Edwards, MD/ Anda Vlad, PhD/ Xin Huang, PhD/ Bill Bigbee, PhD**

Title: A Multidisciplinary Program Evaluating Endometriosis-associated Ovarian Cancer

The novel program is funded through a UPMC initiative to promote paradigm changing medical research. It is a two-year funding initiative, which seeks to identify new mechanisms and biomarkers of ovarian carcinogenesis through the precursor lesions in endometriosis. Multiple sophisticated platforms, including molecular profiling, serum bank screening, and proteomics, are being utilized on archived paraffin specimens housed in the Magee-Womens Hospital Tissue Bank. This grant funds several postdoctoral positions who work exclusively on this project under the direction of the 4 principal investigators. Dr. Bigbee is the director of the UPCI proteomics core and works in collaboration with the division members. This human tissue project runs in parallel with Dr. Vlad's mouse model work and will lead to novel new approaches for screening.

Faculty: **Brian Orr MD, Robert Edwards MD and Anda Vlad PhD**

Title: Chemokine and PD-1 inhibition in recurrent ovarian cancer

In process of finalizing a phase I/II clinical trial protocol that involves combining intraperitoneal chemotherapy, chemokine modulation (rintatolimod), and PD-1 inhibition (pembrolizumab) in recurrent ovarian cancer with progression free interval and immunologic response endpoints. Additionally, there are plans for translational correlative studies of the phenotypic immune changes of the tumor microenvironment, tumor mutational spectrum, and analysis of treatment induced immune-related pathway changes.

Faculty: **Sarah Taylor MD**

Title: Identification of Endocrine Therapy Responsive Low Grade Serous Ovarian Cancers and Ovarian tumors of Low Malignant Potential

Dr. Taylor was awarded a UPP foundation Research Award Grant for $50,000 to study these entities.

**In their first year, our fellows pursue research projects, examples of which are listed below:**

**Fellow:** Casey Hay MD

**Project:** Early specialty palliative care is underutilized for patients with advanced gynecologic malignancies.

**Mentor:** Yael Schenker MD

A qualitative interview study was conducted of 34 gynecologic oncologists at six National Cancer Institute-designated cancer centers with well-established outpatient palliative care services. Semi-structured telephone interviews focused on attitudes, experiences, and preferences related to outpatient specialty palliative care. Three main themes emerged regarding how gynecologic oncologists view outpatient specialty palliative care: (1) long-term relationships with patients is a unique and defining aspect of gynecologic oncology that influences referral, (2) gynecologic oncologists value palliative care clinicians' communication skills and third-party perspective to increase prognostic awareness and help negotiate differences between patient preferences and physician recommendation, and (3) gynecologic oncologists prefer specialty palliative care services embedded within gynecologic oncology clinics. It was concluded that gynecologic oncologists value longitudinal relationships with patients and utilize specialty palliative care to negotiate conflict surrounding prognostic awareness or the treatment plan, and that embedding specialty palliative care within gynecologic oncology clinics may promote communication between clinicians and facilitate gynecologic oncologist involvement throughout the illness course.

**Fellow:** Shannon Grabosch, MD

**Project:** Immunotherapy in Translational Murine Model

**Mentor:** Anda Vlad, PhD

Research focused on immunotherapy in a highly translational murine model for ovarian cancer specifically using immune checkpoint blockade inhibitors (anti-PD-L1) and vaccines (MUC1) in combination with platinum based chemotherapy. Combination therapy demonstrated improved survival and decreased tumor burden with a more favorable cytotoxic gene signature and enhanced immune infiltration of residual tumors.

**Fellow:** Malcolm Ross, MD

**Project:** Gene clusters in endometriosis associated ovarian cancer

**Mentors:** Anda Vlad PhD, Robert Edwards MD

Use of next gen sequencing to evaluate the genetic profile of oncogenes and inflammatory pathways that are similar among endometriosis, atypical endometriosis, and endometriosis associated ovarian cancer. The TIES software system will be employed to search UPMC and affiliated hospitals for pathology reports of: endometriosis, atypical endometriosis, endometriosis and ovarian cancer. After identifying potential patients, paraffin embedded slides will be obtained and next generation sequencing of both inflammatory and oncogenic pathways will be performed and evaluated for clustering with the hopes of elucidating more information of the genetic pathways in endometriosis associated ovarian cancer.

**Fellow:** Malcolm, Ross, MD

**Mentor:** Madeleine Courtney-Brooks MD, Robert Edwards MD

**Project:** Case-control study of risk factors for unplanned ICU admission in patients undergoing surgery for ovarian cancer. By elucidating demographic, medical, and risk factors related to malignancy we hope to help inform the decision to attempt upfront debulking versus neoadjuvant chemotherapy with the hopes of avoiding the morbidity and mortality often associated with ICU admission. Currently univariate analysis is complete.

**Fellow:** Erin Hartnett MD

**Project:** Immune Checkpoint PD1 and PDL1 Study

**Mentor:** Anda Vlad PhD

The immune system utilizes numerous checkpoints to decrease the immune response to foreign antigens. Tumors can also use these same checkpoints to dampen the anticancer immune response. The PD-1 axis has been implicated in this process, in which PD-1 on immune cells binds to the PD ligand-1 (PD-L1) on tumor cells and prevents an immune system attack against the cancer. Immunotherapies have been developed that block PD-1 as well as PD-L1. Some epithelial ovarian cancers have been found to be more inflammatory than others. Theoretically tumors with higher immune system activity may be more susceptible to therapeutic strategies involving immune modulators. The research project will be looking at the use of PD-1 and PDL1 inhibitors in mouse models expressing “inflammatory” vs “non-inflammatory” epithelial ovarian cancers.

**Project:** Ovarian cancer biomarkers of tumor involution following intraperitoneal chemotherapy

**Fellow:** Adria Suarez Mora MD

**Mentor:** Anda Vlad PhD

Ovarian cancer remains a disease diagnosed at advanced stages and associated with poor survival. Intraperitoneal (IP) chemotherapy has been shown to significantly improve survival in advanced ovarian cancer, however little is known about tumor involution and biochemical responses to IP chemotherapy that lead to improvement in survival. Prior work has shown that analysis of peritoneal fluid can be used to measure biomarkers in the tumor microenvironment in ovarian cancer. We aim to define the pathways which are active in tumor involution and chemotherapy-induced immunogenicity by analyzing serial samples of IP fluid from women with ovarian cancer who underwent IP chemotherapy. IP cells and tumor tissue will be analyzed for immune gene expression using multiplex profiling (Nanostring). Biomarkers will be validated with analysis of protein from IP cells, IP supernatant, and immunohistochemistry of tumor tissue. Lastly, clinical information regarding treatment response and survival will be correlated with identified biomarkers to assess for clinical relevance and prognostic value.

**TEACHING PROGRAM**

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

1. Gynecologic Oncology fellows
2. Residents in Obstetrics, Gynecology and Women's Health Sciences
3. University of Pittsburgh and Chatham College Physician Assistant and Nurse Practitioner Programs
4. Medical students of the University of Pittsburgh
5. Visiting Surgical Oncology Fellows
6. Visiting Medical Oncology Fellows

Teaching activities occur in didactic lecture setting, in small problem based learning groups, in outpatient offices, the inpatient units, and in the operating room. Education centers around the pathophysiology, diagnosis and therapeutic interventions of gynecologic and breast 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.

A 4$^{th}$ year Medical Student elective in gynecologic oncology has been received enthusiastically by the University of Pittsburgh Students. On average, 8 students per year participate in this month-long rotation.

**Formal educational events include:**

Tumor Board

The Division of Gynecologic Oncology sponsors a weekly multi-disciplinary Tumor Board that focuses on patient management issues and current trends in gynecologic oncology. Individuals within the subspecialties of gynecologic oncology, medical oncology, radiation oncology, radiology, pathology, patient care services and social work attend it. 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 Via Oncology and available evidence to support the chosen approach. This Conference allows for discussion of different approaches to the problems encountered in gynecologic oncology. The opportunity to recruit patients within research protocols occurs during this meeting. In the past year, the conference has been revamped to include PowerPoint presentations of all cases, the use of "mini-debates" and the encouragement to discuss patients in a prospective fashion. A didactic lecture series has been started to complement this important conference.

Didactic Lecture Series in Gynecologic Oncology

A recent addition has been a weekly core lecture series covering topics in the field. Presentations by the attending staff and colleagues in other subspecialties 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.

A recent addition to the series is "Chemotherapy School". Monthly, the clinical faculty provides case management on a topic pre-selected by the fellowship director. The presentations involve case histories followed by management questions for fellows and then discussion points by the presenter and the faculty in attendance. This allows for an interactive environment and allows for an evidence based approach to patients along with insight to the nuances of treatment decisions. In the next academic year it is anticipated to add "Surgery School" with video presentations and discussions.

Journal Club

Every six weeks a divisional Journal Club is held to discuss timely and controversial topics in the field of Gynecologic Oncology. The attending staff and/or the house staff choose topics. 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

Patient Safety Conference for both obstetrics and gynecology occurs every six weeks during the Tuesday Grand Rounds Series. The primary goal of the conference is the identification and management of complications of obstetrical and gynecological care. The house staff is encouraged to identify patient events of concern. A list is generated of events and presented at the conference. Five to six case presentations are discussed in detail with subsequent management suggestions from the faculty and house staff based on available evidence.

A separate Gynecologic Oncology Patient Safety conference occurs every six weeks on Friday morning. All available residents, fellows and attending participate as adverse and challenging outcomes are discussed. Patient safety initiatives are among the outcomes of this session.

VitalTalk Workshop

In the past academic year, all the fellows and four of the gynecologic oncology advanced practice providers attended 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. All of the participants strongly recommended the training to other gynecologic oncology providers and 90% strongly agreed that this should be required of all gynecologic oncologists. This program will be repeated in the fall of 2017 and the gynecologic oncology faculty will attend. It is planned to repeat this course on a biannual basis.

Fellowship Program

The division has an American Board of Obstetrics and Gynecology (ABOG) 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. In addition, the fellow may elect to pursue a Master of Science in Clinical Research. 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 a site review in the fall of 2013 and was approved for five years. Over the next year the fellowship will fall under the guidelines of the Accreditation Council for Graduate Medical Education (ACGME) program. Dr.

Sukumvanich is in the process of spearheading this transition. A separate site review of the program is scheduled to occur in the 2017-2018 academic year.

CLINICAL PROGRAM

The division is now composed of 8 full time gynecologic oncologists. This rapid expansion has allowed us to improve access to care for women of Southwestern Pennsylvania for treatment of gynecologic and breast malignancies. The faculty is energized and dedicated to its mission. The past year has presented some challenges with the changing landscape of health care in southwestern Pennsylvania. Approximately 2,000 new patients were seen with almost 9,000 return patient visits and 2,700 visits to the chemotherapy unit. Our charges were approximately 11 million dollars. In the 2016, UPMC accounts for roughly 76 % of the gynecologic oncology market share in Allegheny County and 51% of the market share in the surrounding 29 counties.

- The Women's Cancer program at Magee-Womens Hospital/UPMC has continued to expand with the division of Gynecologic Oncology providing a vital role in this process. The number of patients diagnosed and cared for at our institution has grown in the past five years.

Established clinical initiatives include:

- Ovarian Cancer Assessment and Surveillance Program
- Ovarian Cancer Center of Excellence
- Tissue Procurement Program
- Outreach programs provide both outpatient and surgical services to Butler Hospital, Magee-Womens, UPMC Hamot, UPMC Mercy Hospital, UPMC North Hills Passavant Hospital, and UPMC Shadyside Hospital
- Outpatient services at UPMC Cancer Centers at Horizon Hospital, Latrobe Hospital, and Uniontown Hospital and include separate offices in the Irwin and Johnstown areas

Faculty members strive to innovate in the management of patients afflicted with gynecologic and breast 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 cervical and ovarian cancer. Sentinel mapping pioneered in melanoma has replaced traditional inguino-femoral node dissection for vulvar cancer and is employed in select patients for management of cervical cancer. The role of pelvic and para-aortic node dissection for endometrial cancer is being called into question that will allow for sentinel technology to be utilized in this population. To that end, near infra-red imaging technology has been introduced into the robotic and laparoscopic platform to further our investigations into sentinel mapping for these disease sites.

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.

**ADVOCACY**

Faculty members are active in promoting awareness of women's cancer through participation in local and national organizations such as the Susan B. Komen Foundation, National Ovarian Cancer Coalition, Gilda's Club, Our Clubhouse, and the Society of Gynecologic Oncology.

Division members work with the Magee Womens Research Institute Foundation to raise awareness of these issues within our local community. Several members of the division recently attended a two-day workshop to enhance our philanthropic efforts.

In addition, philanthropic events with grateful patients have raised resources for our educational and research missions. "On the Right Course" golf outing is held biannually at the Laurel Valley Country Club and hosted by a grateful family and Dr. and Mrs. Kelley. Monies raised over the two-day event are placed in the Women's Cancer Research and Educational Fund at the MWRI Foundation. This fund has provided seed funding for young investigators at the Magee Womens Research Institute and for fellows and faculty within our division. Along the same initiative, local business leaders have worked with MWRIF to host an annual Flying Fish Event.

**FACULTY LISTING**

Joseph L. Kelley, MD, MS
Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
Director, Division of Gynecologic Oncology

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

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

Madeleine Courtney- Brooks, MD, MPH
Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences

John T. Comerci, MD, MHCDS
Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
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

Paniti Sukumvanich, MD

Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
Director of the Gynecologic Oncology Fellowship

Alexander Olaiwaye, MD

Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
Principle Investigator for GOG division of the NRG Oncology Group

Sarah Taylor, MD

Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences

Kristin K. Zorn, MD

Adjunct Assistant Professor, Department of Obstetrics and Gynecology, University of Arkansas

***Research:***

Xin Huang, PhD
Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences

Faina Linkov, PhD
Assistant 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

Anda M. Vlad, MD, PhD
Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
Secondary appointment Department of Immunology

***Secondary Appointments:***

Adrian Lee Ph.D.
Professor, Department of Pharmacology & Chemical Biology

Steffi Oesterreich Ph.D.
Professor, Department of Pharmacology & Chemical Biology

**Current Gynecologic Oncology Fellowship Trainees**

Shannon Grabosch, MD
Casey Hay, MD
Erin Hartnett, MD
Malcolm Ross, MD
Lauren Hand, MD

**Graduates Current Appointments**

Brian Orr, MD
Assistant Professor
University of Pittsburgh, Pittsburgh, PA

Jill Gadzinski, MD
Assistant Professor
Beaumont Hospital Royal Oak, Michigan

Michelle Boisen, MD
Assistant Professor
University of Pittsburgh, Pittsburgh, PA

Karyn Hansen, MD
St. Francis Hospital, Hartford CT

Robin Laskey MD
Assistant Professor
University of Toledo

Jeff Lin, MD
Bay Area Gynecology Oncology, San Diego CA

Ashlee Smith, DO
Assistant Professor
Geisinger Health System, Danville, PA

Jamie Lesnock, MD
Mid-Atlantic Gynecologic Oncology of Mon General Hospital
Morgantown, WV

Bunja Rungruang, MD
Assistant Professor
Georgia Regents University, August, GA

Ebony Hoskins, MD
Women's Health Specialists of Montgomery County, Rockville MD

Jennifer Rubatt, MD
Banner Health, Boulder, CO

William McBee, MD
Director of Gynecologic Oncology
Mid-Atlantic Gynecologic Oncology of Mon General Hospital
Morgantown, WV

Rebecca Byler-Dann, MD
Associate Professor
Director of Gynecologic Oncology
OSF St Francis Medical Center, Peoria, IL

Scott Richard, MD
Associate Professor
Director of Gynecologic Oncology
Thomas Jefferson Hospital, Philadelphia, PA

Alfred Guirgus, MD
Associate Professor
Department of Obstetrics and Gynecology
Division of Gynecologic Oncology
Rush University, Chicago, IL

## *DIVISION OF MATERNAL FETAL MEDICINE*

**Hyagriv Simhan, 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 25 first- and senior-authored publications in the past academic year. Our publications include important, high-impact papers on perinatal issues as diverse as twin-to-twin transfusion syndrome, pre-eclampsia pathogenesis, placental fat transport, nutrition in pregnancy, development of standards of fetal growth, genital tract immunologic predisposition to preterm birth, pharmacology of progesterone, identification of risk for adverse pregnancy outcomes among women in their first pregnancy, and stress contributors to preterm birth. The Division continues to be successful in securing federal research funding, with NIH and CDC funded projects on pre-eclampsia, preterm birth prevention, developmental origins of health and disease, nutrition in pregnancy, 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-Fetal Pharmacology Network, and the ECHO collaborative.

From a clinical perspective, the division continues its long tradition of 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 six 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.

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.

## Division of Maternal Fetal Medicine Publications 7-1-2016 to 6-30-2017


1. Grobman WA, Bailit J, Sandoval G, Reddy UM, Wapner RJ, Varner MW, Thorp JM, Caritis SN, Prasad M, Tita ATN, Saade GR, Sorokin Y, Rouse DJ, Blackwell SC, Tolosa JE, Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units (MFMU) Network
   *The Association of Decision-to-Incision Time for Cesarean Delivery with Maternal and Neonatal Outcomes.*
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   *Neonatal Morbidity of Small- and Large-for-Gestational-Age Neonates Born at Term in Uncomplicated Pregnancies.*
   Obstet Gynecol. 2017 Aug 04;
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PMID: 28781143

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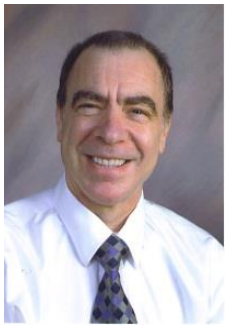
**FACULTY LISTING**

Hyagriv Simhan, MD, MS, Division Director, Division of Maternal-Fetal Medicine
Jennifer Braverman, MD, Fellow
Julia Bregand-White, MD, Fellow
Emily Bunce, MD, Fellow
Mary Beth Caputo, RD, CDE (Dietician)
Steve Caritis, MD
Janet Catov, PhD
Nawal Cuddy, RD, CDE, (Dietician)
Daniel Edelstone, MD
Francesca Facco, MD
Maisa Feghali, MD
Robin Gandley, PhD
Jillian Grove, CRNP
Adriane Haragan, MD, Fellow
Alisse Hauspurg-Janicki, MD, Fellow
Dianne Heidingsfelder, RD, CDE (Dietician)
Katherine Himes, MD
Carl Hubel, PhD
Arun Jeyabalan, MD
Rachel Kingsley, RD, CDE (Dietician)
Jacob Larkin, MD
Mary Lee, PA-C
Sami Makaroun, MD
John Mission, MD, Fellow
Debra Nicolosi, RD, CDE (Dietician)
LeaAnn Ostergaard, RD, CDE (Dietician)
Kristiina Parviainen, MD
Devon Ramaeker, MD
James Roberts, MD
Sara Sakamoto, MD
Allison Serra, MD, Fellow
Roxanna Twedt, MD Fellow
Carrie Weaver, PAC

## *DIVISION OF REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY*



**Joseph Sanfilippo, MD**
**Division Director**

**OVERVIEW**

In accord with the department mission statement, the Division of Reproductive Endocrinology and Infertility (REI) focuses on quality patient care, research and education. Over the past academic year, a number of clinical programs have either been introduced or expanded. These include

- Transgender care, including provision of reproductive technology
- Elective egg (oocyte) cryopreservation
- National and international expansion of fertility preservation program
- In-house (Magee-Womens Hospital) preimplantation genetic screening
- Provision of state-of-the art/IVF technology

Quality patient care is carefully monitored via a number of venues that include a newly developed division morbidity and mortality conference reviewing various aspects of patient care. Our donor oocyte and donor embryo programs continue to expand allowing couples with specific problems, such as premature ovarian insufficiency or other causes of infertility that have been prohibitive, to carry a biological gestation.

By design, our assisted reproductive technology-in vitro fertilization (ART/IVF) program conducts an IVF Ethics Committee chaired by Chaton Turner, J.D. (Senior Associate Counsel, PAG Corporate Legal). At this forum, challenging clinical scenarios are addressed by the committee, with recommendations for ideal patient care.

The Fertility Preservation Program (FPP) is under the direction of Dr. Kyle Orwig in conjunction with Program Coordinator, Dr. Hanna Valli, and Division Director, Dr. Joseph Sanfilippo. Our staff has expanded allowing us to provide 24/7 services for fertility preservation in patients with recent diagnosis of cancer, this includes counseling, consenting and treatment. With support from the Department of Obstetrics, Gynecology and Reproductive Sciences and the Magee-Womens Volunteer Service Board, the dedicated Fertility Preservation Pittsburgh website has

been updated (http://fertilitypreservationpittsburgh.org/) to provide timely access to information and resources for patients and their physicians.

The division conducts a pediatric adolescent gynecology program that facilitates the delivery of quality gynecologic care from neonate to young adult. The REI division also orchestrates multidiscipline sessions that includes maternal fetal medicine, minimally invasive gynecologic surgery and future plans include incorporating gynecologic oncology, all of which are designed to collaborate between divisions with regard to patient care and research.

Telemedicine is an integral segment of the division allowing us to provide care in less accessible areas across Pennsylvania. In addition, the division has conducted faculty attending consultative services at several satellite offices that include Bethel Park, Cranberry, Butler, Johnstown, Erie, UPMC Northwest Horizon, Somerset, Hermitage, McMurray, Clarion, and Youngstown.

The Division of Reproductive Endocrinology and Infertility works closely with the Division of Reproductive Genetics delivering services that include genetic counseling for infertility patients, pre-implantation genetic screening, as well as pursuit of several research endeavors that foster an interdisciplinary approach.

Over the past academic year a Reproductive Endocrinology Steering Committee has been developed. The committee focuses on quality care as well as patient experience and staff support.

**RESEARCH PROGRAM**

Our Fertility Preservation Program of Pittsburgh (FPP) witnessed both national and international expansion over the past academic year. With respect to research, the focus continues on "short-term genetic effects of chemotherapy on male germ cells". In addition, feasibility of differentiating of human pluripotential stem cells into haploid germ cells is being addressed. The Director of REI Research, Dr. Kyle Orwig, and his lab researchers, continue to identify cutting-edge areas of pursuit with regard to stem cell therapies to treat male infertility. Over the past academic year, the laboratory under Dr. Orwig's direction also focused on developing stem cell based therapeutics to restore fertility using primate models and human tissue (pre-pubertal and adult).

Prospective outcomes of pregnancies conceived from cryopreserved oocytes in cancer patients remains monitored through a registry established within the division. With regard to the Division of Reproductive Genetics collaboration, this academic year focus was on "whole exome (gene) sequencing approach in identifying novel genetic variance associated with premature ovarian failure".

In addition, a number of other areas of research were pursued, including, abnormal menstrual patterns in young women following sports related concussions. This work has recently been accepted for publication in *JAMA Pediatrics*; graduated fellow, Dr Meredith Snook, was first author.

Concerns regarding aneuploidy remain of paramount importance in reproductive endocrinology and infertility circles. Over the past academic year, research addressing "unearthing aneuploidy: a study of oocyte quality through Caenorhabditis Elegans" was pursued in collaboration with Dr. Judith Yanowitz.

Regarding stem cell research a collaborative effort addressing homeobox transcription factor RHOX10 driving mouse spermatogonal stem cell establishment was addressed. Dr Kyle Orwig was co-investigator. Other collaborative research incorporated, over expression of NANOS3 and Zazl in human embryotic stem cells; fertility preservation in pediatric patients for which Dr Kyle Orwig participated, represented a collaborative effort in association with the National (Oncofertility) Consortium (Northwestern University). The most recent research from Dr. Kyle's laboratory addressed primate primordial germ cells acquiring transplantation potential (*Stem Cell Reports* in 2017).

The division remains active regarding both clinical and basic science research focused on reproductive endocrinology and infertility.

**ASSISTED REPRODUCTIVE TECHNOLOGY/INVITRO FERTILIZATION PROGRAM**

One of the more commonly encountered problems that couples experience is that of infertility, it affects 8 to 10 percent of the population. The division provides a repertoire of available treatments to expand technological advances within the dynamic field of reproductive endocrinology and infertility. Fertility preservation for cancer patients remains a mainstream option for patients. Elective oocyte freezing for individuals who wish to delay childbearing has relatively recently been removed from the research category by the American Society for Reproductive Medicine (ASRM) and is no longer considered experimental. In our experience, this program has significantly increased over the past year. The IVF Program achieved statistics of clinical pregnancy rates approaching 50% (47.5%) in the less than 35 years/age group. (2016 Society for Assisted Reproductive Technology [SART]).

Our program includes a number of patients with decreased ovarian reserve for which many programs will not offer ART/IVF. Provision of such services to this population provides the hope and realistic expectation that they too can achieve pregnancy.

The In vitro Fertilization Program remains the largest in the region and serves Western Pennsylvania, Eastern Ohio, West Virginal and Western New York State.

**CLINICAL PROGRAMS**

The division continues to expand with respect to depth and breadth of clinical services.

The Center for Fertility and Reproductive Endocrinology statistics

| | **2013** | **2014** | **2015** | **2016** |
|---|---|---|---|---|
| New Patients | 1677 | 1467 | 1386 | 1905 |
| Return Patients | 4155 | 4191 | 3653 | 4420 |

The division provides clinical application of the most current evidence-based medicine for provision of care in virtually all aspects of Reproductive Endocrinology and Infertility.

**Acupuncture**

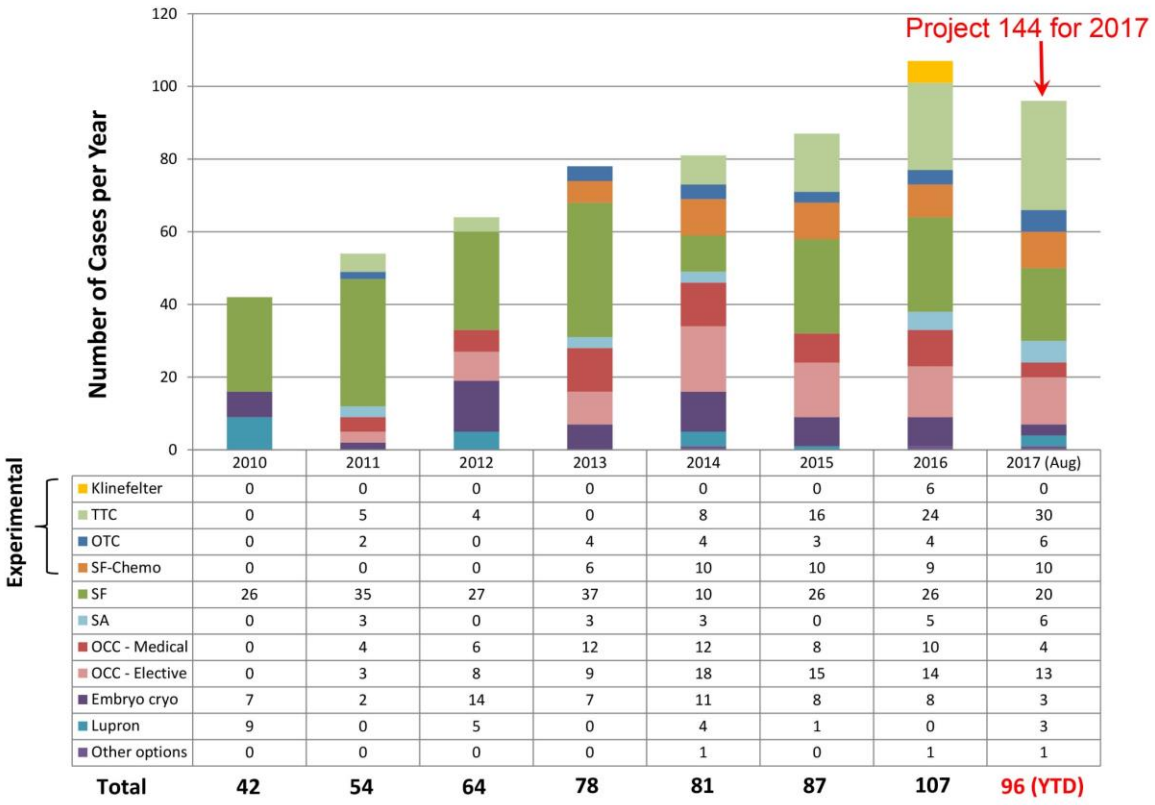
Our certified acupuncturist, Francine Desmone, has expanded the program to include infertility patients, midlife-menopausal, and most recently a gynecological oncology patient sector. The program continues to assist in pain management, stress relief and relaxation techniques including individuals undergoing assisted reproductive technologies/IVF procedures. Over the academic year 532 patients were treated.

**Fertility Preservation Program in Pittsburgh**

The Fertility preservation program at Magee-Womens Hospital provides the most comprehensive menu of fertility preservation options for women, men, girls and boys available anywhere in the United States. With expansion of standard of care as well as research options to preserve gametes, embryos and gonadal tissue as well as commitment to local, national and international outreach, the fertility preservation program has more than tripled the volume of patients seeking fertility preservation services at Magee since inception in 2010 (Figure 1). This includes provision of the following services:

- Ovarian Tissue Cryopreservation
- Testicular Tissue Cryopreservation
- Embryo Cryopreservation
- Oocyte Cryopreservation
- Sperm Cryopreservation
- Expedited IVF
- Fertility Options Counseling

We are part of the Oconfertility Consortium Network which is integrated into the National Physicians Cooperative and Global Partner Network. It is a national, interdisciplinary initiative designed to explore the reproductive future for cancer patients.




| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 (Aug) |
|---|---|---|---|---|---|---|---|---|---|
| Experimental | Klinefelter | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| | TTC | 0 | 5 | 4 | 0 | 8 | 16 | 24 | 30 |
| | OTC | 0 | 2 | 0 | 4 | 4 | 3 | 4 | 6 |
| | SF-Chemo | 0 | 0 | 0 | 6 | 10 | 10 | 9 | 10 |
| | SF | 26 | 35 | 27 | 37 | 10 | 26 | 26 | 20 |
| | SA | 0 | 3 | 0 | 3 | 3 | 0 | 5 | 6 |
| | OCC - Medical | 0 | 4 | 6 | 12 | 12 | 8 | 10 | 4 |
| | OCC - Elective | 0 | 3 | 8 | 9 | 18 | 15 | 14 | 13 |
| | Embryo cryo | 7 | 2 | 14 | 7 | 11 | 8 | 8 | 3 |
| | Lupron | 9 | 0 | 5 | 0 | 4 | 1 | 0 | 3 |
| | Other options | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| **Total** | | **42** | **54** | **64** | **78** | **81** | **87** | **107** | **96 (YTD)** |

**Figure 1. Local Impact: fertility preservation procedures (2010-2017) in Pittsburgh and coordinated recruitment sites.** The Fertility Preservation Program in Pittsburgh projects providing services for 144 patients in 2017. This represents greater than 3-fold increase in fertility preservation case volume since 2010. In addition, the number of number of fertility preservation options has expanded from three standard of care options in 2010 to ten standard of care and experimental options in 2017. Abbreviations: TTC, testicular tissue cryopreservation; OTC, ovarian tissue cryopreservation; SF-Chemo, semen freeze-testing the effect of chemotherapy on sperm; SF, semen freeze; SA, semen analysis; OCC, oocyte cryopreservation (egg freezing), medically indicated or elective.

**Figure 2. Pittsburgh is an international referral center for experimental fertility preservation options.** In addition to Pittsburgh, the Fertility Preservation is recruiting patients at coordinated recruitment sites in the US and abroad. Coordinated centers: Children's National, Washington DC; Cincinnati Children's; Lurie Children's Hospital, Chicago; Children's Hospital of Orange County, LA; Milwaukee Children's Hospital; Beer-Sheva University, Israel; BioCell, Jordon.

The catchment area witnessed significant expansion of national and international sites. (Figure 2) Patients are traveling from all over the world to take advantage of the experimental fertility preservation options that we provide. Historically, this has required travel to Pittsburgh to access the cutting edge experimental procedures. However, to improve availability of services, the Fertility Preservation Program gained approval to establish coordinated recruitments sites in Washington DC, Cincinnati, Chicago, Los Angeles and Milwaukee as well as Beer-Sheva, Israel and Amman, Jordon (Figure 2, Blue stars). Development of additional coordinate recruitment sites continues to occur.

**TEACHING PROGRAM**

The division provides an educational experience for students, residents and fellows that spans from Pediatric Adolescent Gynecology, the reproductive age group on through midlife-menopause. The fourth-year student rotation allows extensive one on one time with faculty as related to clinical activities including outpatient as well as intraoperative patient management. Residents rotate during the second and third year (PGY-2 and PGY-3) and spend the vast majority of their time with patient care heavily supervised by faculty. The third-year rotation includes surgical experience with regard to reproductive endocrinology-infertility. Residents are educated with simulation models to acquire skills related to minimally invasive surgical procedures (hysteroscopy). The division addresses CREOG educational objectives core curriculum in Obstetrics and Gynecology which serves as the basis for resident (core) education. Residents must complete an REI pretest to identify areas of weakness and attention is devoted to specific topic to further enhance the resident educational benefits provided by division faculty.

The fellowship in reproductive endocrinology and infertility remains one of the most competitive nationwide. A number of educational new activities have been introduced over the past academic year and include fellows participating in unique team approaches to patient care. This focus is especially on all aspects of the IVF cycle including ovulation induction retrieval and embryo transfer.

The transition of fellowship oversite to the ACGME occurred during this academic year. Emphasis has been placed on fellows serving as resident mentors with regard to all aspects of REI office patient management, operating procedures, simulation and acquired surgical skills as well as didactic sessions remains a focus for fellow-resident interaction.

Research is a major area of concentration during fellowship training. A basic science thesis is developed and overseen by a Division Thesis Research Committee where the fellow is required to provide regular updates and multispecialty expertise with regard to thesis development. The fellowship program is one of the more surgically oriented REI training programs in the nation. Fellows are exposed to a large array of infertility-reproductive endocrinological procedures. This includes micro surgery for tubal reanastomosis as well as advanced hysteroscopic and laparoscopic procedures. The program has structured external rotations supervised by faculty within the University. The program is designed to meet the American Board of Obstetrics and Gynecology Guide to Learning in Reproductive Endocrinology and Infertility recommendations as the basis for the division didactic lectures.

The pediatric adolescent gynecology clinic operates in accord with Adolescent Medicine Division at Children's Hospital of Pittsburgh. Residents as well as fellows and students on rotation are exposed to a large array of pediatric adolescent gynecologic clinically challenging patient management scenarios.

Beginning in the upcoming academic year, the division leadership will include Dr. Marie Menke, Assistant Professor, serving as Acting Medical Director for the division and Dr. Joseph Sanfilippo Academic Director of the Division of Reproductive Endocrinology and Infertility. In addition, Dr. Sanfilippo will serve as Director of Development and External Relations for the Department.

**Joseph S. Sanfilippo, M.D., M.B.A.** Professor of Obstetrics, Gynecology & Reproductive Sciences, Director Division of Reproductive Endocrinology & Infertility and Program Director-Reproductive Endocrinology and Infertility Fellowship.

In addition to clinical activities related to the specialty of reproductive endocrinology and infertility, he completed a 30-year tenure as Editor-in-Chief for the *Journal of Pediatric and Adolescent Gynecology*. During this time, Dr. Sanfilippo had the opportunity to oversee peer-reviewed research of publications from all over the world. The Editor's Workshop provided an opportunity to comment on current research.

Dr. Sanfilippo served as Executive Director of the North American Society of Pediatric and Adolescent Gynecology for the past 10 years and ended his tenure as Executive Director this academic year.

The Business of Medicine remains an interest for which the textbook MBA for Healthcare was published this year. This is in addition to Dr. Sanfilippo's serving as co-editor for the Second Edition of Clinical Gynecology.

Dr. Sanfilippo's focused research included abnormal menstrual patterns in young women following concussion and he served as a co-author for the work published in *JAMA Pediatrics*. Co-authors included Drs. Meredith Snook, Anthony Contos, Luke Henry and Anthony Zeleznik. In addition, publications focused on the subject of Turner Syndrome and fertility as well as Androgen Sensitivity Syndromes, publications were accepted during the academic year. Research also focused on premature ovarian insufficiency in collaboration with the Division of Reproductive Genetics. The expression level of C19MC miRNAs in early pregnancy and response to viral infection was a collaborative research project with the Division of Maternal Fetal Medicine and MWRI.

Dr. Sanfilippo serves on the editorial board of *Fertility and Sterility* and the *Journal of Minimally Invasive Gynecology* as well as the *Journal of Pediatric and Adolescent Gynecology*. He serves as editor for one edition of Best Practice & Research Clinical Obstetrics & Gynecology and OBG Management for series focused on the Business of Medicine and a separate series on Clinical Jurisprudence Cases.

Dr. Sanfilippo is on the American Board of Obstetrics and Gynecology Maintenance of Certification committee addressing development of a Pediatric Adolescent Gynecology section.

**Anthony Wakim, M.D.** Clinical Professor of Obstetrics, Gynecology and Reproductive Sciences, Director of In vitro Fertilization Program at University of Pittsburgh Physicians-Magee-Womens Hospital

In his capacity as Director of IVF, he has continued to provide clinical services that include many cutting technological advances in the field of assisted reproductive technology/in vitro fertilization. The IVF Program at Magee-Womens Hospital receives patients from across Western Pennsylvania, West Virginia, Eastern Ohio and Western New York State.

His most recent research focused on progesterone levels at oocyte retrieval as a prediction of IVF success in short antagonist protocols. This was a prospective cohort study.

**Gabriella Gosman, M.D.** Professor and Vice Chair for Education, Department of Obstetrics, Gynecology and Reproductive Sciences; Residency Program Director: Obstetrics and Gynecology; Senior Associate Designated Institutional Official, UPMC Medical Education

Over this academic year, under the supervision of Dr. Gosman, the residency program was ranked third nationally among all programs as published in *Doximity's Residency Navigator*. Her work in the department continues to focus on advancing ob-gyn resident education locally and nationally. She mentors multiple education-focused faculty in the Department. She is part of the Department Mentoring Committee and Academic Retreat Planning Committee.

At UPMC Medical Education, the sponsoring institution for more than 120 ACGME-accredited residencies and fellowships at UPMC, Dr. Gosman was promoted to Senior Associate Designated Institutional Official. In this role, she oversees multiple aspects of the institution's far-reaching graduate medical education enterprise.

Dr. Gosman is a member of the ACGME Review Committee for Obstetrics and Gynecology. She is the Chair Elect of the Academy of Master Educators at the School of Medicine. She is a major contributor to the Annual Med Ed Day of the School of Medicine. She serves as an oral board examiner and a Maintenance of Certification module reviewer for the American Board of Obstetrics and Gynecology. Dr. Gosman is the Pennsylvania Section Secretary for the American Congress of Obstetricians and Gynecologists. She is a member of the Advisory Board for District III of this organization. Dr. Gosman is a member of the Technology Committee for the Association of Professors of Gynecology and Obstetrics.

**Marie Menke, M.D, M.P.H.** Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences. Dr. Menke is investigating the effects of lipids and lipid metabolism in reproductive health and completed the NIH K12 Women's Reproductive Health Research (WRHR) Career Development grant program through the Magee-Womens Research Institute.

Dr. Menke is in collaboration with members of the Longitudinal Assessment of Bariatric Surgery to investigate the effects of bariatric surgery on fertility and pregnancy outcomes. She is the principal investigator of the Center for Fertility and Reproductive Endocrinology Research Registry and Biorepository; a registry designed to facilitate retrospective reviews and recruitment for longitudinal studies. Dr. Menke teaches the infertility module of the 2nd year medical school course, precepts for 3rd year medical students, and serves as a mentor for

student and resident trainee projects as they relate to reproductive endocrinology and infertility. As division faculty, she is integrally involved in REI Fellowship training.

**Robert L. Collins, M.D.** Assistant Professor, Department of Obstetrics and Gynecology and Reproductive Sciences. He has expanded our presence in the northwest sector of Pennsylvania as well eastern Ohio and western New York State. Dr. Collins is integrally involved with the telemedicine segment of division activities. In addition, Dr. Collins provides teaching for fellows in reproductive endocrinology and fertility.

**Kyle Orwig, Ph.D.** is Professor of Obstetrics, Gynecology and Reproductive Sciences, Developmental Biology and the Clinical and Translational Science Institute of the University of Pittsburgh. He is the Director of REI Research and Director of the Fertility Preservation Program (FPP) of the University of the Pittsburgh Medical Center. In his capacity as Founding Director of FPP, Dr. Orwig works closely with clinical REI division faculty and provides translational research that includes short term genetic effects of chemotherapy on sperm and effects of transgender hormone therapies on oocytes. He is nationally and internationally recognized for his work on stem cells, regenerative medicine and fertility preservation and serves on the Advisory Counsel to the Alliance for Fertility Preservation and the Medical Advisory Committee of ReproTech. Dr. Orwig works closely with division faculty to expand standard of care and experimental fertility preservation offerings locally, nationally and internationally. Dr. Orwig's laboratory is committed to translating lab bench discoveries into clinical practice with a current emphasis on stem cell therapies and gene therapies for infertility. He collaborates closely with Drs. Rajkovic and Yatsenko in the Genetics division to discover the genetic basis of female and male infertility and develop patient-specific treatment options. Also within the UPMC system, he collaborates with Drs. Erika Friehling and Louis Rapkin in Pediatric Heme/Oncology as well as Selma Witchel in Pediatric Endocrinology to bring experimental fertility preservation options to young patients with diseases or treatments that could impact fertility.

**Tony Zeleznik, Ph.D.,** Professor of Obstetrics, Gynecology and Reproductive Sciences and Cell Biology and Physiology. Dr. Zeleznik over the academic year has continued to receive international recognition for his expertise in ovarian physiology. He is an integral part of the Reproductive Endocrinology and Infertility (REI) teaching program. Dr. Zeleznik participated in research addressing concussions and menstrual abnormalities in adolescents. This complements his work on protein kinases and granulosa cell differentiation. He is chair of the REI Fellowship Thesis Committee. In addition to these activities, Dr. Zeleznik, provides expertise regarding registries for Competency Assessments regarding clinical activities within the division.

**Hanna Valli, Ph.D.** is a Research Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences and Program Coordinator for the Fertility Preservation Program. Dr. Valli's research is focused on fertility preservation in all cancer patients (boys, girls, men and women) and understanding the effects of cancer treatments on fertility. Her background in stem cells and germ line development is critical for taking the next step and understanding how these processes are affected by cancer treatments. Dr. Valli also serve as a Program Coordinator for the Fertility Preservation Program.

**Faculty Listing**

Joseph S. Sanfilippo, M.D., M.B.A. -Division Director, REI Fellowship Director

Gabriella G. Gosman, M.D. -Residency Program Director

Anthony Wakim, M.D. -Medical Director In Vitro Fertilization Program

Kyle Orwig, Ph.D. - Director of REI Research, Director Fertility Preservation Program Department of Obstetrics, Gynecology and Reproductive Services

Robert Collins, M.D. -Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences

Marie Menke, M.D. - Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences

Hanna Valli, Research Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences and Program Coordinator, Fertility Preservation Program

Tony Zeleznik, Ph.D. - Professor of Obstetrics, Gynecology and Reproductive Sciences and Cell Biology and Physiology

Fellows:

Stephanie Rothenberg, M.D., First year REI Fellow
Fabiola Balmir, M.D., Third year REI Fellow
Sunita Katari, M.D., Third year REI Fellow

Past Fellows:

| | Thesis Defense Date | Current Postion |
|---|---|---|
| Meredith Snook, M.D. | 3/21/16 | RHS, Reproductive Health Specialists, Pittsburgh, PA |
| Matrika Johnson, M.D. | 4/27/15 | Reproductive Endocrinology Associates of Charlotte (REACH) |
| Shruti Malik, M.D. | 7/21/14 | Reproductive Endocrinology & Infertility Shady Grove Fertility Reproductive Science Center |
| Shweta Nayak, M.D. | 3/4/13 | Reproductive Medicine Institute in Chicago, IL |
| Melanie Ochalski, M.D. | 1/30/12 | The Fertility Center, LLC, York, PA |
| Serena Dovey, M.D. | 5/31/11 | Assistant Professor, University of Colorado |
| Teresa Erb, M.D. | 9/24/10 | Florida Institute for Reproductive Medicine |

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

## *DIVISION OF REPRODUCTIVE GENETICS*

**Aleksandar Rajkovic, MD, PHD**
**Division Director**

**OVERVIEW**

The Division of Reproductive Genetics provides clinical evaluation of individuals with heritable or undiagnosed disorders, genetic counseling in preconceptional, prenatal and cancer areas, reproductive future and diagnostic testing. The Division's research is focused in a number of areas: non-invasive methods of screening for Down syndrome and other chromosomal abnormalities in pregnancy, mechanisms of cancer predisposition, meiotic mechanisms behind aneuploidy, new approaches for fetal genotyping, the etiology of recurrent pregnancy loss, genetics of male and female gonadal failure, menopause, leiomyomas, ovarian cancer, and utility and design of next generation sequencing in use on constitutional and cancer genetics. The Division sits in the Center for Clinical Genetics and Genomics (pittgenomics.org), which encompasses clinical genetic and genomic services across the UPMC system.

**RESEARCH PROGRAMS**

The Division of Reproductive Genetics and Genomics provides clinical evaluation and genetic counseling to men and women with genetic/genomic disorders, including preconceptional, prenatal, adult and cancer cases. The division is also 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 result interpretation. The division harbors training programs for medical genetic residents, laboratory genetics and genomics fellowhip, as well as clinical biochemical genetics. The division provides education to medical students, residents, and various subspecialty fellows including, pathologists, reproductive endocrinology and maternal fetal-medicine fellows. Research within the division encompasses a number of important topics including: non-invasive methods for fetal genomic diagnoses, development of algorithms for whole 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.

**Dr. Daniel Bellissimo** serves as 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 mixture of DNA fragments from two genomes, whether abnormal copy number variations occur in one of the two genomes. In collaboration with Dr. Peters, these algorithms have been successfully applied to the non- invasive prenatal aneuploidy diagnosis using maternal plasma DNA sequencing data. Dr. Chu also collaborates with Drs. Sadovsky and Mouillet, thru NIH funded grants, to develop computational/statistical tools to study the function of microRNAs in human placenta, in particular the targets of miRNAs, and to discover the comprehensive genomic regulatory network in human placenta involving miRNAs, mRNAs, and proteins.

**Dr. Hu's** research expertise is in use of CGH_SNP 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** has been working on resuming activities in the Cancer Family Registry, which enrolls individuals seen in the Cancer Genetics Program and the High Risk Breast and Ovarian Cancer Program. She continues to work closely with LiFE consortium, and to collaborate on LFS-related projects. Shortly after joining the University of Pittsburgh, Dr. Mai participated in an international workshop to discuss a conceptual framework for identifying patients previously diagnosed with ovarian cancer who had not had genetic testing, and other unrecognized BRCA1 or BRCA2 mutation carriers, to improve the detection of families at risk for breast or ovarian

cancer. This framework serves as a starting point for pilot studies to assess the feasibility and ethical and logistical considerations related to the development of programs to identify individuals at hereditary cancer risk, for whom risk management interventions can then be considered. She has been working on expanding the Cancer Genetics Program, including establishing a pathway to facilitate the process of obtaining cancer genetic testing for patients being seen outside of the Cancer Genetics Clinic, increasing the number of telemedicine sites, and implementing a hereditary cancer clinic where individuals with a hereditary cancer predisposition are followed for risk assessment and management. As part of this clinic, longitudinal data on cancer risk and screening efficacy will be collected, especially for patients with pathogenic variants in genes for which standard management guidelines are not available.

**Dr. David Peters** and his research group received NIH funding to recruit and validate their methodology in the clinical setting of the Magee-Womens Hospital of UPMC. Dr. Peters has recently expanded these efforts to explore the development of non-invasive phenotyping and diagnostic approaches for a variety of complex diseases. 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. Aleksandar Rajkovic** is interested in both prenatal and gynecologic genomics. The Rajkovic laboratory is utilizing whole exome/genome sequencing to determine genetic causes of structural birth defects *in utero*. Moreover, his group is utilizing genomic tools thru NIH funded studies to understand genetic causation of gonadal failure and uterine fibroids. His group discovered several important genes involved in premature ovarian failure such as MCM8/MCM9 and determined that MED12 mutations are present in almost 70% of leiomyomas isolated from American women. He has also interest in developing small molecule inhibitors to regulate reproductive life span and contraception.

**Dr. Devereux N. Saller, Jr.** has a long-standing interest in prenatal diagnosis and management of fetal structural birth defects. He is especially interested in the applications of non-invasive prenatal testing to high risk and low risk pregnancies, and establishing new guidelines for prenatal genetic/genomic 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 is X-linked gene responsible for azoospermia, *TEX11* mutations were a frequent cause of meiotic arrest and azoospermia in infertile men, as well as contribution of numerous other genes to causation of male infertility. This work on TEX11 and male azoospermia has led to a 2015 publication in the *New England Journal of Medicine* (PMID: 25970010). He also works on sperm RNA biomarkers that could be utilized in predicting fertilization outcomes in infertile men. He was recently awarded a one year extension on an R21 grant entitled, "Genomic Signatures of X-Linked and Autosomal Candidate-genes in Azoospermia from NICHD to further dissect genomics of male infertility."

**Dr. Svetlana Yatsenko** studies the utility of chromosomal microarrays in perinatal disorders, disorders of sexual differentiation and oncology. The superior resolution of chromosomal arrays can detect genomic imbalances as small as a few thousand base pairs. Their studies show that it augments regular karyotype by approximately 10% in cases of ultrasound-detected anomalies. Dr. Yatsenko has also developed a high resolution X chromosome array (with a resolution of few hundred base pairs) that can be utilized to study X-linked disorders and can be used as a research tool to study the contribution of the X chromosome to sex determination disorders and ovarian failure. She also developed a comprehensive cancer array that can be utilized to study genomic imbalances in hematologic cancers. Her preliminary data show superiority of her arrays over classical karyotype in detecting genomic imbalances with additional findings in more than 50% of cases.

**Members of the Division of Reproductive Genetics authored or co-authored 40 publications for the 2016-2017 academic year.**

**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 as part of their Ultrasound/Genetics Block. Dr. Saller is the course directors for the 4th year elective in clinical genetics. Drs. Yanowitz and Rajkovic lectured for the newly developed Reproductive Development Course. Dr. Yanowitz is co-Director of the course and plans to offer this course yearly to undergraduate, graduate students and clinical fellows. Dr. S. Yatsenko and Dr. Rajkovic also teach genetic counselors, graduate students and fellows in the Human Genetics course. Members of the Division are also involved in teaching Molecular Genetics and Cytogenetic Laboratory Fellows.

Microarray Case Conference is offered on a monthly basis for CME credits and broadcast by video link to Children's Hospital of Pittsburgh. Cytogenomic cases of interest are discussed in depth to

an audience consisting of clinical care providers, physicians, genetic counselors, laboratory personnel, residents, medical students and fellows.

Magee Clinical Genetic Meeting occurs weekly in which patient care, cases, and pertinent publications are reviewed and discussed in depth. CAFD meeting occurs weekly with discussions of fetal diagnosis, management and treatment in multidisciplinary setting.

**MEDICAL GENETIC RESIDENCY**

The Division offers one position per year in an ACGME accredited medical genetics residency training program. The two-year residency involves the faculty of the Division of Reproductive Genetics at Magee and the Division of Medical Genetics at Children's Hospital of Pittsburgh of UPMC. Our residency program prepares medical genetic residents 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 methods of fetal diagnosis and therapy, natural history of fetal malformations, and the role of heredity in gynecologic cancer. A one year biochemical genetics fellowships is offered through Children's Hospital of Pittsburgh of UPMC. Fellows also gain experience in laboratory genetics through hands-on training in molecular, cytogenetic and biochemical genetics. Didactic training occurs throughout to teach basic knowledge that can be immediately applied to the clinical setting.

**LABORATORY GENETICS & GENOMICS FELLOWSHIP (LGG)**

We were recently accredited to offer a new LGG training program to qualified MD and PHD candidates. LGG is a new specialty thru American Board of Medical Genetics and Genomics (ABMGG) that combines the previously separate Fellowships in Molecular Genetics and Genomics, and Cytogenetics and Genomics. The training is 24 months in duration, and both traditional and new cytogenetic and molecular techniques are integrated throughout the training. The training will likely be changed to 36 months to allow for appropriate training in all aspects of cytogenetics and genomics.

**CLINICAL PROGRAMS**

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

**Prenatal Counseling, Center for Advanced Fetal Diagnostics (CAFD), Adult and Cancer Genetics Consultations**. It should be noted that Clinical Genetics activity was migrated to EpicCare in June 2016, therefore the volume capture process for FY17 is fundamentally different than it was in FY16. There were 8,537 total patient visits captured in FY17 including the procedure coordination efforts of 4,176 First Trimester Screens. Keeping in mind the volume capture changes noted above, this reflects a 2.3% increase over FY16.

**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 identified with birth defects. In FY17 there were 611 patient visits through the CAFD down from 791 in FY16. This apparent decrease may be explained by factors including: 1) the volume capture changes noted above; 2) the impact of some Highmark patients being redirected to services outside of the CAFD or UPMC; and 3) follow-up visits may not be completed and captured in EpicCare if there are no significant changes in patient management because of the visit. The fetal therapy program (Center for Innovative Fetal Intervention) 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, and potentially to open fetal surgery for repair of myelomeningocele. The Department of Genetics is a major training venue and an excellent source for clinical and basic science research opportunities in Genetics for OB Residents, Maternal-Fetal Medicine Fellows and other Post Baccalaureate students.

***The laboratory services include:***

**Pregnancy Screening Laboratory (PSL)** performs on site Quad Screen (alphafetoprotein, human chorionic gonadotropin, unconjugated estriol, and inhibin A), amniotic fluid AFP measurements, and amniotic fluid acetylcholinesterase. The PSL also performs first trimester screening using nuchal translucency, pregnancy associated plasma protein A and human chorionic gonadotropin. In July 2016 – June 2017 a total of 6,974 tests were performed, which is slightly down from the previous year. This is not unexpected as the availability of cell-free fetal DNA testing continues to shift the high-risk screening population in the direction of this new test.

**Pittsburgh Cytogenetics Laboratory (PCL)** serves as the reference laboratory for the UPMC system and for a number of hospitals in the tri-state area. Servicesinclude:1) high quality chromosomal analysis on amniotic fluid, chorionic villus samples (CVS), peripheral blood, cord blood, bone marrow, lymph node, skin biopsy, malignant tumors and products of conception; 2) molecular cytogenetic analyses by fluorescence *in situ* hybridization (FISH) for aneuploidy, microdeletion/micro duplication syndromes, marker chromosome identification, translocation characterization, sub telomere rearrangement, Her2/neu amplification and mosaicism screening; 3) microarray analyses (CGH+SNP,X-HR) for DNA copy number alteration and constitutional uniparental disomy on pediatric, prenatal/adult samples and samples from products of conception. The PCL is also accredited by American Board of Medical Genetics for clinical cytogenetics fellowship training. In FY16 a total of 16,918 tests were performed, which represents a .6% increase over the previous year. The laboratory has begun to perform preimplantation genetic screening in a combined effort with the new Pittsburgh Clinical Genomics Laboratory (PCGL) that was launched in August 2014. Please refer to http://pittgenetics.com for the full array of our services.

**Pittsburgh Clinical Genomics Laboratory (PCGL)** was launched in August 2014 with the goal to in-source costly genomic testing that was leaving the UPMC system. Initial testing included a novel 144 mutation Cystic Fibrosis Screening test (full gene sequencing and targeted mutation analysis is performed also) as well as maternal cell contamination testing that supplements the prenatal diagnostic testing (amniocentesis and CVS) performed in the Pittsburgh Cytogenetics Laboratory. Preimplantation Genomic Screening (PGS) was initiated in the spring of 2015 and combines the resources of the PCGL (whole genome amplification) and the PCL (Array CGH performed on the amplified DNA from individual embryos). From July 2016 through June 2017, a total of 2,300 tests (all types) were performed by the PCGL). The PCGL also plays a role in the delivery of personalized medicine by offering CYP2C19 genotyping to assess response to clopidogrel (Plavix) in patients receiving cardiac stents. From July 2016 through June 2017, a total of 2,294 tests (all types) were performed by the PCGL.

**Publications**

**July 1, 2016 – June 30, 2017**

**Tianjiao Chu, Ph.D.**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## *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 combining clinical expertise in Ob/Gyn with diagnostic ultrasound imaging. This is a high quality, elite service which provides unequaled ultrasound expertise to the women of western half of 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 to all any patient in a timely and cost-effective manner;
- Provide robust resident/fellow ultrasound education and instruction 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 and nationally 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. The accreditation process provides independent quality review and certification confirms our high level 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-sight at facilities, with one on one training, web based uLearn instruction, real-time hands on tele-conference instruction, computer based simulation and monthly teleconferenced grand rounds.
2. Establishment of detailed 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 preliminary report generation by our staff.

To date, this model has been implemented at 34 sites.

We have continued our vision 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 satellite imaging centers. This allows the Physician to guide the local sonographer in the ultrasound examination and allows the patient and her family to ask questions of the Physician. The Physician can review the ultrasound findings with the patient in real-time.

The division upgraded its ultrasound equipment at Magee Womens Hospital and its satellites to the cutting edge GE E10 ultrasound machine. This equipment greatly expands the capabilities of the service providing:

1. Improved image quality and expand image post processing capabilites.
2. Improved 3d and 4D imaging resolution and imaging manipulation software.
3. The ability to transmit 3D and 4D volumes to Magee Womens Hospital for on-site manipulation by the physician to improve diagnostic interpretation of the imaging without having the patient travel to Magee Womens Hospital for physician guided imaging.
4. The capability to email de-identified images to providers and colleagues for collaborative review.
5. The capability to transmit de-identified images and videos to the email address of patients as keepsakes of their fetus.

6. The use of artificial intelligent software to automate and improve consistency in nuchal translucency measurements for first trimester screening.

**CLINICAL PROGRAM**

The ultrasound division performed 115,799 procedures in FY2017; which is a 4% increase compared to FY2016. Thirty-five percent were performed at a telemedicine site which is increased from 31% in FY2016.

Dr. Devereux Saller, Director of the Center for Advanced Fetal Diagnostics (CAFD) and Dr. Timothy Canavan, continue to enhance patient access to the Center by collaboration through telemedical consults and teleultrasound to patients in distance locations. This has improved compliance and patient satisfaction. We have implemented cutting edge genetic testing at these satellite locations to complement the CAFD and ultrasound services to expand the comprehensive approach to patient care while improving 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 and individualized treatment for each patient.

Dr. Stephen Emery continues to provide around the clock access to fetal therapy through the Center for Innovative Fetal Intervention. Placental laser photocoagulative therapy for twin-to-twin transfusion, radio frequency ablations, urinary bladder stenting for obstruction and fetal thoracentesis are being offered at Magee-Womens Hospital. He has expanded the program to include animal research with his continued work developing a sheep model to investigate the in-utero treatment of fetal Aqueductal stenosis and hydrocephalus.

Dr. Timothy P. Canavan has continued the transperineal pelvic floor diagnostic service which provides ultrasound evaluation of pelvic floor disorders as well as evaluation of pelvic floor mesh and slings 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. 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 are visualized and measured by ultrasound, providing unique clinical data to guide treatment of pelvic floor disorders.

**TEACHING PROGRAM**

The training of residents and fellows is a major commitment of the division. In addition to Obstetric and Radiology residents, Emergency medicine residents, as well as fellows in Maternal-Fetal Medicine, Genetics, Reproductive Endocrinology, Midwifery 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 two day 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, didactic lectures on specific ultrasound examinations and procedures and the opportunity to plan, collect data, analyze and publish original research. This year, three residents are working on ultrasound research projects.

The division continues a career development rotation for 4th year medical students from the University of Pittsburgh. The goal is to mentor 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. These medical students have the opportunity to be part of our ongoing research studies and publish the findings.

Dr. Paul Speer continues the course he developed for 4th year medical students entitled "Ultrasound basics: Correlation with the Physical Exam" which is offered every spring and he continues as co-director of a 4th year medical student fall course entitled "Ultrasound Basics: Human Anatomy from a Different Perspective". He is also one of the faculty members teaching the iPOCUS 4th year medical student elective and teaches the pelvic ultrasound portion at WISER. These courses are supported by the faculty and ultrasound technicians from the division.

The department continues to be very active in the training of ultrasound technicians from four 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 many of our satellite centers.

A full-time experienced sonographer continues to coordinate the teaching goals of the division and has expanded her role to ultrasound technician students as well as residents and fellows.

The division was host to a visiting Physician from China for 3 months of observation and sharing of our techniques of ultrasound imaging, our extensive experience in patient assessment and our protocols for patient evaluation. The Physician attended our grand rounds and case

conferences and participated in one on one session with our Physicians as we reviewed complicated cases.

**RESEARCH PROGRAM**

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

1. Development of biometric growth curves in fetuses with Gastroschisis.
2. The influence of cardiac defects on the biometric growth patterns and outcomes of fetuses with trisomy 21.
3. Neonatal outcome in fetuses with a persistent right umbilical vein.
4. Early pregnancy failure by first trimester ultrasound.
5. Adnexal masses in pregnancy.
6. The impact of pregnancy and parturition on the vaginal angle and stress urinary incontinence 12 months post partum.
7. The effects of obesity on the nuchal translucency measurement in the first trimester.
8. Attitude of US obstetricians and gynecologists to global warming and medical waste.
9. Thromboelastography in term neonates.
10. The Evolution of Fetal Therapy Centers - A Joint Opinion from the International Fetal Medicine and Surgical Society.
11. Blood group antigen matching influence on gestational outcomes.
12. Growth restriction: identifying Fetuses at risk.

Division faculty has published several book chapters on early pregnancy loss, fetal cleft lip and palate and fetal hydrops. The Division completed the 3rd edition of Structured Fetal Anomalies which was released in 2017. The 3rd edition was completed by the Division 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.

**FACULTY LISTING**

| | |
|---|---|
| Timothy P. Canavan, MD | Associate Professor of Obstetrics, Gynecology and Reproductive Sciences, Division Director of Ultrasound, member, Center for Advanced Fetal Diagnostics |
| Jerry G. Martin, MD | Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences |
| 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 |
| Paul Speer, MD | Associate Professor of Obstetrics, Gynecology and Reproductive Sciences and Advisory Dean, University of Pittsburgh School of Medicine |
| Noe Copley-Woods, MD | Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences |
| Isabelle Wilkins, MD | Professor of Obstetrics, Gynecology and Reproductive Sciences and Vice Chair of Clinic Affairs |
| Sami Makaroun, MD | Assistant Professor of Obstetrics, Gynecology and Reproductive Sciences and member, Division of Maternal Fetal Medicine |
| Tonya Lightcap, RDMS | Sonographer Specialist |

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

## *COMMUNITY PRACTICES DIVISION*

Vice Chair of Operations for OB/GYN/RS
Vice President of Medical Affairs for Magee-Womens Hospital
Director of Community Practices in Allegheny County

Vice Chair of Community Practices
Director of Community Practices Outside Allegheny County

**OVERVIEW**

The academic year 2016-2107 was a year of continuing integration for the Community Practice Service Line as well as the addition of new leadership. Given the different population and financial dynamics of care inside of Allegheny County compared to outside of Allegheny County, the leadership structure was altered. Dr. Richard Beigi, Vice Chair of Operations for the department and Vice President of Medical Affairs for Magee-Womens Hospital was named Director of Community Practices in Allegheny County. Dr. David Badway, Vice Chair of Community Practices was named Director of Community Practices for all practices outside of Allegheny County.

The mission of the Community Practice Division has remained and is to "provide compassionate, quality integrated care in a community of practices which continues to grow through a pairing of innovative technology and dedicated physicians and staff who both value their patients and are valued by UPMC." This division continues to recognize significant growth in clinical activity, increasing interaction with subspecialty partners within the department and continuing support of the academic mission of the department. As an example,

at least 2 research investigations have occurred at multiple community practice sites and serve as proof of concept for community practice involvement in the academic mission of the department.

The clinical staff consists of over **115** physicians and advanced practice providers with a support staff of **375**. The service line provided approximately **275,000** patient visits, **25,000** inpatient and outpatient procedures, and nearly **8,000** deliveries. This clinical activity resulted in patient charges of over $**100M**. These clinical activities provided a robust environment for medical students, residents, and fellows to not only learn from the patients they served, but from the clinicians directly caring for these patients on the "front lines of medicine."

**A Brief History**

When UPMC acquired Mercy Hospital in 2008, it made a commitment to continue to provide high quality health care for women, including obstetrical care. While the Department of OB/GYN/Women's Health had made an initial entrée into community practice support with the practice of Morris Turner and Robert Thompson years earlier, the Mercy need for obstetrical support represented a new challenge in a new venue with the added need to provide those services within the framework of the Ethical and Religious Directives of the Catholic Church. The Greater Pittsburgh OB/GYN and Metro OB/GYN practices were well established, full service OB/GYN practices at Mercy, and bringing them into the department was a natural choice. By July of 2008, the newly formed practices were the foundation of women's health care at Mercy. The academic year 2008-2009 was devoted to the successful integration of these practices into the department and supporting the newly named UPMC-Mercy in its transition efforts.

The following years have seen continued recruitment, partnering and expansion for this division. Growth in the service area and relocation of some providers out of the Pittsburgh area allowed the GPOB practice to recruit new talent for their team. The Midwife Center for Birth and Women's Health, formerly utilizing Allegheny General Hospital as their referral center for hospital-based obstetrics, decided on UPMC-Mercy and its OB providers as their choice for a new relationship in Pittsburgh. In January of 2010 the well regarded Womencare Associates of Magee-Womens Hospital of UPMC joined the department, more than doubling the size of the Community Practices Division. By July of 2010 the newly-designated Community Practices Division was well positioned to be the community foundation of the department's clinical activities. In 2010-2011 the department acquired two community practices and combined them to form Magee Womens Specialties at Northwest. In 2012 numerous practices were acquired in Mercer and Lawrence counties to form Magee Women's Specialties at Horizon. University Obstetrics and Gynecology Associates (UOA), a joint effort between Community Practices and the Obstetric Specialties Division, was developed in 2013, serving patients at Magee and three outpatient sites. Obstetrics and Gynecology Associates of Pittsburgh also joined the service line in 2013, adding seven new providers to the roster. During the current period the service line created Magee-Womens Specialties at Uniontown, consolidating three independent practices to

better serve the Uniontown area. All together with the addition of additional hospitals and practices over many years into the UPMC network this division has grown and now stretches across the state of Pennsylvania within the Women's Health Service Line and provides much of the general obstetric and gynecologic care for the department.

**Clinical Program**

The division 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. In spite of recent acquisitions and program development, the overall clinical volume has remained relatively constant.

| Service | FY 2016 |
|---|---|
| Total OB Visits | 84,626 |
| Total GYN Visits | 167,018 |
| Total Outpatient and Inpatient Procedures | 27,366 |
| Total Deliveries | 7,042 |

The division 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 within the Womens Health Service Line. Reproductive Genetics also has a robust telemedicine service in the communities and 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 this division required thoughtful examination of both the assets and direction of the practices. Over the years efforts have been made to:

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

Along these lines, the community practices division 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 division.

**Future Growth and Development**

The service line will continue to acquire practices and develop practices as opportunities present across the Commonwealth, 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 division 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 will be implemented in all our practices.

# MAGEE-WOMENS RESEARCH INSTITUTE

**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, organisms 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 100 investigators, 51% of whom are women, include 70 primary faculty members. Of these, 56 are from the OBGYN-RS department. Nearly half of the primary faculty members are engaged primarily in basic and translational research, and the other half are engaged primarily in clinical and outcomes research. In addition, 30 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 2016-2017, funding from all grants and contracts was $50.8 million, of which 84% ($42.7 million) was from Federal sources, primarily from the NIH, and including entities such as the FDA and the Department of Defense.

**Representative new MWRI grants in the past academic year include:**

- MWRI received a $5.14M grant from the Richard King Mellon Foundation that will support research on 9-90 projects, enhacement to the MOMI Database and establishment of the MOMI Biobank.
- Hyagriv Simhan, MD, received a 5-year, $3M, R01 grant from NIA, entitled “Social Disadvantage and Fetal Programming of Newborn-Infant Telomere Biology”.
- Janet Catov, PhD, and Yoel Sadovsky, MD, received a 5-year $3 M grant from the NIH’s NCATS as part of Pitt’s CTSA grant (Integrating Special Populations core).
- Yoel Sadovsky, MD, received a 5-year, $1.9M, R37 MERIT grant from NICHD, entitled “Exosome Based Placental Maternal Communication”
- Charlene Dezzutti, PhD, received a 4-year, $1.9M, R01 grant from NICHD, entitled “Hormones, Immunity and HIV Risk”
- Aleksandar Rajkovic, MD, PhD, received a 5-year, $1.7M R01 grant from NICHD, entitled " Med12 mechanisms of uterine leiomyoma formation”
- Kyle Orwig, PhD, received a 5-year, $1.6M, T32 grant from NICHD, entitled “Reproductive Development from Gonads to Fetuses”
- Gerald Schatten, PhD, received a 5-year, $1.5M, competitive renewal of his R25 grant from NCI, entitled “Frontiers in Stem Cells in Cancer (FriSC$^2$)
- David Peters, PhD, received a 1-year, $1.5M, grant from UPMC, entitled “A Non-Invasive Diagnostic Test For Necrotizing Enterocolitis”
- Kyle Orwig, PhD, received a 3-year, $1.1M, R01 grant from NICHD, entitled “Improving Fertility Preservation in Boys with Cancer”
- Hyagriv Simhan, MD, with team members at the the University of Rochester, received, a 7-year, $700K UG3/UH3 grant from the NIH, entitled “Pre- and Postnatal Exposure Periods for Child Health: Common Risks and Shared Mechanisms (ECHO)”
- Judith Yanowitz, PhD, received a 2-year, $450K, R21 grant from NICHD, entitled “Fluorescently Tagged *C. Elegans* to Probe Meiotic Recombination”
- Jean-Francois Mouillet, PhD, and Yoel Sadovsky, MD, received a 2-year, $450K, R21 grant from National Institute of Child Health and Human Development, entitled “The Regulatory Code Governing the Placenta-Specific Expression of the Chromosome 19 microRNA Cluster”
- Catherine Chappell, MD, received a 2-year, $450K, R21 grant from NICHD, entitled “A Phase 1 Pharmacokinetic Trial of Ledipasvir/Sofosbuvir Fixed Dose Combination in Pregnant Women with Chronic Hepatitis C Virus Infection”
- Beatrice Chen, MD, received a 1-year, $400K, grant from CONRAD, entitled “Exploratory Pharmacokinetics & Pharmacodynamics Study”
- Judy Chang, MD, received a 2-year, $290K, R56 grant from NIDA, entitled “Understanding the Beliefs, Concerns and Needs of Pregnant Patients Who Use Marijuana and of the Obstetrics Providers Caring for Them”

- Pamela Moalli, MD, PhD, received a 1-year, $260K, grant from the DOD, entitled "Elastometric Auxetic Urogenital Meshes: Exploring Alternatives to Knitted Polypropylene"
- Sharon Hillier, PhD, received a 1-year, $230K, grant from Becton, Dickinson & Company, entitled "Diagnostic Accuracy by Providers - DAP Study"
- David Wiesenfeld, MD, received a 1-year, $215K, grant from the CDC Foundation, entitled "STD Testing in Outpatient Practices - The STOP STDs Study"
- Ian McGowan, MD, PhD, received a 1-year, $124K, grant from CONRAD, entitled "Rectal Sample Collection and Analysis and Processing of Study Samples for Exploratory Pharmacokinetics"

**Highlighted research and leadership accomplishments:**

- Richard Beigi, MD, served as the President of the Infectious Diseases Society for Obstetrics and Gynecology.
- Yoel Sadovsky, MD, served as the President of the Society for Reproductive Investigation.
- Halina Zyczynski, MD, is the President of the American Urogynecologic Society.
- Adrian Lee, PhD, was appointed Director of Pitt's Institute for Precision Medicine.
- Judy Chang, MD, was appointed Director of the Clinical Scientist Training Program in Pitt's CTSI.
- Kyle Orwig, PhD, was invited to Chair the Cellular, Molecular and Integrative Reproduction Study Section at NIH's Center for Scientific Review.
- Hyagriv Simhan, MD, was appointed to the Board of Directors for the National Perinatal Information Center.
- Aleks Rajkovic, MD, PhD, was appointed to the American College of Obstetrics and Gynecology Committee on Genetics; he also serves as an American Board of Obstetrics and Gynecology Board Examiner.

**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, development and differentiation, reproductive aging, and meiotic crossover recombination. Key researchers include Yaacov Barak, Richard Chaillet, Tianjiao Chu, Mellissa Mann, Kyle Orwig, David Peters, Aleksandar Rajkovic, Gerald Schatten, Urvashi Surti, and Judith Yanowitz.

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

Discoveries, patents, and investigational new drug (IND) applications this past year include a pending patent application by Dr. Aleksandar Rajkovic and colleagues, entitled “Ovarian-Derived Hydrogels for Biomedical and Biotechnology Applications.”

*Selected publications*


1. 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;9(1):329-41. PMID 28579394.
2. Simerly C, Castro C, Hartnett C, Lin CC, Sukhwani M, Orwig K, Schatten G. Post-testicular sperm maturation: Centriole pairs, found in upper epididymis, are destroyed prior to sperm's release at ejaculation. *Sci Rep* 2016;6:31816. PMID 27534805.
3. Ahuja JS, Sandhu R, Mainpal R, Lawson C, Henley H, Hunt PA, Yanowitz JL, Borner GV. Control of meiotic pairing and recombination by chromosomally tethered 26S proteasome. *Science* 2017;355:408-11. PMID 28059715.
4. White CR, MacDonald WA, Mann MR. Conservation of DNA Methylation programming between mouse and human gametes and preimplantation embryos. *Biol Reprod* 2016;95:61. PMID 27465133.
5. Machovina TS, Mainpal R, Daryabeigi A, McGovern O, Paouneskou D, Labella S, Zetka M, Jantsch V, Yanowitz JL. A surveillance system ensures crossover formation in C. elegans. *Curr Biol* 2016;26:2873-84. PMID 27720619.
6. Shin YH, Ren Y, Suzuki H, Golnoski KJ, Ahn HW, Mico V, Rajkovic A. Transcription factors SOHLH1 and SOHLH2 coordinate oocyte differentiation without affecting meiosis I. *J Clin Invest* 2017;127:2106-17. PMID 28504655.
7. Dangle P, Touzon MS, Reyes-Mugica M, Witchel SF, Rajkovic A, Schneck FX, Yatsenko SA. Female-to-male sex reversal associated with unique Xp21.2 deletion disrupting genomic regulatory architecture of the dosage-sensitive sex reversal region. *J Med Genet* 2017;54(10)705-9. PMID 28483799.
8. Rajkovic A, Pangas S. Ovary as a Biomarker of Health and Longevity: Insights from Genetics. *Semin Reprod Med* 2017;35(3):231-240. PMID 28658706.
9. Zhang P, Chu T, Dedousis N, Benjamin S. Sipula I, Li L, Bunce K, Shaw P, Zhu J, Argmann C, O’Doherty RM, Peters DG, Scott DK. DNA methylation alters transcriptional rates of differentially expressed genes and contributes to pathophysiology in mice fed a high fat diet. *Mol Metab* 2017;6(4):327-339. PMID 28377872.

***Pregnancy and newborn medicine***

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

*Overview*

Research in the areas of embryogenesis, pregnancy, and pregnancy outcomes centers on normal and abnormal processes that shape fetal health. Investigators analyze diverse influences on the feto-placental genome and epigenome and on gene expression, including gene imprinting, gene-environment interactions, nutrition, and the effect of drugs and medications. The research also includes uterine function and its implications for parturition. Building on these fundamental research trajectories, MWRI scientists collaborate with other scientists at the University of Pittsburgh and worldwide to study key pregnancy complications, such as preeclampsia, fetal growth restriction, and 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) preterm birth, including the long-term risk for cardiovascular disease of women who have had preterm birth; (c) cellular and molecular mechanisms of preeclampsia, as well as behavioral, epidemiological, and clinical components leading to the disorder, with emphasis on the mechanisms by which obese and overweight women are at increased risk of developing preeclampsia; (d) molecular mechanisms, including genomic and microRNA (miRNA) 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; and (e) nanovesicle (exosome)-based fetal-placental-maternal interaction to maintain homeostasis and deliver miRNAs that attenuate susceptibility to viral pathogens, including Zika virus. Support by the Bill and Melinda Gates Foundation allowed Jim Roberts to facilitate CoLab, a worldwide collaboration that spans 22 centers with data and biological samples from 300,000 pregnant women and serves as a resource for global research on long-term outcomes of pregnancy complications.

This year, with new funding from the American Heart Association's "Go Red for Women" Strategically Focused Research Network, Drs. Hubel, Catov, Powers, and Roberts will bring together investigators at MWRI and the University of Pittsburgh with expertise in basic science, obstetrics, epidemiology, vascular biology, and cardiology to examine microvascular pathways during and after pregnancy and contribute to later-life cardiovascular disease in women. In addition, furthering our relationship with the Richard King Mellon Foundation (RKMF), we have been awarded a grant that advances our "9 months to 90 years" (9-90) research initiative, a new a collaobrarion with RKMF leadership and investigators at Pitt and the 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 their program's NIH renewal. This collaboration will enhance women's health practice-based research, research that involves special populations across the lifespan, and provide key support for our obstetrical database and biobank.

Discoveries, patents, and IND applications this past year include a pending patent application for

by Stephen Emery and colleagues, entitled “Novel Low-profile Ventriculoamniotic Shunt for Fetal Aqueductal Stenosis,” and an invention discovery by Katherine Himes, entitled “Healthy Beyond Pregnancy.”

*Selected publications*


1. Krishnamurti T, Davis AL, Wong-Parodi G, Fischhoff B, Sadovsky Y, Simhan HN. Development and testing of the MyHealthyPregnancy App: A behavioral decision research-based tool for assessing and communicating pregnancy risk. *JMIR Mhealth Uhealth* 2017;5:e42. PMID 28396302.
2. Jarlenski M, Hutcheon JA, Bodnar LM, Simhan HN. State medicaid coverage of medically necessary abortions and severe maternal morbidity and maternal mortality. *Obstet Gynecol* 2017;129:786-94. PMID 28383380.
3. Chu T, Shaw PA, Yeniterzi S, Dunkel M, Rajkovic A, Hogge WA, Bunce KD, Peters DG. Comparative evaluation of the Minimally-Invasive Karyotyping (MINK) algorithm for non-invasive prenatal testing. *PLoS One* 2017;12:e0171882. PMID 28306738.
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***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, Richard Beigi, Catherine Chappell, Beatrice Chen, Charlene Dezzutti, Sharon Hillier, Ian McGowan, Lisa Rohan, and Harold Wiesenfeld.

*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 are 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.

*Selected publications*

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10. Wiesenfeld HC. Screening for Chlamydia trachomatis Infections in Women. *N Engl J Med* 2017;376:765-73. PMID 28225683.
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***Gynecology***

Research in this area centers on family planning, benign gynecological disorders, urogynecology, and pelvic floor dysfunction. Key researchers include Sharon Achilles, Beatrice Chen, Richard Guido, Faina Linkov, Pamela Moalli, Aleksandar Rajkovic, Harold Wiesenfeld, and Halina Zyczynski.

*Overview*

Gynecology research focuses on women's health from 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 in developing countries. 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 urge and stress urinary incontinence. New initiatives target novel molecular mechanisms underlying the development of fibroids and surgical techniques for the treatment of fibroids using radiofrequency ablation.

Discoveries, patents, and IND applications this past year include a new invention discovery by David Peters, entitled “Non-Invasive Diagnosis of Endometriosis.”

*Selected publications*


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***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 Mary Menke, Kyle Orwig, Tony Plant, Aleksandar Rajkovic, William Walker, Alexander Yatsenko, and Anthony Zeleznik.

*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. Research spans the endocrine regulation of the hypothalamic-pituitary-gonadal axis, which affects ovulation, fertilization, the menstrual cycle, and menopause, and the cross-talk between the brain and gonads that regulates the transition from infancy, through puberty, to adulthood. 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. These investigators also serve as the core of the Fertility Preservation Program, a collaborative effort that provides new options for preserving fertility in boys who may lose fertility because of cancer treatment or other diseases.

Discoveries, patents, and IND applications this past year include an invention discovery by William Walker, entitled "A Male Contraceptive Using Peptide Inhibitors of the Non-classical Testosterone Signaling."

*Selected publications*


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***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 Robert Edwards, Xin Huang, Faina Linkov, Adrian Lee, Priscilla McAuliffe, Francesmary Modugno, Carola Neumann, Steffi Oesterreich, Anda Vlad, and Mei Zhang.

*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 cancer; and miRNA pathways that contribute to cancer, particularly in the context of tumor hypoxia.
A multicenter study, with investigators from Roswell Park Cancer Institute, Dana Farber Cancer Center, Memorial Sloan-Kettering Cancer Center, and others, was recently initiated to investigate factors associated with molecular signatures in female cancers. This and other initatives enabled our researchers to participate in large, international studies such as the Cancer Genome Atlas and other coopertative research projects.

Discoveries, patents, and IND applications this past year include two invention discoveries: "Murine Ovarian Cancer Cell Lines with Defined Genetic Traits" by Anda Vland and "MammaSeq: Detection of Clinically Actionable Mutations in Breast Cancer" by Adrian Lee.

*Selected publications*


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2. Yang W, Zhang S, Zhang Y, Huang X. A novel strategy to dissect endogenous gene transcriptional regulation in live cells. *Biochem Biophys Res Commun* 2017;487:573-9. PMID 28433629.
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5. Bahreini A, Levine K, Santana-Santos L, Benos PV, Wang P, Andersen C, Oesterreich S, Lee AV. Non-coding single nucleotide variants affecting estrogen receptor binding and activity. *Genome Med* 2016;8:128. PMID 27964748.
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7. Cancer Genome Atlas Research Network (including Edwards RP). Integrated genomic and molecular characterization of cervical cancer. *Nature* 2017;543:378-84. PMID 28112728.
8. Andersen CL, Sikora MJ, Boisen MM, Ma T, Christie A, Tseng G, Park Y, Luthra S, Chandran U, Haluska P, Mantia-Smaldone GM, Odunsi K, McLean K, Lee AV, Elishaev E, Edwards RP, Oesterreich S. Active estrogen receptor-alpha signaling in ovarian cancer models and clinical specimens. *Clin Cancer Res* 2017;23(14):3802-12. PMID 28073843.

9. Downs-Canner S, Berkey S, Delgoffe GM, Edwards RP, Curiel T, Odunsi K, Bartlett DL, Obermajer N. Suppressive IL-17A+Foxp3+ and ex-Th17 IL-17AnegFoxp3+ Treg cells are a source of tumour-associated Treg cells. *Nat Commun* 2017;8:14649. PMID 28290453.
10. Adambekov S, Goughnour SL, Mansuria S, Donnellan N, Elishaev E, Villanueva HJ, Edwards RP, Bovbjerg DH, Linkov F. Patient and provider factors associated with endometrial Pipelle sampling failure. *Gynecol Oncol* 2017;144:324-8. PMID 27912906.

***Women's health and wellness***

Research in this general area centers on health services outcomes, patient-provider communication, behavioral health and alternative medicine, quality-of-life measures, medical decision making, and community-based research. Key researchers include Judy Chang, Beatrice Chen, Elizabeth Krans, and Faina Linkov.

*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 these services. This includes drug abuse by pregnant women, with a special focus on the current epidemic of opiate abuse, and choices made during pregnancy and behavioral research that addresses the best practices for improving the quality and cost-effectiveness of women's care and health services delivery. Ongoing projects include studies of intimate-partner violence, substance use, and patient-provider communication. The latter 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 outcomes. Adolescent sexual decision making, parent-child communication about sexual health education, and sexual health issues are also pursued, as is the relationship between body weight and sexual risk behaviors.

*Selected publications*

1. Colicchia LC, Parviainen K, Chang JC. Social contributors to glycemic control in gestational diabetes mellitus. *Obstet Gynecol* 2016;128:1333-9. PMID 27824747.
2. Jarlenski M, Zank J, Tarr J, Chang JC. Public health messages about perinatal marijuana use in an evolving policy context. *Subst Abus* 2017;38:48-54. PMID 27925865.
3. Jarlenski M, Bodnar LM, Kim JY, Donohue J, Krans EE, Bogen DL. Filled prescriptions for opioids after vaginal delivery. *Obstet Gynecol* 2017;129:431-7. PMID 28178050.
4. Morrison PK, Hawker L, Miller EP, Cluss PA, George D, Fleming R, Bicehouse T, Wright K, Burke J, Chang JC. The operational challenges for batterer intervention programs: Results From a 2-year study. *J Interpers Violence* 2016. PMID 27561744.
5. Paul J, Boraas CM, Duvet M, Chang JC. YouTube and the single-rod contraceptive implant: A content analysis. *J Fam Plann Reprod Health Care* 2017;43(3)195-200. PMID 28108504.
6. Linkov F, Sanei-Moghaddam A, Edwards RP, Lounder PJ, Ismail N, Goughnour SL, Kang C, Mansuria SM, Comerci JT. Implementation of hysterectomy pathway: Impact on complications. *Womens Health Issues* 2017;27(4):493-8. PMID 28347618.
7. 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;107:1023-7. PMID 28314508.

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**EDUCATION**

The field of reproductive biology is in need of bright, creative, and energetic new scholars who can advance knowledge in the areas of reproductive development, reproductive 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 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. Under Dr. Sadovsky's leadership, the program has recently been renewed and will continue in the next year with currently appointed trainees Marian Jarlenski, PhD (Epidemiology), Catherine Chappell, MD (OBGYN infectious diseases), and Katherine Grace Lim, MD (Anesthesiology). The second program, the Women's Reproductive Health Research (WRHR) program, 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. The program's appointed trainees are John Harris, MD, and Mary Ackenborn, MD. Additional faculty supported via training or early investigator awards include Mellissa Mann, MD, 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 Elizabeth Krans, MD, supported by an NIH K23 mentored patient-oriented research career development award.

*Postdoctoral training*
MWRI hosts four programs for postdoctoral training. The MWRI Fellowship Program prepares individuals for independent and productive careers as research scientists by providing them with the environment necessary for an intensive research experience. 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. We typically have two to four trainees, each, typically, for 2 years of training. In 2015, the Magee-Womens Auxiliary Board established the Bright Star Award, a 1-year, $25,000 award for postdoctoral training. Nicholas Macaisne, PhD, a trainee of Judith Yanowitz, PhD, received the FY2017 award. This year, MWRI was awarded an NIH T32 training grant entitled "Reproductive Development from Gonads to Fetuses." Directed by Kyle Orwig, PhD, this program will provide funding for three postdoctoral and three graduate trainees. Steve Caritis, MD, and Raman Venkataramanan,

PhD, direct an NIH T32 postdoctoral training program in basic and clinical pharmacology in pregnancy. MWRI postdoctoral fellows have been successful in partnering with their mentors to receive funding for their training. Examples include Kelly Baumgartel, PhD, who will be mentored by Francesca Facco, MD, in the coming year with the support of an NIH F32 Postdoctoral National Research Service Award.

*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. The program funded four projects: "Zika Virus Infection of Human Fetal Brain Microvascular Endothelial Cells" by Nitin Arora, MD; "Preoperative Pelvic Floor Muscle Injections with Bupivacaine and Dexamethasone for Improved Pain Control after Vaginal Reconstructive Surgery: A Three-Arm Randomized Controlled Trial" by Lauren Gigale, MD; "Acceptance of Patient Narratives to Illustrate Long-term Outcomes of Perviable Neonates", by Adriane Haragan, MD; and "Nitrosative Stress and ADMA in the Genesis of Adverse Pregnancy Outcomes and Long-Term Maternal Microvascular Dysfunction" by Alisse Hauspurg Janicki, MD.

*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 Interdisplinary 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 70 primary investigators are members of graduate programs within the University of Pittsburgh, and Kyle Orwig, PhD, directs the Molecular Genetics and Developmental Biology Program.

*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 two R25 grants from the NIH's National Cancer Institute and National Institue on Aging, MWRI's Gerald Schatten, PhD, has engaged in a national program 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 Aging and Regeneration Research” and the recently renewed, “Frontiers in Stem Cells in Cancer”, 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.

*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 20, 2016, MWRI was honored to host two outstanding guest lecturers. J. Lee Nelson, MD, Professor of Medicine, University of Washington and Member, Fred Hutchinson Cancer Research Center, gave the Margaret Prine Joy Lecture in Reproductive Sciences, entitled “The Legacy of Maternal-Fetal Exchange: Microchimerism.” Teresa K. Woodruff, PhD, DSc, Thomas J. Watkins Professor of Obstetrics and Gynecology and Vice Chair for Research at Northwestern University Feinberg School of Medicine gave the Celebration of Life, A Lecture Honoring Mothers, entitled “Oncofertility: From Bench, to Bedside, to Babies.” The program also included presentations by Elizabeth Krans, MD, and Lisa Rohan, PhD, and oral presentations by fellows, graduate students, and residents, as well as a trainees’ poster session.

**FINAL NOTE**

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 review our website at www.mageewomens.org.

## Grant Funding Awarded in FY17

| | | | FY17 | |
|---|---|---|---|---|
| **PI** | **Grant Title** | **Funding Type** | **Direct** | **Indirect** |
| Achilles | Estera E 4 Freedom Study | Industry | 4,938 | 1,055 |
| Barak | Lactate Metabolism in Placental Development and Injury | Non-Federal | 158,612 | 27,424 |
| Barak | The Placenta-Heart Axis | Foundation | 90,000 | 0 |
| Beigi | Efficacy of GEN-003 in Subjects with HSV-2 | Industry | 10,004 | 2,501 |
| Beigi | Maternal Immunization with RSV Vaccine | Industry | 31,126 | 7,782 |
| Boisen | Identification of Drivers of ILC Progression | Foundation | 1,898 | 475 |
| Caritis | Optimization of Drug Dosing in Pregnant Women through Research and Education | Federal | 623,385 | 156,476 |
| Caritis | Training in Basic and Clinical Pharmacology in Pregnancy - Year 5 | Federal | 264,944 | 19,756 |
| Caritis | Establishing & Measuring Database Success | Non-Federal | 26,000 | 0 |
| Catov | Dyslipidemia and Pregnancy | Foundation | 90,000 | 0 |
| Catov | Pregnancy-Related Risk Factors and Glucose Intolerance in Women During Midlife | Federal | 15,917 | 9,710 |
| Catov | Pregnancy as a Window to Future Cardiovascular Health: Pregnancy Outcomes | Federal | 16,823 | 9,358 |
| Chang | Perinatal Marijuana Use, Tobacco Co-Use, Pregnancy Outcomes, and Use of Social Services | Non-Federal | 75,000 | 15,000 |
| Chang | Understanding the Beliefs, Concerns and Needs of Pregnant Patients Using Marijuana and of the Obstetric Providers Caring for Them | Federal | 221,399 | 63,726 |
| Chappell | A PK evaluation of Sofosbuvir & Ledipasvir in Pregnancy | Industry | 120,125 | 16,579 |
| Chappell | A Phase 1 Pharmacokinetic Trial of Ledipasvir/Sofosbuvir (LDV/SOF) Fixed Dose Combination in Pregnant Women with Chronic Hepatitis C Virus Infection | Federal | 213,890 | 75,806 |
| Chen | Fellowship in Family Planning and Contraception- Site Funding for Fellowship | Foundation | 284,453 | 0 |
| Chen | Copper IUD Trial | Foundation | 168,103 | 25,215 |
| Chen | Core Functions Activities | Federal | 9,152 | 5,400 |
| Chen | A Phase 3, Multi-Center, Open-Label Study of a Levonorgetrel Releasing Intrauterine System for Long Term Reversible Contraception | Industry | 64,795 | 12,959 |
| Chen | Pitt-Ohio State-Georgetown Clinical Trial | Federal | 28,072 | 16,394 |
| Chen | Exploratory Pharmacokinetics and Pharmacodynamics Study of Oral F/TAF for Prevention of HIV Acquisitions | Federal | 363,761 | 138,920 |
| Chu | Identification of IncRNA Signatures During the Differentiation of Trophoblasts | Non Federal | 80,501 | 15,000 |
| Dezzutti | Hormones, Immunity, and HIV Risk | Federal | 340,255 | 143,713 |

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| Dezzutti | MTN - Laboratory Center (LC): Leadership Group for a Clinical Research Network on Microbicides to Prevent HIV | Federal | 3,595,104 | 1,004,026 |
| Dezzutti | Exploratory Pharmacokinetics and Pharmacodynamics Study of Oral F/TAF for Prevention of HN Acquisition | Federal | 48,634 | 29,667 |
| Donnellan | Assessing the Role of Macrophage Polarization in the Transition from Endomtriosis to Endometriosis Associated Ovarian Cancer | Internal Foundation | 22,500 | 0 |
| Edwards | NCI NCTN-Network Lead Academic Site at UPCI | Federal | 24,979 | 13,489 |
| Edwards | Transcriptomic Profiling and Functional Characterization of Fusion Genes in Recurrent Ovarian Cancer | Federal | 12,690 | 6,876 |
| Facco | Sleep Disordered Breathing, Obesity, and Pregnancy Study | Federal | 491,517 | 68,586 |
| Gandley/Hubel | Glycocalyx in Pregnancy and the Preeclampsia Syndrome | Federal | 178,572 | 17,402 |
| Guido | Intra-Operative Sampling of Fallopian Tubes | Federal | 49,356 | 26,106 |
| Guido | Evaluation of the Gynesonics System for Transcervical Treatment of Symptomatic Uterine Fiboids with Radiofrequency Abiation Under Integrated Intrauterine Sonography Guidance | Industry | 6,334 | 1,584 |
| Hillier | MTN - Leadership and Operations Center (LOC): Microbicide Trials Network | Federal | 24,686,881 | 2,607,187 |
| Hillier | Diagnostic Accuracy by Providers (DAP) Study | Industry | 197,675 | 32,974 |
| Hilllier/Rohan | Film Antirotroviral Microbicide Evaluation (FAME II) | Federal | 3,056,588 | 606,137 |
| Himes | Neonatal Morbidity | Foundation | 90,000 | 0 |
| Himes | Informing Evidence-based Maternal Weight Gain Guideline | Federal | 45,831 | 24,749 |
| Huang | A Theoretical Framework for Early Detection of Ovarian Cancer by Combining Novel PET/CT Imaging and Circulating Tumor DN | Internal Foundation | 25,000 | 0 |
| Hubel | Glycocalyx Syndecan-1 in Trophoblast Lipid Transport | Federal | 63,949 | 14,743 |
| Hubel/ Catov/ Powers | Women's Cardiovascular Health: Novel Insights from Pregnancy on Microvascular Mechanisms (AHA) | Foundation | 926,102 | 32,577 |
| Jeyabalan | University of Pittsburgh Clinical and Translational Science | Federal | 90,470 | 50,098 |
| Krans | Social Networks to Lessen Drug Use and High Risk Behavior in Pregnant Women with Opioid Use Disorder | Non Federal | 143,146 | 28,629 |
| Krans | Buprenorphine Assignment in Pregnancy: Objective Criteria | Federal | 165,423 | 5,456 |

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| Krans | Immediate Postpartum Nexplanon Placement Versus Standard Postpartum Contraceptive Care for Opiod Dependent Women | Industry | 104,057 | 26,014 |
| Larkin | The Role of Oxysterols in Placental Biology | Federal | 157,315 | 19,034 |
| Larkin | Placental Cholesterol Metabolism | Foundation | 90,000 | 0 |
| Mann | Reproductive Technologies and Imprinting | Foundation | 90,000 | 0 |
| McGowan | Development of a Urine Based Point of Care Test for Adherence to Antiretroviral | Federal | 357,480 | 41,610 |
| McGowan/Rohan | Delivery of Rectal Enema as Microbicide (DREAM) - McGowan | Federal | 263,754 | 62,060 |
| McGowan | Griffithsin-based Rectal Microbicides for PREvention of Viral ENTry (PREVENT) Core D&Proj 3 | Federal | 410,182 | 222,970 |
| McGowan | Rectal Sample Collection and Analysis and Processing of Study Samples for the Exploratory Pharmacokinetics | Federal | 87,546 | 36,112 |
| Moalli | Evaluation of UBM to Augment or Replace Mesh Use in Pelvic Organ Prolapse | Industry | 28,219 | 7,055 |
| Moalli | Assessing the Impact of Macrophage Polarization Upon the Success of Biomaterials Implants | Federal | 9,207 | 5,401 |
| Moalli | Elastometric Auxetic Urogenital Meshes: Exploring Alternatives to Knitted Polypropylene | Federal | 201,195 | 58,596 |
| Moalli | Porosity & tensioning: Critical factors to consider | Federal | 364,567 | 103,567 |
| Moalli | Textile and Mechanical Properties on Single Incision Sling Outcomes - an In Vivo Study | Industry | 264,331 | 64,620 |
| Moalli | Effect of Implantation of Gynecological Meshes in a Rat Model | Industry | 44,712 | 11,178 |
| Modugno | Novel Immunological Biomarkers in Ovarian Cancer Prognosis | Federal | 63,791 | 30,230 |
| Orwig | Cisplatin-induced epigenomic modifications in male germ cell | Federal | 14,529 | 8,572 |
| Orwig | Human to Monkey Transplants | Industry | 75,000 | 0 |
| Orwig | Preserving Male Fertility after Cancer Therapy | Federal | 1,191,061 | 148,265 |
| Orwig | Preservation of Pre-Pubertal Primate Male Fertility | Foundation | 17,391 | 2,609 |
| Orwig | Philanthropic Preserving Fertility Program | Internal Foundation | 95,226 | 0 |
| Orwig | Cellular Mechanisms of Chemotherapy-induced Male Infertility: Stem Cell or Niche? | Federal | 484,432 | 138,604 |
| Orwig | Preserving the Fertility of Children | Foundation | 30,000 | 0 |
| Orwig | Ex Vivo Female Reproductive Tract Integration in a 3D Microphysiologic System | Federal | 5,000 | 3,050 |
| Orwig | Differentiating Human Embryonic Stem Cells into Developing Germ Line | Federal | 30,531 | 18,013 |
| Orwig | Improving Fertility Preservation in Boys with Cancer | Federal | 346,336 | 57,608 |

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| Orwig | Reproductive Development from Gonads to Fetuses | Federal | 192,928 | 15,466 |
| Peters | Metabolics of Treatment Refractory Depression and Suicidal Behavior | Foundation | 103,216 | 0 |
| Peters | Central Nervous System Methylation in Treatment-Refractory Depression and Suicidal Behavior | Foundation | 53,000 | 0 |
| Peters | Non-Invasive Diagnosis of Major Depressive Disorders | Foundation | 17,684 | 0 |
| Peters | The Placental Epigenome | Foundation | 90,000 | 0 |
| Peters | A Non-Invasive Diagnostic Test For Necrotizing Enterocolitis | UPMC Enterprise | 1,278,096 | 133,125 |
| Rajkovic | Magee-Womens Basic and Translational Reproductive Health Training Program | Federal | 332,783 | 9,417 |
| Rajkovic | Transcriptional Regulation of Early Folliculogenesis | Federal | 271,012 | 55,628 |
| Rajkovic | Genetic Determinants of Female Differentiation | Foundation | 45,001 | 0 |
| Rajkovic | MED 12 Mutation and Leiomyoma Pathogenesis | Industry | 41,340 | 0 |
| Rajkovic | Prenatal Genomic Testing | Internal Foundation | 167,000 | 0 |
| Roberts | PRE-EMPT (Pre-eclampsia, eclampsia, monitoring, Prevention & Treatment) - Supplement | Foundation | 56,814 | 6,313 |
| Roberts | Grand Challenges Brazil Prematurity Reduction by Preeclampsia Care (PREPARE) | Non Federal | 55,151 | 1,984 |
| Rohan | Thermostable Vaginal Probiotic Microbicide | Federal | 17,847 | 9,085 |
| Rohan | A Biorelevant Dissolution Methods for Particulate Dosage | Federal | 162,423 | 12,304 |
| Rohan | Preparation of Gels with Increased MK-2048 Concentrations | Federal | 98,669 | 58,214 |
| Rohan/Dezzutti | Griffithsin-Based Rectal Microbicides-Prevent Study Core B | Federal | 224,106 | 131,302 |
| Sadovsky | Vesicle Based Maternal-Placental-Fetal Communication | Foundation | 90,000 | 0 |
| Sadovsky | Building Interdisciplinary Research Careers in Women's Health in Pittsburgh - Year 14 | Federal | 491,595 | 3,106 |
| Sadovsky | Extracellular Vesicles and Their ncRNA Cargo as Markers of Trophoblast Injury - Year 2 | Federal | 673,499 | 51,942 |
| Sadovsky | The Impact of Maternal Placental Fetal Communication on Pregnancy Health | Foundation | 125,000 | 0 |
| Sadovsky | The Regulatory Code Governing the Placenta Specific Expression of the Chromosome 19 microRNA Cluster | Federal | 169,937 | 40,738 |
| Sadovsky | Exosome Based Placental Maternal Communication | Federal | 302,800 | 31,946 |
| Sadovsky | Zika Research | Foundation | 10,000 | 0 |

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|---|---|---|---|---|
| Sadovsky | Placental miRNA Profiles Associated with Maternal Insulin Resistance and Fetal Adiposity: Maternal | Federal | 56,902 | 17,400 |
| Sadovsky | March of Dimes Transdisciplinary Research for the Study of Preterm Birth | Foundation | 98,299 | 1,701 |
| Schatten | Frontiers in Stem Cells in Cancer | Federal | 279,519 | 13,166 |
| Schatten | Oocyte Centriole Preservation Helps Preserve Fertility in Girls and Women Undergoing Cancer Chemotherapy | Non-Federal | 150,573 | 30,115 |
| Sheng | Optimization of CRISPR/Cas9-Mediated Homologous Recombination for Generation of Transgenic Animals | Non-Federal | 75,000 | 15,000 |
| Simhan | Eunice Kennedy Shriver NICHD Maternal Fetal Medicine Units Network | Federal | 197,904 | 74,104 |
| Simhan | Capitation for MFMU Network | Federal | 62,611 | 38,801 |
| Simhan | Intergenerational Effects of Maternal Childhood Trauma on the Fetal Brain | Federal | 328,112 | 157,390 |
| Simhan | Pre and Postnatal Exposure Periods for Child Health: Common Risks and Shared Mechanisms (ECHO) | Federal | 220,872 | 130,168 |
| Simhan | Social Disadvantage and Fetal Programming of Newborn-Infant Telomere Biology | Federal | 871,248 | 332,109 |
| Simhan | Chronic Hypertension and Pregnancy - CHAP Clinical Coordinating Center | Federal | 49,797 | 25,075 |
| Simhan | Telomeres and Preterm Birth | Foundation | 90,000 | 0 |
| Taylor | NCI ET-CTN with Phase i Emphasis at UPCI | Federal | 2,967 | 1,602 |
| Valli | Xenografting of prepubertal human testicular tissue | Foundation | 10,000 | 0 |
| Vlad | Immune Checkpoint Blockade and Neo-Epitope Peptide Vaccines in Ovarian Cancer | Internal Foundation | 25,000 | 0 |
| Vlad | Oncogenic Pathways and Tumor Inflammation in Ovarian Cancer | Non-Federal | 152,234 | 30,447 |
| Walker | Construction of Transgenic Mice to Identify the Molecular | Non-Federal | 99,321 | 19,864 |
| Wiesenfeld | Solubilized Metronidazole and/or Terconazole Gels Inta-Vaginal Efficacy and (Safety SMART GIVES) | Industry | 78,539 | 19,762 |
| Wiesenfeld | STD Testing in Outpatient Practices - The STOP STDs Study | Foundation | 203,915 | 11,021 |
| Wiesenfeld | Performance of Nucleic Acid Amplificationfor the Detection of Neisseria Gonorrhoeae and Chamydia Trachorn | Federal | 35,600 | 8,900 |

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|---|---|---|---|---|
| Yanowitz | Characterization of a Meiotic Crossover Surveillance System | Federal | 201,212 | 64,770 |
| Yanowitz | Fluorescently Tagged C. Elegans to Probe Meiotic Recombination | Federal | 205,447 | 45,393 |
| Yanowitz | Regulation of Chromosomal Crossover | Foundation | 90,000 | 0 |
| Yatsenko | Genetic & Genomic Aspects of Male Reproductive Defects | Foundation | 25,000 | 0 |
| Zyczynski | Pittsburgh Pel vic Floor Research Program | Federal | 211,580 | 62,512 |
| | **TOTAL RESEARCH GRANT AND CONTRACT FUNDING AWARDED** | | **50,941,319** | **8,058,573** |

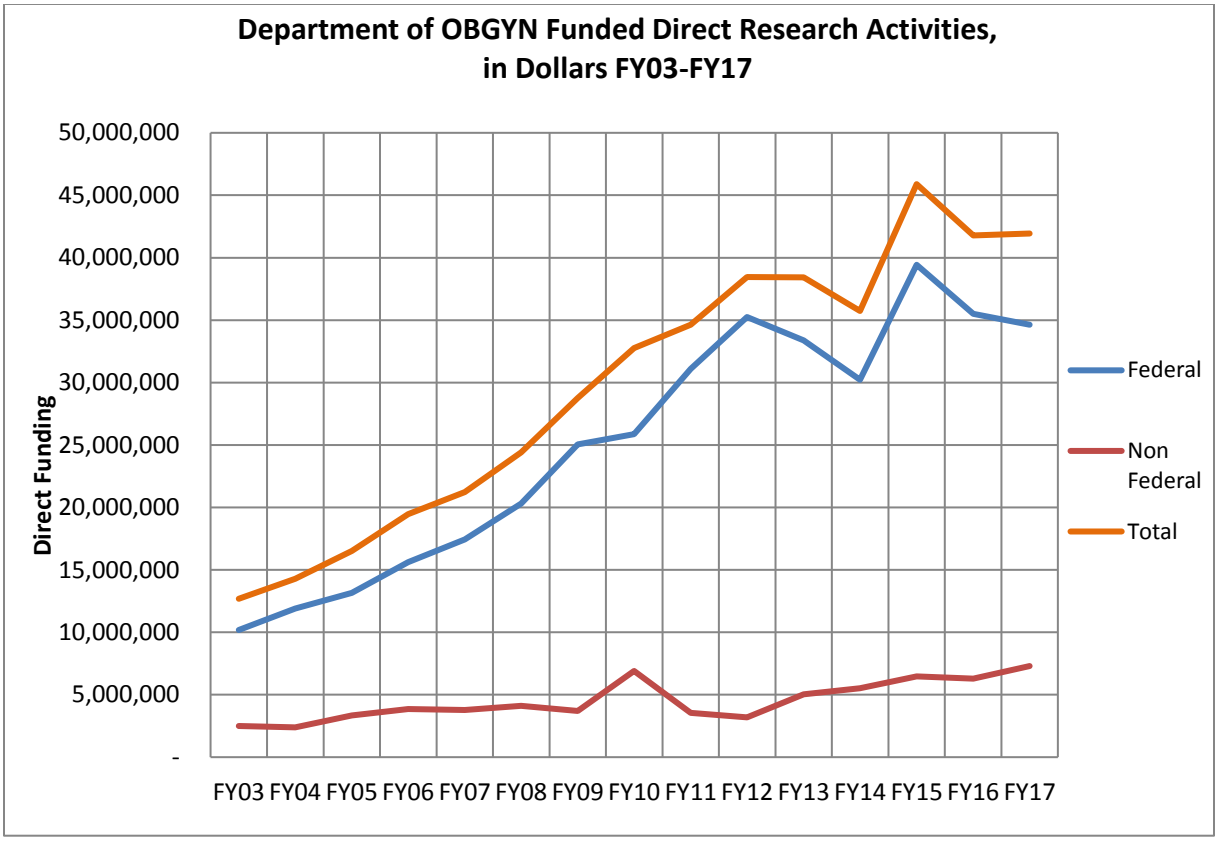
**Department of OBGYN**
**Funded Research**
**Activities**
**FY03-FY17**

| DIRECTS | FY03 | FY04 | FY05 | FY06 | FY07 | FY08 | FY09 |
|---|---|---|---|---|---|---|---|
| Federal | 10,185,087 | 11,905,136 | 13,161,379 | 15,621,465 | 17,427,857 | 20,300,955 | 25,060,501 |
| Non Federal | 2,500,627 | 2,387,976 | 3,352,767 | 3,849,685 | 3,790,746 | 4,116,838 | 3,705,694 |
| **Total** | **12,685,714** | **14,293,112** | **16,514,146** | **19,471,149** | **21,218,603** | **24,417,793** | **28,766,195** |

| FY10 | FY11 | FY12 | FY13 | FY14 | FY15 | FY16 | FY17 |
|---|---|---|---|---|---|---|---|
| **25,859,781** | **31,085,451** | **35,255,580** | **33,385,221** | **30,223,248** | **39,432,206** | **35,504,132** | **34,633,692** |
| **6,899,925** | **3,547,819** | **3,199,125** | **5,041,101** | **5,509,427** | **6,457,417** | **6,286,953** | **7,298,473** |
| **32,759,705** | **34,633,270** | **38,454,705** | **38,426,322** | **35,732,676** | **45,889,623** | **41,791,085** | **41,932,165** |

| INDIRECTS | FY03 | FY04 | FY05 | FY06 | FY07 | FY08 | FY09 |
|---|---|---|---|---|---|---|---|
| Federal | 3,905,853 | 3,800,637 | 4,235,695 | 5,411,426 | 5,279,440 | 5,264,228 | 6,154,400 |
| Non Federal | 323,035 | 316,465 | 461,662 | 453,887 | 455,980 | 535,996 | 684,462 |
| **Total** | **4,228,888** | **4,117,102** | **4,697,357** | **5,865,312** | **5,735,420** | **5,800,224** | **6,838,861** |

| FY10 | FY11 | FY12 | FY13 | FY14 | FY15 | FY16 | FY17 |
|---|---|---|---|---|---|---|---|
| **7,480,618** | **9,044,596** | **9,275,042** | **9,767,240** | **8,802,512** | **8,414,750** | **7,216,206** | **8,058,580** |
| **789,504** | **707,579** | **529,152** | **785,720** | **557,306** | **822,472** | **824,841** | **835,163** |
| **8,270,121** | **9,752,175** | **9,804,194** | **10,552,959** | **9,359,818** | **9,237,222** | **8,041,047** | **8,893,743** |


Department of OBGYN Funded Direct Research Activities, in Dollars FY03-FY17
Direct Funding
50,000,000
45,000,000
40,000,000
35,000,000
30,000,000
25,000,000
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FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13 FY14 FY15 FY16 FY17
Federal
Non Federal
Total

## Selected Publications (FY14-FY17)

### Clinician

Stephen Corey, MD, Peter Bulova, MD, and by Sonya Charles, PhD
*Is Proxy Consent for an Invasive Procedure on a Patient with Intellectual Disabilities Ethically Sufficient?"*
AMA Journal of Ethics. April 2016, Volume 18, Number 4: 373-383.
PMID: 27099186

Corey, S.
Re "The tragedy of the electronic health record"
The Pharos/Autumn 2015, pp 64
PMID: 8999

### 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

Schatten G, Stearns T
*Sperm Centrosomes: Kiss Your Asterless Goodbye, for Fertility's Sake.*
Curr Biol. 2015 Dec 21;25(24):R1178-81
PMID: 26702655

### Genetics

Rajkovic A, Ibba M
*Elongation Factor P and the Control of Translation Elongation.*
Annu Rev Microbiol. 2017 Sep 08;71:117-131
PMID: 28886684

Hu J, Ou Z, Infante E, Kochmar SJ, Madan-Khetarpal S, Hoffner L, Parsazad S, Surti U
*Chromosome 12q13.13q13.13 microduplication and microdeletion: A case report and literature review*.
Mol Cytogenet. 2017;10:24
PMID: 28649281

Rajkovic A, Pangas S
*Ovary as a Biomarker of Health and Longevity: Insights from Genetics.*

Semin Reprod Med. 2017 May;35(3):231-240
PMID: 28658706

Shin YH, Ren Y, Suzuki H, Golnoski KJ, Ahn HW, Mico V, Rajkovic A
*Transcription factors SOHLH1 and SOHLH2 coordinate oocyte differentiation without affecting meiosis I.*
J Clin Invest. 2017 May 15;
PMID: 28504655

Tas E, Sebastian J, Madan-Khetarpal S, Sweet P, Yatsenko AN, Pollock N, Rajkovic A, Schneck FX, Yatsenko SA, Witchel SF
*Familial deletion of the HOXA gene cluster associated with Hand-Foot-Genital syndrome and phenotypic variability.*
Am J Med Genet A. 2017 Jan;173(1):221-224
PMID: 27649277

Yatsenko SA, Mittal P, Wood-Trageser MA, Jones MW, Surti U, Edwards RP, Sood AK, Rajkovic A
*Highly heterogeneous genomic landscape of uterine leiomyomas by whole exome sequencing and genome-wide arrays.*
Fertil Steril. 2017 Feb;107(2):457-466.e9
PMID: 27889101

Dangle P, Touzon MS, Reyes-Múgica M, Witchel SF, Rajkovic A, Schneck FX, Yatsenko SA
*Female-to-male sex reversal associated with unique Xp21.2 deletion disrupting genomic regulatory architecture of the dosage-sensitive sex reversal region.*
J Med Genet. 2017 May 08;
PMID: 28483799

Desai S, Rajkovic A
*Genetics of Reproductive Aging from Gonadal Dysgenesis through Menopause.*
Semin Reprod Med. 2017 Mar;35(2):147-159
PMID: 28278532

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

Martin LA, Porter AG, Pelligrini VA, Schnatz PA, Jiang X, Kleinstreuer N, Hall JE, Verbiest S, Olmstead J, Fair R, Falorni A, Persani L, Rajkovic A, Mehta K, Nelson LM
*A design thinking approach to primary ovarian insufficiency.*
Panminerva Med. 2016 Nov 09;
PMID: 27827529

Mainpal R, Yanowitz JL
*A twist of fate: How a meiotic protein is providing new perspectives on germ cell development.*
Worm. 2016 Apr-Jun;5(2):e1175259
PMID: 27383565

Bregand-White J, Saller DN, Clemens M, Surti U, Yatsenko SA, Rajkovic A
*Genotype-phenotype correlation and pregnancy outcomes of partial trisomy 14q: A systematic review.* Am J Med Genet A. 2016 Jun 10;
PMID: 27286879

Grive KJ, Gustafson EA, Seymour KA, Baddoo M, Schorl C, Golnoski K, Rajkovic A, Brodsky AS, Freiman RN *TAF4b Regulates Oocyte-Specific Genes Essential for Meiosis.*
PLoS Genet. 2016 Jun;12(6):e1006128
PMID: 27341508

Mateo AR, Kessler Z, Jolliffe AK, McGovern O, Yu B, Nicolucci A, Yanowitz JL, Derry
*The p53-like Protein CEP-1 Is Required for Meiotic Fidelity in C. elegans.*
Curr Biol. 2016 May 9;26(9):1148-58
PMID: 27151662

McClendon TB, Sullivan M, Bernstein K, Yanowitz J
*Promotion of Homologous Recombination by SWS-1 in Complex with RAD-51 Paralogs in Caenorhabditis elegans.*
Genetics. 2016 Mar 2;
PMID: 26936927

Olszewska M, Wanowska E, Kishore A, Huleyuk N, Georgiadis AP, Yatsenko AN, Mikula M, Zastavna D, Wiland E, Kurpisz M
*Genetic dosage and position effect of small supernumerary marker chromosome (sSMC) in human sperm nuclei in infertile male patient.*
Sci Rep. 2015;5:17408
PMID: 26616419

Yatsenko SA, Bakos HA, Vitullo K, Kedrov M, Kishore A, Jennings BJ, Surti U, Wood-Trageser MA, Cercone S, Yatsenko AN, Rajkovic A, Iannaccone A
*High-resolution microarray analysis unravels complex Xq28 aberrations in patients and carriers affected by X-linked blue cone monochromacy.*
Clin Genet. 2015 Jul 8;
PMID: 26153062

Mittal P, Shin YH, Yatsenko SA, Castro CA, Surti U, Rajkovic A
Med12 gain-of-function mutation causes leiomyomas and genomic instability.
J Clin Invest. 2015 Aug 3;125(8):3280-3284
PMID: 26193636

Yatsenko SA, Rajkovic A
*Reproductive aging and MCM8/9.*
Oncotarget. 2015 Jun 22;
PMID: 26119146

Kalynchuk EJ, Althouse A, Parker LS, Saller DN, Rajkovic A
*Prenatal whole-exome sequencing: parental attitudes.*
Prenat Diagn. 2015 Jun 17;
PMID: 26151551

Ren Y, Suzuki H, Jagarlamudi K, Golnoski K, McGuire M, Lopes R, Pachnis V, Rajkovic A
*Lhx8 regulates primordial follicle activation and postnatal folliculogenesis.*
BMC Biol. 2015 Jun 16;13(1):39
PMID: 26076587

Peterson JF, Thakur P, Peffer A, Kolthoff M, Kochmar SJ, Surti U
*Seizure Disorder in a Patient with a 5.09 Mb 7q11.23-q21.11 Microdeletion Including the MAGI2 Gene.*
J Assoc Genet Technol. 2014;40(1):16-21
PMID: 26030165

Wiland E, Yatsenko AN, Kishore A, Stanczak H, Zdarta A, Ligaj M, Olszewska M, Wolski JK, Kurpisz M
*FISH and array CGH characterization of de novo derivative Y chromosome (Yq duplication and partial Yp deletion) in an azoospermic male.*
Reprod Biomed Online. 2015 May 7;
PMID: 26096031

Yatsenko AN, Georgiadis AP, Röpke A, Berman AJ, Jaffe T, Olszewska M, Westernströer B, Sanfilippo J, Kurpisz M, Rajkovic A, Yatsenko SA, Kliesch S, Schlatt S, Tüttelmann F
*X-Linked TEX11 Mutations, Meiotic Arrest, and Azoospermia in Infertile Men.*
N Engl J Med. 2015 May 13;
PMID: 25970010

Hu J, Sathanoori M, Kochmar S, Azage M, Mann S, Madan-Khetarpal S, Goldstein A, Surti U
*A novel maternally inherited 8q24.3 and a rare paternally inherited 14q23.3 CNVs in a family with neurodevelopmental disorders.*
Am J Med Genet A. 2015 Apr 10;
PMID: 25866352

Luo X, Cideciyan AV, Iannaccone A, Roman AJ, Ditta LC, Jennings BJ, Yatsenko SA, Sheplock R, Sumaroka A, Swider M, Schwartz SB, Wissinger B, Kohl S, Jacobson SG
*Blue Cone Monochromacy: Visual Function and Efficacy Outcome Measures for Clinical Trials.*

PLoS One. 2015;10(4):e0125700
PMID: 25909963

Beck M, Peterson JF, McConnell J, McGuire M, Asato M, Losee JE, Surti U, Madan-Khetarpal S, Rajkovic A, Yatsenko SA
*Craniofacial abnormalities and developmental delay in two families with overlapping 22q12.1 microdeletions involving the MN1 gene.*
Am J Med Genet A. 2015 Mar 21;
PMID: 25810350

Marinescu PS, Saller DN, Parks WT, Yatsenko SA, Rajkovic A
*Prenatal diagnosis of trisomy 6q25.3-qter and monosomy 10q26.12-qter by array CGH in a fetus with an apparently normal karyotype.*
Clin Case Rep. 2015 Feb;3(2):92-5
PMID: 25767704

Chu T, Yeniterzi S, Yatsenko SA, Dunkel M, Rajkovic A, Hogge WA, Peters DG
Cell-free nucleic acids as non-invasive biomarkers of gynecological disorders, fetal aneuploidy and constitutional maternal chromosomal mosaicism
Hum Reprod Update. 2015 Mar 12;
PMID: 25765864

Wood-Trageser MA, Gurbuz F, Yatsenko SA, Jeffries EP, Kotan LD, Surti U, Ketterer DM, Matic J, Chipkin J, Jiang H, Trakselis MA, Topaloglu AK, Rajkovic A
*MCM9 Mutations Are Associated with Ovarian Failure, Short Stature, and Chromosomal Instability.*
Am J Hum Genet. 2014 Dec 4;95(6):754-62
PMID: 25480036

Peters DG, Yatsenko SA, Surti U, Rajkovic A
*Recent advances of genomic testing in perinatal medicine.*
Semin Perinatol. 2014 Nov 28;
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*The use of mechanical bowel preparation in laparoscopic gynecologic surgery: A decision*

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*How Surgical Mentors Teach: A Classification of In Vivo Teaching Behaviors Part 2: Physical Teaching Guidance.*
J Surg Educ. 2014 Nov 29;
PMID: 25468768

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J Urol. 2014 Dec 15;
PMID: 25524241

## *RESIDENCY TRAINING PROGRAM*

### *Residency Training Program in Obstetrics & Gynecology*

The UPMC Medical Education Residency in Obstetrics and Gynecology aims to provide residents with the following:

- Rigorous clinical experience and didactics to acquire excellent skills of general ob/gyn.
- Opportunities for individualized training to make good career decisions.
- Preparation to serve as leaders and contributors in future careers.

We continue to attract the very top candidates from medical schools nationally and were successful in this year's Match. During the 2017 interview season, we screened 736 applicants with 627 from LCME schools and 109 international medical graduates. Of these applicants, 120 were invited to interview and ultimately interviewed 111 prospective residents. The 2017-2018 intern class filled the 9 positions.

**Residency Curriculum and Major Changes**

The program initiated an interprofessional Gyn Onc Team Work Group (including residents, fellows, faculty, and advanced practice providers--APP) to redesign the Interprofessional team for the Gyn Oncology Inpatient Unit. Redesign involved clear lines of reporting, clear expectations of roles, and incorporation of level-appropriate resident learning objectives into team design. The program initiated an interprofessional ED Consult APP Work Group (including residents, faculty, and APP's) to prepare for clinical care changes related to the decreased residency complement. As the residency complement decreases, daytime weekday ED consults will be conducted by a team of APP's. Residents will perform ED consults on an ED Consult Night Float rotation and during weekend call, thus maintaining the important clinical and systems learning this experience provides. Residents play a critical role on this Work Group and have impacted the following: 1. orientation and training of newly-hired advanced practice providers to learn the systems and medical care to be able to perform ED consultation; 2. Design of handovers between APP team and resident; 3. Identification/problem solving of multiple specific issues that should be addressed/decided prior to academic year 2018-2019 when this system goes into place. This model of structured on-boarding of women's health APP's can be applied broadly at UPMC and elsewhere.

The residency recruited only 9 first-year residents for the 2017-2018 academic year. The residency has a tradition of graduating outstanding well-rounded ob/gyn clinicians and institutional contributors. The program proactively decided to decrease class size from 10 to 9. This was done to ensure outstanding procedure training for each resident, in light of increasing non-surgical management of patients in Ob/Gyn nationally. With 9 per year, first year residents participate in a combined Magee ICU rotation and Ultrasound rotation. Each of these

experiences have been redesigned to accomplish learning objectives in the shorter amount of time allocated. The residency worked with leadership of each of these units to revise the education approach.

Establishment of a Resident Well-Being Committee. Residents organized a committee to address well being in the residency. This group complements the longstanding resident-initiated "Res Life Committee" which address the "community building/relationship building" aspects of well being for the residency.

Administrative Co-Chief Residents attended the first Annual UPMC ME Chief Resident Bootcamp event in April 2017. This event featured leadership development sessions targeted to build skills in Chief Residents/Fellows across specialties at the Sponsoring Institution. Leadership development for residents is a key priority. Multiple sessions exist in the residency curriculum. Administrative Co-Chiefs also attend a national Leadership Conference to prepare for their special roles.

Residency leadership established monthly meetings with the Vice President of Medical Affairs at Magee-Womens Hospital of UPMC. This collaboration allows optimal teamwork and communication about multiple aspects of the ever-changing clinical and learning environment. This relationship is a testament to the mutual commitment between Magee and the Ob/Gyn residency program.

Magee established a Magee Resident/Fellow Patient Safety Leadership Committee consisting of resident/fellow representatives from programs that train at Magee and hospital leadership. The institution shares patient safety and quality metrics with members of the committee and discusses institutional priorities based upon this data. Together the group is working to implement an EMR-linked system (UPMC MyTeam) that streamlines determination of the first call provider for every inpatient.

**Awards**

During the past academic year, our residents were the recipients of the awards listed below. Highlights of their accomplishments include several prize papers at national meetings, and several 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. Tiffany Deihl, a third-year resident, was awarded this prestigious award for the second year in a row.

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

## National Awards

Daniel Chan, MD, PhD (R3)

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

Ann Peters, MD (R4)

- Society of Laparoscopic Surgeons - Outstanding Resident Award

Kelly Ferroni, MD (R3)

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

Erin Rhinehart, MD (R4)

- Society for Academic Specialists in General Obstetrics and Gynecology

Elizabeth O'Neill Pronesti, MD (R2)

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

Jessica Rose, MD, (R4)

- Ryan Program Resident Award for Excellence in Family Planning

## Institutional Awards

Erin Rhinehart, MD

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

Tiffany Deihl, MD

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

Alayna Butcher, MD

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

Emily Redman, MD

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

## Program Awards

Taylor Orellana, MD (R1)

- Best General Obstetrical Skills by an Intern

Alison Garrett, MD (R1s)

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

Carly Werner Zuwaila, MD (R3)

- The Margaret Scearce Compassionate Care Award

Ann Peters, MD (R4)

- The Dr. Morris Turner Procedural Teaching and Guidance Award

## Published Articles - Peer Review Articles

Mendez LE, Atlass J. Triple synchronous primary malignancies of the colon, endometrium and kidney in a patient with Lynch syndrome treated via minimally invasive techniques. Gynecol Oncol Rep. 2016 May 25;17:29-32. PMID: 27331139.

Matsuo K, Machida H, Horowitz MP, Shahzad MMK, Guntupalli SR, Roman LD, Wright JD. Risk of metachronous ovarian cancer after ovarian conservation in young women with Stage I cervical cancer. Am J Obstet Gynecol. 2017 Jun 27. Epub ahead of print] PMID: 28666700.

Serra AE, Lemon LS, Mokhtari NB, Parks WT, Catov JM, Venkataramanan R, Caritis SN. Delayed villous maturation in term placentas exposed to opioid maintenance therapy: a retrospective cohort study. Am J Obstet Gynecol. 2017 Apr;216(4):418.e1-418.e5. PMID: 28024988.

Peters A, Rindos NB, Guido RS, Donnellan NM. Uterine-sparing laparoscopic resection of accessory cavitated uterine masses. J Minim Invasive Gynecol. 2017 Jul 21. pii: S1553-4650(17)30314-X. PMID: 28599883.

Peters A, Sadecky AM, Winger DG, Guido RS, Lee TTM, Mansuria SM, Donnellan NM. Characterization and preoperative risk analysis of leiomyosarcomas at a high-volume tertiary care center. Int J Gynecol Cancer. 2017 Jul;27(6):1183-1190. PMID: 28463949.

Peters A, Rindos NB, Lee T. Hemostasis during ovarian cystectomy: Systematic review of the impact of suturing versus surgical energy on ovarian function. J Minim Invasive Gynecol. 2017 Feb;24(2):235-246. PMID: 28011097.

Peters A, Stuparich MA, Mansuria SM, Lee TT. Anatomic vascular considerations in uterine artery ligation at its origin during laparoscopic hysterectomies. Am J Obstet Gynecol. 2016 Sep;215(3):393. PMID: 27287682

Valent AM, Peticca K, DiMatteo A, Banks S, Shah R, Chernicky L, et al. Pyelonephritis in pregnancy: Prediction of prolonged hospitalization and maternal morbidity using prognostic scoring systems. Am J Perinatol. 2017 Apr 25. doi: 10.1055/s-0037-1602418. [Epub ahead of print]. PMID: 28444678.

## Abstract Presentations

### Oral Presentations

Deihl T, Wiesenfeld HC. STD tracker reminder system increases repeat testing following treatment for Chlamydia or Gonorrhea. 2016 National Sexually Transmitted Diseases Prevention Conference Scientific Committee; September 20-23, 2016, Atlanta, Georgia.

Klocek M, Bernstein S, Larkin J, Simhan H. Exploring the interaction between maternal and placental physiology: The dynamic relationship between maternal blood pressure and umbilical artery Doppler indices throughout gestation. American College of Obtetrics and Gynecology Armed Forces District; September 19, 2016, Orlando, Florida

Ricciuti J, Boisen M, Kelley JL, Taylor SE, Sukumvanich P, Berger J, Orr B. The significance of lymphovascular space invasion in micoinvasive squamous cell carcinoma of the vulva. Society of Gynecologic Oncology 2017 Winter Meeting; January 26-28, 2017, Brackenridge, Colorado

### Poster Presentations

Atlass J, Menke M, Parks WT, Derzic K, Catov J. Pre-conception blood pressure and evidence of placental malperfusion. Society for Reproductive Investigation's 64th Annual Scientific Meeting; March 16, 2017, Orlando, Florida.

Ross MS, Burriss ME, Winger DG, Courtney-Brooks M, Edwards RP, Boisen MM. Unplanned postoperative intensive care unit admission for ovarian cancer cytoreduction is associated with significant decrease in overall survival. Society of Gynecologic Oncologists 2017 Annual Winter Meeting; January 26-28, 2017, Breckenridge, Colorado.

Ross MS, Burriss ME, Winger DG, Courtney-Brooks M, Edwards RP, Boisen MM. Unplanned postoperative intensive care unit admission for ovarian cancer cytoreduction is associated with significant decrease in overall survival. Society of Gynecologic Oncologists 2017 Annual Meeting; March 12-15, 2017, National Harbor, Maryland.

Chandler CK, Ferroni KL, Boisen MM, Berger J, Taylor SE, Huang M. IV and IV/IP Chemotherapy as adjuvant treatment in patients with ovarian cancer leads to similar rates of progression free and overall survival after neoadjuvant chemotherapy. Society of Gynecologic Oncologists 2017 Annual Meeting; March 12-15, 2017, National Harbor, Maryland.

Mission JF, Catov J, Feghali M, Deihl T, Scifres C. Are obese women screened early in pregnancy for diabetes? The Pregnancy Meeting; 37th Annual Meeting of the Society for Maternal-Fetal Medicine; January 23-28, 2017, Las Vegas, Nevada

Mission JF, Catov J, Feghali M, Deihl T, Scifres C. Obesity, early diabetes screening, and perinatal outcomes. The Pregnancy Meeting; 37th Annual Meeting of the Society for Maternal-Fetal Medicine; January 23-28, 2017, Las Vegas, Nevada.

Deihl T, Simhan H. Antenatal magnesium sulfate and ponderal index from birth to age 2 in preterm male and female infants. 64th Annual Society for Reproductive Investigation Annual Meeting; March 15-18, 2017, Orlando, Florida

Mission JF, Catov J, Feghali M, Deihl T, Scifres C. The impact of antibiotic use in pregnancy on fetal growth and gesteational diabetes. 77th Annual Meeting of the American Diabetes Association; June 9-13, 2017, San Diego, California.

Hacker F, Serra A, Twedt R, Cheng Y, Caughey A. Role of genetic sonogram and cell-free fetal DNA after CPC detection: a cost-effectiveness analysis. Society of Maternal-Fetal Medicine 37th Annual Meeting; January 23 – January 28, 2017, Las Vegas, Nevada.

Hacker F, Griffin E, Shaffer B, Caughey A. Gestational age and association with successful vaginal birth after cesarean. Society of Maternal-Fetal Medicine 37th Annual Meeting; January 23 – January 28, 2017, Las Vegas, Nevada.

Hacker F, Griffin E. Shaffer B, Caughey A. Role of sequential genetic sonogram and cell-free fetal DNA after EIF detection: A cost-effectiveness analysis. Society of Maternal-Fetal Medicine 37th Annual Meeting; January 23 – January 28, 2017, Las Vegas, Nevada.

Hacker F, Pilliod R, Fields A, Shaffer B, Caughey A. Factors associated with timing of demise in trisomy 18 infants. Society of Maternal-Fetal Medicine 37th Annual Meeting; January 23 – January 28, 2017, Las Vegas, Nevada.

Hacker F, Griffin E. Shaffer B, Caughey A. Role of genetic sonogram after EIF detection: a cost-effectiveness analysis. 2017 Annual American College of Obstetricians and Gynecologists Clinical and Scientific Meeting; May 6-9, 2017, San Diego, California.

Horowitz M, Orr B, Sukumvanich P, Kelley JL, Taylor SE. Rate of ovarian micrometastasis in endometrial cancer: Is ovarian preservation a reasonable option? Society of Gynecologic Oncologists Annual Meeting on Women's Cancers; March 12-15, 2017, National Harbor, Maryland.

Horowitz M, Orr B, Sukumvanich P, Kelley JL, Taylor SE. Rate of ovarian micrometastasis in endometrial cancer: Is ovarian preservation a reasonable option? Society of Gynecologic Oncology 2017 Spring Meeting; March 12-15, 2017, National Harbor, Maryland.

Mokhtari N, Lemon LS, Serra AE, Caritis SN. Chorangiosis in placentas exposed to opioid maintenance therapy. Society of Maternal-Fetal Medicine 37th Annual Meeting; January 23 – January 28, 2017, Las Vegas, Nevada.

Mokhtari N, Canavan T. Fetal growth patterns in pregnancies complicated by gastroschisis. 2017 American Institute of Ultrasound in Medicine Convention; March 25-29, 2017, Orlando, Florida.

Bunce E, Sheperd JP, Paruchuri Y, Simhan H. Optimal strategy for venous thromboembolism prophylaxis following cesarean delivery: a decision analysis. Society of Maternal-Fetal Medicine 37th Annual Meeting; January 23 – January 28, 2017, Las Vegas, Nevada.

Paruchuri Y, Larkin J. Race and gender-based overestimation of fetal weight may lead to missed diagnoses of fetal growth retardation. Society for Reproductive Investigation's 64th Annual Scientific Meeting; March 17, 2017, Orlando, Florida.

Singer S, Shepherd J. Cost-effectiveness of robotic salpingostomy for management of ectopic pregnancy. American Society for Reproductive Medicine, 72nd Annual Scientific Congress and Expo; October 15-19, 2016, Salt Lake City, Utah.

Vani K, Wolfe N, Facco F, Himes KP. Pregnancy after periviable birth: Making the case for postpartum and interpregnancy care. American College of Obstetricians and Gynecologists Annual Clinical Meeting; May 6-9, 2017, San Diego, California.
Haragan A, Werner C, Himes KP. Misinformation in the information age: what are our patients reading about periviability online. Society of Maternal-Fetal Medicine 37th Annual Meeting; January 23–28, 2017, Las Vegas, Nevada.

**Video Presentation:**

Peters A, Rindos N, Guido R, Donnellan N. Uterine-sparing laparoscopic resection of accessory cavitated uterine masses. American Association of Gynecologic Laparoscopists (AAGL) 45th Global Congress; November 17, 2016, Orlando, Florida.

**Annual Research Day in Reproductive Biology & Women's Health**

The department's annual research day was conducted on May 19, 2017. The day featured the newest data from the department faculty researchers and selected presentations by clinical fellows, residents and graduate trainees.

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 Department partnered with Magee-Womens Hospital to establish an endowment to award the best resident oral presenter with the Marvin C. Rulin, MD, Resident Research Day Presentation Award. The 2017 award was presented to Dr. Tiffany Deihl, third-year resident, for her presentation, "STD Tracker Reminder System Increases Repeat Testing Following Treatment for Chlamydia or Gonorrhea." Doctor Deihl received a monetary award and an award plaque. In addition to the oral presentation award, an award is also presented to the resident with the best poster presentation. The recipient of the 2017 award was presented to Dr. Jason Ricciuti, second-year resident, for his presentation, "The Significance of Lymphovascular Space Invasion in Microinvasive Squamous Cell Carcinoma of the Vulva."

The following oral presentations were presented by third- and fourth-year residents:

Sadie Ackerman, MD, MEd (R4)
Title: The Use of Video as an Adjunct to ObGyn Resident Education: The Case of C-section
Research Advisor: Robert Kaminski, MD

Amy Alexander, MD (R4)
Title: The Impact of Prior Endometrial Ablation on Endometrial Cancer Diagnosis, Treatment, and Survival
Research Advisor: Alexander Olawaiye, MD

Rachel Beverley, MD (R3)
Title: Associations Between Military Status and Female Infertility
Research Advisor: Marie Menke, MD

Tiffany Deihl, MD (R3)
Title: STD Tracker Reminder System Increases Repeat Testing Following Treatment for Chlamydia or Gonorrhea
Research Advisor: Harold Wiesenfeld, MDCM

Kelly Ferroni, MD (R3)
Title: A Study on the Clinical Course of Intrauterine Devices (IUDs) that are Diagnosed as Embedded on Ultrasound
Research Advisors: Colleen Krajewski, MD and Isabelle Wilkins, MD

Max Horowitz, MD, PhD (R3)
Title: Rate of Ovarian Micrometastasis in Endometrial Cancer: Is Ovarian Preservation a Reasonable Option?
Research Advisor: Sarah Taylor, MD

Neggin Mokhtari, MD (R3)
Title: Fetal Growth Patterns in Pregnancies Complicated by Gastroschisis
Research Advisor: Timothy Canavan, MD

Jessica Rose, MD (R4)
Title: Using a Combined Workshop and Observed Structured Clinical Exam (OSCE) to Teach Communication About Intimate Partner Violence
Research Advisor: Judy Chang, MD

Kavita Vani, MD (R3)
Title: Pregnancy After Periviable Birth: Making the Case for Postpartum and Interpregnancy Care
Research Advisor: Katherine Himes, MD

Carly Werner Zuwiala, MD (R3)
Title: Misinformation in the Information Age: What Are Our Patients Reading About Periviability Online?
Research Advisor: Katherine Himes, MD

The following poster presentations were presented by other residents:

Jacqueline Atlass, MD (R2)
Pre-conception blood pressure and evidence of placental Malperfusion
Research Advisor: Marie Menke, MD

Alison Garrett, MD (R1)

Title: Disparities in HPV vaccination and age of administration by body mass index among US women: a population-based cross-sectional analysis
Research Advisor: John Harris, MD

Jason Ricciuti, MD (R2)
Title: The significance of lymphovascular space invasion in microinvasive squamous cell carcinoma of the vulva.
Research Advisor: Michelle Boisen, MD

**OTHER CHANGES WE MADE IN THE CURRICULUM**

The residency had a week of wellness-focused didactic sessions in February 2017. Residents now have "wellness wildcard" sessions build into the Residency Core Lecture Schedule. These are 2 hours of protected time to attend health appointments, meet with mentors, or select other individualized well being activities.

**Awards and Accomplishments**

Jodi Boocks, Ob/Gyn Fellowship Manager:

- Participating in a three-part CREOG School for Ob/Gyn Educators program.

Diana Brucha, Academic Manager, Ob/Gyn Residency:

- Achieved TAGME (Training Administrators of Graduate Medical Education) recertification, Fall 2016.
- Appointed to the Coordinator Description Task Force (National, Multispecialty Group), Coordinator Tier Subgroup, February 2017.
- Serves as a mentor to a new Obstetrics and Gynecology residency training program academic manager at St. Joseph Mercy Ann Arbor, Michigan.

Nicole Donnellan, MD, Gyn Division Educational Director:

- Appointed as Co-Associate Program Director, Ob/Gyn residency.
- Graduated from the first APGO/CREOG Surgical Scholars Program in 2016.
- Accepted to participate in the University of Pittsburgh Health Science Leadership Academy for Early Career Development 2016.
- Accedpted to participate in the PROMISED Mentoring Program 2017-2018.
- Received the department Gynecology Faculty Teaching Award, 2016.
- CREOG National Faculty Award for Excellence in Resident Education, Spring 2017.

Gabriella G. Gosman, MD, Program Director:

- Appointed to the ACGME Review Committee for Obstetrics and Gynecology.
- Appointed a reviewer for the ABOG Maintenance of Certification Modules
- Promoted to Senior Associate Designated Instititutional Official in the leadership of the health system-wide Graduate Medical Education.
- Named the Chair Elect of the Academy of Master Educators.

- Served on the planning committee and as abstract session coordinator for the 2nd Annual Med Ed Day hosted by the Academy of Master Educators. Med Ed Day is an annual conference for educators in all of the Health Sciences Schools at the University of Pittsburgh.

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

- Accepted into the APGO Scholars Program.

The residency has continued to be active with State and District American College of Obstetrician and Gynecologists activities. Drs. Grace Ferguson, Kelly Ferroni, Neggin Mokhtari and Yasaswi Paruchuri all had roles at the Junior Fellow level. Dr. Gosman serves as Secretary for the Pennsylvania Section of ACOG. Drs. Audrey Lance and Sara Sakamoto serve on the Section Advisory Committee of ACOG.

**Doximity Rankings for Residencies and Training Institutions**

Doximity's Residency Navigator ranked the Obstetrics and Gynecology Residency third among more than 268 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.

**Philanthropic Efforts**

Magee Ob/Gyn residents are currently undertaking their 10th annual fundraiser to benefit Pittsburgh Action Against Rape (PAAR). This is an entirely resident-run philanthropic effort, consisting of a Valentine's Day chocolate rose sale and a performance event. This year's performance was the Vagina Monologues.

**Education Publications and Presentations:**

Brucha D: Training for UPMC Medical Education Program Managers, Coffee and Conversation Sessions, Pittsburgh, PA, August 25, 2016, Web-Based ERAS Program Director Work Station: Enhancements and Updates.

Donnellan NM. Finding Feedback: Implementation of a Web-Based Evaluation Tool. University of Pittsburgh Health Science Medical Education Day, September 2016, Pittsburgh, PA.

Donnellan NM. Transitioning to competencybBased Evaluations: Why Feedback is Important. University of Pittsburgh Department of OB/GYN Grand Rounds, October 2016, Pittsburgh, PA.

Connolly A, Donnellan N, Lutz E, Goepfert A, Blanchard A, Buys E, Galvin S, Litwiller A, Gosman G, Amundsen C, Gerber S, Dunivan G, Gregory T, Gesci K, Botros S, Lane F, Higgins R, Major C, Frishman G, Bienstock J, Cantrell L, Parviainen K, Kenton K. "Real-time" feedback for milestones and procedural skills: A multi-center trial of "myTIPreport." Oral Presentation at American Association of Gynecologic Laparoscopy 45th Global Congress of Minimally Invasive Gynecology; November 14-18, 2016. Orlando, Florida.

Connolly, A, Donnellan N, Lutz E, Buys E, Lane F, Gesci K, Adams K, Kenton K, Amundsen C, Gregory T, Botros S, Blanchard A, Dunivan G, Gosman G. Real-time feedback – Trying something new; What works? What gets in the way? Program Directors' perspectives on the myTIPreport rollout experience. Poster Presentation at American Association of Gynecologic Laparoscopy 45th Global Congress of Minimally Invasive Gynecology; November 14-18, 2016. Orlando, Florida.

Bump GM, Coots N, Liberi CA, Minnier TE, Phrampus PE, Gosman G, Metro DG, McCausland JB, Buchert A. Comparing trainee and staff perceptions of patient safety culture. Acad Med. 2017 Jan;92(1):116-122. PMID:27276009.

Connolly A, Goepfert A, Blanchard A, Buys E, Kenton K, Litwiller A, Donnellan N, Gosman G, Amundsen C, Adams K, Gerber S, Dunivan G, Gregory T, Gesci K, Botros S, Lane F, Lutz E, Major C, Parviainen K, Frishman G, Valea F, Bienstock J, Higgins R. Surgical skills feedback and myTIPreport: Is there construct validity? A mutli-center trial. Oral Presentation at Council of Resident Education in Obstetrics and Gynecology/Association of Professors of Gynecology and Obstetrics Annual Meeting; March 8-11, 2017. Orlando, Florida.

Rindos NB, Wroble-Biglan M, Ecker A, Lee TT, Donnellan NM. Impact of video coaching on gynecologic resident laparoscopic suturing: A randomized controlled trial. J Minim Invasive Gynecol. 2017 Mar - Apr;24(3):426-431. PMID: 28063907.

Donnellan NM. Social media and medicine: Pearls, pitfalls and professionalism. Postgraduate Course Chair and Speaker, "SGS Website Tour" Society for Gynecologic Surgeons 43rd Annual Meeting; March 26-29, 2017. San Antonio, Texas.

**Alumni Update**

Members from the Department's GME Division attend the CREOG & APGO Annual Meeting. This joint meeting is held every March and offers exhibits, receptions, seminars, and plenary and breakout sessions of interest to physician educators. Many of our alumni now hold positions of residency program director, associate residency program director, clerkship director and associate clerkship director. Because of this, we coordinated our first annual alumni social event in 2016 which was very well attended. We continued this event at the 2017 meeting in Orlando and the following alumni educators participated:

Rebecca Byler Dann, MD (Gyn Onc Fellow Alumni)
Residency Program Director, University of Illinois College of Medicine at Peoria

Nicole Donnellan, MD (Ob/Gyn Resident & MIS Fellow Alumni – Current Faculty)
Educational Coordinator, UPMC/Magee-Womens Hospital

Kimberly Gecsi, MD (Ob/Gyn Resident Alumni)
Residency Program Director, Case Western/University Hospital of Cleveland

Gabriella G. Gosman, MD (Current Residency Program Director/Faculty)
UPMC Medical Education, Obstetrics and Gynecology

Marcia Klein-Patel, MD, PhD (Ob/Gyn Resident Alumni)
Associate Residency Program Director, West Penn Allegheny Health System

Deborah Landis-Lewis, MD (Ob/Gyn Resident Alumni)
Associate Program Director, St. Joseph Mercy Health System

Tammy Loucks, MPH, DrPH (Ob/Gyn Staff Alumni)
Vice Chair, Faculty Affairs and Academic Programs, Emory University School of Medicine

Phillip Rauk, MD (MFM Fellow/Faculty Alumni)
Residency Program Director, University of Minnesota Medical School
Residency Program Director Representative, CREOG, Region IV

Bunja Rungruang, MD (Ob/Gyn Resident & Gyn Onc Fellow Alumni)
Program Director, Gynecologic Oncology Fellowship, Augusta University, Medical College of Georgia

Ashlyn Holstein Savage, MD (Ob/Gyn Resident Alumni)
Residency Program Director, Medical University of South Carolina

Alyssa Stephenson-Famy, MD (MFM Fellow Alumni)
Associate Residency Program Director, University of Washington School of Medicine

Ashley-Ann Storms, MD (Ob/Gyn Resident Alumni)
Clerkship Director, Grand Rapids Medical Education Partners, College of Human Medicine Michigan State University

Dale Stovall, MD (Faculty Alumni)
Residency Program Director, Riverside Regional Medical Center

Gary Sutkin, MD (Ob/Gyn Residency/Faculty Alumni)
Residency Program Director, University of Medicine Kansas City, Truman Medical Center
Associate Dean of Women's Health and Victor and Caroline Schutte Chair in Women's Health

Andrew Sword, MD (Ob/Gyn Residency Alumni)
Clerkship Director , West Penn Allegheny Health System

Rebecca Waltner-Toews, MD (Current Faculty)
Educational Coordinator, UPMC/Magee-Womens Hospital

Omar Young, MD (MFM Fellow Alumni)
Associate Residency Program Director, Washington University School of Medicine

<u>Current Department Graduate Medical Education Staff:</u>

Jodi L. Boocks
Fellowship Manager, Ob/Gyn

Diana L. Brucha, C-TAGME
Academic Manager, Ob/Gyn Residency

Michele Nix
Residency Coordinator, Ob/Gyn Residency

## 2017 OBSTETRICS AND GYNECOLOGY RESIDENCY GRADUATES

| | |
|---|---|
| Sadie Ackerman, MD, MEd | East Suburban Obstetrical and Gynecological Associates of the Allegheny Health Network, Pittsburgh, PA |
| Amy Alexander, MD | Fellow in Gynecologic Oncology at the Northwestern Medicine Feinberg School of Medicine, Chicago, IL |
| Grace Ferguson, MD | Fellow in Family Planning, University of Pittsburgh School of Medicine, Magee-Womens Hospital of Pittsburgh of UPMC, Pittsburgh, PA |
| Megan Klocek, MD | Active Duty Naval Medical Center Portsmouth, VA |
| Ann Peters, MD, MS | Fellow in Minimally Invasive Gynecologic Surgery, University of Pittsburgh School of Medicine, Magee-Womens Hospital of Pittsburgh of UPMC, Pittsburgh, PA |
| Erin Rhinehart, MD | Faculty at the University of Pittsburgh School of Medicine, Magee-Womens Hospital of UPMC |
| Jessica Rose, MD | Faculty at Bellevue Hospital Center, New York University School of Medicine, New York, NY |
| Jessica Sassani, MD | Fellow in Female Pelvic Medicine and Reconstructive Surgery at the UPMC Medical Education, Magee-Womens Hospital of UPMC, Pittsburgh, PA |
| Shereen Singer, MD | Doctor Singer will care for her new infant while pursuing a position as a generalist and continuing to pursue her research, Pittsburgh, PA |

## 2016- 2017 OBSTETRICS AND GYNECOLOGY RESIDENTS

**First-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 |

**Second-Year Residents**

| | |
|---|---|
| Jacqueline Atlass, MD | Florida International University Herbert Wertheim College of Medicine |
| Mary Burriss, MD | Medical College of Georgia at Georgia Regents University |
| Alayna Butcher, MD | University of Illinois College of Medicine |
| Kelsey Dressen, MD | New York Medical College |
| Joanna Evans, MD | Duke University School of Medicine |
| Francis Hacker, MD | Oregon Health & Science University School of Medicine |
| Elizabeth O'Neill, MD | University of Pittsburgh School of Medicine |
| Yasaswi Paruchuri, MD | Michigan State University College of Human Medicine |
| Kathryn D. Peticca, MD | University of Cincinnati College of Medicine |
| Jason Ricciuti, MD | University of South Florida Morsani College of Medicine |

## Third-Year Residents

| | |
|---|---|
| Rachel M. Beverley, MD | Temple University School of Medicine |
| Daniel Chan, MD, PhD | Sanford School of Medicine, University of South Dakota |
| Chelsea K. Chandler, MD | Medical College of Georgia at Georgia Regents University |
| Tiffany E. Deihl, MD | Pennsylvania State University College of Medicine |
| Kelly L. Ferroni, MD | University of Iowa College of Medicine |
| Max P. Horowitz, MD, PhD | University of Pittsburgh School of Medicine |
| Neggin Mokhtari, MD | University of Maryland School of Medicine |
| Misha Pangasa, MD | Weill Cornell Medical College |
| Kavita Vani, MD | Columbia University College of Physician & Surgeons |
| Carly A. Werner, MD | University of Pittsburgh School of Medicine |

## Senior Residents

| | |
|---|---|
| Sadie W. Ackerman, MEd, MD | Temple University School of Medicine |
| Amy Alexander, MD | University of North Carolina at Chapel Hill School of Medicine |
| Grace P. Ferguson, MD | Jefferson Medical College of Thomas Jefferson University |
| Megan E. Klocek, MD | Pennsylvania State University College of Medicine |
| Ann Peters, MD | University of Virginia School of Medicine |
| Erin L. Rhinehart, MD | University of Pittsburgh School of Medicine |
| Jessica Rose, MD | George Washington University School of Medicine and Health Sciences |
| Jessica Sassani, MD | State University of New York Upstate Medical University |
| Shereen A. Singer, MD | University of Medicine & Dentistry New Jersey / R.W. Johnson Medical School |

## 2016- 2017 OBSTETRICS AND GYNECOLOGY FELLOWSHIPS

**Female Pelvic Medicine and Reconstructive Surgery Fellows (Urogynecology):**

Charelle Carter, MD
Medical School: University of Maryland School of Medicine
Residency: Washington Hospital Center/Georgetown University Hospital

Lauren Giugale, MD
Medical School: University of Virginia School of Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

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

**Minimally Invasive Surgery Fellows:**

Christina Ramirez, MD
Medical School: Harvard Medical School
Residency: National Capital Consortium

Lisa Chao, MD
Medical School: University of Illinois
Residency: Stanford University

Ann Peters, MD
Medical School: University of Virginia School of Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

**Gynecologic Oncology Fellows:**

Casey Hay, MD
Medical School: Michigan State University College of Human Medicine
Residency: Maine Medical Center

Shannon Grabosch, MD
Medical School: University of Kansas School of Medicine
Residency: Saint Louis University School of Medicine

Erin Hartnett, MD
Medical School: Loyola University Chicago Stritch School of Medicine
Residency: Warren Alpert Medical School of Brown University, Women and Infants Hospital

Malcolm Ross, MD
Medical School: University of North Carolina
Residency: UPMC Medical Education, Obstetrics & Gynecology

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

**Family Planning Fellows:**

Grace Ferguson, MD
Medical School: Jefferson Medical College of Thomas Jefferson University
Residency: UPMC Medical Education, Obstetrics & Gynecology

**Combined Fellowship in Family Planning and Reproductive Infectious Diseases Fellow:**

Jessica Tarleton, MD
Medical School: Emory University School of Medicine
Residency: Emory University Department of Gynecology and Obstetrics

**Maternal Fetal Medicine Fellows:**

Adriane Haragan, MD
Medical School: University of Texas Medical Branch
Residency: Medical University of South Carolina

Allison Serra, MD
Medical School: University of North Carolina at Chapel Hill
Residency: University of California, Irvine

Jennifer Braverman, MD
Medical School: Baylor College of Medicine
Residency: The George Washington University

Alisse Hauspurg Janicki, MD
Medical School: Yale University School of Medicine
Residency: Warren Alpert Medical School of Brown University, Women & Infants Hospital

Roxanna Twedt, MD
Medical School: University of Nevada school of Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

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

**Reproductive Endocrinology and Infertility Fellows:**

Stephanie Rothenberg, MD
Medical School: University of Washington School of Medicine
Residency: UPMC Medical Education, Obstetrics & Gynecology

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

**Medical Genetics Fellowship:**

N/A

**Global Health Fellowship:**

N/A

**DEPARTING FELLOWS JUNE 30, 2017:**

**Female Pelvic Medicine and Reconstructive Surgery Fellows:**

Mary Ackenbom, MD

Current position: Faculty
University of Pittsburgh School of Medicine, Department of Ob/Gyn/RS, Division of Female Pelvic Medicine and Reconstructive Surgery, Magee-Womens Hospital of UPMC
Pittsburgh, PA

Erin Lavelle, MD
Current position: Faculty
Allegheny Health Network, Division of Female Pelvic Medicine and Reconstructive Surgery
Pittsburgh, PA

**Minimally Invasive Surgery Fellows:**

Mallory Stuparich, MD
Current position: Faculty
Southern California Permanente Medical Group
Downey, CA

**Gynecologic Oncology Fellows:**

Jill Gadzinski, MD
Current Position: Faculty
Oakland University William Beaumont School of Medicine, Division of Gynecologic Oncology of William Beaumont Hospital
Royal Oak, MI

Brian Orr, MD
Current position: Faculty
University of Pittsburgh School of Medicine, Department of Ob/Gyn/RS, Division of Gynecologic Oncology, Magee-Womens Hospital of UPMC
Pittsburgh, PA

**Family Planning Fellows:**

Rachel Flink-Bochacki, MD
Current position: Assistant Professor
Albany Medical Center Department of Obstetrics and Gynecology
Albany, NY

**Medical Genetics Fellows:**

Ermal Aliu, MD
Current Position: Postdoctoral Fellow
UPMC Children's Hospital, Genetics Lab
Pittsburgh, PA

Evgenia Skilou, MD
Current Position: Fellow

UPMC Medical Education, Medical Biochemical Fellowship
Pittsburgh, PA

**Reproductive Infectious Diseases Fellow:**

N/A

**Maternal Fetal Medicine Fellows:**

Emily Bunce, MD
Current Position: Assistant Professor
Wake Forest School of Medicine, Department of Maternal-Fetal Medicine
Wake Forest, PA

Julia Bregand White, MD
Current Position: Faculty
University of Chicago School of Medicine, Department of Ob/Gyn, Division of Maternal-Fetal Medicine
Chicago, IL

John Mission, MD
Current position: Faculty
Legacy Medical Group, Division of Maternal-Fetal Medicine
Portland, OR

**Reproductive Endocrinology and Infertility:**

Fabiola Balmir, MD
Current Position: Faculty
Allegheny Health Network, Department of Ob/Gyn, Division of Reproductive Endocrinology & Infertility
Pittsburgh, PA

Sunita Katari, MD
Current Position: Faculty
University of Pittsburgh School of Medicine, Department of OB/GYN/RS, Division of Reproductive Endocrinology & Infertility
Pittsburgh, PA

**Global Health Fellowship:**

N/A

# 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 department has a two or three-year fellowship program in Medical Genetics and offers one position per year. The program focuses on methods of fetal diagnosis and therapy, natural history of fetal malformations, and role of heredity in gynecologic cancer. A broad base of clinical and laboratory training is offered. *Director: Aleksander Rajkovic, MD*

**Reproductive Infectious Disease**

The ACGME (Accreditation Counsel for Graduate Medical Education) Reproductive Infectious Disease fellowship trains obstetrician-gynecologists 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: Steve N. Caritis, 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*

**Global Womens Health**

This two year fellowship in Global Women's Health will provide the opportunity to gain experience and knowledge of women's global health in the area of direct patient care, research and policy implementation. The fellowship will create leaders who will develop educational initiatives, improve clinical services and promote research in international reproductive health. Clinical training will emphasize medical issues unique to low resource populations such as tropical diseases, malnutrition, HIV/AIDS etc. Fellows will gain experience in grant writing, budgeting, and the administrative aspects of clinical research while designing and conducting a research trial with the goal of publishing. In addition to the clinical and research obligations of the fellowship, 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. *Director: Joseph S. Sanfilippo, MD*

***University of Pittsburgh School of Medicine***
***University of Pittsburgh***
***Physicians***
***Department of***
***Schedule of Revenue and Expenses Fiscal Year 2018***
***Budget***

| | University | UPP | Total Budget FY 2018 |
|---|---|---|---|
| ***Revenue*** | | | |
| Patient Care | $ - | $ 77,637,672 | $ 77,637,672 |
| Grant: | | | |
| Directs | $ 6,364,186 | $ 372,140 | $ 6,736,326 |
| Indirects | $ 2,104,463 | | $ 2,104,463 |
| Hospital Contract | | $ 37,081,956 | $ 37,081,956 |
| School of Medicine | $ 484,040 | | $ 484,040 |
| VAMC | | $ 373,132 | $ 373,132 |
| Other | $ 4,190,125 | $ 706,579 | $ 4,896,704 |
| ***Total Revenue*** | $ 13,142,815 | $116,171,479 | $129,314,294 |
| ***Expenses*** | | | |
| Salaries and Fringe Benefits: | | | |
| Faculty | $ 9,218,253 | $ 63,261,631 | $ 72,479,884 |
| Non-Faculty | $ 2,125,048 | $ 30,987,427 | $ 33,112,475 |
| Malpractice Insurance | | $ 6,349,218 | $ 6,349,218 |
| Space Rental | $ 120,000 | $ 5,441,323 | $ 5,561,323 |
| UPP Overhead | | $ 5,430,077 | $ 5,430,077 |
| University Overhead | $ 1,172,472 | | $ 1,172,472 |
| Other Operating Expenses | $ 920,313 | $ 12,350,890 | $ 13,271,203 |
| ***Total Operating Expenses*** | $ 13,556,086 | $123,820,566 | $137,376,652 |
| ***Excess Revenue over Expenses*** | $ (413,271) | $ (7,649,087) | $ (8,062,359) |
| ***Capital Equipment/Improvements*** | $ - | | |
| ***Fund Balances*** | | | |
| University Restricted Accounts *as of* 6/30/17 | $ - | | |
| University Endowments *as of* 6/30/17 | | | |
| UPP Fund Balance *as of* 6/30/17 | | $ 19,936,775 | |
| UPMC Endowments as of 6/30/17 | | $ 8,914,577 | |
| UPMC SPF Accounts *as of* 6/30/17 | | $ 70,782 | |
| ***Total Fund Balances*** | $ - | $ 28,922,134 | |