THE WESTERN ASSOCIATION OF GYNECOLOGIC ONCOLOGISTS

Forty-Sixth Annual Meeting

JUNE 14-17, 2017

RITZ-CARLTON RANCHO MIRAGE
RANCHO MIRAGE, CALIFORNIA
WAGO Program Book Table of Contents

1. WAGO Program Committee and Officers
2. Past Presidents
3. 2016 Award Winners
4. WAGO Lunch & Learn
5. Schedule of Events (contains hyperlinks to presentation and abstract details)
6. Continuing Medical Education
7. Poster Presentation Numbers (contains hyperlinks to abstract details)
8. Oral Presentations
9. Poster Presentations
10. McMeekin Travel Scholars
11. Exhibitors
12. Save the Date
13. Acknowledgements
2017 Program Committee

Joseph Lucci III, MD, Program Chair
Brian Slomovitz, MD
Robert Coleman, MD
Lydia Roman, MD
Maryilyn Huang, MD
Koenraad DeGeest, MD, FACOG
Michael McHale, MD
Leslie Randall, MD
Michael Goodheart, MD
Katherine Moxley, MD
Edward Kost, MD
Yevgeniya Ioffe, MD, FACOG
Wui-Jon Koh, MD
Bobbie Gostout, MD

2016-2017 WAGO Officers

President                  Bradley Monk, MD
President-Elect            Joseph Lucci III, MD
Vice President            Randall Gibb, MD
Secretary-Treasurer        Lee-May Chen, MD
Past President             Illana Cass, MD
Member-at-Large            Lowell Byers, MD
Member-at-Large            Kathleen Moore, MD
WAGO Past Presidents

- James F. Nolan, MD 1970 - 1971
- J. George Moore, MD 1972 - 1973
- Duane E. Townsend, MD 1973 - 1974
- William E. Lucas, MD 1974 - 1975
- Leo D. Lagasse, MD 1975 - 1976
- David C. Figge, MD 1976 - 1977
- C. Paul Morrow, MD 1977 - 1978
- Philip J. DiSaia, MD 1978 - 1979
- Gary H. Johnson, MD 1979 - 1980
- Edward W. Savage, MD 1980 - 1981
- McClure L. Smith, MD 1981 - 1982
- Samuel Ballon, MD 1982 - 1983
- Robert Hilgers, MD 1983 - 1984
- Francis J. Major, MD 1984 - 1985
- Watson G. Watring 1985 - 1986
- Leo B. Twiggs, MD 1986 - 1987
- Michael L. Berman, MD 1987 - 1988
- Earl Surwit, MD 1988 - 1989
- Conley Lacey, MD 1989 - 1990
- Karl Podratz, MD, PhD 1990 - 1991
- Jonathan S. Berek, MD 1991 - 1992
- James A. Roberts, MD 1992 - 1993
- A. Dennis DePetrillo, MD 1993 – 1994
- Benjamin E. Greer, MD 1994 - 1995
- Patricia S. Braly, MD 1995 - 1996
- Alberto Manetta, MD 1996 - 1997
- Christopher J. Jolles, MD 1997 - 1998
- Anthony (Tim) Russell, MD 1998 - 1999
- Richard E. Buller, MD, PhD 1999 - 2000
- Nelson Teng, MD, PhD 2000 - 2001
- Barrie Anderson, MD 2001 - 2002
- Hisham K. Tamimi, MD 2002 – 2003
- Beth Y. Karlan, MD 2003 - 2004
- Joan Walker, MD 2004 – 2005
- Sidney Scudder, MD 2005 – 2006
- David Miller, MD 2006 – 2007
- Gary Leiserowitz, MD 2008 - 2009
- William R. Robinson, MD 2009 – 2010
- Barbara Goff, MD 2010 – 2011
- D. Scott McMeekin, MD 2011 – 2012
- Bobbie Gostout, MD 2012 – 2013
- Bethan Powell, MD 2013 – 2014
- Susan Davidson, MD 2014 – 2015
- Illana Cass, MD 2015 – 2016
2016 Award Winners for Outstanding Papers

J. G. MOORE AWARD
Best Basic Science Presentation by a Resident/Fellow
Inactivation of the Tumor Suppressor BRCA1 Interacting Protein C-terminal Helicase 1 (BRIP1)
Gene Confers Increased Susceptibility to Platinum Antineoplastic Agents and Augments the
Synergistic Response to Poly (ADP-ribose) Polymerase (PARP) Inhibition
in Ovarian Epithelial Cells
Marcia Ciccone, MD
USC Norris Comprehensive Cancer Center, Keck School of Medicine

LEO D. LAGASSE AWARD
Best Clinical Presentation by a Resident/Fellow
Impact of a Surgical Site Infection Prevention Bundle
in Women Undergoing Cytoreductive Surgery for Ovarian Cancer
Melissa Lippitt, MD
John Hopkins Medicine

JAMES F. NOLAN AWARD
Best Presentation by a WAGO Member
Risk Reducing Salpingooophorectomy Versus Ovarian Preservation
Among BRCA Mutation Carriers
Lee-May Chen, MD
University of California, San Francisco

BEST POSTER AWARD
Impact of sentinel node approach to endometrial cancer on fellowship training
Amanika Kumar, MD
Mayo Clinic
WAGO invites you to attend the
Lunch & Learn
Molecular Tumor Board; Why and How to Implement

Thursday, June 15, 2017
Salon 3 & 4, Ritz-Carlton
12:00 p.m. – 1:30 p.m.

The luncheon is being supported by Foundation Medicine and Clovis; however, the supporters have had no influence on the planning, implementation or evaluation of this educational activity.

Session title: Molecular Tumor Board; Why and How To Implement

12:00 PM – 12:10 PM  Welcome Remarks

12:10 PM – 12:20 PM  What Tools are Available for the Molecular/Genetic Analysis of Tumors? – Katherine Moxley, MD

12:20 PM – 12:40 PM  Ovarian Cancer – PARP Inhibitors – Kathleen Moore, MD, Robert Coleman, MD

12:30 PM - 1:00 PM  Endometrial Cancer – Katherine Moxley, MD, Kathleen Moore, MD

1:00 PM – 1:20 PM  Rare Tumor – Joseph Lucci, MD, Robert Coleman, MD

1:20 PM – 1:30 PM  Question & Answer
# Schedule of Events

**Western Association of Gynecologic Oncologists Annual Meeting**  
**June 14-17, 2017**  
**Ritz-Carlton Rancho Mirage, Rancho Mirage, CA**

**Course Description:**
The 2017 WAGO Annual Meeting will be held in conjunction with the Felix Rutledge Society at the Ritz-Carlton, Rancho Mirage in Rancho Mirage, California. This year's program includes scientific abstracts to allow attendees to understand new advancements in gynecologic cancers and to better understand advancements and treatment options in gynecologic cancers.

The meeting will provide two and a half days of broad continuing education with an emphasis on gynecologic oncology.

**Course Objectives:**
At the conclusion of the course, participants will be able to measure their participation based on the objectives indicated for each abstract presentation. Please see below for specific objectives germane to the presentation content below. In addition, participants will be able to analyze contemporary research findings in the prevention and screening for various gynecologic cancers while implementing them into their practice as well as assess the implications for future research and clinical practice of new developments in gynecologic cancers.

**Target Audience:**
Gynecologic Oncologists, Radiation Oncologists/Radiation Therapists, Medical Oncologists, Residents and Fellows.

### Wednesday, June 14, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Function</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00pm - 6:00pm</td>
<td>Exhibits Set-up</td>
<td>Salon 1&amp;2</td>
</tr>
<tr>
<td>4:00pm - 6:00pm</td>
<td>Poster Set-up</td>
<td>Salon 1&amp;2 &amp; Foyer</td>
</tr>
<tr>
<td>4:00pm - 7:00pm</td>
<td>Conference Registration</td>
<td>Ballroom Foyer</td>
</tr>
<tr>
<td>6:30pm - 8:00pm</td>
<td>Welcome Reception</td>
<td>Ballroom Terrace</td>
</tr>
</tbody>
</table>

### Thursday, June 15, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Function</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00am - 12:00pm</td>
<td>Conference Registration</td>
<td>Ballroom Foyer</td>
</tr>
<tr>
<td>7:00am - 8:00am</td>
<td>Continental Breakfast</td>
<td>Salon 1&amp;2</td>
</tr>
<tr>
<td>7:00am - 12:00pm</td>
<td>Exhibits</td>
<td>Salon 1&amp;2</td>
</tr>
<tr>
<td>7:00am - 12:00pm</td>
<td>Poster Hall</td>
<td>Salon 1&amp;2 &amp; Foyer</td>
</tr>
<tr>
<td>8:00am - 8:10am</td>
<td>Opening Remarks, Presidential &amp; Program Chair Welcome</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:10am - 10:00am</td>
<td>Scientific Session I</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:10am - 8:20am</td>
<td>Abstract 1: Choosing Wisely: Decreasing the incidence of perioperative blood transfusions in gynecologic oncology; Lauren Prescott, MD, MPH, MD Anderson Cancer Center</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:20am - 8:25am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
</tbody>
</table>
### Thursday, June 15, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Abstract/Moderator</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:25am - 8:35am</td>
<td><strong>Abstract 1</strong> Learning Objective: Define the choosing wisely campaign. Identify the benefits of a restrictive transfusion strategy. Describe how to implement a restrictive transfusion policy.</td>
<td></td>
</tr>
<tr>
<td>8:35am - 8:40am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:40am - 8:50am</td>
<td><strong>Abstract 2</strong> Learning Objective: Determine progression free, recurrence specific and overall survival in obese patients receiving weight based chemotherapy. Determine the effect of obesity on complications and overall survival in patients with gynecologic malignancies.</td>
<td></td>
</tr>
<tr>
<td>8:50am - 8:55am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:55am - 9:05am</td>
<td><strong>Abstract 3</strong> Learning Objective: To identify the rate of HPV vaccination completion for cancer prevention among adolescents and young women within and between ethnicity groups</td>
<td></td>
</tr>
<tr>
<td>9:05am - 9:10am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:10am - 9:20am</td>
<td><strong>Abstract 4</strong> Learning Objective: Learners will be able to assess potential utility and safety of DOACs in the treatment of VTEs in gynecologic cancer patients.</td>
<td></td>
</tr>
<tr>
<td>9:20am - 9:25am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:25am - 10:25am</td>
<td>Invited Lecturer: ASCO Update: Kathleen Moore, MD</td>
<td></td>
</tr>
<tr>
<td>10:25am - 11:00am</td>
<td>Break &amp; View Posters</td>
<td>Salon 1&amp;2 &amp; Foyer</td>
</tr>
<tr>
<td>11:00am - 12:00pm</td>
<td>Scientific Session II Moderators: Katherine Moxley, MD &amp; Lynda Roman,</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:00am - 11:10am</td>
<td><strong>Abstract 5</strong> Learning Objective: Learners will identify the changes in cognition over time after surgical menopause. Learners will observe the impact of hormone replacement therapy on cognition after surgical menopause</td>
<td></td>
</tr>
<tr>
<td>11:10am - 11:15am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:15am - 11:25am</td>
<td><strong>Abstract 6</strong> Learning Objective: Identify the reasons for lack of HPV vaccine initiation in adolescent boys in the US.</td>
<td></td>
</tr>
<tr>
<td>11:25am - 11:30am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:30am - 12:30pm</td>
<td><strong>Abstract 7</strong> Learning Objective: Learners will be able to describe the utility of various cervical cancer screening methods as well as a management algorithm adapted for use in low resource settings.</td>
<td></td>
</tr>
</tbody>
</table>
### Thursday, June 15, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Abstract/Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30am - 11:40am</td>
<td>Abstract 8: Feasibility of Integrated PET/MRI and PET/CT Imaging for Gynecological Malignancies; Melissa Schwartz, MD, Icahn School of Medicine at Mount Sinai</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:40am - 11:45am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:45am - 11:55am</td>
<td>Abstract 9: Ethnic Disparities in Screening, Treatment and Outcomes in Women with Cervical Carcinoma; Kelly Davis, MD Tulane University School of Medicine</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:55am - 12:00pm</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
</tbody>
</table>

**Abstract 8 Learning Objective:** Identify situations in which FDG-PET/MRI might be a useful adjunct to staging of gynecologic malignancies.

**Abstract 9 Learning Objective:** Demonstrate whether racial disparities exist in time from diagnosis to treatment of cervical cancer. Demonstrate racial disparities in utilization of appropriate healthcare screening. Demonstrate racial differences in treatment outcomes.

<table>
<thead>
<tr>
<th>Time</th>
<th>CME Lunch &amp; Learn: Molecular Tumor Board; Why and How to Implement</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00pm - 1:30pm</td>
<td>CME Lunch &amp; Learn: Molecular Tumor Board; Why and How to Implement</td>
<td>Salon 3&amp;4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Networking Event – Palm Springs Aerial Tramway</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00pm – 4:30pm</td>
<td>Networking Event – Palm Springs Aerial Tramway</td>
<td>Ritz-Carlton Lobby Entrance</td>
</tr>
</tbody>
</table>

### Friday, June 16, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Abstract/Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00am - 1:30pm</td>
<td>Registration</td>
<td>Ballroom Foyer</td>
</tr>
<tr>
<td>7:00am - 8:00am</td>
<td>Continental Breakfast</td>
<td>Salon 1&amp;2</td>
</tr>
<tr>
<td>7:00am – 1:30pm</td>
<td>Exhibit Hall</td>
<td>Salon 1&amp;2</td>
</tr>
<tr>
<td>7:00am - 1:30pm</td>
<td>Poster Hall</td>
<td>Salon 1&amp;2 &amp; Foyer</td>
</tr>
<tr>
<td>8:00am - 10:00am</td>
<td>Scientific Session III Moderators: Robert Coleman, MD &amp; Bobbie Gostout, MD</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:00am - 8:10am</td>
<td>Abstract 10: Favorable tumor immunophenotype is associated with homologous recombination deficiency in ovarian carcinoma; Christopher Morse, MD, University of Washington</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:10am - 8:15am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
</tbody>
</table>

**Abstract 10 Learning Objective:** Define the tumor immunophenotype among a cohort of patients with ovarian carcinoma. Relate the presence of tumor infiltrating lymphocytes to homologous recombination deficiency.

<table>
<thead>
<tr>
<th>Time</th>
<th>Abstract/Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:15am - 8:25am</td>
<td>Abstract 11: Mechanism of tumor suppressor miRNA let-7 downregulation in ovarian cancer; transcription factor Snail represses let-7 and is associated with invasiveness phenotype; Yevgeniya Ioffe, MD, Loma Linda University School of Medicine</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:25am - 8:30am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
</tbody>
</table>

**Abstract 11 Learning Objective:** Identify mechanisms of metastatic progression of ovarian cancer. Identify potential therapeutic targets for treating metastatic disease in ovarian cancer. Illustrate cancer stem phenotype of metastatic ovarian cancer.

<table>
<thead>
<tr>
<th>Time</th>
<th>Abstract/Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30am - 8:40am</td>
<td>Abstract 12: Pretty Fly for GPI: Altered Carbohydrate Metabolism in Ovarian Cancer; Rebecca Previs, MD, MD Anderson Cancer Center</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:40am - 8:45am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
</tbody>
</table>

**Abstract 12 Learning Objective:** Define GPI role in ovarian cancer cell metabolism.

<table>
<thead>
<tr>
<th>Time</th>
<th>Abstract/Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:45am - 8:55am</td>
<td>Abstract 13: Carboplatin synergizes with CA125-targeted TRAIL variant Meso64-TR3 via death receptor, caspase-3 and TNF-α upregulation: a novel targeted therapy for ovarian cancer; James Cripe, MD, Washington University</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:55am - 9:00am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>Time</td>
<td>Event</td>
<td>Abstract/Location</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>9:00am - 9:10am</td>
<td>Abstract 13 Learning Objective: Identify the function of TRAIL on the extrinsic apoptosis pathway. Outline the function of Meso64-TR3. Demonstrate the synergy of carboplatin with TRAIL based therapeutics in ovarian cell lines.</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:10am - 9:15am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:15am - 9:25am</td>
<td>Abstract 14 Learning Objective: Compare PARP inhibitors for maintenance therapy in platinum-sensitive ovarian cancer from cost-effectiveness perspective.</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:25am - 9:30am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:30am - 9:40am</td>
<td>Abstract 15 Learning Objective: Describe the relevance of homologous recombination repair defects to ovarian cancer development, progression and treatment. Characterize BRIP1 and BRCA1 mutations in ovarian epithelial cells in 2-D adherent and 3-D spheroid culture models with regard to functional differences in proliferative capacity and chemosensitivity. Recognize the potential clinical impact of the cancer stem cell-like phenotype as it contributes to therapeutic resistance.</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:40am - 9:45am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:45am - 9:45am</td>
<td>Abstract 17 Learning Objective: Describe the first preclinical studies using a retroviral replicating vector carrying a suicide gene for the treatment of ovarian cancer.</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:45am - 10:30am</td>
<td>Break &amp; View Posters</td>
<td>Salon 1&amp;2 &amp; Foyer</td>
</tr>
<tr>
<td>10:00am - 10:40am</td>
<td>Scientific Session IV Moderators: Koenraad De Geest, MD &amp; Yevgeniya Ioffe, MD, FACOG</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>10:40am - 10:45am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>10:45am - 11:00am</td>
<td>Abstract 18 Learning Objective: The learner will be able to determine the toxicity and tolerability of olaparib in older women with advanced recurrent ovarian cancer.</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:00am - 11:45am</td>
<td>Abstract 19 Learning Objective: Identify signatures of genomic rearrangements in high grade serous ovarian carcinoma (HGSOC). Describe relationships between genomic rearrangement signatures and BRCA1 mutation status. Describe relationships between genomic rearrangement signatures and overall survival.</td>
<td>Salon 3&amp;4</td>
</tr>
</tbody>
</table>
### Friday, June 16, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00am - 11:10am</td>
<td><strong>Abstract 20: Imaging Biomarkers of Adiposity and Sarcopenia as Potential Predictors for Overall Survival Among Patients with Endometrial Cancer Treated with Bevacizumab; Jessica Gillen, MD, The University of Oklahoma</strong></td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:10am - 11:15am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:15am - 11:25am</td>
<td><strong>Abstract 21: Germline BRCA mutation rate in Southern California Latina women; Linda Hong, MD, Loma Linda University Medical Center</strong></td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:25am - 11:30am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:30am - 11:40am</td>
<td><strong>Abstract 22: Co-expression of the Hypoxic Marker Carbonic Anhydrase 9 (CA-IX) with Breast Cancer Associated 1 (BRCA1) is associated with faster recurrence in High Grade Serous Adenocarcinoma; Adam Krieg, PhD, Oregon Health &amp; Science University</strong></td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:40am - 11:45am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>11:45am - 12:45pm</td>
<td><strong>Abstract 23: Inhibition of the Receptor Tyrosine Kinase AXL Sensitizes Uterine Serous Cancer to Paclitaxel via Increased Accumulation of Paclitaxel in Tumor Cells; Jeanne Quinn, BS, Washington University in Saint Louis School of Medicine</strong></td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>12:05pm - 12:10pm</td>
<td>Case 1: by Henry Reyes, MD</td>
<td>Salon 3 &amp; 4</td>
</tr>
<tr>
<td>12:11pm - 12:15pm</td>
<td>Case 2: by Varvara Mazina, MD</td>
<td>Salon 3 &amp; 4</td>
</tr>
<tr>
<td>12:25pm - 12:30pm</td>
<td>Case 3: by Danielle Chau, MD</td>
<td>Salon 3 &amp; 4</td>
</tr>
<tr>
<td>12:45pm - 1:30pm</td>
<td><strong>Presidential Lectureship: Ovarian Cancer: State of the Science; Michael Birrer, MD, PhD</strong></td>
<td>Salon 3 &amp; 4</td>
</tr>
<tr>
<td>6:30pm - 8:00pm</td>
<td><strong>WAGO President's Reception</strong></td>
<td>Vista Lawn</td>
</tr>
<tr>
<td>Time</td>
<td>Abstract</td>
<td>Location</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>8:15am - 8:25am</td>
<td>Abstract 24: Identification of Clinical-Molecular Characteristics Associated with Recurrent Endometrial Cancer; Andreea Newston, MD, University of Iowa Hospitals and Clinics</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:25am - 8:30am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:30am - 8:40am</td>
<td>Abstract 25: Treatment with SQ1274, a Novel Tubulin Polymerization Inhibitor, Results in Improved Therapeutic Efficacy Compared to Paclitaxel in Serous Gynecologic Cancers; Kathryn Mills, MD, Washington University School of Medicine</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:40am - 8:45am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:45am - 8:55am</td>
<td>Abstract 26: Clinical and Genomic Differences by Loss of Heterozygosity Status in Recurrent Ovarian Cancer; Laura Holman, MD, The University of Oklahoma Health Sciences Center</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>8:55am - 9:00am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:00am - 9:10am</td>
<td>Abstract 27: High Rates of Minimally Invasive Hysterectomy Surgery for Endometrial Cancer at National Comprehensive Cancer Network Centers Jennifer Bergstrom, MD, Johns Hopkins Hospital</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:10am - 9:15am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:15am - 9:25am</td>
<td>Abstract 28: Risk of metachronous ovarian cancer after ovarian conservation in young women with stage I endometrioid endometrial cancer; Koji Matsuo, MD, PhD, University of Southern California</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:25am - 9:30am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:40am - 9:45am</td>
<td>Abstract 29: Patient Satisfaction After Open Gynecologic Oncology Surgery With Enhanced Recovery Pathway; Natsai Nyakudarika, MD, University of California, San Francisco</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:30am - 9:40am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:45am - 9:55am</td>
<td>Abstract 30: A cost-effectiveness analysis of universal testing for Lynch syndrome in endometrial carcinoma; Joseph Dottino, MD, MPH, MD Anderson Cancer Center</td>
<td>Salon 3&amp;4</td>
</tr>
<tr>
<td>9:55am - 10:00am</td>
<td>Question &amp; Answer</td>
<td>Salon 3&amp;4</td>
</tr>
</tbody>
</table>

**Abstract 24 Learning Objective:** Identify independent (a) clinical factors and (b) molecular factors associated with recurrent endometrial cancer. Identify two main clinical-molecular clusters of recurrent endometrial cancer. Describe significance of these two main clusters in terms of both risk and implications for treatment in recurrent endometrial cancer.

**Abstract 25 Learning Objective:** Identify a potential novel chemotherapeutic agent SQ1274. Categorize potential pathways responsible for serous gynecologic cancer cells’ ability to escape cellular apoptosis when exposed to SQ1274.

**Abstract 26 Learning Objective:** Learners will identify clinical and genomic differences by loss of heterozygosity status in ovarian cancer patients.

**Abstract 27 Learning Objective:** Discuss surgical quality measures in endometrial cancer care as defined by the Society of Gynecologic Oncology, American College of Surgeons Commission on Cancer and the National Comprehensive Cancer Network (NCCN). Define MIS hysterectomy rates and identify factors associated with failure to perform MIS hysterectomy and with perioperative complications in endometrial cancer care performed at high volume NCCN centers. Determine whether previously defined racial and hospital-based disparities in surgical care in endometrial cancer exist at NCCN centers.

**Abstract 28 Learning Objective:** To describe the incidence of metachronous ovarian cancer after ovarian conservation in endometrial cancer. To identify the risk factor of metachronous ovarian cancer after ovarian conservation in endometrial cancer.

**Abstract 29 Learning Objective:** Assess the advantages of an enhanced recovery pathway in a healthcare system that stresses cost, value, and quality.

**Abstract 30 Learning Objective:** Identify current accepted testing guidelines for Lynch Syndrome in endometrial carcinoma patients and rationale. Justify supporting universal Lynch Syndrome screening practices in endometrial cancer patients. Demonstrate cost modeling as a tool for exploring potential changes in clinical practice around Lynch Syndrome screening in endometrial cancer.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00am - 10:30am</td>
<td>Break &amp; View Posters</td>
<td>Salon 1&amp;2 &amp; Foyer</td>
</tr>
</tbody>
</table>
| 10:30am - 12:00pm | Scientific Session VI  
Moderator: Leslie Randall, MD | Salon 3&4          |
| 10:30am - 10:40am | Abstract 31: Factors Associated with Increased Narcotic Usage after Undergoing Robotic Assisted Laparoscopy; Andrea Moreno, MD, Phoenix Integrated Residency in Obstetrics and Gynecology | Salon 3&4          |
| 10:40am - 10:45am | Question & Answer                                                      | Salon 3&4          |
| 10:45am - 10:55am | Abstract 32: Survival across lines of therapy in uterine leiomyosarcoma; Camille Gunderson, MD, MS, University of Oklahoma Health Sciences Center | Salon 3&4          |
| 10:55am - 11:00am | Question & Answer                                                      | Salon 3&4          |
| 11:00am - 11:10am | Abstract 33: Discrepancies in outside pathology slide review of uterine neoplasms; Carolyn Haunschild, MD, Stanford Hospital | Salon 3&4          |
| 11:10am - 11:15am | Question & Answer                                                      | Salon 3&4          |
| 11:15am - 11:25am | Abstract 34: Robotic-assisted Gynecologic Surgery in an Elderly Population: A Comparison Study; Elise Vo, MD, St. Joseph Hospital and Medical Center | Salon 3&4          |
| 11:25am - 11:30am | Question & Answer                                                      | Salon 3&4          |
| 11:30am - 11:40am | Abstract 35: Adjuvant Therapy for Grade 3, Deeply Invasive Endometrioid Adenocarcinoma of the Uterus; Michaela Onstad, MD, MPH, MD Anderson Cancer Center | Salon 3&4          |
| 11:40am - 11:45am | Question & Answer                                                      | Salon 3&4          |
| 11:45am - 11:55am | Abstract 36: Effect of Diabetes and Metformin on Uterine Risk Factors in Type 2 Endometrial Cancers; Iman Alsaden, MD, University of Chicago | Salon 3&4          |
| 11:55am - 12:00pm | Question & Answer                                                      | Salon 3&4          |
| **Conference Adjourns** |                                                                      |                   |

**Abstract 31 Learning Objective:** Describe factors associated with increased usage of narcotic medication when undergoing a laparoscopic assisted procedure in gynecologic surgery. To identify if pain medication usage is related to length of stay, type of procedure, duration of case, co-morbidities, etc.

**Abstract 32 Learning Objective:** Learners will be able to evaluate the life cycle of uLMS and identify the variety of treatment strategies utilized in each phase of relapse.

**Abstract 33 Learning Objective:** Learners will be able to quantify the discrepancy rates of outside slide review of uterine neoplasms. Learners will be able to discuss the clinical impact of pathology review by pathologists who specialize in diagnosing gynecologic neoplasms.

**Abstract 34 Learning Objective:** Illustrate similar complication rates of robotic surgery between patients 65 years old and younger, and older than 65 years.

**Abstract 35 Learning Objective:** Compare outcomes of adjuvant therapy strategies for grade 3 deeply invasive endometrial cancer. Justify the performance of lymph node evaluation in grade 3 endometrial cancer. Identify the high rates of nodal positivity in grade 3 deeply invasive endometrial cancer.

**Abstract 36 Learning Objective:** Describe the effect of diabetes and metformin on uterine risk factors in type 2 endometrial cancers.
The following presenters have noted that they have no commercial relationships to disclose:

Crystal L. Adams, MD
Iman Alsaden, MD
Dominique m Barnes, MD
Anna L. Beavis, MD, MPH
Jennifer Bergstrom, MD
Megan Buechel, MD
Sigita Cahoon, MD
Heidi Yi-Shin Chang, MD
Sara Collins, MD
Lesley B. Conrad, MD
James Cripe, MD
Brittany Davidson, MD
Kelly Ann Davis, MD
Lauren Dockery, MD
Joseph Dottino, MD, MPH
Sean Dowdy, MD
Alexandra H. Freeman, MD
Jessica Gillen, MD
Carolyn Haunschild, MD
Robert Tyler Hillman, MD
Laura Holman, MD, MS
Linda Hong, MD
Yevgeniya Ioffe, MD, FACOG
Priyanka Kamath, MD
Adam Krieg, PhD
Annie Y. Liu, MD
Koji Matsuo, MD, PhD
Kathryn A Mills, MD
Andrea Moreno, MD
Christopher B Morse, MD
Andreea Mihai Newton, MD
Natsai Charlene Nyakudarika, MD
Michaela Onstad, MD
Victoria B. Perkins, MD
Lauren Prescott, MD, MPH
Rebecca Ann Previs, MD
Jeanne Quinn, BS
Melissa Schwartz, MD
William P. Tew, MD
Elise Vo, MD
Heather Renee Williams, MD
The following speakers have disclosed financial relationships with commercial interest (as listed) that have been resolved through WAGO’s & SGO’s Conflict of Interest Resolution Policy:

Camille Gunderson, MD  Advisory Board, Clovis

Kathleen Moore, MD  Advisory Board, Amgen, Astra Zeneca, Genentech/Roche, Clovis, Immunogen, Merrimack, VBL Therapeutics, Janssen; Steering Committee, Immunogen, Advaxis

Relevant relationship with a commercial interest organization exists. The relevant relationship with the commercial interest organization was evaluated by the program committee and determined to not be specific to the content of the educational activity. No resolution required.

The following WAGO Program Committee members disclosed no financial relationships:

Lydia Roman, MD
Maryilyn Huang, MD
Koenraad DeGeest, MD, FACOG
Michael McHale, MD
Leslie Randall, MD
Michael Goodheart, MD
Katherine Moxley, MD
Edward Kost, MD
Yevgeniya Ioffe, MD, FACOG
Wui-Jon Koh, MD
Bobbie Gostout, MD

The following WAGO Program Committee members have disclosed financial relationships with commercial interest (as listed) that have been resolved through WAGO’s & SGO’s Conflict of Interest Resolution Policy:

Joseph Lucci III, MD  AstraZeneca, PI on Clinical Trial, PARP Inhibitor Trial

Robert Coleman, MD  Clovis, Research Grant, Abbvie, Research Grant, AstraZeneca, Research Grant

Brian Slomovitz, MD  Advaxis, Consulting, AstraZeneca, Advisory Board, Clovis, Advisory Board

Relevant relationship with a commercial interest organization exists. In most cases, the relevant relationship with the commercial interest organization was evaluated by the program committee and determined to not be specific to the content of the educational activity. No resolution required. In the cases in which the financial relationship may relate to relevant content, the Program Committee members recused themselves from abstract review and/or discussion of topics relevant to their financial relationships completely.
Non Endorsement
WAGO/SGO does not endorse any products or services that are displayed or referred to in conjunction with this activity and are not responsible for the actual presentation of content during scientific sessions.

Policy on Disclosures
WAGO strives to ensure balance, independence, objectivity and scientific rigor in all of its educational programs. All planners, faculty members, moderators, discussants, panelist and presenters participating in this program have been required to disclose any real or apparent conflict(s) of interest that may have a direct bearing on the subject matter of this program. This includes relationships with pharmaceutical companies, biomedical device manufacturers or other corporations whose products or services are related to the subject matter of the presentation topic. The intent of this policy is to identify openly any conflict of interest so that the attendees may form their own judgments about the presentation with full disclosure of the facts. In addition, faculty is expected to openly disclose any off-label, experimental and/or investigational uses of drugs or devices in their presentation. Disclosures, Conflict of Interest (COI) and Resolution of COI policies are available via the printed program.

Joint Accreditation
The Society of Gynecologic Oncology is accredited by the Accreditation Council for Continuing Medical Education (ACCME) and the American Nurses Credentialing Center (ANCC) to provide continuing education for the healthcare team. However, currently we are not approved to provide credit by the Accreditation Council for Pharmacy Education (ACPE). SGO designates this educational activity for a maximum of 11.00 AMA PRA Category 1 Credits™ and a maximum of 10.75 ANCC contact hours.

CE Compliance
SGO has earned full accreditation from the Joint Accreditation Council, which includes the ACCME, ACPE, and ANCC. Acquiring this status ensures that SGO’s educational activities and products are free from commercial bias and based on valid content by the healthcare team for the healthcare team. Activities that are designated with CME/CNE credit assure the medical community and the public that such activities provide medical practitioners with information that can assist them in maintaining or improving their practice of medicine. An important element of Joint Accreditation compliance is disclosing and and resolving any potential conflicts of interest between a presenter and a corporate entity. Policies approved by the SGO Board of Directors state that all individuals participating in an accredited continuing medical education activity must disclose any financial relationships. All conflicts will be resolved through a mechanism included in SGO’s Conflict of Interest Resolvtion Policy. Protecting and maintain SGO’s accreditation status is vital for the continued success of SGO’s educational offerings. Activities and products with accreditation attached equate to a fair and balanced educational experience.
Instructions on how to obtain CME Credits
To claim CME credits for your participation in the WAGO Annual Meeting, you must complete an online evaluation. A link to the online evaluation system will be sent to all registered participants who provide a valid email address and attend the activity. This link will be sent at the conclusion of the meeting. Evaluations must be completed by July 14, 2017.

WAGO strives to provide the best education to its members and conference attendees; your feedback provides important information in order to develop future educational offerings.

WAGO Annual Meeting CME Credit Hours

<table>
<thead>
<tr>
<th>Date</th>
<th>Time Frame</th>
<th>Hours</th>
<th>Minutes</th>
<th>CME Credits</th>
<th>CNE Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, June 15, 2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific Session I</td>
<td>8:10 am – 10:00 am</td>
<td>2</td>
<td>110</td>
<td>2</td>
<td>1.75</td>
</tr>
<tr>
<td>Invited Lecturer</td>
<td>9:25 am – 10:25 am</td>
<td>1.00</td>
<td>60</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Scientific Session II</td>
<td>11:00 am – 12:00 pm</td>
<td>1.00</td>
<td>60</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lunch &amp; Learn</td>
<td>12:00 pm – 1:30pm</td>
<td>1.5</td>
<td>75</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Friday, June 16, 2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific Session III</td>
<td>8:00 am – 10:00 am</td>
<td>2.00</td>
<td>120</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Scientific Session IV</td>
<td>10:00 am – 11:45 am</td>
<td>1.25</td>
<td>75</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>Tumor Board</td>
<td>11:45 am – 12:45 pm</td>
<td>1</td>
<td>60</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Presidential Lecturship</td>
<td>12:45 pm – 1:30pm</td>
<td>.75</td>
<td>45</td>
<td>.75</td>
<td>.75</td>
</tr>
<tr>
<td>Saturday, June 17, 2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific Session V</td>
<td>8:00 am – 10:00 am</td>
<td>2</td>
<td>120</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Scientific Session VI</td>
<td>10:30 am – 12:00 pm</td>
<td>1.50</td>
<td>90</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total Meeting</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>14</strong></td>
<td><strong>13.75</strong></td>
</tr>
</tbody>
</table>
## Poster Presentations

<table>
<thead>
<tr>
<th>Poster #</th>
<th>First Name</th>
<th>Abstract Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abigail Zamorano, MD</td>
<td>Compliance After Treatment Is a Major Barrier to the Optimal Treatment of Cervical Cancer in Guatemala</td>
</tr>
<tr>
<td>2</td>
<td>Alexandra Martin, MD</td>
<td>A systematic assessment of Google search queries and readability of online gynecologic oncology patient education materials.</td>
</tr>
<tr>
<td>3</td>
<td>Allison Barrie, MD</td>
<td>Disparities and demographics in sentinel lymph node mapping for endometrial cancer.</td>
</tr>
<tr>
<td>4</td>
<td>Allison Kay, MD</td>
<td>Friend or foe? Intraperitoneal ports placed at the same time as bowel resection: complication rates and outcomes</td>
</tr>
<tr>
<td>5</td>
<td>Allison Kramer</td>
<td>Detection of Chronic Hepatitis B in Gynecologic Oncology Patients Undergoing Systemic Chemotherapy</td>
</tr>
<tr>
<td>6</td>
<td>Alyssa Wield, MD</td>
<td>Aspirin Use Correlates with Survival in Women with Clear Cell Cancers of the Ovary</td>
</tr>
<tr>
<td>7</td>
<td>Amanda Shepherd, MD</td>
<td>Tumor Board and Clinical Hospice Discussions among Elderly, Advanced Stage Gynecology Oncology Patients</td>
</tr>
<tr>
<td>8</td>
<td>Amaranta D. Craig, MD</td>
<td>Focal treatment for high-grade cervical intraepithelial neoplasia: a pilot study</td>
</tr>
<tr>
<td>9</td>
<td>Anna Beavis, MD, MPH</td>
<td>Racial Disparity in the Treatment of Women with Cervical Cancer: Understanding the How and Why</td>
</tr>
<tr>
<td>10</td>
<td>Anna Beavis, MD, MPH</td>
<td>Racial Differences in Reasons for Lack of HPV Vaccine Initiation in Adolescent Girls in the U.S., 2015</td>
</tr>
<tr>
<td>11</td>
<td>Annie Liu, MD</td>
<td>Genomic Alteration Patterns and Incorporation of Comprehensive Genomic Profiling in Management of Patients with Ovarian Carcinoma</td>
</tr>
<tr>
<td>12</td>
<td>Annie Liu, MD</td>
<td>Genomic comparisons between histologic and molecular subtypes of endometrial cancer reveal opportunities for therapeutic crossover</td>
</tr>
<tr>
<td>13</td>
<td>Annie Liu, MD</td>
<td>Impact of Intra-peritoneal Chemotherapy and Bevacizumab in Front Line Chemotherapy for Ovarian Cancer Among gBRCA and wtBRCA Patients: A Multi-Institutional, Frequency Matched, Case Control Study</td>
</tr>
<tr>
<td>14</td>
<td>Benedict Benigno, MD</td>
<td>Evidence for the Importance of Post-transcriptional Regulatory Changes in ovarian cancer metastasis and the contribution of miRNAs</td>
</tr>
<tr>
<td>15</td>
<td>Carolyn Lefkowits, MD</td>
<td>Specialty Palliative Care Rotation Improves Gynecologic Oncology Fellows’ Knowledge, Rates of Explicit Teaching and Perceived Competence in Palliative Care</td>
</tr>
<tr>
<td>16</td>
<td>Chelsea Salyer, MD, MPH</td>
<td>Bone Loss in Women with BRCA1 and BRCA2 Mutations</td>
</tr>
<tr>
<td>17</td>
<td>Christa Dominick, MD</td>
<td>Genomic Profiling of Ovarian Squamous Cell Tumors to Drive Targeted Therapies</td>
</tr>
<tr>
<td>18</td>
<td>Christopher Breed, MD</td>
<td>The role of specialty training in the administration of chemotherapy for women with ovarian cancer</td>
</tr>
<tr>
<td>19</td>
<td>Cici Liu, MD</td>
<td>Correlations Between Stage and Survival When Comparing the International Federation of Gynecology and Obstetrics to the American Joint Committee on Cancer Staging Systems for Locally Advanced Cervical Cancer</td>
</tr>
<tr>
<td>20</td>
<td>Claire Hoppenot, MD</td>
<td>Malignant bowel obstruction in recurrent uterine and ovarian cancer patients</td>
</tr>
<tr>
<td>21</td>
<td>Dominique Barnes, MD</td>
<td>Clinic-based Depression Screening in Gynecologic Oncology Patients using the Patient Health Questionnaires-2 (PHQ-2): are we identifying the highest risk patients?</td>
</tr>
<tr>
<td>22</td>
<td>Dominique Barnes, MD</td>
<td>Patient characteristics associated with obesity in an endometrial cancer patient: first steps towards the design of a weight loss intervention</td>
</tr>
<tr>
<td>23</td>
<td>Elizabeth V. Connor, MD</td>
<td>Predicting Non-Home Discharge in Epithelial Ovarian Cancer Patients: External Validation of a Predictive Model</td>
</tr>
<tr>
<td>24</td>
<td>Emily Zantow, MD</td>
<td>Clinical Factors Associated with Short- and Long-Term Survival in Low Grade Ovarian Carcinoma</td>
</tr>
<tr>
<td>25</td>
<td>Erica Manrriquez, MD</td>
<td>Disparities in Genetics Assessment for Women with Ovarian Cancer</td>
</tr>
<tr>
<td>26</td>
<td>Heather Miller, MD</td>
<td>Utility of Vaginal Vault Cytology in Detection of Recurrent Endometrial Cancer in a Tertiary, Safety Net Health System: an Area for Quality Improvement and Cost Saving</td>
</tr>
<tr>
<td>27</td>
<td>Jaimin Shah, MD</td>
<td>Does Intraoperative Frozen Section Diagnosis Correlate with Final Pathology in Borderline Ovarian Tumors</td>
</tr>
<tr>
<td>28</td>
<td>Jennifer Herrera-Mullar, MGC, CGC, DMA</td>
<td>Role of SMARCA4 Mutations in Ovarian Carcinoma: Preliminary Data from a Laboratory-based Multigene Panel Testing Cohort</td>
</tr>
<tr>
<td>29</td>
<td>Jessica Grubman, MD</td>
<td>Specimen Fragmentation and Outcomes of Loop Electrosurgical Excision Procedures (LEEP) and Cold Knife Cone Biopsies (CKC) for Cervical Dysplasia</td>
</tr>
<tr>
<td>30</td>
<td>Jill Alldredge, MD</td>
<td>Evaluation of PD-1 and PD-L1 levels in clear cell histologic subtypes of ovarian and uterine malignancies and correlation with stage and survival</td>
</tr>
<tr>
<td>31</td>
<td>Jocelyn Chapman, MD</td>
<td>Immunoprofiling epithelial ovarian cancer</td>
</tr>
<tr>
<td>32</td>
<td>Jocelyn Ray, MD, PhD</td>
<td>Overcoming Clear Cell Ovarian Cancer Resistance to Taxol by an Oligo Arginine Transporter Conjugate</td>
</tr>
<tr>
<td>33</td>
<td>Jocelyn Ray, MD, PhD</td>
<td>Down Regulation of MAPK Signaling by Cytotoxic Human Monoclonal Antibody in Epithelial Ovarian Cancer</td>
</tr>
<tr>
<td>34</td>
<td>John Siemon, MD</td>
<td>Preparation in the Business and Practice of Medicine: Perspectives from Graduates and Fellowship Directors</td>
</tr>
<tr>
<td>35</td>
<td>Jordan Mattson, MD</td>
<td>Clinical Factors Important in the Management of Stage II Endometrial Cancer</td>
</tr>
<tr>
<td>36</td>
<td>Jorge L. Alvarado, MD</td>
<td>Improving Documentation of Medical Proxy and Code Status</td>
</tr>
<tr>
<td>37</td>
<td>Kaleigh Lindholm, MD</td>
<td>Immunohistochemical Characterization of Gynecologic Clear Cell Carcinoma</td>
</tr>
<tr>
<td>38</td>
<td>Katelyn Handley, MD</td>
<td>Postoperative Outcomes in Gynecologic Oncology Patients using a Multimodal Analgesia Regimen with Liposomal Bupivacaine</td>
</tr>
<tr>
<td>39</td>
<td>Katharina Laus, MD</td>
<td>Cardiovascular Risk Factors and Their Influence on Stage and Treatment Modalities in Type 2 Endometrial Cancers</td>
</tr>
<tr>
<td>40</td>
<td>Kathryn Mills, MD</td>
<td>Use of Hormone Replacement Therapy After Risk Reducing Salpingo-oophorectomy and Risk of Malignancy in High Risk Genetic Mutation Carriers: A Pilot Study</td>
</tr>
<tr>
<td>41</td>
<td>Kathryn Kennedy, MD</td>
<td>Fertility Preservation in the Setting of Gynecologic Malignancy</td>
</tr>
<tr>
<td>42</td>
<td>Kimberly Dessources, MD</td>
<td>N-Acetylation and Ovarian Cancer: A study of the Metabolomic Profile of Ovarian Cancer Compared to Benign Counterparts</td>
</tr>
<tr>
<td>43</td>
<td>Kiran Clair, MD</td>
<td>Medicaid payer status is associated with increased cancer-related mortality among stage IA cervical cancer patients</td>
</tr>
<tr>
<td>44</td>
<td>Lauren Dockery, MD</td>
<td>Extending the Platinum-Free Interval: The Impact of Omitting 2nd Line Platinum Chemotherapy in Intermediate Platinum-Sensitive Ovarian Cancer</td>
</tr>
<tr>
<td>45</td>
<td>Laurin Cristiano, MD</td>
<td>Bony metastases as identified by PET/CT in early stage and advanced endometrial cancer</td>
</tr>
<tr>
<td>46</td>
<td>Lavanya H. Palavali Parsons, MD</td>
<td>Family History of Cancer Shows Improved Survival in Uterine Papillary Serous Carcinoma</td>
</tr>
<tr>
<td>47</td>
<td>Lesley B. Conrad, MD</td>
<td>Patients with Sarcopenia Benefit from Neoadjuvant Chemotherapy in Advanced Ovarian Cancer</td>
</tr>
<tr>
<td>Page</td>
<td>Author(s), MD</td>
<td>Title</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>48</td>
<td>Lindsey Minion, MD</td>
<td>Preclinical investigation of DNA histone deacetylase inhibition in ovarian cancer.</td>
</tr>
<tr>
<td>49</td>
<td>Mariann Hom, MD</td>
<td>Incidence of Urinary Tract Injury and Utility of Routine Cystoscopy during Total Laparoscopic Hysterectomy for Endometrial Cancer.</td>
</tr>
<tr>
<td>50</td>
<td>Marianne Hom, MD</td>
<td>Intrauterine Manipulator Use During Minimally Invasive Hysterectomy and Risk of Lymphovascular Space Invasion in Endometrial Cancer.</td>
</tr>
<tr>
<td>51</td>
<td>Marina Delazari Miller, MD</td>
<td>A Clinical Prediction Model Stratifies Patients by Risk and Helps with Surgical Staging Decisions in Endometrioid Endometrial Cancers.</td>
</tr>
<tr>
<td>52</td>
<td>Marina Delazari Miller, MD</td>
<td>Single Nucleotide Polymorphism on Codon 72 of the P53 Gene is Significantly Associated with Tumor Grade in Endometrioid Endometrial Cancers.</td>
</tr>
<tr>
<td>53</td>
<td>Marina Delazari Miller, MD</td>
<td>NOTCH2 Expression is Significantly Associated with FIGO Stage at Diagnosis in Endometrioid Endometrial Cancer.</td>
</tr>
<tr>
<td>54</td>
<td>Marina Delazari Miller, MD</td>
<td>A Clinical Prediction Model for Recurrence in Endometrial Cancer.</td>
</tr>
<tr>
<td>55</td>
<td>Megan Buechel, MD</td>
<td>Dedifferentiated Endometrial Adenocarcinoma: Clinicopathologic Factors Associated with an Aggressive Subtype of Endometrial Cancer.</td>
</tr>
<tr>
<td>56</td>
<td>Megan Swanson, MD, MPH</td>
<td>HPV positivity among women in Central Uganda participating in a Community Health Campaign offering self-collected HPV-based cervical cancer screening.</td>
</tr>
<tr>
<td>57</td>
<td>Melinda Zhang, MD</td>
<td>Evaluating the Use of a Modified Mayo Criteria for Early Stage Endometrial Cancer Surgical Staging.</td>
</tr>
<tr>
<td>59</td>
<td>Melissa Javellana, MD</td>
<td>Clinical and Pathologic Characteristics of Long-Term Survivors of Type 2 Endometrial Cancer.</td>
</tr>
<tr>
<td>60</td>
<td>Michelle Kuznicki, MD</td>
<td>Brain metastases from Uterine Cancer: Features, Treatment and Outcomes of a Rare Phenomenon.</td>
</tr>
<tr>
<td>61</td>
<td>Michelle Rowland, MD, PhD</td>
<td>Optimizing Second Line Chemotherapy in Germline BRCA Positive Patients with Platinum Sensitive Recurrent Ovarian Cancer.</td>
</tr>
<tr>
<td>62</td>
<td>Monica Avila, MD</td>
<td>The Use of An Alternative Measurement of Visceral Adiposity to Evaluate Endometrial Cancer Recurrence and Survival.</td>
</tr>
<tr>
<td>63</td>
<td>Robert Dood, MD, MSCE</td>
<td>When Advanced Ovarian Cancer is not Ovarian Cancer: Characteristics and Predictors of non-Ovarian Pathology in a Systematic, Laparoscopic-Based System.</td>
</tr>
<tr>
<td>64</td>
<td>Rosa Guerra, MD</td>
<td>Awareness of HPV Vaccinations and Barriers to Vaccination Administration Among Underserved Women.</td>
</tr>
<tr>
<td>65</td>
<td>Sarah Watson, MD</td>
<td>Prevalence of Sexual Health and Intimacy Concerns in Female Patients Referred to a Comprehensive Cancer Center.</td>
</tr>
<tr>
<td>66</td>
<td>Sarah Simmons, MD</td>
<td>Complete Salpingectomy or Bilateral Tubal ligation: Change in Sterilization Practice in The United States.</td>
</tr>
<tr>
<td>67</td>
<td>Sarah Eckhardt, MD</td>
<td>Single marital status among women with malignancy of the uterine cervix in the United States.</td>
</tr>
<tr>
<td>68</td>
<td>Shannon MacLaughlan David, MD</td>
<td>Therapeutic Ultrasound as a Novel, Non-hormonal Treatment of Vulvovaginal Atrophy: a Pilot Phase II Study.</td>
</tr>
<tr>
<td>69</td>
<td>Tanya Pulver, MD</td>
<td>L1 Cell Adhesion Molecule is a Potential Biomarker for Recurrence and Aggressive Endometrial Cancer Subtypes.</td>
</tr>
<tr>
<td>70</td>
<td>Tiffany Chen, MD</td>
<td>Surgical Staging for Mucinous Borderline Ovarian Tumors.</td>
</tr>
<tr>
<td>71</td>
<td>Victoria Perkins, MD</td>
<td>Comprehensive Genomic Profiling of Rare Female and Lower Genital Tract Malignancies.</td>
</tr>
</tbody>
</table>
ORAL PRESENTATIONS
ABSTRACT #1: Choosing Wisely: Decreasing the incidence of perioperative blood transfusions in gynecologic oncology

L. Prescott, J. Taylor, C. Marten, M. Munsell, K. Myers, L. Meyer, P. Ramirez, C. Levenback, D, Bodurka, K. Schmeler, The University of Texas MD Anderson Cancer Center, Houston, TX

OBJECTIVES: To evaluate the efficacy of a transfusion reduction initiative for patients undergoing gynecologic surgery

METHODS: We implemented a multidisciplinary educational initiative to align transfusion practices with the American Society of Hematology’s Choosing Wisely campaign. This included grand rounds, journal club and small group presentations targeting residents, fellows, nurse practitioners, nurses and faculty at our cancer center about the determents of transfusion and safety of restrictive transfusion practices. Baseline transfusion rates were determined for all major surgical cases performed in the department of gynecologic oncology from 4/1/14 to 6/30/14. Data for the post-intervention period from 5/15/15 to 5/16/16 were captured prospectively. Demographic, perioperative variables and transfusion rates were compared between the baseline and post-intervention cohorts using Chi-square, Fisher exact and Mann-Whitney descriptive statistics. The primary outcome was transfusion rate within 72 hours of surgery.

RESULTS: We identified 1240 patients, 269 in the baseline and 971 in the post-implementation cohort. The baseline cohort was noted to have a statistically, but not clinically lower median preop hgb (12.3 v. 12.5, p = 0.01). Otherwise, there were no differences in clinical characteristics, surgical time, surgical approach, tumor type between the two cohorts. The overall transfusion rate decreased from 23.8% to 11.3%, with a relative risk reduction (RRR) of 52.5%, p < 0.001. Forty-five percent of cases were performed via laparotomy. The transfusion rate for laparotomy decreased from 47.4% to 24.8%, RRR 47.7%, p < 0.001. In our multivariate analysis after adjusting for key clinical and perioperative variables the OR for overall transfusion was 0.28, (95% CI 0.16 – 0.48, p<0.001). The number of occurrences in which more than 1 unit was ordered at a time decreased from 56/88 (63.6%) to 31/110 (28.2%), p = 0.005. The incidence of surgical site infections declined in the post-intervention group (12.6% v 7.4%, p = 0.004). There were no differences in 30-day mortality, cardiac or VTE rates between the groups. Assuming a cost/unit of blood at $274, this intervention lead to an institutional cost savings of $154,536.

CONCLUSIONS: Implementation of an educational based program resulted in substantial reductions in perioperative transfusions without compromising patient safety.

LEARNING OBJECTIVES: Define the choosing wisely campaign. Identify the benefits of a restrictive transfusion strategy. Describe how to implement a restrictive transfusion policy.
ABSTRACT #2: The Effect of Weight Based Chemotherapy Dosing in a Cohort of Gynecologic Oncology Patients: A Follow-Up Study

H. Williams (1), J. Mattson (1), V. Wagner (1), E. Salinas (1), M. McDonald (1), J. Hansen (2), S. Mott (1), J. Stephan (1), M. Goodheart (1)

OBJECTIVES: Chemotherapy is often capped at a maximum body surface area (BSA) of 2 m2. Our institution previously reported that gynecologic cancer patients with a BSA >2 m2 treated with weight based (WB) chemotherapy had no increase in hematologic or non-hematologic toxicities when compared to controls. The aim of our current study was to determine the recurrence-specific and overall survival outcomes of this cohort of patients.

METHODS: A retrospective chart review was performed on patients with BSA >2 m2 who received WB chemotherapy for a gynecologic cancer between January and August 2013. Subjects were matched with two controls: patients with BSA <2 m2 who received WB dosing and patients with BSA >2 m2 who received capped dosing at BSA = 2 m2. The side effect profile of WB versus capped chemotherapy dosing was previously determined on this cohort of patients. We reviewed the charts of the same subjects to determine the effect of chemotherapy dosing on recurrence and survival. Survival probabilities were estimated using the Kaplan-Meier method and compared using the log-rank test.

RESULTS: Survival data was collected for 75 patients. Median length of follow-up was 42.9 months. Median recurrence-specific survival (RSS) for all patients in the WB dosing group was 19.8 months compared to 19.0 months for capped dosing. A significant difference between groups was evidenced at 1-year (p=0.05) but was not sustained long-term (p=0.32). When considering patients with BSA >2, median RSS for the WB group was 24.1 months and 19.0 months for the capped group (p=0.03). No difference in overall survival (OS) was evidenced between the WB and capped groups (p=0.84, median 55.6 vs 69.9 months). When stratified for cancer type, differences in RSS and OS were not significant.

CONCLUSIONS: Weight based chemotherapy has previously been shown to have no increase in hematologic and non-hematologic toxicities. Follow up of these patients indicates that WB dosing demonstrates an improvement in short-term RSS. An OS advantage was not seen with WB compared to capped dosing, although this study may be underpowered to detect meaningful OS differences. Interestingly, the WB chemotherapy dosing appears to be more beneficial to obese patients with a BSA >2. Larger studies may show a survival advantage in this cohort of patients.

LEARNING OBJECTIVES: Determine progression free, recurrence specific and overall survival in obese patients receiving weight based chemotherapy. Determine the effect of obesity on complications and overall survival in patients with gynecologic malignancies.
ABSTRACT #3: Disparities in the Rates of HPV Vaccine Series Completion for Cervical Cancer Prevention

A. H. Freeman (1), C. Gamboa (2), J. Darbinian (3), S. Torrente (1) Kaiser Permanente San Francisco Obstetrics & Gynecology, CA (1), Salud Para La Gente, Watsonville, CA (2), Kaiser Permanente Northern California, Division of Research, Oakland, CA (3)

OBJECTIVES: Vaccination against the human papillomavirus (HPV) is recommended for the prevention of HPV-related diseases, including cervical, vulvar, vaginal, and anal cancers. The HPV vaccine is administered in a series of three injections over a 6-month period. Several cultural barriers to the initiation and completion of vaccination have been suggested. The objective of this study was to determine the rate of HPV vaccination completion and disparities by race/ethnicity as well as age.

METHODS: We conducted a retrospective analysis of women ages 11 to 26 years who received at least one HPV-4 Gardisil vaccine from 2008 through 2012 in a community based health care system in Northern California. Vaccine completion was defined as having received three total doses after vaccine initiation during the study period. Demographic data including age, race/ethnicity, and language preferences were obtained. Among Hispanic women, acculturation was categorized as low or high using written and spoken Spanish versus English language as a proxy. Age groups were defined as: younger adolescents (ages 11 – 14 years), teens (ages 15 – 17 years), and young adults (ages 18-26 years). Bivariate analyses using Chi-square tests and age-adjusted logistic regression was performed.

RESULTS: Among all women who initiated the HPV vaccine (N= 102,052) during the study period, a total of 4,941 (41%) completed the series. Younger adolescents had the highest prevalence of series completion (43.4%, p<0.001) while teens and young adults had a similar completion rates (37.4% vs 38.0%, respectively). By race/ethnicity, Asians had the highest prevalence of series completion (49.5%, 95% CI, 48.7-50.2) and African Americans had the lowest (28.7%; 95% CI, 27.8-29.6). Among Hispanics, the prevalence of vaccine completion was 38.9% (95% CI 38.3-39.5) and the low acculturated group was 1.2 times more likely to complete the series compared to the high acculturated group (AOR 1.23 [95% CI 1.16-1.31]).

CONCLUSIONS: In this diverse Northern California population, the majority of those who initiated vaccination did not complete the series. The rate of HPV vaccine completion for cancer prevention varied by age and race/ethnicity among young women. Within the Hispanic population, the highest acculturated group had the lowest rate of vaccination series completion. Community health efforts should focus on improving health care compliance with culturally sensitive education for diverse populations.

LEARNING OBJECTIVES: To identify the rate of HPV vaccination completion for cancer prevention among adolescents and young women within and between ethnicity groups.
ABSTRACT #4: The use of direct oral anticoagulants for the treatment of venous thromboembolism in patients with gynecologic malignancies

Perkins V., Buechel M., Toal C., Gunderson C.C., Zhao D., Moore K.N., Holman L.L.

OBJECTIVES: Venous thromboembolism (VTE) is a significant cause of morbidity and mortality in cancer patients. The current standard of care is low molecular weight heparin (LMWH), which is costly and inconvenient for patients. Direct oral anticoagulants (DOACs) inhibit either factor Xa or thrombin directly, and provide an opportunity for treatment of VTE without need for frequent monitoring or injections. However, these oral medications have not been well studied in cancer populations. This study aims to investigate the safety and efficacy of DOACs in patients with gynecologic malignancies.

METHODS: A retrospective, IRB-approved, review of patients with gynecologic malignancies treated with DOACs or LMWH for a known or presumed VTE between 2010 and 2017 was performed. Patients without adequate data in the medical record or those who received warfarin for treatment of their VTE were excluded. Rates of recurrence or progression of VTE and rates of bleeding between LMWH and DOAC were compared using the Fisher’s exact test. Time to recurrence or progression of VTE was tested between LMWH and DOACs using the log-rank test.

RESULTS: A total of 47 patients met inclusion criteria. Of these, 55% had ovarian cancer, 19% had uterine cancer, and 15% had cervix cancer. VTE was diagnosed during primary treatment in 62% of patients, while 30% were diagnosed during a recurrence. Though 91% received LMWH as initial VTE therapy, 40% of these patients changed to DOACs. Cited reasons for change included drug cost or patient/provider preference. There was no difference in the rate of VTE progression or recurrence between the LMWH and DOAC groups (26.9% vs 26.3%, p>0.99). There was also no statistical difference in rates of bleeding between the two groups (25.9% vs 15%, p=0.48).

CONCLUSIONS: There is significant interest in the utility of DOACs for treatment of VTE in gynecologic cancer patients as they are convenient to use. However, these drugs have not been well studied in patients with active malignancy. Though the current study is small, it suggests that DOACs are effective and safe in the gynecologic cancer population. Larger studies are warranted to validate these findings.

LEARNING OBJECTIVE: Learners will be able to assess potential utility and safety of DOACs in the treatment of VTEs in gynecologic cancer patients.
ABSTRACT #5: Short Term Impact of Surgically Induced Menopause on Cognitive Function and Well-Being in Women at High Risk for Ovarian Cancer following RRSO

H. Chang, D. Kamara, J. Lester, I. Cass, Cedars-Sinai Medical Center, Los Angeles, CA

OBJECTIVES: To assess the short term impact of surgically induced menopause on cognitive function, sleep disruption, and depression in pre-menopausal women at high risk of ovarian cancer following risk reducing bilateral salpingo-oophorectomy (RRSO), and to determine if hormone replacement therapy (HRT) mitigates these conditions

METHODS: Cognitive function was assessed using Functional Assessment of Cancer Therapy Scale Cognitive (FACT-Cog), a self-report measure of cognitive complaints to include total cognition and domains of cognition. FACT-Cog and well-being questionnaires were collected at 4 time points: pre-operatively, 6, 12 and 18 months post- RRSO. Data was tested for changes across time using mixed model regression for continuous data. Categorical data was analyzed using Chi-square test and/or repeated measures logistic regression was used to test changes over groups or time. Post-hoc pairwise testing across groupings was adjusted for multiple comparisons. Differences were considered statistically significant where p<0.05

RESULTS: 50 pre-menopausal women were enrolled from 4/ 2015 to 3/ 2017, median age 43 (range 30-54). 43 (86%) were BRCA mutation carriers. 6-month follow up data is available for 31 patients and 12 month follow up data is available for 11 patients. At 6 and 12 months, 17 (55%) and 8 (67%) patients respectively, used systemic HRT. Statistically significant changes in total cognition (p=0.05), perceived cognitive impairment (PCI) (p=0.033), and comments from others (p=0.01) were noted from baseline to 6 months, reflecting a decline in cognitive function. Only changes in PCI persisted after adjusting for multiple comparisons over time (p=0.037). There were no significant differences over time in domains of perceived cognitive abilities, quality of life, verbal and overall memory. Hormone use did not mitigate changes in cognitive function. There were no significant differences in sleep disruption or alcohol use over time, although there was a decrease in the incidence of depression over 6 month follow up from 31% to 12% (p=0.009).

CONCLUSIONS: Surgically induced menopause among high risk women did not result in significant changes in cognition or well-being during 12-month follow-up. The majority of these women use HRT post RRSO, although HRT had no apparent effect on cognition. RRSO was associated with lower incidence of depression at 6 months.

LEARNING OBJECTIVE: Learners will identify the changes in cognition over time after surgical menopause. Learners will observe the impact of hormone replacement therapy on cognition after surgical menopause
ABSTRACT #6: HPV Vaccination of Adolescent Males in the U.S.: Physician Recommendation Needs to Focus on Safety and Necessity, Not Gender and Sexuality

A. Beavis (1), M. Krakow (2), K. Levinson (1), A. Rositch (3) The Kelly Gynecologic Oncology Service at Johns Hopkins Hospital, Baltimore, MD (1), Division of Cancer Control and Population Sciences, National Cancer Institute, Bethesda, MD (2), Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health, Baltimore, MD (3)

OBJECTIVES: HPV vaccination in adolescent males has the potential to contribute to a decrease in HPV-related cancers overall; moreover, the impact on gynecologic cancers would be the most substantial in populations with suboptimal rates of female HPV vaccination, such as in the U.S. Despite approval for use in males since 2010, HPV vaccine initiation rates in males have remained suboptimal. Therefore, we sought to characterize the trends in vaccine initiation and reasons for non-initiation in parents of adolescent males in the U.S.

METHODS: Provider-verified data from the National Immunization Survey-Teen 2010-2015 was used to calculate survey-weighted prevalence estimates of HPV vaccine initiation and provider recommendation among males aged 13-17. Annual prevalence estimates for parent-reported reasons for lack of initiation were calculated and trends were evaluated over the 6 year period.

RESULTS: From 2010-2015, HPV vaccine initiation increased in adolescent males from 1.4% to 49.8% (p<0.001), and reported provider recommendation rates rose from 6% to 60% (p<0.001). The most common reason in 2010 and 2015 was perceived lack of necessity, the prevalence of which decreased slightly from 24% in 2010 vs. 22% in 2015 (p<0.001). The second most common reason in 2010 and 2015 was lack of provider recommendation, the prevalence of which decreased slightly from 22% in 2010 to 19% in 2015 (p=0.04). The third most common reason, lack of knowledge, was reported by 16% of parents in 2010 vs 14% in 2015, with no change noted on trend analysis. In 2010, the child’s lack of sexual activity was reported as a reason for non-initiation by 16% of parents, which decreased to 9% in 2015 (p <0.001). In 2010, male gender was reported as a reason by 13% of parents, which decreased to 3% in 2015 (p <0.001). However, parents reporting safety concerns increased from 5% in 2010 to 10% in 2015 (p <0.001). In each year, reasons related to religion, anti-vaccination sentiment, and concerns about increased sexual activity were reported by <2% of parents.

CONCLUSIONS: While most reasons for lack of initiation in males are related to knowledge and necessity, lack of provider recommendation is still reported by 1 in 5 parents. Parents are less concerned about their child’s gender and lack of sexual activity, and more focused on safety. This suggests that the child’s gender or sexual activity should not deter a physician from recommending the vaccine and discussing its importance and safety.

LEARNING OBJECTIVES: Identify the reasons for lack of HPV vaccine initiation in adolescent boys in the US. Illustrate how reasons for lack of HPV vaccine initiation have changed from 2010 to 2015. Demonstrate that reasons related to sexual activity and male gender have decreased significantly over time as reasons for lack of HPV vaccine initiation.

*Figure for Abstract #6 on next page
Reasons for Lack of HPV Initiation in Adolescent Males

* p-value for test for trend over time <0.05
ABSTRACT #7: Pilot Evaluation of Cervical Cancer Screening Modalities in a Low Resource Ugandan Setting

S. Cahoon (1), V. Cortessis (1), S. Najuna (1), R. Stumler (2), J. Jubilee (3), U. Ihenacho (1), J. Felix (1), L. Muderspach (1) University of Southern California, Los Angeles, CA (1), University of Vermont, Burlington, VT (2), Mpigi Health Center IV, Mpigi, Uganda (3).

OBJECTIVES: Cervical cancer incidence has declined steadily in areas of the world where most women have access to screening followed by treatment of pre-malignant lesions. Scarcity of these services has facilitated an epidemic in the developing world. We performed a pilot study of cervical cancer screening and lesion treatment in rural Uganda, where disease prevalence remains high, and few providers are trained in these techniques. Our goals were to compare performance of visual inspection with acetic acid (VIA) with and without HPV DNA testing to that of conventional cytology, and to assess both the feasibility of introducing these methods and the potential sustainability in this setting.

METHODS: Patients were screened for cervical lesions using VIA, glass slide cervical cytology, and high risk HPV DNA testing. Additional demographic data and medical history were collected. Proportions and accompanying 95% confidence intervals were calculated estimating the predictive values for VIA alone of abnormal cytology as well as predictive values of positive VIA plus positive HPV DNA.

RESULTS: We screened 392 women, of whom 326 were screened with each method: cytology, VIA, and HPV testing. 51 women (13.0%) reported being HIV positive. 70 women (17.9%) scored VIA positive, and 38 (9.7%) were positive for high risk HPV DNA. By comparison, 38 (9.7%) had abnormal cytology, 12 (3.1%) with low grade lesions, 15 (3.8%) with high grade lesions, and 11 (2.8%) concerning for squamous cell carcinoma on cytology. Histology was not available in this setting, so conventional cytology lesion grade was used for treatment decisions, with 17 women treated by loop electrode excision (LEEP) and 16 treated with cryotherapy. 6 women with visible tumor were referred for a higher level of care. VIA was useful in excluding premalignant lesions, with a 94.6% (95% confidence interval: 92.1-97.2) negative predictive value compared to cytology. The positive predictive value of VIA alone was only 14.5% (CI 6.2-22.8). However, VIA positivity followed by a positive HPV test was a better predictor of premalignant lesions, with a positive predictive value of 70.0% (CI 34.8-93.3). Among HIV positive women, positive VIA alone had a 42.9% (CI 9.9-81.6) positive predictive value, while VIA positivity followed by positive high risk HPV DNA had a 100% (CI 29.2-100) positive predictive value. Among HIV negative women, positive VIA alone had a positive predictive value of 10.2% (CI 2.5-17.9), but VIA positivity followed by positive HPV DNA had a positive predictive value of 57.1% (CI 18.4-90.1).

CONCLUSIONS: These results indicate that screening by VIA followed by HPV testing of only VIA positive women would result in less over-treatment than by VIA alone, and incur less cost than universal screening with HPV DNA. This sequential screening approach increases accessibility in areas with limited resources to support cytology based cervical cancer screening.

LEARNING OBJECTIVES: Learners will be able to describe the utility of various cervical cancer screening methods as well as a management algorithm adapted for use in low resource settings.
ABSTRACT #8: Feasibility of Integrated PET/MRI and PET/CT Imaging for Gynecological Malignancies

M. Schwartz (1); S. Gavane (1); J. Bou-Ayache (1); V. Kolev (1); K. Zakashanksy (1); M. Prasad-Hayes (1); B. Taouli (1); L. Chuang (1); L. Kostakoglu (1) Icahn School of Medicine at Mount Sinai, New York, NY (1)

OBJECTIVES: To assess the technical feasibility and diagnostic performance of FDG-PET/MRI whole body imaging compared to PET/CT for staging of patients with a gynecological malignancy.

METHODS: From February 1, 2014 to December 31, 2016, a total of 25 patients with a gynecologic malignancy were prospectively enrolled into this pilot study. Patients underwent sequential PET/CT and PET/MRI whole body imaging studies after administration of a single dose of F-18 FDG. PET/MRI and PET/CT images were independently reviewed by two expert radiologists. Readers were blinded to the results of the other imaging procedures. Clinical and pathologic information was abstracted from medical charts.

RESULTS: 18 patients were included in the final analysis, 7 were excluded – 3 due to inability to tolerate PET/MRI due to claustrophobia, 3 due to enrollment at time of recurrence, and 1 due to lack of surgical or clinical staging. Median age of patients was 62 years (range 31-88). 56% of patients were non-Hispanic white and median BMI was 27 kg/m2 (range 19-37). 61% of patients (11/18) had cervical cancer, while the remaining patients had endometrial cancer. PET/MRI as compared to PET/CT was able to detect 18/18 primary tumors, 7/7 patients with regional lymph nodes, and 1/1 patient with an abdominal metastasis. 2 patients had additional lymph nodes outside of the abdominopelvic cavity detected on PET/CT that were not seen on PET/MRI. Whereas, 6 patients had parametrial invasion and 1 patient had invasion of the bladder clearly seen on PET/MRI not detected on PET/CT. 5 cervical cancer patients had discordant clinical versus radiographic staging based on PET/MRI detection of soft tissue involvement not clinically palpated (see Table). Management changed for one patient who had clinical stage IB1 and radiographic stage IIB cervical cancer with treatment changing from surgery to chemoradiation.

CONCLUSIONS: PET/MRI is feasible and has at least comparable diagnostic ability to PET/CT for identification of primary cervical and endometrial tumors and regional metastases. PET/MRI may be superior to PET/CT for initial radiographic assessment of cervical cancers and have added benefits in assessing treatment response for these cancers. Additional studies are needed to investigate which patients would benefit the most from PET/MRI.

LEARNING OBJECTIVES: Identify situations in which FDG-PET/MRI might be a useful adjunct to staging of gynecologic malignancies.

Table. Clinical staging and PET/MRI staging for patients with additional soft tissue involvement noted on PET/MRI. Of note, all had cervical cancer. CRT = chemoradiation therapy

<table>
<thead>
<tr>
<th>PT</th>
<th>Clinical Stage</th>
<th>PET/MRI Stage</th>
<th>PET/MRI Findings</th>
<th>Treatment Changed Based on PET/MRI?</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>IB1</td>
<td>IIB</td>
<td>Parametrial Invasion</td>
<td>No</td>
</tr>
<tr>
<td>14</td>
<td>IIIB</td>
<td>IVA</td>
<td>Bladder Invasion</td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>IB2</td>
<td>IIB</td>
<td>Parametrial Invasion</td>
<td>No</td>
</tr>
<tr>
<td>18</td>
<td>IB2</td>
<td>IIB</td>
<td>Parametrial Invasion</td>
<td>No</td>
</tr>
<tr>
<td>22</td>
<td>IB1</td>
<td>IIB</td>
<td>Parametrial Invasion</td>
<td>Yes: Surgery to CRT</td>
</tr>
</tbody>
</table>
ABSTRACT #9: Ethnic Disparities in Screening, Treatment and Outcomes in Women with Cervical Carcinoma.

W Robinson, K Davis, W Robinson IV, Tulane University School of Medicine, New Orleans, LA

OBJECTIVES: To determine if ethnic differences in screening, treatment and outcomes exist in women with cervical cancer. Specifically, to determine if utilization of cancer screening services (pap smears), outpatient physician encounters between the time of last pap smear and diagnosis of cancer, time from diagnosis to start of treatment, and 3-year survival differ by ethnicity in a large urban community.

METHODS: All subjects diagnosed with invasive cervical cancer at a large urban hospital between 2000-2014 were identified via Tumor Registry and other hospital databases. The associated data was reviewed in retrospective fashion as part of an ongoing Quality Improvement program. All subjects were treated by Board-Certified oncologists within widely-accepted guidelines. The study was declared exempt from IRB review. Statistical analysis was performed using SAS statistical software.

RESULTS: 494 subjects were identified and had sufficient data available for review. Ethnicity: 332 (Black), 121 (Caucasian), 23 (Asian), and 18 (Hispanic). For all subjects, 3-year survival was 49.3% (242/494); mean time since last pap was 118 months, mean time from biopsy-proven diagnosis to beginning of treatment (surgery, radiation therapy and/or chemotherapy) was 31.0 days, and mean number of outpatient physician encounters between last pap and diagnosis of cancer was 8.6. 3-year survival was: Blacks 47.6% (158/332); Caucasians 53.7% (65/121); Asians 52.2% (12/23); Hispanics 47.1% (8/18). The mean number of days from diagnosis to treatment was: Blacks 32.8; Caucasians 25.1; Asians 26.6; Hispanics 33.8. The mean number of physician encounters between last pap smear and diagnosis was: Blacks 9.0; Caucasians 8.3; Asians 6.5; Hispanics 3.2. All differences p<0.05. No statistical difference in time from last pap smear to diagnosis was seen based on ethnicity.

CONCLUSIONS: Significant differences in screening, delivery of care and outcome exists based on ethnicity in this center. The time between diagnosis and treatment is longer, and 3-year survival is worse for Blacks/Hispanics compared to Caucasians/Asians. Further, although time since last pap smear was almost 10 years for all ethnicities, Blacks had more physician encounters during that time, and therefore more missed opportunities for early diagnosis. Delivery of both cervical cancer screening and treatment is sub-optimal in black women in this community. Potential interventions, including church-based community nurses, healthcare navigators, and Medicaid eligibility facilitators are discussed.

LEARNING OBJECTIVES: Demonstrate whether racial disparities exist in time from diagnosis to treatment of cervical cancer. Demonstrate racial disparities in utilization of appropriate healthcare screening. Demonstrate racial differences in treatment outcomes.
ABSTRACT #10: Favorable tumor immunophenotype is associated with homologous recombination deficiency in ovarian carcinoma

C. Morse (1), M. Harrell (1), K. Agnew (1), S. Bernards (1), M. Radke (1), B. Norquist (1), K. Pennington (1), M. Kilgore (2), R. Garcia (2), E. Swisher (1)  Department of Obstetrics and Gynecology, University of Washington, Seattle, WA (1), Department of Pathology, University of Washington, Seattle, WA (2).

OBJECTIVES: Both the presence of tumor infiltrating lymphocytes (TIL) and defects in homologous recombination (HR) are important prognostic factors in ovarian carcinoma, but their relationship to each other is not defined. We characterized the distribution of TIL in a cohort of ovarian carcinoma patients with and without HR deficiency (HRD).

METHODS: Subjects were prospectively enrolled in a university-based gynecologic oncologic tissue bank at the time of cancer diagnosis. Included subjects had carcinoma of the ovary, fallopian tube, or primary peritoneum, collectively called ovarian carcinoma. Subjects who received neoadjuvant chemotherapy were excluded. Malignant neoplasm and serum samples were collected and patients were followed longitudinally. Immunohistochemistry (IHC) was performed on 119 patients for CD3 and CD8 (intratumoral T cells), CD68 (tumor associated macrophages), and FoxP3 (regulatory T cells). Microvessel density (MVD) was assessed at both 20x and 40x. Damaging germline and somatic mutations in genes in the HR pathway were determined using BROCA sequencing. HRD was defined as a damaging mutation in one of 17 genes in the HR pathway or promoter hypermethylation in BRCA1 or RAD51C.

RESULTS: Forty-six of 119 (38.7%) subjects had either a mutation in the HR pathway or promoter hypermethylation and were classified as HRD. Tumor immune infiltrate was significantly higher in cancers with HRD compared to carcinomas without HRD (p=0.003 for CD3 and p=0.015 for CD68). CD8, FoxP3, and MVD were not statistically different among HRD groups. Among subjects with a defect in HR, median overall survival (OS) was significantly longer (57.6 vs. 37.3 months; hazard ratio 0.57, 95% CI, 0.37-0.86; p=0.006).

CONCLUSIONS: Among a cohort of prospectively followed patients with ovarian carcinoma, subjects with HRD, defined by either mutation or hypermethylation of a key HR gene, had a significantly higher tumor immune infiltrate and a dramatic (20 month) improvement in overall survival. A larger study is needed to determine the relative contribution of the presence of TILs or HRD to improved outcomes. HRD could lead to an immunostimulatory environment through an increased neoantigen load, by stimulating the innate immune system with damaged or free cytosolic DNA, or by yet unrecognized mechanisms.

LEARNING OBJECTIVES: Define the tumor immunophenotype among a cohort of patients with ovarian carcinoma. Relate the presence of tumor infiltrating lymphocytes to homologous recombination deficiency.
ABSTRACT #11: Mechanism of tumor suppressor miRNA let-7 downregulation in ovarian cancer: transcription factor Snail represses let-7 and is associated with invasiveness phenotype

Nozomi Hojo* (1), Alyse Hill* (1), Evgeny Chirshev (1), Hanmin Wang (1), Yevgeniya Ioffe (2), Juli Unternaehrer (1)  Department of Basic Sciences (1), Obstetrics and Gynecology, School of Medicine, Loma Linda University, Loma Linda, CA 92350 (2)  *co-first authors

OBJECTIVES: Metastatic progression in epithelial ovarian carcinoma (EOC) is in part driven by epithelial-mesenchymal transition (EMT) and cell reversion to cancer stem cell (CSC) phenotype. Decrease in let-7 microRNA(miRNA) levels correlates with reversion to mesenchymal phenotype and shorter survival. We aimed to 1) describe the mechanism for let-7 repression, 2) determine the effect of Snail knockdown (KD) on EOC cell stemness and invasiveness, and 3) determine whether Snail KD results in decreased tumor burden in an orthotopic patient-derived xenograft (PDX) model.

METHODS: EOC lines and patient-derived samples: Cells were treated with EGF to increase Snail expression. Snail KD was achieved via lentiviral delivery of small hairpin (sh)RNA. Quantitative RT-PCR was used to quantitate gene expression. Cell surface expression of CSC markers was analyzed by flow cytometry. Cell migration was determined by scratch assay and live-cell imaging. Data was analyzed by linear regression. Snail binding to let-7 promoters was demonstrated by chromatin immunoprecipitation (CHIP) assays. Snail overexpression was achieved via tamoxifen induction of estrogen receptor fusion protein. Let-7 transcription was measured by luciferase assays, analyzed by Student’s t-test. PDX murine model: 6 week old nude (J:NU) mice underwent ovarian bursa injections. Mice were injected with luciferized EOC cells: control vs. Snail knockdown (125,000 cells per injection). Bioluminescence was quantified (IVIS Lumina) over 16 days to assess tumor burden and quantitated by ANOVA.

RESULTS: Cell lines: Overexpression of Snail was associated with CSC phenotype (increased expression of pluripotency factors Lin28 and Nanog, decreased let-7 expression). Cells with shRNA Snail knockdown exhibited CSC phenotype reversal. OVCAR8 cells with Snail KD exhibited slower hourly migration rates in migration assays (p<0.001). CHIP assays demonstrated that Snail bound promoters of let-7 miRNAs and promoter binding increased upon Snail overexpression. Luciferase assays demonstrated direct repression of let-7 by Snail. PDX murine model: Orthotopic xenografts injected with Snail KD cells resulted in decreased tumor burden (p<0.05).

CONCLUSIONS: Snail directly represses let-7 transcription. Snail KD results in reversal of CSC phenotype in EOC cells. Further, knocking down Snail results in decreased tumor burden in murine orthotopic PDX. We propose that Snail is a potential pharmaceutical target for recurrent, metastatic EOC.

LEARNING OBJECTIVE: Identify mechanisms of metastatic progression of ovarian cancer. Identify potential therapeutic targets for treating metastatic disease in ovarian cancer. Illustrate cancer stem phenotype of metastatic ovarian cancer.
ABSTRACT #12: Pretty Fly for GPI: Altered Carbohydrate Metabolism in Ovarian Cancer

R. Previs, T. Moss, B. Zand, J. Hansen, R. Dood, G. Armaiz-Pena, Y. Lyons, R. Coleman, A. Sood, The University of Texas MD Anderson Cancer Center

OBJECTIVES: To identify the biological consequences of glucose-6-phosphate isomerase (GPI) dysregulation within the carbohydrate metabolism pathway in ovarian cancer.

METHODS: We profiled 101 high-grade serous ovarian cancer (HGSOC) samples and 15 normal ovarian tissues samples; 172 significantly altered metabolites were identified. We classified these metabolites into altered pathways and carried out full-scale gene expression systems-based analyses. We further examined GPI levels in a separate cohort of 75 epithelial ovarian cancer patients and evaluated the effect that upregulation in this pathway had on survival and in vivo models.

RESULTS: We carried out genomic analyses coupled with synthetic lethality screens (in three chemoresistant cell lines) followed by integrated analyses of these data sets. The most enriched pathway identified was carbohydrate metabolism, specifically within the glycolytic and pentose phosphate pathway. Our analyses revealed the GPI is the key driver of these changes. The impact of GPI knockdown using siRNA was evaluated in a murine orthotopic model of ovarian cancer (SKOV3ip1). There was significantly decreased tumor growth (p=0.0007) and metastases (p<0.0001) in the siGPI group. We measured GPI in 75 epithelial ovarian cancer patients. Within this cohort, the median age was 58, with the majority having advanced stage disease (93.3%) and high grade serous histopathology (56%). GPI levels were measured using qRT-PCR from these patients’ tumors and normalized to normal fallopian tube (average 50; range: 0.005-575.6) and ovarian scrapings (mean: 2.2; range: 0.0002-25). Significantly worse overall survival was noted in patients with elevated GPI levels (p=0.02).

CONCLUSIONS: We developed a novel systems-based approach using altered metabolites and genes to predict a malignant phenotype specific to HGSOC patients. Altered metabolism coupled with genomic analyses identified GPI as a key driver of altered ovarian cancer metabolism that will uncover novel biomarkers and therapeutic approaches.

LEARNING OBJECTIVE: Define GPI role in ovarian cancer cell metabolism.

*Figure for Abstract #12 on next page
Overall survival for epithelial ovarian cancer patients stratified by median GPI level

p=0.02
ABSTRACT #13: Carboplatin synergizes with CA125-targeted TRAIL variant Meso64-TR3 via death receptor, caspase-3 and TNF-α upregulation: a novel targeted therapy for ovarian cancer.


OBJECTIVES: TNF-related apoptosis-inducing ligand (TRAIL) binds to death receptors (DR) 4 and 5 to activate the extrinsic apoptosis pathway. Meso64-TR3 is a genetically engineered, stabilized TRAIL trimer, and modified to interact with high affinity to CA125 via incorporation of a 64 amino acid sequence derived from mesothelin. Clinical TRAIL therapies suffer from poor response rates secondary to lack of tumor-directed delivery and drug resistance. Our objective was to further improve the efficacy of Meso64-TR3 in combination with platinum based therapy.

METHODS: CA125-positive ovarian cancer cells (OVCAR3) were treated with carboplatin, Meso64-TR3, TR3, and combination therapy. Cell viability assay was performed with ATP quantification using CellTiter-Glo. Apoptotic signaling was evaluated with RayBio C-series human apoptosis immunoblotting array. DR4, DR5, and decoy receptors 1 and 2 (DcR1, DcR2) were analyzed with flow cytometry after exposure to carboplatin. Drug combination indices (CI) were calculated using CompuSyn software with synergy being defined as CI < 1.

RESULTS: OVCAR3 cells were confirmed to strongly express CA125 via flow cytometry. OVCAR3 cells were exposed to serial dilutions of carboplatin for 24 hours in addition to Meso64-TR3 or TR3. ED50 of carboplatin, Meso64-TR3, and TR3 were 306 uM, 86 pM, and 1323 pM respectively. Carboplatin was strongly synergistic with Meso64-TR3 (mean CI = 0.30) and moderately synergistic with TR3 (mean CI = 0.45). DR4 and DR5 expression was confirmed to be greatly elevated after exposure to carboplatin. DR5 expression increased 80%, DR4 expression increased 88%. In contrast DcR1 and 2 did not change expression levels after exposure to carboplatin. Apoptosis signaling array identified a 2-fold increase in caspase-3 and TNF-α expression in carboplatin treated cells, while caspase-3, -8, and BID levels were elevated in Meso64-TR3-treated cells. Conversely, similar findings were not identified in TR3-treated control cells.

CONCLUSIONS: The addition of carboplatin to Meso64-TR3 improved efficacy beyond their sole additive effects, as all levels of treatment effect and dosing were found to be synergistic. Targeting CA125 and utilizing carboplatin therapy may abrogate toxicities and improve response rates to this novel therapy. Consequently, we are currently in the process of testing Meso64-TR3 in combination with carboplatin using xenograft CA125-positive ovarian cancer.

LEARNING OBJECTIVE: Identify the function of TRAIL on the extrinsic apoptosis pathway. Outline the function of Meso64-TR3. Demonstrate the synergy of carboplatin with TRAIL based therapeutics in ovarian cell lines

*Figure for Abstract #13 on next page
A. OVCAR3 cell killing profiles after 24 hour exposure to sublethal concentrations of TR3 and Mes664-TR3 followed by dose escalation treatment with carboplatin. ***, p = 0.0018. B. OVCAR3 cell were treated with 50 μM of TR3 and Mes664-TR3 for 4 hours and carboplatin 100 μM for additional 24 hours after which lysates were prepared and submitted to apoptosis array analysis. C. OVCAR3 cell were treated with 100 μM carboplatin for 24 hours prior to flow cytometric detection of DR4 and DR5. ****, p < 0.001. MFI: mean fluorescent intensity.
ABSTRACT #14: A Cost-Effectiveness Analysis of Three PARP Inhibitors for Maintenance Therapy in Platinum-Sensitive Recurrent Ovarian Cancer

A.Y. Liu (1, 2), J.G. Cohen (1), C.S. Walsh (2), C.H. Holschneider (3), A.K. Sinno (3) University of California, Los Angeles, Los Angeles, CA (1), Cedars-Sinai Medical Center, Los Angeles, CA (2), Olive View-UCLA Medical Center, Sylmar, CA (3)

OBJECTIVES: To determine the cost effectiveness of PARP inhibitors when used for maintenance therapy in platinum-sensitive recurrent epithelial ovarian carcinoma (EOC).

METHODS: Three decision analysis models were generated to compare the cost of observation versus the cost of PARP inhibitor therapy for patients with platinum-sensitive recurrent EOC with germline BRCA1/2 mutations, somatic homologous recombination deficiency (HRD), and wild-type. Drug costs were derived from 2016 average wholesale prices. Costs of laboratory tests, imaging, and physician visits were based on 2016 Medicare reimbursement rates. Assumptions for the models include a 20% rate of BRCA1/2 mutation and a 40% rate of HRD in patients with platinum sensitive recurrent EOC. Progression-free survival was based on previously published trials. Incremental cost-effectiveness ratios (ICERs) per progression-free life-year saved (PF-LYS) were calculated. A sensitivity analysis was performed to estimate the cost at which each PARP inhibitor would be cost effective in patients with BRCA1/2 mutations.

RESULTS: The estimated population cost of observation for U.S. patients with BRCA1/2 mutations and recurrent EOC is approximately $1 million. In comparison, the population costs of maintenance therapy in BRCA1/2 mutation carriers with olaparib, niraparib, and rucaparib are $251 million, $286 million, and $200 million, respectively. For patients with BRCA1/2 mutations, maintenance olaparib is the most cost effective PARP inhibitor (ICER of $195,788 per PF-LYS), followed by niraparib (ICER of $196,117 per PF-LYS) and rucaparib (ICER of $290,245 per PF-LYS). For patients with somatic HRD, niraparib is more cost effective than rucaparib (ICER of $205,171 per PF-LYS versus $496,157). For wild-type patients without a BRCA1/2 mutation or HRD, niraparib is most cost effective (ICER $321,799 per PF-LYS). On sensitivity analysis, in order to obtain an ICER of $100,000 per PF-LYS, the monthly cost of PARP inhibitors would need to be significantly lower (olaparib: $5,872, niraparib: $6,088, and rucaparib: $4,698). To put these costs in perspective, the ICER for maintenance paclitaxel therapy is $9,186 per PF-LYS and the ICER of bevacizumab maintenance therapy is $635,456 per PF-LYS.

CONCLUSIONS: At their current average wholesale prices, PARP inhibitors are not cost effective maintenance therapies in patients with platinum-sensitive recurrent EOC.

LEARNING OBJECTIVE: Compare PARP inhibitors for maintenance therapy in platinum-sensitive ovarian cancer from cost-effectiveness perspective.

*Figure for Abstract #14 on next page*
A Cost-Effectiveness Analysis of Three PARP Inhibitors for Maintenance Therapy in Platinum-Sensitive Recurrent Ovarian Cancer

<table>
<thead>
<tr>
<th>BRCA mutation</th>
<th>Somatic HRD</th>
<th>Wildtype</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total cost</td>
<td>PFS (mo)</td>
</tr>
<tr>
<td><strong>Olaparib</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obs.</td>
<td>$1.0 M</td>
<td>5.5</td>
</tr>
<tr>
<td>Main.</td>
<td>$250.6 M</td>
<td>19.1</td>
</tr>
<tr>
<td>Diff.</td>
<td>$249.6 M</td>
<td>13.5</td>
</tr>
<tr>
<td><strong>Niraparib</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obs.</td>
<td>$1.0 M</td>
<td>5.5</td>
</tr>
<tr>
<td>Main.</td>
<td>$286.0 M</td>
<td>21</td>
</tr>
<tr>
<td>Diff.</td>
<td>$285.0 M</td>
<td>15.5</td>
</tr>
<tr>
<td><strong>Rucaparib</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obs.</td>
<td>$1.0 M</td>
<td>5.5</td>
</tr>
<tr>
<td>Main.</td>
<td>$199.6 M</td>
<td>12.8</td>
</tr>
<tr>
<td>Diff.</td>
<td>$198.6 M</td>
<td>7.3</td>
</tr>
</tbody>
</table>

Table 1. Total cost of observation (Obs.), total cost of maintenance therapy (Main.), difference (Diff.) in costs and PFS, and ICERs for olaparib, niraparib, and rucaparib in the BRCA mutation, somatic HRD, and wildtype cost analysis models.
ABSTRACT #15: BRCA1, DNA repair associated (BRCA1)- and BRCA1 Interacting Protein C-terminal Helicase 1 (BRIP1)-Mutated Ovarian Epithelial Cells Acquire a Cancer Stem Cell-Like Phenotype and Decreased Sensitivity to Cisplatin and Olaparib in Three Dimensional Spheroid Culture

C.L. Adams, M.A. Ciccone, S.B. Gruber, K. McDonnell  USC Norris Comprehensive Cancer Center, Keck School of Medicine, Los Angeles, CA

OBJECTIVES: Mutations in BRCA1 and BRIP1 confer increased risk of ovarian cancer, but enhanced response to platinum agents and PARP inhibition. Three-dimensional tumor spheroid models provide a novel platform for assessment of cancer stem cell (CSC)-like phenotype and in vitro therapeutic screening. We aim to characterize and assess chemosensitivity in BRCA1- and BRIP1-mutated adherent two dimensional (2-D) and spheroid three dimensional (3-D) ovarian models.

METHODS: BRCA1 (c.412_413insA) and BRIP1 (c.257delC) mutated Chinese hamster ovary cell lines were generated using CRISPR/Cas9 targeted genome editing. Hemizygous BRCA1 and hemi- and homozygous BRIP1 mutant clones were verified by Sanger sequencing and qRT-PCR assessment of BRCA1 and BRIP1 expression. Cells were grown in 2-D adherent monolayers and 3-D non-adherent spheroid cultures. CSC marker expression was determined via qRT-PCR. Luminogenic ATP assays were conducted to measure cell viability and chemosensitivity. Cytotoxicity studies were performed to assess sensitivity of BRCA1- and BRIP1- mutated cells to cisplatin and olaparib as compared to wild type (WT).

RESULTS: Decreased proliferation in 2-D culture over 72 hours was observed for BRIP1- mutated cell lines as compared to WT (fold change 34.8 vs. 25.4 and 19.2). CSC markers Oct4, Klf4, and PIWIL2 were overexpressed in WT 3-D and BRCA1- and BRIP1-mutated 3-D cells as compared to WT 2-D cells. BRCA1- and BRIP1-mutated 2-D cells were more sensitive to cisplatin compared with WT, however the 3-D spheroid phenotype was associated with reduced sensitivity to cisplatin in both WT and BRCA1- and BRIP1- mutated cells (WT IC50 cisplatin 9.9 vs. 27.5 uM, BRCA1 7.8 vs. 11.9 uM, BRIP1 hemizygous 1.5 vs. 9.9 uM, BRIP1 homozygous 1.2 vs. 6.5 uM, p = <0.05). BRCA1- and BRIP1- mutated 2-D cells were more sensitive to cisplatin and olaparib compared with WT 2-D cells, while reduced sensitivity was observed in 3-D cultures (WT IC50 olaparib 35.7 vs.142.4 uM, BRCA1 27.4 vs.80.8 uM, BRIP1 hemizygous 25.6 vs. 151.6 uM, BRIP1 homozygous 20.9 vs 177.4 uM, p<0.01).

CONCLUSIONS: Mutations in BRIP1 and BRCA1 have important prognostic and therapeutic implications with regard to ovarian cancer treatment. While increased sensitivity to platinum agents and PARP inhibitors characterizes these mutations, this effect is partially attenuated in 3-D spheroid cultures with acquisition of a CSC-like phenotype.

LEARNING OBJECTIVE: Describe the relevance of homologous recombination repair defects to ovarian cancer development, progression and treatment. Characterize BRIP1 and BRCA1 mutations in ovarian epithelial cells in 2-D adherent and 3-D spheroid culture models with regard to functional differences in proliferative capacity and chemosensitivity. Recognize the potential clinical impact of the cancer stem cell-like phenotype as it contributes to therapeutic resistance.
ABSTRACT #16: Shifts in Practice Patterns: Addressing Disparities in Ovarian Cancer Care


OBJECTIVES: In recent years, neoadjuvant chemotherapy (NACT) and universal genetic testing has been added to our arsenal for managing epithelial ovarian cancer. Within our university health system, all of our attending physicians work at both a safety net hospital (SNH) as well as a comprehensive cancer center (CCC). As such our objective was to assess whether there were differences in current practice patterns between the two facilities especially regarding NACT and genetic testing despite having the same physicians practicing at both.

METHODS: IRB approval was obtained. We conducted a retrospective review of patients diagnosed with epithelial ovarian cancer treated between 2011 and 2015. Abstracted data included sociodemographic factors, genetic testing results, and treatment histories. Statistical analysis was performed using Fisher exact tests, Chi-square tests, and Kaplan-Meier curves.

RESULTS: Complete treatment data was available for 176 subjects. There were 44 patients from SNH and 132 patients from CCC. The median follow-up at CCC was 39 months vs 25 months at SNH. There were more black patients at the SNH compared to the CCC (41.3% vs 13.6%, p<0.01), however there was no significant difference in the percentage of Hispanic patients between the two groups. The proportion of insured patients was much greater at the CCC (94.7% vs 78.2%, p<0.01). SNH patients were more likely to receive NACT compared to CCC patients (30.4% vs 12.8%, P= .0118) without any significant difference in stage between the two (88.6% vs 77.8% diagnosed at stage 3 or higher at SCCC vs SNH, respectively, P= 0.08). Patients at both centers were also found to have similar outcomes in regards to their surgeries with 53.3% optimally cytoreduced at SNH and 56.0% optimally cytoreduced at CCC (P= 0.86). Survival was significantly better for those without any residual disease compared to those who were suboptimally debulked at both institutions (median OS = 240 months and median OS = 60 months, respectively, P=.0010). However, there was no significant difference in survival between those who had cytoreduction to R0 (no gross residual) between SNH and CCC, while those who underwent suboptimal debulking at CCC had a survival advantage over those at SNH (median OS = 51 months at CCC vs median OS = 22 months at SNH, P= 0.005). Patients treated at SNH were significantly less likely to receive genetic testing compared to CCC patients: 15.2% vs 43.9% (P= .0004). Molecular genomic testing was performed to identify targetable pathways for 15.9% of CCC patients while no SNH patients received such testing (P=.0024). In multivariate analysis using the mixed effects model, treatment at CCC (OR 7.62, P= 0.0048) and optimal debulking (OR 17.06, P < 0.001) both had a positive impact on 2 year overall survival.

CONCLUSIONS: There are clear disparities in treatment and survival in women with epithelial ovarian cancer. Multiple, complex socioeconomic factors significantly impact these disparities. Future studies that elucidate rationale for use of NACT and identify barriers to genetic testing may improve cancer-related mortality.

LEARNING OBJECTIVE: Identify differences and disparities in ovarian cancer management between hospitals within a single university based system.
ABSTRACT #17: Prodrug Activator Gene Therapy of Ovarian Cancer using a Retroviral Replicating Vector

Sara A. Collins (1,2), Priyanka Kamath (3), James Grosso (4), Suzanne Matsuura (1,2), Xiangxi Xu (1,2), Tan Ince (2,5), Douglas J. Jolly (6), Brian Slomovitz (2,3), Noriyuki Kasahara (1,2,5) (1) Department of Cell Biology, University of Miami, FL, USA (2) Sylvester Comprehensive Cancer Center, University of Miami, FL, USA (3) Department of Gynecologic Oncology, University of Miami, FL, USA (4) Cancer Biology Graduate Program, Miller School of Medicine, University of Miami, FL, USA (5) Department of Pathology, University of Miami, FL, USA (6) Tocagen Inc., San Diego, CA, USA

OBJECTIVES: Ovarian cancer is the leading cause of death in women with gynecologic malignancies in the U.S. We have demonstrated significant survival benefit when tumor-selective retroviral replicating vectors (RRV) are employed for gene therapy in a variety of preclinical cancer models. RRV-mediated prodrug activator gene therapy using yeast cytosine deaminase (RRV-CD; ‘Toca 511’) is being investigated in a Phase II/III trial at multiple international sites for recurrent glioblastoma or anaplastic astrocytoma (NCT02414165). We have conducted the first preclinical studies to evaluate feasibility, safety, and efficacy of RRV-mediated prodrug activator gene therapy for ovarian cancer.

METHODS: In vitro RRV replication was examined by flow cytometry, and cytotoxicity examined by MTS assay after 5-FC treatment of RRV-transduced established human ovarian cancer cell lines, patient-derived primary ovarian cancer isolates and transgenic model-derived primary murine ovarian cancer cells. In vivo transduction, spread and therapeutic efficacy are currently being evaluated in SKOV3-IP peritoneal carcinomatosis models.

RESULTS: Robust replication activity was observed over time after initial virus inoculation at MOI 0.01, reaching >80%~90% transduction by Day 9-12 in all cases. After transduction with RRV-CD, in vitro cytotoxicity analysis by MTS assay showed that viability of established SKOV3-IP and primary C5X human ovarian cancer cells was reduced >30% by Day 6-9 after exposure to 0.1 mM 5-FC prodrug, and ~90-100% killing was observed with 1-10 mM 5-FC, with little or no change in viability of untransduced cells. Primary PSX cells were more resistant, showing 20% and 70% reduced viability by Day 9 at 1 mM and 10 mM 5-FC, respectively. In vivo transduction and spread of a GFP expressing RRV vector was demonstrated in SKOV3-IP peritoneal carcinomatosis models. Following RRV vector dose escalation, SKOV3-IP cells recovered from disaggregated intraperitoneal tumors on Day 23 post-virus administration were >60% GFP+ by flow cytometry, indicating significant levels of tumor transduction. Therapeutic studies evaluating RRV-CD (Toca 511) + 5-FC prodrug activator gene therapy in SKOV3-IP peritoneal...
carcinomatosis models are currently underway, and interim survival results support the efficacy of this approach.

**CONCLUSIONS:** Our preclinical studies support the investigation of RRV-CD gene therapy in ovarian cancer.

**LEARNING OBJECTIVE:** Describe the first preclinical studies using a retroviral replicating vector carrying a suicide gene for the treatment of ovarian cancer
ABSTRACT #18: Tolerance and Toxicity of the PARP Inhibitor Olaparib in Older Women with Ovarian Cancer

L. Dockery (1), W. Tew (2), K. Moore (1) K. Ding (1) University of Oklahoma Health Sciences Center, Oklahoma City, OK (1), Memorial Sloan Kettering Cancer Center, New York, NY (2).

OBJECTIVES: The PARP inhibitor olaparib possesses distinct efficacy and utility in the treatment of BRCA 1/2 germline mutated ovarian cancer in both the recurrent (US) and platinum sensitive maintenance (Europe) setting. PARP inhibitors have also demonstrated efficacy in homologous recombination deficient (HRD) or somatic BRCA 1/2 mutated high-grade serous ovarian cancers. The objective of this study was to determine the overall tolerability and toxicity of olaparib among older (>65 yrs) patients (pts) treated on 8 completed prospective trials of olaparib in the setting of recurrent ovarian cancer.

METHODS: An ancillary data analysis of 398 pts with recurrent ovarian cancer enrolled on 8 prospective trials of olaparib was performed. Pts aged 65 yrs and older were stratified into age groups by 5 yr increments (ages 65-69, 70-74, >75 yrs) and compared to those <65. Analysis was restricted to those patients receiving the recommended treatment dose of 400mg PO b.i.d. Studies included were: D0810C00002 (n=5), D0810C00009 (n=33), D0810C00012 (n=54), D0810C00019 (n=74), D0810C00020 (n=17), D0810C00024 (n=21), D0810C00042 (n=193), D081AC00001 (n=1). Chi-square/Fisher’s exact tests were used to compare tolerability and toxicity between the 2 groups.

RESULTS: Of the 398 pts included, 78 were >65 (age 65-69 n=38, age 70-74 n=23, age >75 n=17). The majority of elderly pts were Caucasian (n=2 Asian) and had received >5 prior lines of chemotherapy. In pts <65, 53.1% did not require dose reduction as compared to 55.3% of pts 65-69yrs, 52.2% of pts 70-74yrs, and 35.3% of pts >75yrs (p=0.62). In pts <65yrs 58.8% did not require dose interruption, as compared to 50%, 56.5%, and 35.3% of pts aged 65-69, 70-74, and >75, respectively (p=0.11). There were no occurrences of myelodysplastic syndrome or acute myeloid leukemia in any of the older cohorts. Toxicities were similar across age groups. Grade 3/4 nausea occurred in 3% (age 65-69), 4% (age 70-74), and 0% (age >75) as compared to 2% in pts <65yrs (p=0.69). Grade 3/4 anemia occurred in 13%, 13%, 9%, and 24% of pts aged <65yrs, 65-69, 70-74, and >75yrs, respectively (p=0.70).

CONCLUSIONS: There appears to be similar tolerability and toxicity of olaparib in older women treated for advanced recurrent ovarian cancer as compared to their younger counterparts. Use of olaparib should be considered in this pt population especially given the ease of administration and overall tolerability.

LEARNING OBJECTIVE: The learner will be able to determine the toxicity and tolerability of olaparib in older women with advanced recurrent ovarian cancer.
ABSTRACT #19: A Genomic Rearrangement Signature Associated with Poor Overall Survival in High Grade Serous Ovarian Cancer

R.T. Hillman, K.H. Lu, P.A. Futreal  The University of Texas M.D. Anderson Cancer Center

OBJECTIVES: To identify clinically prognostic genomic rearrangement signatures in high grade serous ovarian cancer (HGSOC).

METHODS: Whole genome sequencing (WGS) reads were obtained for primary HGSOC tumors and matched normal samples sequenced by the Australian Ovarian Cancer Study (AOCS) (N=80), and genomic rearrangements were identified. A mathematical framework based on non-negative matrix factorization (NMF) was used to extract rearrangement signatures. Validation of signature predictions was performed using copy number profiles from the Cancer Genome Atlas (TCGA) ovarian cancer study (N=490). Fisher exact test or Χ2 test were used for comparison of categorical variables, and Wilcoxon rank-sum test was used for comparison of continuous variables. Overall survival (OS) was assessed using Kaplan-Meier and Cox regression methods.

RESULTS: We identified five genomic rearrangement signatures (Ov.RS1-5) in HGSOC. Ov.RS3 exhibited 10 kilobase to 10 megabase deletions and duplications, and contribution from this signature was negatively correlated with total number of rearrangements (Spearman coefficient -0.29, two-sided P=0.009). Tumors with a high contribution from Ov.RS3 demonstrated poor OS. The median overall survival OS was 22.7 months (95% CI, 20.2 to 39.0 months) in the Ov.RS3-High group versus 38.2 months (95% CI, 22.7 to 69.1 months) in the Ov.RS3-Low group (hazard ratio, 1.86; 95% CI, 1.12 to 3.09; P=0.015). Among patients in an independent TCGA cohort, the median OS was 38.0 months (95% CI, 35.3 to 41.4 months) in the Ov.RS3-High group versus 48.8 months (95% CI, 44.1 to 56.5 months) in the Ov.RS3-Low group (hazard ratio, 1.51; 95% CI, 1.18 to 1.93; P=0.001).

CONCLUSIONS: A novel genomic rearrangement signature identifies a subset of HGSOC with poor clinical outcome.

LEARNING OBJECTIVE: Identify signatures of genomic rearrangements in high grade serous ovarian carcinoma (HGSOC). Describe relationships between genomic rearrangement signatures and BRCA1 mutation status. Describe relationships between genomic rearrangement signatures and overall survival.
ABSTRACT #20: Imaging Biomarkers of Adiposity and Sarcopenia as Potential Predictors for Overall Survival Among Patients with Endometrial Cancer Treated with Bevacizumab

J. Gillen (1), K.A. Mills (2), J. Dvorak (1), B. Zheng (3), T. Thai (1), R. Salani (4), C.M. Cosgrove (4), B. Davidson (5), P.H. Thaker (2) and K.N. Moore (1) The University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA, (1) Washington University School of Medicine St. Louis, MO, USA, (2) The University of Oklahoma, Norman, OK, USA, (3) The Ohio State University, James Cancer Hospital, Columbus, OH, USA (4) Duke University School of Medicine, Durham, NC, USA (5)

OBJECTIVES: To examine the associations of BMI, subcutaneous fat area (SFA), visceral fat area (VFA), and total psoas area to outcomes in patients treated with and without first-line bevacizumab-based chemotherapy for endometrial cancer.

METHODS: We performed a multi-institutional, retrospective, cohort study of women with endometrial cancer treated with and without frontline Bevacizumab (bev). Demographics, physical exam parameters, surgical data, and tumor characteristics were collected. To assess a patient’s adiposity, SFA and VFA calculated from pre-treatment CT scans. These were then compared with survival data, including overall survival (OS) and progression free survival (PFS).  SAS 9.3 was used for statistical analyses.

RESULTS: A total of 134 patients were analyzed in this study. The majority of women were Caucasian with a mean BMI of 34.7 kg/m2. Of patients with pre-treatment CT scans, the median SFA was 324 cm2, median VFA 169.7cm2, and median psoas region 14.3 cm2. OS did not differ between patients with BMI, SFA, VFA, or psoas area greater than the median when compared to those <50th percentile (p=0.995, 0.367, 0.464, and 0.588 respectively). PFS did not differ either between cohorts (p=0.913, 0.607, 0.875, and 0.541 respectively). When adjusting for age, stage, and residual disease, however, elevated SFA (HR = 2.44 [1.24–4.82]; p = 0.0098) and high psoas area (HR = 2.87 [1.33–6.22]; p = 0.0074) were significantly associated with lower OS. When adjusted for age, stage, and residual disease, no marker of adiposity or sarcopenia was significantly associated with PFS. Those who received Taxol(Ixabepalone)/Carbo/Bev vs. Taxol/Carbo only had similar overall survival (37.6 vs 44.5 months, p=0.409). However, when stratified by adiposity markers, use of bev in the high psoas group was associated with lower OS (21.3 mo vs. 61.8, p=0.0309). After adjustment for prognostic factors and stratification by treatment regimen, higher BMI (HR=2.21 [1.12–4.38]; p=0.0255), SFA (HR=2.83 [1.13–7.10]; p=0.0267), and psoas area (HR=4.15 [1.52–11.28]; p = 0.0054) were associated with significantly lower overall survival in the Bevacizumab treatment group.

CONCLUSIONS: Obesity is associated with increased circulating levels of vascular endothelial growth factor (VEGF), a key regulator of tumor angiogenesis and the main target for bevacizumab antibody therapy. Imaging measurements of adiposity and/or sarcopenia may be predictive of treatment response in patients with endometrial malignancies treated with bevacizumab.

LEARNING OBJECTIVE: To help identify those patients with endometrial cancer who may respond better or worse to therapy with bevacizumab.
ABSTRACT #21: Germline BRCA mutation rate in Southern California Latina women

L. Hong (1), R. Gonzalez (1), S. Abu-Tabikh (1), L. Cristiano (1), S. Nguyen (2), J. Unternaehrer (3), Y. Ioffe (1) Loma Linda University Medical Center, Loma Linda, CA (1), University of California, Riverside School of Medicine, Riverside, CA (2), Department of Basic Sciences, Loma Linda University School of Medicine, Loma Linda, CA (3).

OBJECTIVES: Germline BRCA mutation rate in Latina population of United States is yet to be well described. In this study, we aimed to evaluate prescribing patterns for genetic testing, and testing completion rates while stratifying results by patients’ ethnic background. Finally, we aimed to quantitate the germline BRCA mutation rate in Latina population.

METHODS: We reviewed 1511 charts of new patients seen at a tertiary care center gynecologic oncology practice in Southern California between 7/5/2013 and 8/19/2016. Data abstracted included: referral for testing according to NCCN Guidelines Version 2.2017 for breast and/or ovarian cancer genetic assessment, testing completion rate, testing outcome, as well as racial/ethnic patient backgrounds. Data were analyzed with Chi-square test.

RESULTS: Of 1511 patients, 408 patients met criteria for testing based on personal or family history. Genetic testing was prescribed as indicated in 189/408 (46%) patients. By racial background testing was prescribed as follows: 108/250 (43%) Caucasian, 53/102 (52%) Latina, 14/27 (52%) African-American, and 14/29 (48%) of Asian/other background (p=ns). Genetic testing was completed in 74/108 (69%) Caucasian patients, 33/53 (62%) Latina, 10/14 (71%) African-American, and 10/14 (71%) patients (p=ns). In patients who underwent testing results were as follows: Caucasian: 34 of 74 patients with deleterious mutations, 7 variants of unknown significance (VUS): 26 BRCA 1/2; 6 MLH1/MSH2&6, PMS2, 1 MUTY-H, 1 BARD1. Germline BRCA mutation rate of 32%. Latina: 11 of 33 patients with deleterious mutations, 3 VUS: 7 BRCA 1/2, 1 MUTY-H, 1 NBN, 1 APC, 1 PTEN. Germline BRCA mutation rate of 21%. African-American: 5 of 10 patients with deleterious mutations (BRCA1/2), 2 VUS. Germline BRCA mutation rate of 50%. Asian/other: 2 of 10 patients with deleterious mutations (BRCA 1/2), 1 VUS. Germline BRCA mutation rate of 20% BRCA mutation rates were not statistically different between the groups.

CONCLUSIONS: At a single site tertiary institution, 46% of patients warranting genetic testing were prescribed as indicated, with 67% completion rate. There was no difference by race/ethnicity in rates of testing prescription, completion, or detection of BRCA mutation rates. 21% of tested Latina patients were found to have BRCA mutations, indicating a high rate of BRCA mutations in this population. Further studies are underway to identify barriers to testing referral, and completion, as well as types of mutations encountered.

LEARNING OBJECTIVE: Identify the rate of BRCA1/2 germline mutations in Southern California Latina women.

*Figure for Abstract #21 on next page
Figure 1. Genetic testing of gynecologic oncology patient population in Southern California.
ABSTRACT #22: Co-expression of the Hypoxic Marker Carbonic Anhydrase 9 (CA-IX) with Breast Cancer Associated 1 (BRCA1) is associated with faster recurrence in High Grade Serous Adenocarcinoma.

A. Krieg (1), P. Mwahech-Fauceglia (2), J. Lim (3), T. Pejovic (1) Department of Obstetrics and Gynecology, Oregon Health & Science University, Portland, OR (1), Departments of Pathology and Gynecologic Oncology, University of Southern California, Pasadena, CA (2), Biostatistics Shared Resource, Knight Cancer Institute, Oregon Health & Science University, Portland, OR (3)

OBJECTIVES: Tumor hypoxia is frequently a contributing factor to poor outcome in multiple cancer types, in part by influencing the expression of DNA repair enzymes. The objective of this study was to examine the possible relationship between Carbonic Anhydrase 9 (CA-IX, an indicator of tumor hypoxia), BRCA1 expression (a potential indicator of competent DNA repair), and patient outcome in epithelial ovarian cancer.

METHODS: BRCA1 and CA-IX were evaluated by immunohistochemistry in a tissue microarray of 157 epithelial ovarian cancer (EOC) patient samples, and their respective expression correlated to other biological parameters in all patients. The correlations between BRCA1 and CA-IX expression, and clinical outcome were determined in the High Grade Serous Adenocarcinoma samples (N = 101) on the array using Spearman’s correlation and log-rank (Mantel-Cox) tests.

RESULTS: As predicted by previous reports, elevated expression of BRCA1 strongly correlated with shorter intervals for disease recurrence and mortality (median time to recurrence = 1.05 yrs vs 1.94 yrs, P < 0.001; median time to mortality: 2.01 yrs vs 4.72 yrs, P < 0.001). There was a significant positive correlation between CA-IX and BRCA1 expression (Spearman’s r = 0.486, P <0.001). CA-IX expression alone was significantly associated with recurrence-free survival (restricted to first 1500 days, P = 0.0036). When patients were stratified by BRCA1 expression, co-expression of CA-IX and BRCA1 correlated with the shortest recurrence-free interval (P = 0.034).

CONCLUSIONS: The co-expression of CA-IX and BRCA1 may be a useful prognostic indicator for rapid recurrence in high grade serous ovarian cancer. As a hypoxia regulated gene, CA-IX may help identify preferential sensitivity of patients to anti-angiogenic agents or other factors to improve chemotherapeutic response.

LEARNING OBJECTIVE: Learners will be able to identify factors in HGSA that may interact with BRCA1 expression to confound treatment.
ABSTRACT #23: Inhibition of the Receptor Tyrosine Kinase AXL Sensitizes Uterine Serous Cancer to Paclitaxel via Increased Accumulation of Paclitaxel in Tumor Cells

J. Quinn, M. Palisoul, L. Guo, K. Fuh

OBJECTIVES: AXL expression has been associated with decreased survival in uterine serous cancer (USC). We determined whether inhibition of AXL could improve response to chemotherapy in chemotherapy-resistant uterine cancer.

METHODS: AXL knockdown by shRNA or therapeutically with an AXL specific inhibitor, R428, was performed in taxane resistant USC cell lines (ARK1 and ARK4). In vitro cell viability (XTT) assays were performed to assess response to paclitaxel. Transforming Growth factor-B (TGF-β) was used to induce epithelial to mesenchymal transition (EMT). A subcutaneous tumor model of ARK1 in NOD-SCID mice treated with paclitaxel only vs. paclitaxel plus R428 vs. R428 only, or no treatment. Statistical analysis was performed with GraphPad. Statistical significance was p<0.05.

RESULTS: Inhibition of AXL by shRNA restored paclitaxel-sensitivity in ARK1 (paclitaxel IC50 of 7.6nM in shAXL vs IC50 of 31.2nM in shControl) and ARK4 (paclitaxel IC50 of 5.7nM in shAXL and IC50 of 12.7nM in shControl). Therapeutic inhibition of AXL using a small molecule inhibitor, R428, restored paclitaxel-sensitivity in a dose-dependent fashion from untreated (IC50 of 29.3nM) to IC50 of 2.3nM, 12.5nM and 19.5nM at 3uM, 1uM, and 0.1uM, p<0.01, respectively in ARK1 cells. ARK1 cells pre-treated with 0.5uM R428 and 1.0uM R428 demonstrated a 31.4% and 42.9% increase in paclitaxel uptake, respectively, compared to ARK1 cells without AXL inhibition (p<0.05). This suggests that AXL contributes to retention and thus increasing exposure of paclitaxel in tumor cells. An additional mechanism for AXL restoration of chemosensitivity is through the epithelial mesenchymal transition as TGF-B treated epithelial cells underwent mesenchymal transition, had higher AXL expression, and were more chemoresistant. In vivo studies of combination treatment with R428 and paclitaxel (298mm3) showed a greater than 51% decrease in tumor volume after 2 weeks of treatment when compared to no treatment (895mm3), R428 treatment alone (774mm3), and paclitaxel treatment alone (609mm3), p<0.001.

CONCLUSIONS: Genetic and therapeutic inhibition of AXL restores chemosensitivity in paclitaxel resistant USC cells. AXL inhibition increases the intracellular accumulation of paclitaxel, providing insight into the mechanism by which inhibition of AXL can lead to sensitivity to chemotherapy. The combination of paclitaxel with an AXL inhibitor should be further explored as a therapeutic option for chemoresistant USC.

LEARNING OBJECTIVE: Identify how the receptor tyrosine kinase AXL contributes to chemoresistance in uterine serous cancer. Demonstrate increased tumor cell response to paclitaxel chemotherapy when AXL is genetically and therapeutically inhibited. Relate AXL expression to mesenchymal phenotypes and intracellular accumulation of paclitaxel.
ABSTRACT #24: Identification of Clinical-Molecular Characteristics Associated with Recurrent Endometrial Cancer

A.M. Newtson, E. A. Salinas, M.E. McDonald, M. Miller, M. Keeney, E. Devor, J. Gonzalez-Bosquet

OBJECTIVES: Endometrial cancer is the most common gynecologic malignancy diagnosed in the United States. Most women present with early stage disease, and their disease will not recur after initial treatment. For patients at risk, there is no method that accurately predicts who will recur. Our goal was to create a model to predict which patients with endometrioid endometrial cancer (EEC) will recur. The model was constructed by integrating clinical and molecular data from the Cancer Genome Atlas (TCGA). Then, based on these features, we stratified patients into subgroups that could inform potential alternative treatments.

METHODS: We included 271 TCGA patients with EEC, with 50 of them experiencing a recurrence. To identify elements associated with recurrence, a univariate analysis of clinical data; gene and miRNA expressions; DNA methylation; gene copy number and mutation analysis was performed. A multivariate analysis was done to identify variables independently associated with recurrence. Recurrent patients were classified into subgroups based on clinical-molecular features using a genome-wide unsupervised ‘cluster of clusters,’ and pathway analysis performed to identify targetable processes.

RESULTS: Elements of clinical data, gene expression, miRNA expression, DNA methylation, somatic mutations, and copy number variations were independently associated with disease recurrence. Three main clinical-molecular clusters were identified. Cluster 1 included 71% of patients, cluster 2 included 25%, and cluster 3 included 4% of patients with recurrent EEC. Pathway analysis revealed that the molecular features of cluster 1 were mostly associated with host-immune interactions, including both cellular and humoral immunity, as well as cytokine signaling (p-values < 0.001 – 0.048). The molecular features of cluster 2 were mostly associated with cell cycle regulation, including glycan degradation and DNA replication (p-values 0.002 – 0.035). The wnt signaling pathway was included in both clusters with a p-value of 0.038 for cluster 1 and 0.022 for cluster 2.

CONCLUSIONS: Integrating clinical and molecular data may help to predict patients at risk for EEC recurrence and may improve our knowledge of the biological processes involved. Cluster analysis stratified patients at risk for recurrence based on clinical-molecular features and may give an insight into processes involved in treatment failure for each subgroup and potential targeted therapies for them.

LEARNING OBJECTIVE: Identify independent (a) clinical factors and (b) molecular factors associated with recurrent endometrial cancer. Identify two main clinical-molecular clusters of recurrent endometrial cancer. Describe significance of these two main clusters in terms of both risk and implications for treatment in recurrent endometrial cancer.
ABSTRACT #25: Treatment with SQ1274, a Novel Tubulin Polymerization Inhibitor, Results in Improved Therapeutic Efficacy Compared to Paclitaxel in Serous Gynecologic Cancers

K.A. Mills (1), J.M. Quinn (1), H.M. Noia (1), L. Guo (1), G.R. Eldridge (2), D.G. Mutch (1), C. Starks (2) K.C. Fuh (1), Washington University School of Medicine, Division of Gynecologic Oncology, St. Louis, MO (1), Sequoia Sciences, Inc., St. Louis, MO (2)

OBJECTIVES: To determine whether SQ1274, a novel tubulin polymerization inhibitor, is a more effective chemotherapeutic agent than paclitaxel and to identify whether this inhibitor downregulates an active pathway in ovarian and uterine cancer metastasis - the AXL pathway.

METHODS: Ovarian (OVCAR8, OVCAR3, OVCAR3TP) and uterine serous cancer (ARK1) cell lines were treated with SQ1274 (Sequoia Sciences, St. Louis, MO). SQ1274 is a synthetic analogue of the plant compound bifidenone. (J. Nat. Prod., 2017, 80 (3), pp 616–624). Viability assays were performed after 72 hours of treatment with either SQ1274 or paclitaxel and IC50s were calculated using GraphPad Prism. Western blots were also performed of treated cells to identify markers of chemotherapy resistance, cellular apoptosis, and potential pathways that may be affected by SQ1274.

RESULTS: The IC50 of SQ1274 is 6-fold less than that of paclitaxel (0.94nM vs 6.16nM) in OVCAR8 and 3-fold less than paclitaxel (0.5nM vs 1.5nM) in ARK1 tumor cells. In an established paclitaxel-resistant ovarian cancer cell line (OVCAR3TP), SQ1274’s IC50 is 3-fold less than that of paclitaxel (0.57nM vs 1.7nM). Furthermore, SQ1274 was found to substantially inhibit p-AXL and AXL pathway expression by 90% in Western blotting in both uterine (ARK1) and ovarian (OVCAR8) cell lines. In addition, expression of other known factors in metastasis, Gas6 and SRC, was found to be substantially decreased by SQ1274.

CONCLUSIONS: After 72 hours of drug exposure, SQ1274 had improved killing efficacy at equivalent doses. Decreased expression of chemoresistance markers and increased expression of pro-apoptotic pathway proteins were seen in cells treated with the same concentration of SQ1274 as compared to paclitaxel and control treated cells. Inhibition of the AXL pathway may be one mechanism that SQ1274 utilizes. The SRC pathway was unaffected by SQ1274, and the potential combination treatment with a SRC inhibitor may result in an even greater cell death. Further investigation of SQ1274 as a possible novel therapeutic in vitro and in vivo in serous gynecologic cancers is currently ongoing, including in xenograft models.

LEARNING OBJECTIVE: Identify a potential novel chemotherapeutic agent SQ1274. Categorize potential pathways responsible for serous gynecologic cancer cells’ ability to escape cellular apoptosis when exposed to SQ1274.
ABSTRACT #26: Clinical and Genomic Differences by Loss of Heterozygosity Status in Recurrent Ovarian Cancer

L. L. Holman, MD1, J. Elvin, MD, PhD2, C. C. Gunderson, MD1, K. Moore, MD1  
1Section of Gynecologic Oncology, Stephenson Cancer Center, The University of Oklahoma Health Sciences Center, Oklahoma City, OK, 2Foundation Medicine Inc, Cambridge, MA

OBJECTIVES: Homologous recombination deficiency causes loss of heterozygosity (LOH), a pattern of allelic imbalance detectable by comprehensive genomic profiling (CGP). LOH has been shown to predict response to PARPi treatment in ovarian cancer (OC) patients (pts). This pilot study was designed to evaluate clinical and genomic differences among LOH-high (LOH-H) and LOH-low (LOH-L) recurrent OC pts.

METHODS: Retrospective analysis of demographic and clinical data was performed for OC pts who had undergone CGP as part of treatment planning for recurrent disease. CGP (FoundationOne®) by hybridization-capture of up to 315 cancer-related genes (FoundationOne®) identified genomic alterations (GA = SV, indels, CNA, rearrangements), tumor mutation burden (TMB), microsatellite instability status (MSI), and LOH status. LOH-H was defined as an LOH score of ≥14.

RESULTS: Of the 73 OC pts identified, 71.1% were serous, 75.3% were grade 3, and 71.2% were platinum sensitive. Only 5.5% had a germline BRCA mutation. LOH was evaluable in 58 pts. Of these, 62.1% were LOH-L and 37.9% were LOH-H. All of the LOH-H pts had high grade serous OC (HGSC). When LOH-H HGSC pts (n=22) were compared with LOH-L HGSC pts (n=22), there was no difference in clinical factors, including age, platinum sensitivity, progression-free survival, or overall survival (all p>0.05). There was also no difference in TMB between the two groups (p=0.44). However, the frequency of GA was different between LOH-H & LOH-L HGSC pts (Table 1).

CONCLUSIONS: Though LOH status does not appear to correlate with clinical factors in our cohort, there are striking genomic differences between LOH-H and LOH-L tumors. Confirmation of this data in a larger cohort is warranted. The utilization of targeted agents to exploit differences between LOH-H and LOH-L tumors is a strategy that should be explored further.

LEARNING OBJECTIVE: Learners will identify clinical and genomic differences by loss of heterozygosity status in ovarian cancer patients.

*Figure for Abstract #26 on next page
Figure: Long-Tail Plot of GA by LOH Type in High Grade Serous OC

Gene Alterations in LOH-L Tumors

Gene Alterations in LOH-H Tumors
ABSTRACT #27: High Rates of Minimally Invasive Hysterectomy Surgery for Endometrial Cancer at National Comprehensive Cancer Network Centers

J. Bergstrom (1), A. Aloisi (2), T. Yen (1), M. Leitao (2), J. Casarin (3), R. Matsuno (4), S. Dowdy (3), E. Tanner (1), A. Nickles Fader (1)  Kelly Gynecologic Oncology Service, Department of Gynecology and Obstetrics, Johns Hopkins Medicine, Baltimore, MD, USA (1), Department of Gynecologic Surgery, Memorial Sloan Kettering Cancer Center, New York, NY, USA (2), Division of Gynecologic Surgery, Mayo Clinic, Rochester, MN USA (3), Moores Cancer Center, University of California, San Diego, La Jolla, CA USA (4)

OBJECTIVES: Minimally invasive surgery (MIS) is considered a quality measure for the treatment of primary, stage I-III endometrial cancer (EC) by the Society of Gynecologic Oncology and the American College of Surgeons Commission on Cancer. In 2017, the National Comprehensive Cancer Network (NCCN) stated MIS hysterectomy is “the preferred approach” in the treatment of early-stage disease. Recent studies suggest only 50% of hysterectomies are performed via MIS and are less likely to be performed in the elderly or obese, racial minorities, those with aggressive tumor histologies, or in low EC volume hospitals. Therefore, a nationwide disparity in EC surgical care exists. Our study objective was to assess the percentage of EC cases performed by MIS at high-volume, NCCN centers and an evaluation of perioperative outcomes.

METHODS: A retrospective review at three high-volume, NCCN-designated centers was performed. Patients with pathologically confirmed EC who underwent primary surgical treatment by a gynecologic oncologist between 2013-2014 were included. Demographic and clinical characteristics for MIS vs. laparotomy were compared. Multivariable mixed logistic regression models were used to analyze factors associated with failure to perform MIS and perioperative complications.

RESULTS: A total of 1,311 patients were evaluated; 86.4% of surgeries were performed via MIS. The majority of MIS cases were robotic-assisted (79.3%), followed by laparoscopic (12.5%) and vaginal (8.2%). Age, race, BMI and histology were not associated with route of hysterectomy. On multivariable analysis, factors associated with failure to perform MIS were uterine size >12cm (OR: 0.17, 95% CI 0.03-0.88), stage III (OR: 0.15, 95% CI 0.05-0.48) and stage IV disease (OR 0.07, 95% CI 0.02-0.21). For stage I/II cases, patients undergoing laparotomy were more likely to suffer any complication (OR: 5.24, 95% CI 2.58-10.6), a gastrointestinal complication (OR: 10.91, 95% CI 3.09-38.54) or be readmitted within 30 days (OR: 2.65, 95% CI 1.35-5.22) compared to those who underwent a MIS procedure.

CONCLUSIONS: At high-volume NCCN centers, the rate of MIS in EC surgical care is higher than the reported national average, with low overall peri-operative adverse events. Previously identified disparities in surgical approach by age, race, BMI and tumor histology were not observed. A proposed MIS hysterectomy benchmark of >80% for women with EC is feasible at high-volume institutions when performed by gynecologic oncologists.

LEARNING OBJECTIVE: Discuss surgical quality measures in endometrial cancer care as defined by the Society of Gynecologic Oncology, American College of Surgeons Commission on Cancer and the National Comprehensive Cancer Network (NCCN). Define MIS hysterectomy rates and identify factors associated with failure to perform MIS hysterectomy and with perioperative complications in endometrial cancer care performed at high volume NCCN centers. Determine whether previously defined racial and hospital-based disparities in surgical care in endometrial cancer exist at NCCN centers.
ABSTRACT #28: Risk of metachronous ovarian cancer after ovarian conservation in young women with stage I endometrioid endometrial cancer


OBJECTIVES: To examine the cumulative incidence of metachronous ovarian cancer among young women with stage I endometrioid endometrial cancer who had ovarian conservation at surgical treatment.

METHODS: This retrospective study examined the Surveillance, Epidemiology, and End Results Program to identify women aged <50 years who underwent hysterectomy with ovarian conservation for stage I endometrioid endometrial cancer between 1983 and 2013. Time-dependent ovarian cancer risk after endometrial cancer diagnosis was examined.

RESULTS: Among 1,322 women in the study cohort, 16 women developed metachronous ovarian cancer with 5- and 10-year cumulative incidences being 1.0% and 1.3%, respectively. Median time to develop metachronous ovarian cancer was 2.4 years, and the majority of metachronous ovarian cancer was diagnosed within the first three years from the diagnosis of endometrial cancer (68.8%). The majority of metachronous ovarian cancer was endometrioid type (81.3%) and stage I disease (75.0%). With median follow-up time of 11.6 years, there were no ovarian cancer deaths. Younger age at endometrial cancer diagnosis was significantly associated with increased risk of metachronous ovarian cancer (10-year cumulative incidences: age <40 versus 40-49 years, 2.6% versus 0.4%, hazard ratio 5.00, 95% confidence interval 1.60-15.7, P=.002). On multivariable analysis, younger age remained an independent predictor for developing metachronous ovarian cancer, and a decrease in one year in age at endometrial cancer diagnosis was associated with a 9% increase of metachronous ovarian cancer (adjusted-hazard ratio 0.91, 95% confidence interval 0.84-0.99, P=.024).

CONCLUSIONS: Young women with stage I endometrioid endometrial cancer have an approximately 1% risk of developing metachronous ovarian cancer after ovarian conservation that was associated with favorable tumor factors resulting in good ovarian cancer-specific survival. These findings suggest the importance of genetic testing and close follow-up when counseling about this procedure especially for those who aged <40 years.

LEARNING OBJECTIVE: To describe the incidence of metachronous ovarian cancer after ovarian conservation in endometrial cancer. To identify the risk factor of metachronous ovarian cancer after ovarian conservation in endometrial cancer.
ABSTRACT #29: Patient Satisfaction After Open Gynecologic Oncology Surgery With Enhanced Recovery Pathway

N.C. Nyakudarika, L.L. Chen, J.S. Chapman, L.M. Chen

OBJECTIVES: To determine how an enhanced recovery after surgery (ERAS) pathway affects satisfaction levels in gynecologic oncology patients undergoing open surgery.

METHODS: This was a retrospective case-control study. Gynecologic oncology patients who underwent open surgery between November 2015 and June 2016, after implementation of an enhanced recovery pathway, were compared to historical control patients who underwent surgery between June 2014 and October 2015, prior to implementation of the pathway. Enhanced recovery components included patient education, multimodal analgesia with opioid minimization, nausea prophylaxis, and early ambulation, diet advancement and bladder catheter removal. Cases were matched in a 1:2 ratio with historical controls by age and procedure type. Baseline characteristics, including age, diagnosis, surgery performed, operative time, pain control, blood loss, intensive care unit admission, post-operative nausea and vomiting, return of bowel function, bladder catheter removal, and length of stay were compared between the two groups. The primary outcome evaluated was patient satisfaction as reported on telephone surveys administered within 48 to 72 hours of discharge. 30-day readmission was assessed as a secondary outcome. Statistical analysis was performed using t-test and Chi-squared test.

RESULTS: The final cohort included 140 patients, 51 of whom had undergone surgery with an enhanced recovery pathway. Although the two groups were largely similar at baseline, enhanced recovery pathway patients had epidurals for longer (3.27 days versus 2.61 days, p = 0.02) and fewer of them experienced post-operative nausea and vomiting (47% versus 67%, p = 0.0024). Patient satisfaction levels were not significantly different between the groups, with 88% of enhanced recovery patients reporting complete satisfaction compared to 85% of historical controls (p = 0.55). In addition, 30-day readmission rates did not differ significantly between the enhanced recovery patients and the controls (8% versus 6%, p = 0.49).

CONCLUSIONS: In patients undergoing open gynecologic oncology surgery, an enhanced recovery pathway is not associated with better or worse satisfaction. Patient satisfaction levels remain high both before and after the implementation of this protocol. Improved outcomes are expected with pathway optimization and longer follow up.

LEARNING OBJECTIVE: Assess the advantages of an enhanced recovery pathway in a healthcare system that stresses cost, value, and quality.
ABSTRACT #30: A cost-effectiveness analysis of universal testing for Lynch syndrome in endometrial carcinoma

J. Dottino (1), D. Lairson (2), S. Cantor (1), R. Suidan (1), Karen H. Lu (1) MD Anderson Cancer Center, Houston, TX (1); The University of Texas Houston Health Sciences Center School of Public Health, Houston, TX (2)

OBJECTIVES: To estimate the cost-effectiveness of universal Lynch Syndrome (LS) testing in newly diagnosed endometrial cancer (EC) patients.

METHODS: We created a decision analysis model to compare different universal LS testing strategies in EC patients. In our first testing strategy, all patients underwent germline sequencing for mismatch repair genes. In our second strategy, all patients had tumor immunohistochemistry testing (IHC) and those with abnormal results received germline sequencing. In our third strategy, patients had both IHC and microsatellite instability (MSI) testing, with testing-directed sequencing. Costs and outcomes were obtained from the published literature and Medicare reimbursement rates. LS carriers were modeled to undergo intensive screening for colorectal cancer (CRC) compared to patients without LS. Costs included LS testing, genetic counseling, and CRC screening costs in 2016 US Dollars. Effectiveness was defined as life-years gained as determined by 5-year CRC disease-specific survival. Incremental cost-effectiveness ratios (ICERs) were calculated and measured in dollars per life year gained (LYG). We varied selected individual parameters to perform one-way sensitivity analyses.

RESULTS: For the 60,000 US women diagnosed with EC each year, the cost of universal germline testing, IHC only testing, and combination IHC/MSI testing is $157 million, $42 million, and $67 million, respectively. Testing with combination IHC/MSI testing and germline testing are both costlier and more effective than testing with IHC alone, with ICERs of $159,087/LYG and $3,337,074/LYG. IHC only testing had an ICER less than $50,000/LYG compared to no screening. Sensitivity analysis showed that if the cost of germline testing < $500, this strategy would be more cost-effective than universal tumor testing with IHC alone.

CONCLUSIONS: If universal testing for LS in EC patients is undertaken, IHC testing appears to be more cost-effective compared to combination testing with IHC/MSI or germline testing. If germline testing pricing is < $500, this strategy should be considered over tumor testing strategies.

ABSTRACT #31: Factors Associated with Increased Narcotic Usage after Undergoing Robotic Assisted Laparoscopy

A. Moreno (1), Elise Vo (1), B. Bhattarai (2) S. Patel (3), J. Farley (4), L. Willmott (5), B. Monk, MD (5), D. Chase (5) Phoenix Integrated Residency in Obstetrics and Gynecology, Phoenix, Az (1) Maricopa Integrated Health System, Phoenix, Az (2), Creighton School of Medicine, Omaha, NE (3), University of Arizona Cancer Center Dignity Health, Phoenix, Az (4), Arizona Oncology, Phoenix, Az (5)

OBJECTIVES: To identify factors associated with post-operative pain medication usage in patients undergoing robotic assisted laparoscopic surgery.

METHODS: A retrospective chart review of patients that underwent robotic assisted laparoscopic surgery from 2012-2015 in accordance with the regulations set forth by the Institutional Review Board of St. Joseph’s Hospital and Medical Center. The following data points were extracted regarding demographics, procedure, anesthesia time, post-operative complications and pain medication requirements. Subjects were assigned a Charlson comorbidity index score. The Spearman’s rho Coefficient was used to test the association between total morphine equivalent narcotics to BMI, age, Charlson age-comorbidity index, intraoperative complications (bladder injury, bowel injury, ureteral injury, intraoperative transfusion), postoperative complications (infection, urinary retention, reoperation, wound complications, ileus, fever), length of stay, PCA, total anesthesia time, total procedure time. Based on the amount of IV narcotics and oral 5/325 tabs, total oral morphine equivalent narcotics administered to the patients during the post-surgery hospital stay periods were calculated. The correlation of total oral morphine equivalent narcotics to multiple variables were evaluated.

RESULTS: A total of 784 subjects were included. The average age, BMI, and LOS were 53.77 (17-92), 31.75 (17-56), and 1.56 (range 0-19), respectively. Surgeries varied from adnexal procedures (n=67), hysterectomies with and without bilateral salpingo-oophorectomy (n=753) and hysterectomies with pelvic lymphadenectomy (n=762) Total oral morphine equivalent narcotics were correlated positively with: BMI (Spearman’s rho = 0.076, P = 0.36), any intraoperative complication (Spearman’s rho = 0.021, P = 0.563), any postoperative complication (Spearman’s rho = 0.16, P<0.001), length of stay in days (Spearman’s rho = 0.291, P<0.001), procedure time (0.046), total anesthesia time (very weak, 0.032) Total oral morphine equivalent narcotics were correlated negatively with: 65 or older (-0.088, P=0.016), Charlson age-comorbidity index (rho = -0.457, P = 0.025), use of patient controlled analgesia (rho=-0.171, P < 0.001).

CONCLUSIONS: Younger age, <65, appears to be a predictor for increased requirement of total morphine equivalent medication after robotic assisted laparoscopic surgery; while PCA use and Charlson age-comorbidity index had a negative association.

LEARNING OBJECTIVE: Describe factors associated with increase usage of narcotic medication when undergoing a laparoscopic assisted procedure in gynecologic surgery. To identify if pain medication usage is related to length of stay, type of procedure, duration of case, co-morbidities, etc.
ABSTRACT #32: Survival across lines of therapy in uterine leiomyosarcoma

Perkins V.B., Mashburn S.G., Chen S., Moore K.N., Gunderson C.C.

OBJECTIVES: Uterine leiomyosarcoma (uLMS) is a rare disease with high recurrence and mortality rates. It has a 5-year survival of 66%. There is very limited data regarding treatment of recurrent disease, especially in higher-order relapses. The purpose of this study is to retrospectively investigate the lifecycle of recurrent uterine leiomyosarcoma to determine if treatment at each relapse phase is beneficial.

METHODS: A retrospective, IRB-approved, analysis of patients with any stage of uLMS who underwent treatment between January 2006 and December 2016 at a single institution was performed. Descriptive statistics of the demographic, oncologic, and treatment characteristics were performed. OS was estimated using the Kaplan Meier method. The clinical data was correlated to a large database 232 FFPE uLMS by hybridization-capture of up to 405 cancer-related genes (FoundationOne) which provided data regarding genomic alterations (GA; SV, indels, CNA, rearrangements).

RESULTS: 29 patients met inclusion criteria. 56% presented with Stage I, 11% with Stage II or III, and 33% presented with Stage IV disease. 19% had a complete response to primary therapy without recurrence and 70% had disease recurrence or progression. The median number of chemo regimens was 2 with 15% receiving greater than 3 regimens. The median number of relapses was 2. 26% received hospice or no further treatment at any time during their disease course. The median times from diagnosis to first relapse, first relapse to second relapse, and second relapse to third relapse were 10.4, 12.2, and 10.9 mo, respectively. Median OS was 26.8 months (Figure 1). Analysis of 232 clinically advanced/recurrent uLMS revealed 96.5% harbor at least one alteration (mean 3.5; range 0-17), most frequently in one or more of the critical tumor suppressors TP53 (66%) and RB1 (50%). 34% of cases demonstrated inactivation of the chromatin remodeling regulator ATRX. GA predicted to activate the PI3K/AKT/mTOR pathway were identified in 33% of uLMS.

CONCLUSIONS: Although the majority of patients with uLMS present with early-stage disease, recurrence rates are high and prognosis is poor. The disease tends to follow 2 dichotomous patterns: curative primary therapy without relapse versus recurrent disease requiring multiple therapies. The interval between relapses does not seem to diminish with treatment of uterine LMS, contrary to the pattern with other recurrent gynecologic cancers such as ovarian. For those with recurrent disease, a large proportion have genomic alterations which may be targeted with agents under development.

LEARNING OBJECTIVE: Learners will be able to evaluate the life cycle of uLMS and identify the variety of treatment strategies utilized in each phase of relapse.

*Figure for Abstract #32 on next page
*Figure for Abstract #32*
ABSTRACT 33: Discrepancies in outside pathology slide review of uterine neoplasms

C. Haunschild, G. Hsieh, K. Vierkoetter, M. Baskovic, A. Folkins, S. MacLaughlan-David

OBJECTIVES: Outside pathology slide review is mandatory for all patients with endometrial sampling or hysterectomy specimens referred to gynecologic oncology at our academic tertiary care center. The purpose of this study is to identify the rate of clinically relevant discordance of uterine neoplastic diagnoses between outside pathologists and our institutional pathologists.

METHODS: A de-identified patient electronic medical record (EMR) database was used to identify female patients of any age with an Outside Slide Review report and an ICD-10 diagnosis of either malignant neoplasm of female genital organs (ICD-10 C51-C58) or noninflammatory disorders of female genital tract (ICD-10 N80-N98) over a three-year time period. The EMRs were reviewed and patients were included if they had an outside slide review of a uterine neoplasm that was requested by a gynecologic oncologist. Discrepancies on pathology review were evaluated for clinical significance and whether they changed management recommendations. Descriptive statistics were used for analysis. IRB approval was obtained for this study.

RESULTS: Between October 2013 and October 2016, 496 patients (with 830 specimens) underwent pathology review for gynecologic diagnoses. Two hundred forty three of these patients had uterine neoplasms with 319 specimens meeting our eligibility criteria for analysis. Pathologic discordance was identified for 108 specimens (34%), and 54 patients had a change in management based on this discordance (clinically significant discordance rate of 17%). One-third of the specimens reviewed (n=102) were hysterectomy specimens, with a clinically significant discordance rate of 22% (n=22). Pre-operative endometrial sampling procedures were the majority (68%, n=217) of specimens and had a 16% clinically significant discrepancy rate. A total of 21 hysterectomies could be avoided based on change in diagnosis after review of outside endometrial sampling pathology slides.

CONCLUSIONS: The rate of clinically significant discordance in uterine pathologic diagnoses is substantial between referring institutions and this academic tertiary care center, justifying the institution’s policy for mandatory review, and demonstrating a need for objective, reproducible diagnostic criteria. Future studies will evaluate cost efficacy of this practice as well as predictive “accuracy” of pre-operative sampling review as it correlates with final hysterectomy diagnoses.

LEARNING OBJECTIVE: Learners will be able to quantify the discrepancy rates of outside slide review of uterine neoplasms. Learners will be able to discuss the clinical impact of pathology review by pathologists who specialize in diagnosing gynecologic neoplasms.
ABSTRACT #34: Robotic-assisted Gynecologic Surgery in an Elderly Population: A Comparison Study

Elise Vo, MD; Andrea Turner, MD; Bikash Bhattarai, PhD; Shreya Patel, BS; John Farley, MD, Lyndsay Willmott, MD, Bradley Monk, MD, Dana Chase, MD

OBJECTIVES: To evaluate the peri- and postoperative complication rates in patients age 65 years or above in minimally-invasive robotic gynecologic surgery.

METHODS: We performed a retrospective review of 760 consecutive patients scheduled for minimally-invasive robotic-assisted surgery with gynecologic oncologists from January 2012 to October 2015 at a single institution. These surgeries included one or more of the following: hysterectomy, salpingectomy with or without oophorectomy, ovarian cystectomy, and/or lymphadenectomy. The patients were divided into two groups: non-elderly patients age less than 65 years and elderly patients aged 65 years and above. These groups were assessed for patient characteristics, intra-operative, and post-operative course. Associations of these two age-groups with categorical variables were analyzed with Fisher’s exact test and continuous outcomes were compared with the Wilcoxon rank-sum test. Descriptive statistics, percentages and odds ratios for categorical outcomes were reported for the two age groups.

RESULTS: 23.9% (182/760) of patients were 65 or older. Within the patients over age 65 years, 54.4% (99/182) were aged 65-70, 22.0% (40/182) aged 71-75, 12.1% (22/760) aged 76-80 and 11.5% (21/182) over 80. Roughly equal proportions of patients in the two age groups had hysterectomy (72% vs 78%) with a larger number of patients in the older group having lymphadenectomy (40% vs 25%). 1.7% (13/760) of patients had intraoperative and 14.1% (107/760) had postoperative complications. Intraoperative complication in patients less than 65 was 1.9% (11/578) versus 1.1% (2/180) in women 65 or older (P = 0.744). Postoperative complications in patients less than 65 were 13.3% (77/578) versus 16.5% (30/182) in women 65 and older (P = 0.328). We observed possible association between intraoperative and post-operative complications regardless of age (OR = 2.78, P=0.097). Average (median, range) length of stay was 1.5 days (1.5, 0-19) for younger than 65 and 1.75 days (1, 0-11) for 65 or older (P=0.001). Average IV fluids administered from admission to discharge was 2,565 ml (2565, 1289 – 3841) for less than 65 and 4831 (4831 (3813-5850) for 65 and older (P=0.667). Average number of units of blood transfused was 0.07 (0, 0-5) units for less than 65 and 0.14 (0, 0-9) units for patients 65 and older (P=0.514). Average blood loss was 135 ml (100, <10-900) for patients younger than 65 and 117ml (100, <10-750) in patients 65 or older (0.028).

CONCLUSIONS: In this large single institution retrospective chart review, elderly patients are not at increased risk for complications with minimally-invasive robotic-assisted gynecologic oncologic surgery.

LEARNING OBJECTIVE: Illustrate similar complication rates of robotic surgery between patients 65 years old and younger, and older than 65 years.
OBJECTIVES: Although patients with grade 3, deeply invasive endometrioid adenocarcinoma are typically managed with primary surgery, the type of adjuvant therapy used is controversial. This subgroup was excluded from PORTEC-1 and -2 because they were felt to have a high risk of recurrence, and though they were included in GOG99, only 38 patients fell into this category. The purpose of this study was to evaluate the role of adjuvant radiation and/or chemotherapy in women with deeply invasive grade 3 endometrioid tumors.

METHODS: A multi-center retrospective chart review was performed at three large medical institutions in the United States. Patients with grade 3 endometrioid adenocarcinoma invading >50% of the myometrium were included. Medical records were queried to evaluate whether lymph node assessment was performed, the status of the lymph nodes, and adjuvant treatment strategy used. Overall survival (OS) was calculated from date of primary surgery to date of last follow-up or death. Log-rank tests were performed to compare management strategies. A multivariable Cox proportional hazards model was then conducted controlling for age and BMI.

RESULTS: Between 1984 and 2012, 257 patients were identified with a median follow-up of 3.08 years. Most patients (215, 84.7%) had evaluation of pelvic and/or para-aortic lymph node status and 92 (43%) had positive lymph nodes. For node negative patients, there was no difference in 5 year survival between those who received adjuvant pelvic radiation +/- vaginal brachytherapy (n=52) versus brachytherapy alone (n=46) (0.73 vs 0.70, p=0.729). Among patients with positive lymph nodes (n=92), 16 patients received radiation alone versus 50 who received combination of chemotherapy +/- radiation. Chemotherapy did not improve 5 year overall survival compared to radiation alone (0.48 vs 0.50, p=0.761).

CONCLUSIONS: Among women with grade 3, deeply invasive endometrioid adenocarcinoma, vaginal cuff brachytherapy alone resulted in similar survival when compared to pelvic radiation in node negative patients. The addition of chemotherapy did not show clear benefit when compared to radiation therapy alone in women with positive nodes.

LEARNING OBJECTIVE: Compare outcomes of adjuvant therapy strategies for grade 3 deeply invasive endometrial cancer. Justify the performance of lymph node evaluation in grade 3 endometrial cancer. Identify the high rates of nodal positivity in grade 3 deeply invasive endometrial cancer.
ABSTRACT #36: Effect of Diabetes and Metformin on Uterine Risk Factors in Type 2 Endometrial Cancers


OBJECTIVES: To explore the relationship between diabetes (DM) and metformin on uterine risk factors in type 2 endometrial cancers.

METHODS: Using our single institution, high grade endometrial cancer database we identified DM patients, their DM medications and uterine pathologic findings. The following variables were evaluated to explore associations between DM and metformin use on uterine disease: tumor size, LVSI, cervical stromal invasion, histologic type, depth of myometrial invasion and adnexal/serosal involvement. Fisher’s exact tests were used to evaluate the association of non-DMs, metformin DMs and non-metformin DMs with these uterine risk factors.

RESULTS: 247 patients were included, of which 61 (24.7%) had a diagnosis of DM and 186 (75.3%) did not. Of the 61 DM patients 28 (46.0%) were taking metformin and 33 (54.0%) were non-metformin users. Comparing these three groups non-DMs, non-metformin DMs and metformin DMs mean ages (years) at diagnosis were 66 ± 10.7, 69.5 ± 8.8 and 64 ± 8.3 respectively, P=0.219. The mean BMIs (kg/m2) at the time of diagnosis were 31.4 ± 7.3, 33.2 ± 8.5 and 35.0 ± 9.8, P=0.166. Mean tumor sizes (cm) at the time of surgery were 4.8 ± 3.1, 4.9 ± 4.1 and 5.2 ± 3.2, P=0.848. African American race differed within the three groups (45.7% vs. 78.8% vs. 57.1%, P=0.003). The following uterine risk factors were statistically different among the 3 groups: positive pelvic washings (23.2% vs. 9.1% vs. 7.1%, P=0.045), presence of LVSI (54.5% vs. 28.5% vs. 34.6%, P=0.007). Trends in differences of the following uterine risk factors were observed: presence of cervical stromal involvement (31.1% vs. 37.5% vs. 48.1%, P=0.190), adnexal or serosal involvement (25.5% vs. 19.4% vs. 11.1%, P= 0.252) and early stage at diagnosis (52.2% vs. 59.4% vs. 71.4%, P=0.146). Depth of myometrial invasion >50% did not show a clear trend (44.3% vs. 30% vs. 50%, P=0.261).

CONCLUSIONS: Age, tumor size and BMI were not significantly different among groups. Non-DM patients, when compared to DM patients were more likely to have LVSI and positive pelvic washings. Trends toward DM patients having decreased incidence of adnexal/serosa involvement, earlier stage at diagnosis and cervical stromal involvement were observed. There may be differences in frequency of histologic subtypes seen in DM patients vs. general population. When comparing metformin DMs vs. non-metformin DMs data trended toward metformin users having decreased incidence of adnexal/serosal involvement and increased incidence of early stage at presentation.

POSTER #1: Compliance After Treatment Is a Major Barrier to the Optimal Treatment of Cervical Cancer in Guatemala

A. Zamorano (1), J. Barnoya (2), E. Gharzouzi (3), C. Chrisman Robbins (1), D. Mutch (1) (1) Department of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, MO, United States. (2) Department of Surgery, Washington University School of Medicine, St. Louis, MO, United States. (3) Instituto de Cancerología, Guatemala City, Guatemala.

OBJECTIVES: To assess treatment compliance of cervical cancer patients at the Guatemala Cancer Institute (INCAN), the largest cancer referral center for the poor and underserved in this low/middle income country.

METHODS: We reviewed charts of women diagnosed with cervical cancer at INCAN between 2005 and 2007 and assessed follow up until December 2015. Patients were randomly selected from a database maintained by the hospital of all patients diagnosed with cervical cancer. Demographics and clinical characteristics were tabulated.

RESULTS: A total of 92 women were analyzed; most presented with squamous cell carcinoma (73%) and at advanced stages (IIB 51% and IIIB 33%). Regarding treatment, 79% received external beam radiation, 68% brachytherapy, and 3% concomitant chemotherapy. 73% completed treatment and 65% were followed up after treatment completion (median 32 months). 18.3% of patients were lost to follow up in the first 6 months and 65% in the first five years. 18% of all patients did not receive any treatment after diagnosis. Only 15 (16%) patients were diagnosed with a recurrence. There were no hospital deaths or evidence of death at follow up found in the charts.

CONCLUSIONS: While a recurrence rate of only 16% and zero documented deaths in a population with such advanced stage appears favorable, it is a dramatic representation of the poor compliance rate. According to our findings, over a quarter of women with cervical cancer do not complete treatment, and one-third are not followed after treatment completion. This highlights the need to more fully examine compliance among this population and identify the barriers that impair the optimal treatment of cervical cancer.

LEARNING OBJECTIVE: Describe the unique demographics of this population. Identify the barriers to treatment of cervical cancer in Guatemala. Analyze the association between recurrence rates and compliance with treatment.
POSTER #2: A systematic assessment of Google search queries and readability of online gynecologic oncology patient education materials.

A. Martin, J.R. Stewart, E. Medlin

OBJECTIVES: Internet use among patients is ubiquitous. Patients with gynecologic cancer and their family members frequently use the Internet to obtain information. Patient education materials should be available at a seventh- to eighth-grade reading level, but many fall short. This study sought to determine the most used search queries for gynecologic cancers and determine the readability of the most common web addresses.

METHODS: Google AdWords Keyword Planner and the Python programming language (Version 3.5.1) were used to describe Google search terms used by the public related to gynecologic cancers and to explore individuals, businesses and institutions providing content resulting from these searches. Four validated readability formulae were used to report the calculated readability scores of the top Google search results.

RESULTS: The most common website was cancer.org. The most common TLD was *.com. The majority of websites analyzed were above the recommended seventh to eighth grade reading level. The mean grade-level readability for all 4 formulae, and all sites across all groups was 12.1 ± 3.4, with only 18.9% of sites below the recommended 8th grade reading level. The SMOG Index was the most reliable among the 4 formulae used. The mean grade level readability for all sites across all groups as calculated by the SMOG index was 9.4 ± 2.3, with 23.9% of sites falling at or below the recommended 8th grade reading level. The first ten results for each Google keyword were the easiest to read.

CONCLUSIONS: Patients who use Internet search engines to acquire health information for gynecologic cancers frequently see reliable health information. However, most websites fall short in readability. Further attention to the grade level readability of patient information is required to adequately meet the needs of the gynecologic cancer patient population.

LEARNING OBJECTIVE: To identify the most common Google search queries related to gynecologic oncology. To explore the individuals, businesses, and institutions providing content resulting from these searches. To calculate the readability of the top websites resulting from these searches.

*Figure for Poster #2 on next page
Figure 1. SMOG Index readability scores.
POSTER #3: Disparities and demographics in sentinel lymph node mapping for endometrial cancer.

A. Barrie, MD; M. McHale, MD; C. Saenz, MD; K. Taylor, MD; S. Plaxe, MD. University of California, San Diego, Moore's Cancer Center, La Jolla, CA.

OBJECTIVES: To assess the current state of sentinel lymph node evaluation in endometrial cancer including demographics and survival outcomes.

METHODS: The Surveillance, Epidemiology, and End Results (SEER) database was queried from 2012-2013 to identify women with endometrial carcinoma who underwent cancer directed surgery. Patients were compared by year of diagnosis, type of lymph node sampling performed, age, race, state, and tumor grade. Relative survival was determined using SEERStat and the Kaplan-Meier method, and 95% confidence intervals were calculated.

RESULTS: 21,773 women who underwent surgery for endometrial cancer were identified from 2012-2013. 13,781 of these women underwent lymph node sampling, either sentinel lymph node dissection or non-sentinel lymph node dissection. The frequency of sentinel lymph node dissection more than doubled from 2.51% in 2012 (95% CI 2.51-3.31) to 5.19% in 2013 (95% CI 4.67-5.71). Sentinel node dissection rates were highest in Hawaii (41.18%, 95% CI 35.8-46.6) and New Jersey (9.77%, 95% CI 8.48-11.07), and lowest in Kentucky, New Mexico, and Utah (0%). Women less than 60 years of age underwent sentinel lymph node dissection at higher rates compared to women aged 60 years or greater (4.61% vs 3.71%; RR 1.23, 95% CI 1.05-1.45). Sentinel lymph node dissection was more frequent performed in white patients compared to black patients (3.57% vs 2.39%; RR 1.47, 95% CI 1.02-2.13). Patients with grade 1 tumors had higher rates of sentinel lymph node dissection when compared to those with grade 2 and 3 tumors (5.07% vs 3.91%; RR 1.28, 95% CI 1.06-1.54). The 23-month relative survival rate for the entire cohort was 95.3% (95% CI 94.6-95.9). Patients who underwent sentinel lymph node dissection had similar relative survival compared to those who had non-sentinel lymph node dissection (98.2% [95% CI 94.6-99.8] vs 95.5% [95% CI 94.5-96.2]).

CONCLUSIONS: Findings in this descriptive study identify patient populations where adoption of this novel surgical technique is low. Barriers to application including health care resources, access to modern technologies, variations in practitioner preference, health care cost and reimbursements need to be further assessed.

LEARNING OBJECTIVE: Identify patient populations where uptake in sentinel lymph node mapping for endometrial cancer is high and low.
POSTER #4: Friend or foe? Intraperitoneal ports placed at the same time as bowel resection: complication rates and outcomes


OBJECTIVES: Despite multiple studies showing a survival advantage in ovarian cancer, intraperitoneal (IP) chemotherapy is under-utilized due to concerns about treatment toxicity and IP port complications. When a bowel resection is performed at the same time as IP port placement, our practice is to give 1-2 cycles of intravenous chemotherapy prior to initiating IP chemotherapy in order to reduce possible port and chemo complications. Our objective was to examine our perioperative outcomes.

METHODS: IRB approval was obtained to review patients at our institution who had an IP port placed. Variables examined: demographic information, type of cancer and histology, surgical procedures performed at debulking, IP port complications and chemo complications during chemotherapy treatment course, number of chemotherapy cycles administered (IV and IP), and outcomes. Descriptive statistics, t-test, and chi-squared analysis were used.

RESULTS: Between 2005-2016, 322 patients had IP ports placed for ovarian cancer treatment. Two groups were analyzed: IP ports placed with concurrent bowel resection (IP-BR, 34%) and those without bowel resection (IP, 66%). Types of bowel resections in the IP-BR group: 73% rectosigmoid, 5% ascending colon, 13% transverse colon, 8% small bowel. There was no difference in mean age, stage 4 disease, rates of optimal debulking, or receipt of neoadjuvant chemotherapy between the two groups. The IP-BR group was more likely to receive adjuvant IV chemotherapy prior to starting IP chemotherapy (75% IP-BR vs. 45% IP, p=0.008) with mean number of IV chemotherapy cycles 1.7 IP-BR vs. 2.6 IP (p=0.46). The IP-BR group was more likely to initiate adjuvant IP chemotherapy (96% IP-BR vs. 78% IP, p=0.023). Mean number of IP chemotherapy cycles were 4.5 IP-BR vs. 4.1 IP (p=0.64). Rates of IP port complications were 10.3% IP-BR vs. 20.5% IP, (p=0.22), including rates of IP port infections (0% IP-BR vs. 6.9% IP, p=0.15). IP-BR patients were more likely to have a bowel complication (e.g. bowel obstruction or perforation) while the IP port was in situ (32% IP-BR vs. 2.8% IP, p=0.0006).

CONCLUSIONS: Placing an IP port at the same time as bowel resection for ovarian cancer debulking surgery does not appear to decrease the likelihood of starting or completing IP chemotherapy, nor does it appear to increase the risk of IP port complications. This may be due to delaying initiation of IP chemotherapy by 1-2 cycles allowing bowel to heal. However, there may be an increased risk of a bowel complication while the IP port is in situ when placed at time of bowel resection.

POSTER #5: Detection of Chronic Hepatitis B in Gynecologic Oncology Patients Undergoing Systemic Chemotherapy

University of Texas Southwestern Medical School, Dallas, TX.

OBJECTIVES: In 2010, the American Society of Clinical Oncology (ASCO) published a clinical opinion recommending universal screening for chronic hepatitis B (HBV) in patients undergoing chemotherapy for malignancy. In 2015, ASCO updated its position, recommending screening only for patients at risk for chronic HBV. Our institution initiated universal HBV screening for patients undergoing chemotherapy in January 2012. Our objective is to assess our adherence to this policy, and to identify how many women with gynecologic cancers undergoing chemotherapy at our institution were diagnosed with chronic HBV.

METHODS: A retrospective cohort study was conducted between 1/2/2012 and 8/28/2015 of all gynecologic oncology patients receiving chemotherapy at a single institution with both a private and public hospital system. Pertinent data was abstracted, including known risk factors for chronic HBV such as origin from countries with endemic HBV, previous transfusion history, history of intravenous drug use or high risk sexual contact. HBV status was determined by screening patients for HBsAg and HBCAb, and previously known chronic HBV patients were excluded. Fisher exact test was performed. p <0.05 was considered significant.

RESULTS: 559 patients met inclusion criteria. 93% (522/559) were tested for both HBsAg and HBCAb prior to initiating chemotherapy. Of the patients not tested, 24% (9/37) were positive for at least one HBV risk factor. Five patients (0.9%) were diagnosed with chronic HBV and started on lamivudine. No patient developed reactivated HBV. All five patients received their care at the safety net county hospital and all had cervical cancer, amounting to 2% (5/245) of the cervical cancer population. Cervical cancer patients were more likely to be diagnosed with chronic HBV compared to other gynecologic cancers, p=0.02. All 5 patients were positive for at least one risk factor for chronic HBV. 18% (101/559) of the patients in the study were positive for at least one risk factor. However, 65% (362/559) of patients were missing documentation regarding at least one risk factor.

CONCLUSIONS: Adherence to universal screening for chronic HBV was high. Comprehensive documentation of risk factors for chronic HBV was limited. Universal testing for chronic HBV should be considered for women with cervical cancer undergoing systemic chemotherapy.

LEARNING OBJECTIVE: Review current guidelines for screening for HBV in gynecologic oncology patients receiving chemotherapy. Identify correlation of risk factors and type of cancer with HBV status as well as need for more thorough documentation of risk factor status. Outline current adherence to testing practices at UTSW and Parkland Medical Hospital.
OBJECTIVES: Data from colon, breast and prostate cancers suggest that aspirin users have reduced mortality. It is thought that aspirin may suppress the COX inflammatory pathways overexpressed in PI3K mutations, a mutation found in up to 30% of patients with ovarian clear cell carcinoma (OCCC). Thus, we hypothesized that aspirin users with OCCC would have improved survival outcomes.

METHODS: We performed a retrospective review of patients with OCCC diagnosed between 1995 and 2016. Patients underwent primary cytoreductive surgery followed by platinum-based chemotherapy. We excluded patients with low grade histology or who underwent neoadjuvant chemotherapy. Women were considered aspirin users if this medication was documented on at least two records more than six months apart. PI3K mutation analysis was performed via sequencing. Statistical tests included Fisher’s exact, Kaplan-Meier and Cox regression analyses.

RESULTS: Seventy-seven patients met inclusion criteria. Thirteen (17%) used aspirin. Reasons for use included cardiovascular protection and symptom management. Forty-seven patients (61%) had stage I, 11 (14%) stage II, and 19 (25%) stage III disease. The mean age at diagnosis was 51 years (range 25–88). Four patients (5%) had suboptimal cytoreduction at time of diagnostic surgery. There were no hemorrhagic complications. Aspirin users had a statistically greater disease-free survival (DFS) compared to non-users (HR 0.13, 95% CI 0.13–0.83, p=0.018). While median DFS was not reached for either group, one of 13 (8%) aspirin users recurred at 24 months, compared to 18 of 64 (28%) non-users. In addition, aspirin users demonstrated greater overall survival (HR 0.13, 95% CI 0.13–0.81, p=0.015). Median survival was not reached for aspirin users compared to 166 months for non-users. On multivariate analyses aspirin use retained significance (p=0.044, HR 0.13, 95% CI 0.017–0.947) after controlling for age, stage and cytoreductive status. Four of the 13 aspirin users had PI3K mutations; there was no correlation between aspirin use and PI3K mutation with survival.

CONCLUSIONS: In this cohort of women with OCCC, aspirin use correlated with improved DFS and overall survival, and retained independent significance as a positive prognostic factor. This effect appears to be independent of PI3K mutation status, suggesting that an alternative mechanism may be responsible for the improved survival. Further studies are warranted to confirm these findings before considering aspirin as a therapeutic intervention.

LEARNING OBJECTIVE: To describe the impact of aspirin use on survival outcomes in patients with clear cell ovarian cancer.
POSTER #7: Tumor Board and Clinical Hospice Discussions among Elderly, Advanced Stage Gynecology Oncology Patients

A. Shepherd, V. Kennedy, J. Mayadev

OBJECTIVES: The objectives of this study were to identify the frequency of hospice discussions for advanced stage disease at tumor board meetings and outpatient visits and investigate the association between patient demographics and hospice discussions.

METHODS: A retrospective review was conducted using weekly tumor board notes from a single academic institution over a four-year period. Descriptive data included demographics, ECOG score, tumor type, and histology. Inclusion criteria were having the case discussed in tumor board, being 65 years and older with FIGO stage 4 disease, or 85 years and older with FIGO stage 3 or 4 disease. Initial hospice discussions in tumor board and clinical visits, hospice enrollment, and overall survival data were collected. A high risk category was created with the following criteria: age 80 years or older, ECOG score of 2 or higher, 3 or more co-morbidities, stage 4 disease, and high grade or aggressive tumor histology. Patients in this category were deemed to be at risk of significant complications during surgical or chemotherapy treatment. Fisher’s exact test was used to examine bivariate associations between patient characteristics and discussions of hospice care.

RESULTS: Fifty-four patients were included in the study. Most were between the ages of 75-84 (61%) and were white (80%). Forty-three patients (79%) had more than 2 medical co-morbidities. Hospice care was recommended in 7 cases (13%) during tumor boards. At initial outpatient visits, 5 patients were offered hospice care (9%) and one patient opted for end of life services. There was no evidence of an association between patient characteristics and having a tumor board or clinical discussion recommending hospice. Of the thirty-four patients (63%) who had died, only 15 (44%) used any hospice services and the mean length of time in hospice was 2.5 weeks. There were 17 patients in the high risk category and 2 of those patients had hospice recommendations.

CONCLUSIONS: Most patients age 65 or older, with advanced stage disease, did not have hospice care recommendations during tumor board or during their initial clinic visit. Patients at high risk of morbidity and mortality were not routinely offered end of life options. Hospice care was under-utilized in the majority of patients. Efforts to include hospice discussion as an early, routine part of tumor board and clinical visits may optimize use of these services in terminally ill patients.

LEARNING OBJECTIVE: Identify the need for early discussions of hospice and palliative care options among certain gynecology oncology populations. Establish routine hospice and palliative care discussions in tumor board meetings and initial clinic visits.
POSTER #8: Focal treatment for high-grade cervical intraepithelial neoplasia: a pilot study

Amaranta D. Craig, MD(1); Michelle J. Khan, MD, MPH(2); Ruby Singhrao, MS(3); George F. Sawaya, MD(1); Sejong Bae, PhD(4); Deborah Kamali, MD(1); Huh, Warner(5); Karen K. Smith-McCune, MD, PhD(1)  (1)University of California San Francisco, Department of Obstetrics, Gynecology and Reproductive Sciences  (2)Kaiser Permanente Norther California  (3)University of California San Francisco School of Medicine  (4)University of Alabama at Birmingham School of Medicine, Department of Medicine, Division of Preventive Medicine  (5)University of Alabama at Birmingham School of Medicine, Department of Obstetrics and Gynecology, Division of Women’s Reproductive Healthcare

OBJECTIVES: To determine the feasibility, acceptability, safety, and short-term efficacy of focal treatment of cervical high-grade squamous intraepithelial lesion (HSIL).

METHODS: Eligible women were identified through colposcopy clinics at three urban teaching hospitals and recruited by study staff if they met inclusion criteria. Women who consented underwent focal treatment of the colposcopically visualized lesion with laser ablation, cryotherapy, or loop electrosurgical excision procedure (LEEP). The study participants completed a demographic questionnaire at enrollment and a follow-up survey at two weeks to assess safety and acceptability. Providers completed a feasibility questionnaire after the focal treatment. Pre- and post-treatment survey responses were evaluated using descriptive statistics and Stuart-Maxwell tests. A repeat exam at six months assessed for recurrence of cervical HSIL on cytology or biopsy.

RESULTS: Thirty-four women enrolled from April 2013 to August 2015. Seven women underwent focal cryotherapy, 16 underwent focal laser ablation, and 11 underwent focal LEEP. Two-week follow-up data was available for 30 women, and six-month follow-up data was available for 32 women. Nineteen (63%) reported vaginal bleeding, 24 (80%) reported vaginal discharge, and 25 (83%) reported cramping/pain after focal treatment. Participants reported being satisfied with focal treatment, and there was no significant change post-procedure. Four women had recurrence at six-month follow-up after focal treatment (12.5%, 95% confidence interval 3.5 to 28.9%).

CONCLUSIONS: Focal treatment is feasible to perform and acceptable to participants. Adverse events were comparable to standard treatment of cervical HSIL. Recurrence at six-months were comparable to those published in the literature for standard treatment, and support a direct comparison of focal to standard treatment in a randomized trial, particularly for women desiring conservative management of cervical HSIL.

LEARNING OBJECTIVE: Summarize the current literature on focal treatment of CIN. Describe a pilot study for focal treatment of CIN. Identify potential patients that are candidates for focal treatment of CIN.
OBJECTIVES: National and state-wide data consistently show that black women with cervical cancer receive less than optimal care compared to white women, but these databases fail to provide enough detail to understand why. We evaluated racial differences in completion of cervical cancer treatment at a single institution, and the reasons for those differences.

METHODS: A retrospective cohort study was performed of all black and white women treated for primary cervical cancer at a single tertiary care center from 2011-2015. Clinical and pathologic characteristics and completion rates were compared between black and white women using Wilcoxon rank sum and Fisher’s exact tests. In those who failed to complete primary therapy, reasons were tabulated and described.

RESULTS: Out of 74 women included, 58% (n=43) were white and 42% (n=31) were black. Baseline demographic characteristics did not differ by race. Black women more frequently presented with extra-cervical disease (p=0.04). Intended treatment modality did not differ by race when stratified by disease status; however, of the 25 (34%) women who did not complete treatment, black women were significantly less likely to complete intended treatment compared to white women (45% vs. 81%, p=0.002). While there was no difference by race in completion rates for cervix-confined or metastatic disease, black women with local spread to the pelvis were less likely to complete primary therapy compared to white women (15% vs 60%, p=0.04). The majority of women who did not complete treatment (n=21, 84%) were intended to receive primary or adjuvant radiation with or without chemotherapy. Potentially modifiable reasons for incomplete treatment were identified in half of patients with who did not complete treatment: social/transportation issues (n=4, 17%), patient declined radiotherapy (n=4, 17%); disease progression while planning treatment (n=5, 20%). Incomplete receipt of Cisplatin due to toxicities made up the remainder of reasons for incomplete treatment (n=9, 38%).

CONCLUSIONS: While intended therapy did not differ by race in this cohort, completion rates were significantly lower in black women. Half of the reasons for failure to complete treatment may be actionable. To close the gap in cervical cancer mortality, these factors should be explored as opportunities to improve care and address disparities in cervical cancer treatment.

LEARNING OBJECTIVE: Demonstrate that at the single-institution level, intended treatment modality does not differ by race. Demonstrate that at the single institution level, rates of treatment completion of locally advanced cervical cancer are significantly lower in black compared to white women. Illustrate that actionable reasons for lack of treatment completion in cervical cancer are identifiable almost half the time.
OBJECTIVES: While cervical cancer rates are higher in black compared to white women, HPV vaccine initiation is lower in white teens compared to black teens. We sought to characterize differences in reasons for non-initiation of the HPV vaccine between parents of black and white adolescent females in 2015.

METHODS: Provider-verified data from the National Immunization Survey-Teen (NIS-Teen) 2015 was used to calculate survey-weighted prevalence estimates of HPV vaccine initiation by race for girls aged 13-17. In those teens who had not initiated vaccination, and whose parents reported no intention to vaccinate in the next year, the prevalence of reasons for non-initiation were calculated and compared between black and white teens using Chi squared tests.

RESULTS: In 2015, 63% of adolescent girls overall had initiated HPV vaccination; black teens were significantly more likely to initiate vaccination compared to white teens: 68% vs. 61% (p<0.01). Parents of both black and white teens reported lack of necessity as the most common reason for lack of initiation: 21% in parents of white teens vs. 26% in parents of black teens (p=0.32). Parents of white teens were more likely to report concerns about safety/side effects compared to parents of black teens (16% vs. 5%, p<0.001) and were less likely to report lack of knowledge as reasons for non-initiation (10% in white parents vs. 21% in black parents, p <0.01). Concerns that the child was not yet sexually active were reported similarly by both races (15% vs. 14% in white vs. black parents, p=0.87). While an uncommon reason, white parents were more likely to report religious beliefs as a reason for non-initiation compared to black parents (3% vs. 0.6%, p<0.01).

CONCLUSIONS: Parents of white teens were more likely to report concerns about safety, while parents of black teens more frequently reported lack of knowledge. Thus, understanding racial differences in reasons for lack of initiation could help maximize the impact of HPV vaccination messages. However, concerns about necessity and lack of sexual activity need to be addressed for all parents regardless of race.

LEARNING OBJECTIVE: Demonstrate the differences in HPV vaccine initiation rates between black and white adolescent girls. Identify the differences in reasons for lack of HPV vaccine in black and white adolescent girls in the United States. Illustrate that racial differences in lack of HPV vaccine initiation could help guide HPV vaccine messages.

*Figure for Poster #10 on next page*
Reasons for Lack of HPV Vaccine Initiation

- Not necessary
- Safety/Side effects *
- Not sexually active
- Lack of knowledge *
- Religion *

* p<0.05
OBJECTIVES: This study elucidates the landscape of genomic alterations (GAs) in patients with recurrent or advanced stage epithelial ovarian cancer (EOC) and demonstrates how comprehensive genomic profiling (CGP) facilitates targeted therapy for these patients.

METHODS: An IRB-approved retrospective study of 90 patients treated for EOC was performed. Patient outcomes and clinician use of CGP was extracted from patient charts. CGP of clinical specimens by hybridization-capture of up to 315 cancer-related genes (FoundationOne®) was reviewed to identify clinically relevant GAs (CRGAs). Fisher’s exact test was performed to compare GAs based on platinum sensitivity.

RESULTS: This study included 77 (79%) serous, 8 (9%) clear cell, 4 (4%) endometrioid, 4 (4%) mucinous, 2 (2%) mixed, 1 (1%) undifferentiated, and 1 (1%) Brenner ovarian tumor samples. 64 (67%) were initially platinum sensitive, and 31 (33%) were platinum refractory. CGP was performed in 37 primary tumors and 41 recurrent tumors. In 7 cases, patients had repeat CGP performed at a different point in their treatment course, revealing GA landscape evolution over time. The most common CRGAs were BRCA1, PIK3CA, MYC, CDKN2A, and KRAS. GA pattern differences were identified between platinum sensitive and platinum resistant tumors. More CCNE1 alterations were found in platinum resistant tumors (18%) versus platinum sensitive tumors (4%) (p<0.01). BRCA1 alterations were higher in the platinum sensitive tumors (20%) than platinum resistant tumors (7%) (p=0.01). Overall, CGP results matched 15 (16%) patients to targeted therapy (7 on label, 8 on clinical trial). The most common therapies used were PARP inhibitors (BRCA1/2), CDK4/6 inhibitors (CDKNA2), MEK inhibitors (KRAS), and multikinase inhibitors (MCL1). Clinical outcomes will be reported.

CONCLUSIONS: CGP suggests differences in the GA landscape between platinum sensitive and platinum resistant EOC. CGP allows for personalized treatment with targeted therapies and increased opportunity for clinical trial enrollment. Prospective clinical assessment is warranted to determine optimal use of CGP in management of patients with EOC.

LEARNING OBJECTIVE: Describe the use of comprehensive genomic profiling in identifying targeted therapies to treat patients with epithelial ovarian cancer.
POSTER #12: Genomic comparisons between histologic and molecular subtypes of endometrial cancer reveal opportunities for therapeutic crossover

E. N. Prendergast (1), A. Y. Liu (1), L. L. Holman (3), K.N. Moore (3), J Fahey (1), J. G. Cohen (1), J. A. Elvin (4), G. Konecny (1,2) University of California Los Angeles, Division of Gynecologic Oncology, Los Angeles, CA, USA (1), University of California Los Angeles, Division of Hematologic Oncology, Los Angeles, CA, USA (2), Stephenson Oklahoma Cancer Center, Division of Gynecologic Oncology, Oklahoma City, OK, USA (3), Foundation Medicine, Inc., 150 Second Street, Cambridge, MA, USA (4).

OBJECTIVES: Comprehensive genomic profiling (CGP) panels evaluate for genomic alterations (GA), microsatellite instability-high (MSI-H) status and tumor mutation burden (TMB) to identify potential biomarkers capable of predicting response to therapy. This study will report genomic patterns for endometrial cancer specimens based on histologic and molecular sub-classifications.

METHODS: This was a multi-institution, IRB-approved retrospective study of patients with primary, metastatic or recurrent endometrial cancer who underwent CGP. CGP was analyzed for 65 clinical cancer specimens by hybridization-capture of up to 315 cancer-related genes (FoundationOne®). Reports provided GAs, TMB, and MSI status. TMB was calculated by counting mutations across a 1.25Mb region spanning 315 genes. Patients were classified as TMB high (TMB-H) or low using the top quartile threshold and microsatellite instable (MSI-H) or stable (MSS) using a computational algorithm developed by Foundation Medicine.

RESULTS: The cohort was comprised of endometrioid (41, 63%), serous (15, 23%), clear cell (4, 6%), and mixed (5, 8%) tumors. Molecular subtypes were as follows: POLE (1, 2%), MSI-H (11, 17%), copy number high (CN-H) (27, 42%), and copy number low (CN-L) (25, 38%). There were 53 (82%) MSS tumors. Major GA for MSI-H categorization were PTEN (90.9%), ARID1A (81.8%) and PIK3CA (54.5%). Histologies for the MSI-H group included 9 (22.5%) endometrioid, 1 (25%) clear cell, and 1 (20%) mixed tumor. MSI-H correlated with TMB-H (median 26.1 mut/Mb) status (p=<0.0001) and trended towards a correlation with non-serous and clear cell histology (p=0.07). One exception was a POLE hypermutator (TMB 425 mut/Mb) with endometrioid histology, which was MSS and TP53 negative. Only 7.6% of the MSI-H patients had abnormalities in mismatch repair genes. Major GA for CN-H categorization were TP53 (97%) and PIK3CA (47%). CN-H included 11 (27%) endometrioid, 12 (80%) serous, 1 (25%) clear cell, and 1 (20%) mixed tumor. Endometrioid tumors were predominantly grade 2-3 (91%). Median TMB was low for these specimens (3.1mut/Mb). There was no correlation with CN-L and histologic subtype or TP53. PTEN (58%)and PIK3CA (54%) alterations were most common.

CONCLUSIONS: Molecular categorization of endometrial cancer demonstrates crossover between histologic subtypes, which may have therapeutic implications. Additionally, CGP may reveal opportunities for biomarker-matched therapy based on inclusion of MSI and TMB status.

LEARNING OBJECTIVE: Describe the use of genomic comparisons to categorize histologic and molecular subtypes of endometrial cancer and identify opportunities for therapeutic crossover.
POSTER #13: Impact of Intra-peritoneal Chemotherapy and Bevacizumab in Front Line Chemotherapy for Ovarian Cancer Among gBRCA and wtBRCA Patients: A Multi-Institutional, Frequency Matched, Case Control Study


OBJECTIVES: Objectives: Epithelial ovarian cancer (EOC) patients with BRCA 1 or 2 mutations (gBRCA) have been shown to have a better prognosis including longer progression free intervals and high response rates to platinum–based therapy compared with patients who are BRCA wild type (wtBRCA). This has been attributed to homologous-recombination repair deficiency in the absence of BRCA1/2 function leading to increased tumor sensitivity to chemotherapy. This frequency matched case control study evaluated the impact on progression free survival (PFS) of intraperitoneal chemotherapy (IPC) and bevacizumab (BEV) during primary treatment among patients with gBRCA and wtBRCA.

METHODS: Methods: An IRB approved, multi-institutional retrospective chart review was performed. Patients with a diagnosis of EOC with confirmed gBRCA testing. Demographic and clinical data were retrospectively collected from the electronic medical record. Patients with gBRCA or wtBRCA were frequency matched based on age within 10 years, stage, and histology. Descriptive statistics, univariate and multivariate analyses were performed in SAS v9.4.

RESULTS: Results: 312 patients met the inclusion criteria (155 gBRCA and 155wtBRCA). The median age at diagnosis was 56 (range: 34, 81). 84% had stage III or IV disease. Pathologic features included 95% with serous histology and 96% with high grade tumors. Primary debulking surgery (PDS) was performed in 80 % and 62% had no gross residual disease following surgery. IPC was used in 27 and 24% of gBRCA and wtBRCA pts respectively. 58 and 66% of pts received BEV in addition to platinum based chemotherapy. When controlling for grade, residual disease status after surgery, and PDS versus neoadjuvant chemotherapy, the PFS following primary therapy was not different for patients receiving IPC (median 24.5 vs. 21.8 months: HR=1.06, p=0.3) between gBRCA and wtBRCA. Interestingly, use of BEV as maintenance or during cytotoxic therapy showed improved PFS (29.6 vs 13.9 months, p <0.01) among gBRCA patients (Figure 1).

CONCLUSIONS: Conclusions: When compared with wtBRCA patients gBRCA patients showed significant benefit from BEV therapy but not with IPC. This data suggests that the benefit of IPC may not be greater than what is seen in the general population but that more attention to the use of BEV in front line therapy may be of interest in gBRCA pts. Additional evaluation of the use of IPC and the timing of BEV therapy should be evaluated in this population.

LEARNING OBJECTIVE: Describe the difference in response between ovarian cancer patients with germline BRCA mutations compared to wildtype with regard to treatment response to intraperitoneal chemotherapy. Describe the difference in response between ovarian cancer patients with germline BRCA mutations compared to wildtype with regard to treatment response to bevacizumab.

*Figure for Poster #13 on next page
Figure for Poster #13

Figure 1.
POSTER #14: Evidence for the Importance of Post-transcriptional Regulatory changes in ovarian cancer metastasis and the contribution of miRNAs

M. Zhang 1,2,3, L. Matyunina 1,2,3, L. Walker 1,2,3, W. Chen 1,3,5, H. Xiao 1,3,5 3, B. Benigno1,4,6, R. Wu 1,3,5, J. McDonald1,2,3,4 1Integrated Cancer Research Center (1), School of Biological Sciences (2), and Parker H. Petit Institute of Bioengineering and Bioscience Georgia Institute of Technology, 315 Ferst Drive, Atlanta, GA 30332, USA (3); Ovarian Cancer Institute, 960 Johnson Ferry Road, Suite 130, Atlanta, GA 30342, USA (4); Department of Chemistry and Biochemistry, Georgia Institute of Technology, 950 Atlantic Drive, Atlanta, GA 30332, USA (5).

OBJECTIVES: To explore the relationship between RNA and protein expression in the context of ovarian cancer metastasis by systematically comparing the expression of 4436 genes on the RNA and protein levels between primary and metastatic samples collected from the same ovarian cancer patient.

METHODS: Cancer cells were isolated from bulk primary and metastatic (omentum) tissues by laser capture microdissection. mRNA expression was measured by microarray and protein expression by a highly sensitive mass spectrophotometric method.

RESULTS: The overall correlation between changes in levels of mRNA and their encoding proteins is low (r=0.38). The majority of changes in levels of expression are on the protein level with no corresponding change on the mRNA. Computational and experimental evidence demonstrates that a significant fraction of the discordant changes in levels of RNA and protein between primary and metastatic cancer samples is mediated by miRNAs. The majority (>60%) of changes in RNA and protein levels between the primary and metastatic samples of the same ovarian cancer patient are not correlated underscoring the limitations of functional pathway predictions based on RNA profiling alone.

CONCLUSIONS: Our findings are consistent with growing evidence of the importance of post-transcriptional/translational changes in the onset and progression of ovarian and other cancers and the significance of miRNAs in regulating the process.

LEARNING OBJECTIVE: To explore the relationship between RNA and protein expression in the context of ovarian cancer metastasis.
POSTER #15: Specialty Palliative Care Rotation Improves Gynecologic Oncology Fellows’ Knowledge, Rates of Explicit Teaching and Perceived Competence in Palliative Care

C. Lefkowits (1), J. Kelley (2), J. Sheeder (1), A. Tamber (2), J. Leahy (2), W. Teuteberg (2) University of Colorado Denver (1), Magee Womens Hospital of University of Pittsburgh Medical Center (2)

OBJECTIVES: To evaluate the impact of a month-long specialty palliative care rotation on gynecologic oncology (GO) fellows’ knowledge, exposure to explicit teaching on and perceived competence in palliative care.

METHODS: Four years of GO fellows (n=8) participating in a required month-long specialty palliative care rotation were surveyed before and immediately after the rotation about knowledge, explicit teaching and perceived competence across four palliative care domains - pain management, non-pain symptom management, out of hospital care and communication/ethics. Knowledge was assessed via 30 multiple choice questions. Perceived competence to address 25 palliative care topics was assessed “relative to the competence you would expect from a practicing gynecologic oncologist” on a Likert scale from 1 (novice) to 5 (expert competence). Participants were asked if they had been explicitly taught 21 palliative care topics before the rotation and during the rotation. The rotation involved exposure to 5 clinical settings and 7 dedicated didactic strategies beyond routine participation in clinical care (Table 1). We used medians tests to compare total correct items pre versus post rotation, paired differences pre to post of perceived competence (competent or better) and paired differences pre to during rotation rates of explicit teaching of palliative care topics.

RESULTS: Post-rotation, participants demonstrated significant improvement in knowledge (median percent correct pre 62% v post 67%; p=0.01), explicit teaching (median percent items explicitly taught pre 19% v post 91%; p=0.02) and perceived competence (median percent items competent or better pre 34% v post 100%; p=0.01). The most highly rated clinical settings were inpatient hospice and inpatient palliative care consult service. The most highly rated didactic strategies were direct observation of communication skills practice and 10 minute talks. The educational value of the overall rotation was rated as superior by 100% of participants.

CONCLUSIONS: After a month-long palliative care rotation, GO fellows demonstrated significant improvement in knowledge, rates of explicit teaching and perceived competence in palliative care across all domains examined. Routine incorporation of a dedicated palliative care rotation should be considered for all gynecologic oncology fellows.

LEARNING OBJECTIVE: Articulate two benefits of specialty palliative care rotation for gynecologic oncology fellows.

*Figure for Poster #15 on next page
Clinical Settings

1. Inpatient specialty palliative care consult service
2. Outpatient specialty palliative care clinic
3. Inpatient hospice
4. Hospice home visits
5. Hospice interdisciplinary team meeting

Didactic Strategies

1. Direct observation of communication skills practice
2. 10 minute talks from palliative care attendings on high-value topics
3. Required readings
4. Discussion of required readings
5. Review of complete consult note
6. Reflective writing exercise
7. Review of reflective writing

Table 1. Clinical settings and didactic strategies incorporated into specialty palliative care rotation
POSTER #16: Bone Loss in Women with BRCA1 and BRCA2 Mutations

Chelsea Salyer MD-MPH, Amy Alabaster MPH, Isabella Hamilton BS, Nicole Stoller MPH, Tina Raine-Bennett MD-MPH, C. Bethan Powell MD  Kaiser Permanente Northern California

OBJECTIVES: To establish the prevalence of bone loss and identify associated risk factors in women with BRCA mutations.

METHODS: A database of 1451 women with BRCA mutations in a Northern California health care system was sampled for women over the age of 40 with no history of ovarian cancer. Subjects were enrolled prospectively, completed a questionnaire and underwent a bone density scan. Bone loss was defined as osteopenia (T score -1.0 to 2.5) or osteoporosis (T score < -2.5). Logistic regression was performed to model risk factors associated with bone loss.

RESULTS: Of the total 241 women, there were 20 who had intact ovaries (median age at scan = 54.5) and 218 who had undergone RRSO (median age at scan = 57). Among those who underwent RRSO, 61 were premenopausal at RRSO and 158 were postmenopausal. Those who were premenopausal at RRSO were younger at bone scan than women who had postmenopausal RRSO, (51 vs 59 years, p <0.001). The incidence of bone loss was 55% in the no RRSO group and 72.5% in the RRSO group (p=0.10). Among those who had premenopausal RRSO vs postmenopausal RRSO, the incidence of bone loss was 60% and 77.2% respectively (p=0.01). Although there were differences in bone mineral density and T-scores, the spine, femur and hip Z scores were not significantly different from age adjusted population standards between no RRSO and RRSO or between premenopausal and postmenopausal RRSO groups. The overall incidence of any fracture was not different comparing no RRSO (9.5%) and RRSO (16.2%). Overall fracture incidence and fractures after RRSO were no different among women with premenopausal vs. postmenopausal RRSO (18.3% vs 15.4%). In a multivariable model including RRSO, smoking, age at bone scan, BMI, HRT, and bisphosphonate use, only BMI was protective for bone loss (OR per 5 units:0.57,CI 0.44,0.74) while age at bone scan increased odds of bone loss (OR per 10 units: 1.47, CI 1.05,2.08). Among women with RRSO, neither age or menopausal status at RRSO were associated with significantly different odds of bone loss in a multivariable model also including BMI, HRT, smoking status, chemotherapy, and bisphosphonate use. BMI was similarly protective of bone loss among women with RRSO (OR per 5 units: 0.50, CI 0.37, 0.67).

CONCLUSIONS: Bone loss is common in women with BRCA mutations regardless of RRSO status suggesting increased awareness of bone health and surveillance is appropriate for all mutation carriers.

LEARNING OBJECTIVE: Compare the risk of bone loss and fracture in women with BRCA mutations who have had a risk reducing salpingo-oophorectomy to women with retained ovaries. Predict how age, BMI, smoking history, bisphosphonate use, and hormone replacement therapy use will affect the risk of bone loss among BRCA mutation carriers.

*Figure for Poster #16 on next page*
Multivariable analysis of risk factors associated with bone loss in women with BRCA mutations.
OBJECTIVES: Ovarian squamous cell carcinomas are rare and there is a paucity of data regarding effective treatment methods. Incorporating precision medicine into clinical practice, our aims were to genetically characterize ovarian squamous cell carcinomas arising within mature cystic teratomas and use those results to drive targeted therapy.

METHODS: Cases of squamous cell carcinoma arising from mature cystic teratomas occurring at a single academic institution within the past year were reviewed. Foundation One testing was used to run genomic panels on each tumor. The results were discussed during monthly molecular tumor board meetings. Based on molecular profiling, patients were enrolled in to clinical trials if they met the trial criteria. If no clinical trial was available, therapy was tailored to the driver mutations found in the individual tumors. A histology-specific database was created for ovarian squamous cell carcinomas where genomic results as well as patient treatment and outcomes data are stored.

RESULTS: Four cases of ovarian squamous cell carcinoma were identified. All tumors had Foundation One testing. All four cases had mutations in CDKN2a and TP53 and demonstrated a loss of p16(INK4a) function. Two tumors expressed mutations in PIK3CA. Half of the cases expressed somatic BRCA2 mutations. Many variants of unknown significance were identified. Two patients expired from their disease. One opted for hospice care and declined any treatment. The second underwent three lines of chemotherapy and a second cytoreduction before entering hospice. Two patients are still living after having undergone standard chemotherapy regimens.

CONCLUSIONS: Preclinical research, in combination with molecular profiling, can introduce novel therapies for the treatment of rare gynecologic malignancies. Data suggests that tumors with loss of p16(INK4a) may be sensitive to CDK4/6 inhibitors such as palbociclib. Tumors with somatic BRCA mutations are now eligible for treatment with PARP-inhibitors. PIK3CA may be a prognostic marker or a target for therapy but more research is needed. These targeted therapies may be beneficial for the two living case patients in the event of a recurrence. Long-term follow up and continued preclinical testing is needed to determine if other variants identified in these cases can be used to drive future therapies.

LEARNING OBJECTIVE: Identify common genomic mutations in ovarian squamous cell carcinomas.
POSTER #18: The role of specialty training in the administration of chemotherapy for women with ovarian cancer

C. Breed, A. Brennecke, D. Flink, S. Guntupalli  University of Colorado School of Medicine  Department of Obstetrics and Gynecology  Division of Gynecologic Oncology  Aurora, CO

OBJECTIVES: Traditional management of ovarian cancer includes optimal cytoreductive surgery followed by intravenous or intra-peritoneal platinum-based chemotherapy in order to decrease the risk of recurrence. Currently 70% of ovarian cancer patients are receive chemotherapy treatment from medical oncologists. There is limited information evaluating the effect of specialty training on the management of chemotherapy in ovarian cancer. We evaluated the confidence and level of knowledge of national guidelines of medical oncologists in management of chemotherapy for ovarian cancer.

METHODS: A cross sectional study of medical oncologists was implemented. A 22 multiple-choice items survey was distributed, electronically or in person, to a sample of medical oncologists that represented ~1/5 of medical oncologists in the US. The primary outcome is comfort level for administering chemotherapy to ovarian cancer patients. Secondary outcomes include knowledge of guidelines, experience, and referral practice. Participants were recruited from an online membership directory, oncology society membership email directories, and oncology society conferences. Medical oncologists who completed the survey were given a gift card for participation. All Board-certified medical oncologists were able to participate. Bivariate analysis and χ2 test were performed to establish differences between groups.

RESULTS: A total of 128 responses were obtained after being offered to 2105 MOs. 94% MOs reported familiarity with the NCCN Guidelines. 78% considered themselves up to date for the treatment of ovarian cancer. 36% of MOs reported having received >4 weeks training in management of gynecologic malignancies. 90% of MOs reported having a gynecologic oncologist to who they regularly refer and when presented with a patient with a new diagnosis of ovarian cancer 71% choose to refer to a gynecologic oncologist. When presented with a patient with Stage IIIC ovarian cancer who had undergone a suboptimal tumor debulking surgery 14% reported they would use IP chemotherapy. Those with more training in the treatment of gynecologic malignancies were less likely to choose an inappropriate regimen. When presented with a stage 1 high-grade serous ovarian cancer 22.7% of providers offered observation which correlated with comfort level, amount of training, and how up to date the provider felt. When asked which disease sites MOs felt were amenable to surgical debulking 64.8% choose omental caking, 52.3% diaphragmatic studding, 33.6% parenchymal splenic metastasis, 22.7% malignant pleural effusions and 19.5% choose parenchymal liver metastasis.

CONCLUSIONS: Our study shows that most medical oncologists are familiar with the NCCN guidelines, feel comfortable treating ovarian cancer and work closely with gynecologic oncologists when treating patients with ovarian cancer. There was low uptake of dose-dense taxol with carboplatinum as a choice for adjuvant chemotherapy and concerning amounts of medical oncologists who would choose IP chemotherapy in sub-optimally debulked patients. We found significant variation in the clinical findings which MOs considered amenable to up-front surgical resection. Gynecologic Oncologists should take an active role in educating other providers caring for patients with ovarian cancer about surgical resectability, applications of chemotherapy and use of dose-dense taxol in the treatment of these patients.
LEARNING OBJECTIVE: Demonstrate differences in chemotherapy administration for medical oncologists. Outline areas for improving collaboration between specialties. Identify points for education.
OBJECTIVES: Cervical cancer is clinically staged, but the routine use of imaging studies in the United States represents a management dilemma. The objectives of this study are to describe the clinical features of locally advanced cervical cancer and determine which factors are important predictors of survival.

METHODS: A retrospective cohort study of all women who underwent treatment for stage IIB to IIIB cervical cancer between January 1, 2011 and December 31, 2015 was performed. Patients were identified through institutional databases. Kaplan-Meier curves were generated for progression-free survival (PFS) and statistics including the log rank test and Mantel-Haenszel hazards ratios were performed with p<0.05 considered significant.

RESULTS: 121 women were identified. 35 (29%) were International Federation of Gynecology and Obstetrics (FIGO) stage IIB and 86 (71%) stage IIIB. The median age was 48 (range 21-85) years. 85% were squamous cell carcinoma compared to 10% adenocarcinoma. 30% had no nodal spread, 41% to the pelvic or common iliac nodes only, 19% involved para-aortic nodes, and 10% were indeterminant. All women were treated with radiation: 93 (77%) chemoradiation, 20 (16%) adjuvant chemotherapy, and 8 (7%) radiation alone. A third received extended field radiation to the para-aortics. These variables were similar across FIGO stages. The median PFS was 22 mos for stage IIB compared to 13 mos for stage IIIB, p=0.0939. Similarly, median OS was 31 mos for stage IIB compared to 20 mos for stage IIIB, p=0.0866. For both stages IIB and IIIB, 3% of women progressed during radiation, 36% recurred, and 64% were out of field recurrences. In univariate analysis, only American Joint Committee on Cancer (AJCC) stage (p=0.0364) and para-aortic nodal status (HR 2.3, 95% CI 0.9-5.9, p=0.0251) were predictors of progression-free survival. FIGO stage, tumor volume, race, age, BMI, and histology did not correlate significantly with progression-free survival. When further stratified by nodal status and FIGO stage, we found that nodal status was correlated with PFS for FIGO stage IIB (p=0.0082) but not IIIB (p=0.9585) patients. Specifically, para-aortic lymph node involvement was associated with significantly poorer outcomes (HR 6.5, 95% CI 1.9-21.9, p=0.0025).

CONCLUSIONS: AJCC staging was a better predictor of progression free survival than FIGO. Para-aortic lymph node involvement conferred significantly worse outcomes, particularly for FIGO stage IIB.

LEARNING OBJECTIVE: Learners will be able to define the methods of cervical cancer staging and the clinical factors that affect progression free survival outcomes. Learners will be able to identify factors that may be important for cervical cancer staging system modifications in the future.
POSTER #20: Malignant bowel obstruction in recurrent uterine and ovarian cancer patients

C. Hoppenot, N. Lee, S. D. Yamada  University of Chicago Medical Center, Chicago, IL

OBJECTIVES: To understand patient characteristics and clinical outcomes in women diagnosed with malignant bowel obstruction (MBO) due to recurrent uterine cancer and compare with patients with MBO due to ovarian/fallopian tube/primary peritoneal (“ovarian”) cancer.

METHODS: A descriptive study of women admitted with a MBO from a recurrent or persistent ovarian or uterine cancer from 1/1/2005 to 6/30/2016. We conducted an electronic search of radiology reports for a gynecologic oncology attending name and any of the terms “obstruction,” “nausea,” “vomiting,” “pain,” and “bloating.” We then read all the reports to identify patients with recurrent gynecologic cancer and a bowel obstruction and reviewed the electronic medical record for patient characteristics and clinical outcomes.

RESULTS: After evaluation of 1253 imaging reports and 183 charts, 48 women fit the inclusion criteria. 35 (67.5%) had ovarian cancer and 13 (25%) had uterine cancer. Of patients with uterine cancers, 4 (31%) had papillary serous histology, 4 (31%) sarcomas, 3 (23%) endometrioid, and 2 (15%) other. Compared to patients with ovarian cancer, patients with uterine cancers were older (66 vs 58 years, p = 0.046) and more likely to be black (8/13 vs 6/35, p = 0.01). They had received fewer prior chemotherapy regimens (2.3 vs 3.3, p = 0.03), were less likely to have stage III/IV disease at diagnosis (9/13 vs 34/35, p = 0.02) and more likely to have had a secondary debulking surgery (2/13 vs 4/31, p < 0.01) compared to patients with ovarian cancers. Time since diagnosis was similar (37.4 vs 31.8 months, p=0.8), as were rates of ascites (7/13 vs 18/35) and carcinomatosis (6/13 vs 19/35) at MBO admission. Patients with uterine cancers were less likely to have any procedural intervention for MBO (1/13 vs 18/35, RR 0.22, 95% CI 0.06 – 0.81, p=0.004). Overall survival (49.5 vs 40.2 months, p=0.4), survival after MBO diagnosis (15.4 vs 8.3 months, p=0.2), and cumulative inpatient days for MBO (23.6 vs 21.5 days, p=0.4) for patients with uterine and ovarian cancers were also similar.

CONCLUSIONS: Patients with MBO from uterine cancer have poor outcomes and overall survival once MBO is diagnosed. Patients present similarly to those admitted with ovarian cancer and have comparable outcomes, but undergo fewer surgical interventions during admission. This discrepancy may be related to preexisting secondary debulking surgery or assumptions regarding available treatments for patients with uterine cancers.

LEARNING OBJECTIVE: Describe patients with a malignant bowel obstruction after uterine cancer. Identify similarities and differences between backgrounds and outcomes of patients with malignant bowel obstructions from ovarian and uterine malignancies.
POSTER #21: Clinic-based Depression Screening in Gynecologic Oncology Patients using the Patient Health Questionnaires-2 (PHQ-2): are we identifying the highest risk patients?

Dominique Barnes, MD1, Lyndsay J. Willmott, MD2 John Farley, MD3; Bradley J. Monk2, MD2; Dana Chase, MD2

OBJECTIVES: The 2-item Patient Health Questionnaire (PHQ-2) is a short self-reported questionnaire used to screen for depression. Currently, no studies have evaluated the use of this tool among gynecology oncology patients. The objective of this study was to evaluate the sensitivity of the PHQ-2 in a gynecologic oncology patient population compared to patient reported symptoms, medical history, and treatment for depression. Risk factors for depressive symptoms and treatment effect of antidepressants are also evaluated.

METHODS: A retrospective chart review of demographics, clinical information, the PHQ-2 and a written intake form was completed for 12 months of new patient visits to the gynecologic oncology clinic. Each new patient was verbally administered the PHQ-2. They were also administered a written health questionnaire which gathers information about current symptoms of depression (ROS, within the past week), current diagnosis of depression, and medications with a treatment indication of depression. Additional clinical data was abstracted from patient charts and entered into a database. Zip code data was cross-referenced with US Census data to abstract median income, educational level, and poverty level.

RESULTS: Twelve months of consecutive new patient visits were reviewed, including a total of 439 patients. The average age was 53 years old (SD=15). The majority were White (67%), primarily spoke English (92%) and 54% did not have current diagnosis of cancer at their initial visit. Sixty-one patients screened positive on the PHQ-2, while 121 had a positive history, 92 had positive review of systems, and 79 indicated medications prescribed for depression. The sensitivity of the PHQ-2 for identifying patients meeting any criteria for depression on the written questionnaire was 18.7% with a specificity of 87.9%. The sensitivity and specificity of the PHQ-2 to identify patients reporting a current diagnosis of depression was 56.3% and 97.4% respectively, 28.8% and 89.5% respectively for ROS, and 20.4% and 87.8% for patients on medications. Among the variables, pain correlated positively to PHQ-2 (r=0.13, p<.01), and those with a diagnosis of depression (r=0.22, p<.01). Menopause had a positive association (r=.13, p<.01) in women who scored positive on the PHQ-2. Socioeconomic characteristics, hysterectomy, oophorectomy, current administration of chemotherapy, hormone replacement therapy did not significantly alter rates of depression.

CONCLUSIONS: Depression is prevalent in the gynecologic oncology clinic population, with forty-six percent of all new patients reporting depressive symptoms, diagnosis of depression and/or current treatment for depression. While the PHQ-2 has shown good sensitivity in screening various patient populations for depression, it was found to have poor sensitivity in new gynecologic oncology patient clinics. The written health survey significantly outperformed the PHQ-2 in identification of patients with depression.

LEARNING OBJECTIVE: Identify risk factors for patients at risk of depression utilizing PHQ-2 in a gynecologic oncology population.
POSTER #22: Patient characteristics associated with obesity in an endometrial cancer patient: first steps towards the design of a weight loss intervention

Dominique Barnes, MD1, Kristin M. Shields, MD3,4, Lyndsay J. Willmott, MD5; John Farley, MD5; Bradley J. Monk, MD5; Dana Chase, MD5  1. St. Joseph’s Hospital and Medical Center, Phoenix, AZ, USA  2. Creighton University School of Medicine, Phoenix AZ, USA  3. Department of Trauma, Critical Care, and Acute Care Surgery, Medical College of Wisconsin, Milwaukee, WI, USA  4. Department of Gynecologic Oncology, Arizona Oncology, Creighton University School of Medicine at St. Joseph’s Hospital and Medical Center, Phoenix, AZ, USA  5. Department of Gynecologic Oncology, University of Arizona Cancer Center, Creighton University School of Medicine at St. Joseph’s Hospital and Medical Center, Phoenix, AZ, USA

OBJECTIVES: Increasing body mass index is most strongly associated with endometrial cancer incidence and mortality. Few intervention studies have documented successful weight loss programs in this patient population. We hope to identify risk factors for elevated body mass index (BMI) in the endometrial cancer population; in order to design programs for reducing obesity in this at-risk population.

METHODS: An institutional cancer registry was used to identify patients with uterine cancers. Demographic information such as age, payer source, and zip code was collected along with clinical data including stage, BMI, smoking, and alcohol use history, and treatment summary. Zip code data was cross-referenced with US Census data to abstract median income, educational level, and poverty level.

RESULTS: A total of two hundred ninety-eight patients were selected for the study. The median BMI of registry patients was 34 (range 13.8-81.5), and the median age was 61 (range 31-90). Fifteen percent (n=45) of patients were Hispanic, 4% (n=13) were Black, and 5% (n=15) were Native American. Risk factors for obesity included Hispanic ethnicity (BMI 40 vs 35 for non-Hispanic, P<0.01), Medicare patients (BMI 40 vs 33 for private insurance, P=0.01), living in an area with <85% high school completion rate (BMI 37 vs 34 for those with >85% HS completion P=0.04), and patients <40 years old (BMI 46 vs 35 for ≥40 years old, P<0.001). BMI also varied by disease stage: stage I disease an average BMI of 37, while stage 3 patients’ average BMI is 32, and stage 4 patients’ average BMI is 30 (P<0.01). Factors not associated with BMI include a family history of cancer and patient reported alcohol use.

CONCLUSIONS: Definitive weight loss intervention trials in endometrial cancer patients remain to be conducted at our institution. The design of weight loss intervention programs in this population must take into consideration certain patient characteristics such as ethnicity, educational level, and socioeconomic status.

LEARNING OBJECTIVE: Learners will be able to identify associated early risk factors for elevated body mass index in the endometrial cancer population.
POSTER #23: Predicting Non-Home Discharge in Epithelial Ovarian Cancer Patients: External Validation of a Predictive Model

E. Connor, E. Newlin, J. Jelovsek, M. AlHilli  Cleveland Clinic Foundation, Department of Ob/Gyn and Women’s Health Institute, Cleveland, OH

OBJECTIVES: To externally validate a model predicting non-home discharge in women undergoing debulking surgery for epithelial ovarian cancer (EOC).

METHODS: Women undergoing debulking surgery for EOC at three tertiary medical centers in an academic health system from January 2010 to December 2015 were included in this cohort study. Patients were excluded if they received neoadjuvant chemotherapy, had non-epithelial malignancy, or lacked documentation of the model components. Non-home discharge included discharge to skilled nursing facility, acute rehabilitation facility, or hospice. Perioperative clinical and disease-related variables were extracted from the medical record. The predicted probability of non-home discharge was calculated using age, pre-operative CA-125, ASA score and ECOG performance status as described in a previously published non-home discharge predictive model and compared to actual disposition. Model discrimination was calculated using concordance index and calibration curves were plotted to determine the specific areas of model performance on the cohort.

RESULTS: Of 555 eligible admissions, 314 had complete data and were included for analysis. The overall rate of home discharge was 274 (87%) compared to 40 (13%) with non-home discharge. Mean overall age was 60.4 years (SD 11.4 years). Mean length of stay in days was similar between groups (6.6 for home discharge vs. 6.7 for non-home discharge, P=0.915). The predictive model had a concordance index of 0.86 (95% CI 0.79-0.92), which was similar to the originally described model performance. The model provided accurate predictions from 0 to 80% predicted probabilities (Figure 1). Although the model under-predicted non-home discharge when probabilities were between 20% and 60%, they were within 95% confidence intervals.

CONCLUSIONS: Non-home discharge can be accurately predicted using preoperative clinical variables. Use of this validated non-home discharge predictive model may facilitate patient counseling and early discharge planning. Implications for reducing cost of care and length of hospital stay remain to be evaluated.

LEARNING OBJECTIVE: Identify important characteristics of predictive model validation. Gain awareness of a tool that predicts the risk of non-home discharge following surgery for ovarian cancer.

*Figure for Poster #23 on next page
Figure 1. Calibration Curve for predictive model in validation data set.
OBJECTIVES: Low grade serous ovarian cancer (LGOC) is a rare histologic subtype of ovarian cancer that has a median overall survival (OS) of approximately 7-8 yrs. The objective of this study was to identify clinical factors associated with short- and long-term survival in patients (pts) with LGOC.

METHODS: A retrospective, IRB-approved review of pts diagnosed with LGOC between 2005 and 2016 was performed. Summary statistics were used to describe demographic and clinical characteristics. Survival was estimated with the Kaplan-Meier method. Short-term survival (STS) was defined as patients who were in the 25th percentile of OS. Long-term survival (LTS) was defined as patients who were in the 75th percentile of OS. Chi-square and ANOVA tests were used to compare characteristics between the STS and LTS groups.

RESULTS: Of the 65 pts identified, median age was 53.7 yrs, 93.3% were white, and 69.9% were stage III. Median recurrence-free survival (RFS) was 22.5 mo. Median OS was 45.4 mo. Forty-five pts were determined to be LTS and 15 pts were labeled as STS. The median RFS and OS in the LTS group was 31.3 mo and 62.6 mo, respectively. This was significantly different from the STS group, who had a median RFS of 1.8 mo (p<0.001) and an OS of 13 mo (p<0.001). There was no difference between groups in demographic factors or medical history, including age, race, BMI, and stage (all p>0.05). LTS pts had a lower CA-125 at diagnosis (193.7 vs 620.3, p=0.002). Additionally, LTS pts were more likely to receive adjuvant chemotherapy (82.6% vs 17.4%, p=0.01) and have a complete response to primary therapy (84.1% vs 15.9%, p=0.03).

CONCLUSIONS: As compared with STS, LTS in LGOC appears to be associated with receipt of adjuvant chemotherapy and complete response to primary treatment. Further study of the molecular basis for these differences is planned as it has the potential to improve survival for all pts with this disease.

OBJECTIVES: We sought to characterize genetic counseling and testing referral patterns for women diagnosed with ovarian/tubal/peritoneal cancer (Ov/FT/PPC) and hypothesized that disparities in referral and testing are shaped by socioeconomic barriers.

METHODS: Patients were identified by pathology reports from August 2012 to January 2016 that contained the words “serous” or “ovarian.” Women with benign diagnoses were excluded. Patient information was obtained via electronic medical record. Primary outcomes were placement of a genetics referral and completion of a counseling appointment. A secondary outcome was completion of genetic testing. Variables were categorized and analyzed with chi-square. Multivariate models were created using the same outcomes.

RESULTS: We identified 246 women with a primary diagnosis of Ov/FT/PPC. Ten were previously counseled regarding hereditary risk and excluded. Median age at diagnosis was 60 years (range 15-92). 53% of patients were referred for genetic testing with mean time from diagnosis to counseling of 7.6 months. Age and family history were not significantly associated with counseling referral, however rates differed by ethnicity with 61% of Caucasians and 40%, 38% and 33% of Asians, Latinas and African-Americans, respectively, referred for counseling (p=0.035). Overall, 33% of patients diagnosed underwent genetic testing. Primary English (p<0.0001), high-grade serous histology (p=0.001) and private or Medicare (versus public) insurance (p<0.0001) were significantly associated with referral. Multivariate analysis demonstrated an association between decreased time from diagnosis to counseling and stage 3 or 4 disease.

CONCLUSIONS: We have room for improvement to reach the Society of Gynecologic Oncology recommendation for genetic counseling and testing. Primary English, high-grade serous histology and private insurance or Medicare are predictive of referral and counseling. There were lower referral rates for women of color and those with public insurance. This disparity in care impacts cancer risk and prevents appropriate screening for other hereditary malignancies. In order to provide comprehensive gynecologic oncology care, including genetic assessment, we recommend focusing on these barriers including improving outreach and interpreter services, considering cultural beliefs around genetic information and working with public insurances around service coverage.

LEARNING OBJECTIVE: Describe barriers to accessing genetic counseling and testing for all ovarian cancer patients. Identify potential solutions to overcoming barriers to genetics care and increasing access for all ovarian cancer patients.
POSTER #26: Utility of Vaginal Vault Cytology in Detection of Recurrent Endometrial Cancer in a Tertiary, Safety Net Health System: an Area for Quality Improvement and Cost Saving

H. Miller, T. Hall, H. Sangi-Haghpeykar, R. Masand, M. Anderson, C. Tung  Baylor College of Medicine, Houston, TX

OBJECTIVES: Current guidelines do not recommend vaginal vault cytology for routine surveillance in patients with endometrial cancer. However, in a tertiary, safety net health system, 67% of patients are uninsured and 11% have never received screening with cervical or vaginal vault cytology. Thus, many providers consider this patient population high risk and routinely perform vaginal vault cytology for endometrial cancer surveillance. Our objective was to determine the clinical utility and cost effectiveness of vaginal vault cytology for detecting recurrent endometrial cancer in women receiving care at a tertiary, safety net health system.

METHODS: Retrospective chart review identified patients diagnosed with endometrioid endometrial adenocarcinoma between January 2006 and July 2013 at a tertiary, safety net health system. Demographics, staging information, treatment, post-treatment vaginal vault cytology, rates of recurrence and follow up time were collected. Descriptive and comparative statistics were used to characterize the population and compare methods of recurrence detection. Cost for medical procedures was based on Medicaid reimbursement rates.

RESULTS: 197 subjects were diagnosed with endometrial cancer in the study window with a recurrence rate of 7.6%. The recurrence rates in low risk patients (stage IA to II) and high risk patients (stage III to IVB) were 3.7% and 19.4%, respectively. Of the 15 recurrences, one (6.6%) was detected with vaginal vault cytology, six (40.0%) were detected via computed tomography scan imaging and eight (53.3%) detected by abnormal physical exam. Vaginal vault cytology was used for surveillance in 81.7% of patients. Median number of pap smears performed following primary treatment was 3 (range 0-12). There was no difference in mean number of pap smears performed for surveillance in those with recurrence compared to those without recurrence (p= 0.62). Mean time to recurrence was 24.2 +/- 22.2 months and mean follow up time was 43.4 +/- 28.7 months. A total of 756 pap smears were performed, costing approximately $54,400. Additional expenses included cost associated with colposcopy, biopsies and indirect healthcare costs.

CONCLUSIONS: Routine screening with vaginal vault cytology rarely detects recurrent endometrial cancer in women receiving care in a tertiary, safety net health system. Cytology screening leads to unnecessary procedures and invokes greater health care costs.

LEARNING OBJECTIVE: Identify appropriate screening techniques for recurrent endometrial cancer in women receiving care at a tertiary, safety net health system. Describe the tertiary, safety net health system population in which this was studied.
POSTER #27: Does Intraoperative Frozen Section Diagnosis Correlate with Final Pathology in Borderline Ovarian Tumors

J. Shah (1), M. Mackelvie (1), P. Ramalingam (2), P. Gauthier (3), M. Kott (4), E. Nugent (1), M. Frumovitz (2) The University of Texas - Houston, Dpt. of OBGYN, Houston, TX (1), Gynecologic Oncology and Reproductive Medicine/The University of Texas MD Anderson Center, Houston, TX (2), The Woman’s Hospital of Texas - Dpt. of Pathology (3), Lyndon B. Johnson Hospital - Dpt. of Pathology (4)

OBJECTIVES: Diagnosis of borderline ovarian tumors (BOT) can be challenging and intraoperative pathologic findings directly impact surgical decision-making. The aim of this study is to investigate if frozen section diagnosis (FSD) of BOT is reliable in 3 different hospital settings and how intraoperative FSD correlates with final pathology.

METHODS: This study was a retrospective review of all patients with an intraoperative FSD of BOT at 3 different institutions from 1990-2016. Findings of FSD were compared to final pathology reports. Institutions were separated into 3 groups: an academic institution with gynecologic pathologists (G1), an academic institution with general pathologists (G2), and a community hospital with general pathologists (G3).

RESULTS: In total, 212 patients met inclusion criteria. The overall accuracy of FSD compared to final pathology was 92% and did not significantly differ among the 3 groups: G1 (94%), G2 (90%), and G3 (89%) (p = 0.51). On FSD, the majority of masses were serous BOT (79%) followed by mucinous (18%), and endometrioid (1%) tumors. On final pathology, invasive cancer was found in 13 patients (6%) and benign masses were found in 199 patients (94%). Fifty-six patients (26%) had greater than stage I disease. Of these 56 patients, 35 had implants; 8 (23%) had invasive implants and 27 (77%) had non-invasive implants. In the patients with invasive implants, 3 (38%) had final pathology consistent with invasive carcinoma and 5 (62%) had final pathology showing BOT. Of the 39 mucinous BOT cases identified on FSD, none had disease on the appendectomy specimen. Six patients (3%) with BOT recurred. All had secondary resection and remain disease free. There were no deaths from BOT.

CONCLUSIONS: FSD of BOT is highly accurate and does not significantly differ between academic and community hospitals or between gynecologic and general pathologists. Intraoperative decision making based on FSD of BOT can be undertaken with confidence in any of these environments. Patients with a mucinous BOT and a grossly normal appearing appendix may not require an appendectomy.

LEARNING OBJECTIVE: Learners will be able to identify strategies for performing appropriate components of surgical staging in patients with borderline ovarian tumors.
POSTER #28: Role of SMARCA4 Mutations in Ovarian Carcinoma: Preliminary Data from a Laboratory-based Multigene Panel Testing Cohort

J. Herrera-Mullar, C. Horton, A. Castillo, H. Laduca

OBJECTIVES: This study aims to describe the clinical characteristics of SMARCA4 mutation carriers in a multigene panel testing (MGPT) cohort, estimate the mutation frequency in ovarian cancer probands with and without small cell carcinoma of the ovary, hypercalcemic type (SCCOHT), and identify the utility of SMARCA4 testing in ovarian cancer probands ascertained from a MGPT cohort.

METHODS: A retrospective data review was conducted of 39,879 consecutive individuals who underwent next generation sequence and deletion/duplication analysis of SMARCA4 as part of MGPT at our diagnostic laboratory since May 2015. Molecular results and clinical histories were reviewed in probands with ovarian cancer and/or a positive or inconclusive SMARCA4 result.

RESULTS: Overall, 0.005% (2/39,879) of individuals tested positive for a SMARCA4 pathogenic mutation/likely pathogenic variant. One individual had SCCOHT diagnosed at age 22 years and another individual had a personal history of colon cancer at age 41 years. Family history was noncontributory for both positive individuals. An additional 1.3% (519/39,879) of individuals were found to carry variants of uncertain significance in SMARCA4. The previously mentioned individual with SCCOHT at age 22 was the only proband who tested positive for a SMARCA4 mutation in the ovarian cancer cohort (1/4391 or 0.02%). No SMARCA4 mutations were detected among 890 individuals for whom epithelial ovarian histology was specified. Among 7 individuals for whom small cell ovarian pathology was specified, one individual (14.3%) was found to carry a SMARCA4 mutation. There is no statistically significant difference in mutation rate for ovarian cancer probands undergoing MGPT when SMARCA4 is excluded or included (15.6% vs. 15.7%; OR 1.002; p-value 0.97).

CONCLUSIONS: Results from this study demonstrate that SMARCA4 germline mutations are rare in the absence of SCCOHT and suggest that SMARCA4 mutations do not predispose to epithelial ovarian cancer. While the inclusion of SMARCA4 in MGPT did not significantly improve the diagnostic yield for ovarian cancer patients in this cohort, it should be included in the differential diagnosis for patients with SCCOHT and patients with unknown/questionable ovarian tumor histology diagnosed at a young age. Further investigation in larger ovarian cancer cohorts is necessary to determine the utility of SMARCA4 testing in other types of ovarian cancer.

LEARNING OBJECTIVE: Describe the clinical characteristics of SMARCA4 mutation carriers in a multigene panel testing (MGPT) cohort. Estimate the mutation frequency in ovarian cancer probands with and without small cell carcinoma of the ovary, hypercalcemic type (SCCOHT). Identify the clinical utility of SMARCA4 testing in ovarian cancer probands ascertained from a MGPT cohort.
OBJECTIVES: To evaluate whether LEEP and CKC resulting in fragmented surgical specimen is associated with higher risk of residual disease at time of excisional biopsy and of recurrent cervical dysplasia within two years.

METHODS: Using CPT billing codes, we identified 300 LEEP and CKC cases performed at our medical center between 1/2010 and 7/2011. Pathology reports of the excisional biopsies and dysplasia-related procedures in the following three years were reviewed. Exclusion criteria were invasive cancer, no dysplasia, inconclusive presence of dysplasia, miscoded cases, and repeat LEEP or CKC done for persistent or recurrent high-grade disease during the study period, which were included in the patient’s three-year follow-up. The remaining cases were further analyzed for outcomes including specimen integrity (fragmented vs. unfragmented), margin status, endocervical curettage (ECC) status, and grade of dysplasia present in specimens. Follow-up outcomes including residual or recurrent dysplasia, repeat LEEP/CKC within two years, and hysterectomy for dysplasia within two years were also evaluated. The chi square test was used for statistical analysis.

RESULTS: 261 cases were included in the analysis. 86 (32.9%) specimens were fragmented and 175 (67.9%) were unfragmented. Fragmented specimens were significantly more likely to have any positive margin, to have positive deep or unidentifiable margins, and to have indeterminate margins than unfragmented specimens (p<0.05). There was no significant difference in rates of positive ectocervical and endocervical margins, positive ECC, insufficient ECC, and presence of high-grade versus low-grade dysplasia between groups. Approximately 75% of patients in each group had appropriate follow-up per ASCCP guidelines. Specimen fragmentation was not associated with significant differences in persistence and recurrence of low-grade and high-grade dysplasia or in rates of repeat excisional biopsy and hysterectomy within two years.

CONCLUSIONS: Although fragmentation of LEEP and CKC specimens is associated with more diagnostic uncertainty due to significantly higher rates of indeterminate margins and positive unidentifiable margins, there was no difference in clinical outcomes including dysplasia persistence and further surgery for dysplasia. Based on our data, although an unfragmented specimen is ideal for pathology evaluation, surgeons do not need to alter patient management based on specimen integrity.

LEARNING OBJECTIVE: To evaluate whether LEEP and CKC resulting in fragmented surgical specimen is associated with higher risk of residual disease at time of excisional biopsy. To identify correlation between LEEP and CKC surgical specimen fragmentation and recurrent cervical dysplasia within two years. To evaluate effect of LEEP and CKC surgical specimen fragmentation on patient outcomes including repeat excisional biopsy and hysterectomy for persistent or recurrent disease.
POSTER #30: Evaluation of PD-1 and PD-L1 levels in clear cell histologic subtypes of ovarian and uterine malignancies and correlation with stage and survival

J. Alldredge, M. Phelan, N. Gallegos, T. Serna-Gallegos, T. Longoria, L. Randall    University of California, Irvine

OBJECTIVES: Clear cell carcinomas (CCCs) of the ovary and uterus are rare histologies that are associated with a poor prognosis. Gynecologic CCCs can arise in an inflammatory milieu, such as endometriosis, and non-gynecologic CCCs have shown response to therapeutic targeting of program cell death receptor (PD-1) and its ligand PD ligand-1 (PD-L1). Information regarding expression of tumor infiltrating lymphocytes (TILs), PD-1 or PD-L1 within gynecologic clear cell malignancies is limited.

METHODS: A retrospective study of paraffin-embedded pure ovarian or uterine CCCs stored in the University of California Irvine Tissue Biorepository between 1992-2015 was performed. Information regarding primary site, stage, concurrent endometriosis, and survival time were recorded. Immunohistochemical (IHC) staining for PD-L1 and PD-1 within tumor-infiltrating lymphocytes (TILs) was performed on a Ventana-Roche platform. PD-1 levels were categorized as negative, mild, moderate, or high, and PD-L1 as 0%, <1%, 1-5%, or >5%.

RESULTS: Of the 37 patients with adequate tissue and clinical data, there were 30 ovarian and 7 uterine CCCs, 4 and 0 of which were endometriosis-associated, respectively. Most (n=26) were FIGO Stage I or II. Most tumors were PD-1 negative (23 ovary, 3 uterine). Most ovarian CCCs were PD-L1 negative (n=14) but most uterine CCCs (n=5) had 1-5% expressed. Higher levels of PD-1 and PD-L1 showed a trend toward increased stage that was not statistically significant for CCC site. Cox proportional hazards modeling showed no association between elevated PD-1 or PD-L1 levels and overall survival for ovarian CCC, but did reveal a detrimental effect in uterine CCC, hazard ratio (HR) 5.75 (95% CI 1.05-31.44) and HR 6.35 (95% CI 1.39-29.03), respectively.

CONCLUSIONS: While limited by sample size, these findings are suggestive of a role of both PD-1 and PD-L1 as biomarkers that may be predictive stage of gynecologic CCCs and may serve as therapeutic targets. The correlation between marker expression and survival in uterine CCCs is intriguing and has not yet been reported. Cooperative group tissue bank resources are being queried to increase sample size.

LEARNING OBJECTIVE: Describe PD-1 as a biomarker for stage and survival in clear cell cancers of the ovary and uterus. Describe PD-L1 as a biomarker for stage and survival in clear cell cancers of the ovary and uterus.
OBJECTIVES: Dramatic responses to immune modulation in solid tumors have rekindled interest in the interaction between cancer and the host immune response. Characterization of the immune cell populations infiltrating epithelial ovarian cancer (EOC) is crucial to understanding how these systems might be perturbed to influence disease outcome. We hypothesize that clinical-pathologic characteristics of EOC are associated with different immune fingerprints allowing for a better understanding of pathogenesis and prognosis.

METHODS: Fresh tissue from EOCs was collected and processed via the Immunoprofiler workflow, a translational platform developed to understand the immunologic basis for cancer. Briefly, tumor tissue was digested enzymatically and flow sorted using fluorescence activated cell sorting (FACS) for 6 single-cell populations: live, tumor, effector T, regulatory T, myeloid, and stromal cells. Immune populations were further subjected to multiplexed flow cytometry (> 60 colors) to analyze proportionality of known cell subsets. Analysis of flow cytometry data was done using FlowJo®. Cell counts were tabulated for each sample and normalized by subpopulations generating approximately 1200 variables. Given the high dimensionality of the data and the potential for correlation of the variables, a Random Forest analysis was undertaken to model the immune response as associated with BRCA status. This analysis was conducted as a regression against the probability space in the range [0,1]. Models that had acceptable MSE (mean squared error) and %VAR (% variance explained) were inspected.

RESULTS: From October 2015 to May 2016, 14 primary EOC samples were collected prospectively. There were three endometrioid, 2 clear cell and 9 high-grade serous cancers of which 4 were stage 1C, 2 were stage 3B and 8 were stage 3C. Three patients tested positive for hereditary germline defects in BRCA1 or BRCA2, 7 tested negative and 4 had not yet undergone testing. Compared to all observed myeloid cells, non-serous epithelial cancers were enriched for the minor CD16+ monocyte subpopulation (effectors of antigen dependent cytotoxicity) with a mean proportion of 26.942% (SD 23.902) vs. 43.3125% (SD 13.5343) in serous versus non-serous carcinoma, respectively (p=0.03). Given our small sample size, the Random Forest analysis was limited to triplets of variables. This model identified three variables with 23% variance explained (MSE 0.17) between BRCA associated and BRCA WT cancers. The three cell types increased in BRCA associated cancers were total leukocytes, CD56+ natural killer cells and PD1+ Tcells.

CONCLUSIONS: This exploratory analysis is the first of its kind to characterize the immune cell components in EOC. Immune cell infiltration appears to differ based on histology and BRCA status. A larger cohort will illuminate how these differences impact treatment response and prognosis. Understanding these differences will allow for identification of novel methods to exploit vulnerabilities in epithelial ovarian cancer.

LEARNING OBJECTIVE: Describe the immune cell populations in ovarian cancer. Identify the immune population biases related to ovarian cancer histology. Identify the immune population biases related to ovarian cancer BRCA status.
OBJECTIVES: Taxol remains first line treatment for all epithelial ovarian cancer (EOC). However, it has been shown that ovarian clear cell carcinoma (CCC), a rare histological subtype of EOC, often becomes resistant to platinum based therapy when at advanced stage. This chemo-resistant phenotype has led to a poorer prognosis in patients with CCC than in patients with serous subtypes. While many factors contribute to resistance; a major contributor is the active export of drugs from cells mediated by transmembrane efflux pumps that prevent drugs from reaching their intracellular targets. Our lab has developed a Taxol-oligoarginine conjugate that prevents export of the drug from serous papillary EOC leading to increased cell death. In this study we aim to assess whether this Taxol conjugate is effective in improving Taxol mediated cell death in platinum resistant Clear cell ovarian cancer.

METHODS: Our lab has previously developed a compound which attaches a guanidinium-rich molecular transporter, octa-arginine (D-isomer), to Taxol through a releasable linker. This conjugate (Taxol-r8) enables the Taxol to pass rapidly through the cell membrane, and evade efflux-mediated resistance via P-gp (ABCB1) export. In this study we tested the susceptibility of three primary Clear Cell ascites specimens as well as the ES-2 cell line towards Taxol-r8 compounds in vitro. Cell death was measured via PI uptake and flow cytometry.

RESULTS: Here we show that an established CCC cell line, ES-2, undergoes cell death when treated with our Taxol-r8 conjugate and that cell death is increased when compared to treatment with Taxol alone. We then tested our Taxol-r8 compound in ascites samples from three different patients with Taxol resistant clear cell ovarian cancer. Cell death was increased in a dose dependent fashion in all three patient samples when treated with Taxol-r8. Resistance to Taxol was confirmed by minimal cell death achieved when treated with unconjugated Taxol.

CONCLUSIONS: This study shows that an arginine transporter system enhances Taxol-mediated cell death in clear cell ovarian cancer. This technology proposes a unique therapeutic alternative in cancer cell types where conventional platinum-based chemotherapy is ineffective. With few alternatives available for treatment of CCC, Taxol-r8 provides an attractive alternative.

LEARNING OBJECTIVE: Taxol-conjugates are demonstrated as a technology to avoid cell efflux as a method of overcoming chemo resistance leading to increased cell death in clear cell ovarian cancer cells.
POSTER #33: Down Regulation of MAPK Signaling by Cytotoxic Human Monoclonal Antibody in Epithelial Ovarian Cancer

J. Ray (1), Y. Chen (1), N. Bhat (1), M. Bieber (1), N. Teng (1) Division of Gyncologic Oncology, Dept of Ob/Gyn, Stanford Cancer Institute, Stanford, CA (1)

OBJECTIVES: MAb216 is a human derived IgM monoclonal antibody generated in our lab that binds a straight chain poly n-acetyl lactosamine epitope found on both hematologic and solid tumors including epithelial ovarian cancer cells (EOC). The antibody does not bind normal tissues except a subset of B and T cells and fetal RBC. Previously we had conducted a Phase 1 trial of Mab216 in B cell Leukemia (ALL) which showed the antibody to be cytotoxic to normal and malignant B cells with minimal toxicity at the doses tested. We expanded the research to discern if Mab216 could have a therapeutic role in solid tumor including EOC. We have previously shown that MA216 binding kills ovarian carcinoma cell lines in vitro by membrane disruption through large pore formation. In this study we demonstrate that Mab216 also functions to inhibit EOC cell migration and that the function of Mab216 involves downregulation of the MAPK pathway, which affects the cell proliferation and survival.

METHODS: Mab216 binding of live EOC cells from the ascites of patients diagnosed with high grade serous ovarian carcinoma was assayed using flow cytometry. OVCAR 3 cell lines were used to study the effect of Mab216 on migration using a scratch assay. OVCAR3 were also used to study the effect on the MAPK pathway by assessment of phosphorylation status of MAPK, ERK and AKT by western blot.

RESULTS: We showed that Mab216 binds EOC cells from human ascites that were either sensitive or resistant to Cisplatin [20/23 (87%) and 8/10 (80%) respectively]. Using a well characterized EOC cell line, Ovar 3, we show that incubation with mAb216 leads to inhibition of migration on scratch assay, an in vitro assay of metastasis. We further show that mAb216 inhibits activation of the MAPK enzyme cascade leading to decreased activation of ERK and AKT in vitro.

CONCLUSIONS: Targeting MAPK signaling pathway-associated proteins has been a focus in recent ovarian cancer research. Our current study demonstrates that Mab216, a selective antibody to B cell and EOC, is an inhibitor of the MAPK pathway leading to inhibition of cell migration and invasion while increasing cell death in EOC cells. The cell type specific selectivity of this antibody makes it an attractive candidate for therapeutic use in cancer treatment, as it has previously been shown to have low toxicity profile.

LEARNING OBJECTIVE: Learners will be able to identify Mab216 as a potential therapy for treating epithelial ovarian cancer. Demonstrate that mAb216 functions through inhibition of the MAPK pathway.
POSTER #34: Preparation in the Business and Practice of Medicine: Perspectives from Graduates and Fellowship Directors

J. Siemon, G. Morales, M. Huang, JM. Pearson, B. Slomovitz, M. Schlumbrecht  University of Miami, Sylvester Comprehensive Cancer Center, Miami, FL.

OBJECTIVES: Preparation in the business of medicine is reported to be poor across a number of specialties. No data exist about such preparation in gynecologic oncology (GO) training programs. Our objectives were to evaluate current time dedicated to these initiatives, report recent graduate perceptions about personal preparedness, and assess areas where improvements in training can occur.

METHODS: Two separate surveys were created and distributed, one to 183 Society of Gynecologic Oncology Candidate Members (CM) and the other to 48 GO fellowship Program Directors (PD). CM surveys included questions about perceived preparedness for independent research, teaching, job-hunting, insurance, and billing. PD surveys assessed current and desired time dedicated to the topics asked concurrently on the CM survey. Statistical analysis was performed using Chi-squared (or Fisher’s exact test if indicated) and logistic regression.

RESULTS: Survey response rates of CM and PD were 25% (51/204) and 38% (18/48), respectively. No differences in perceived preparedness were found comparing gender, length of training, or current practice environment. CM reported wanting increased training in all measures except retrospective protocol writing. Female CM wanted more training on writing letters of intent (LOI)(p=0.01) and billing (p<01) compared to male CM. CM in academic jobs also wanted more training on LOI writing compared to CM in a private practice setting (p=0.04). CM were less likely to report wanting more didactics on effective teaching (p<0.01), the Affordable Care Act (p<0.01), and disability insurance (p=0.03) if they had received training on these topics as fellows. Didactics did not vary significantly by length of program, though compared to their current schedules, PD desired more time to teach how to write an investigator initiated trial (p=0.01). 70% of CM were encouraged to review their employment contracts with a lawyer, while 94% of PD reported promoting this practice (p=0.05). CM who were encouraged to review contracts with a lawyer were also more likely to do so (OR 6.87 [1.77-26.76], p<0.01). 94% of PD reported having career goal discussions with their fellows, while only 72% of CM reported that this occurred (p=0.05).

CONCLUSIONS: Recent graduates want more preparation for patient care-unrelated aspects of their careers. Reconciling PD and fellow desires and increasing communication between the two may serve to achieve the educational goals of each.

LEARNING OBJECTIVE: To evaluate the current time dedicated to preparation in the business of medicine during Gynecologic Oncology Fellowship. To report recent graduate perceptions about personal preparedness in this area. To assess areas where improvements in training can occur.

*Figure for Poster #34 on next page
Abstract Figure 1

Figure 1: Preparedness, Education, and Mentorship During Fellowship

Figure 1 shows responses to questions regarding the Candidate Member’s feelings of preparedness and perception about the education and mentorship received during fellowship training.
OBJECTIVES: The current therapy for stage II endometrial cancer with known gross cervical or cervical stromal involvement is either radical hysterectomy with surgical staging or primary radiation therapy. We wanted to determine the differences in outcomes between patients who underwent simple vs. radical hysterectomy. We also sought to identify if radical hysterectomy spared patients post-operative radiation as well as identify factors important in recurrence and survival.

METHODS: A retrospective chart review was completed for all patients with stage II endometrial cancer who underwent surgery at our institution from 1999 to 2016. Demographic, prognostic, clinicopathologic, treatment, and recurrence/survival data were extracted from the medical record and analyzed. All patients were staged based on the 2009 FIGO classification. To investigate differences between types of hysterectomies, Fishers’ exact and Wilcoxon rank sum tests were used. Cox regression models were utilized to assess differences in outcomes.

RESULTS: 155 patients with stage II endometrial cancer were analyzed. 13 (8.4%) underwent radical (RH) and 142 (91.6%) simple hysterectomy (SH). Patients who underwent RH had more major complications, 50.0% vs. 22.4% (p=0.01), stayed in the hospital longer, median 5 vs. 3 days (p=0.02) and received less brachytherapy, 30.8% v 72.1% (p<0.01). No difference in post-operative therapy was evidenced between SH and RH with regards to radiation or combination chemo-radiation. Factors that increased risk of recurrence included: non-endometrioid histology, grade 3 tumors, and advanced age (p≤0.01). Factors that conferred poorer overall survival included: non-endometrioid histology, grade 3 tumors, poor performance status, major post-operative complications, advanced age and increasing depth of myometrial invasion (p≤0.01).

CONCLUSIONS: Recurrence and overall survival between patients with stage II endometrial cancer who undergo SH vs. RH are very similar. Undergoing RH may spare patients post-operative brachytherapy, but whole pelvic radiation and combination chemo-radiation are not decreased by radical pelvic surgery. Generalizations are limited due to the small number of patients who underwent RH. Further investigation may be warranted in a larger cohort.

LEARNING OBJECTIVE: Identify differences in outcomes for patients with stage II endometrial cancer who underwent radical vs. simple hysterectomy. Predict whether undergoing radical hysterectomy spared patient with stage II endometrial cancer from undergoing radiation therapy. Identify factors important in recurrence or survival for patients with stage II endometrial cancer.
POSTER #36: Improving Documentation of Medical Proxy and Code Status

J. L. Alvarado, N. Homaifar, N. Nyakudarika, M. Autry, L. Chen

OBJECTIVES: To improve goals of care conversations and transitions to end of life care for benign gynecology (benign gyn) and gynecologic oncology (gyn/onc) patients by initiating discussions about medical proxy and code status for inpatient admissions.

METHODS: Residents, fellows and nurse practitioners in the Divisions of Obstetrics, Gynecology & Gynecologic Subspecialties (benign gyn) as well as the Division of Gynecologic Oncology (gyn/onc) were charged with discussing code status as well as chosen medical proxy on admission as part of a year-long quality improvement (QI) project. For scheduled benign gynecology and gynecologic oncology surgeries, we asked that all preoperative patients have medical proxy documented in the interval history and physical by the resident or fellow. For all gynecologic oncology admissions, we asked that code status be confirmed and recorded during the hospitalization. The charts of these patients were then reviewed every quarter for documentation of code status and medical proxy designation. The QI team aimed for documentation of medical proxy in 75% of cases and a 10% increase in code status documentation in each quarter.

RESULTS: Results are shown in the table below. In three quarters, there were a total of 85 gyn/onc medical admissions and 153 surgical admissions; there were 29 benign gyn medical admissions and 87 surgical admissions. Documentation of medical proxy and code status improved between quarter one and quarter two, but recently fell off again quarter three. Medical proxy may be easier to address in a preoperative setting, while code status may be a more natural conversation to have during a medical admission. Reviewing our results, we discussed additional strategies to improve house staff awareness including scheduling resident education on goals of care discussions, designating QI champions in each resident class, orienting residents to new resident blocks, and creating dot phrases for use in the electronic medical record.

CONCLUSIONS: Implementing QI projects that require reframing our approach to patients and initiating potentially difficult conversations are challenging, but with time can help normalize these conversations. Previous to 2016, residents and fellows were not documenting code status or medical proxy. Now, documentation occurs for over 40% of cases in all quarters. As we are not yet meeting our goals, we aim to improve documentation by sending frequent reminders to residents and fellows and by creating a template for history and physical where providers are prompted to document.

LEARNING OBJECTIVE: Learners will describe one system of standardizing documentation of code status for patients admitted to a surgical service. Learners will identify challenges of developing a systems improvement project and appreciate how to set appropriate metrics for goals.

*Figure for Poster #36 on next page
Trend in Documentation of Medical Proxy and Code Status

- Medical Proxy
  - in Benign Gynecology
  - in Gynecologic Oncology
- Code Status

Percentage of cases documented:
- Q1: 45%, 41%, 42%
- Q2: 77%, 76%, 59%
- Q3: 62%, 53%, 46%

Quarter
POSTER #37: Immunohistochemical Characterization of Gynecologic Clear Cell Carcinoma

K. Lindholm, J. Wisell, K. Torkko, E. Smith, K. Behbakht, M. Post

OBJECTIVES: Clear cell carcinoma (CCC) of the gynecologic tract is a rare but aggressive malignancy that may be unresponsive to traditional chemotherapy. It has many histologic mimics including other gynecologic carcinomas, therefore we attempted to develop a panel of immunohistochemical stains to best classify this entity.

METHODS: Following IRB approval, the Pathology departmental database was searched for CCC and mixed epithelial carcinomas with greater than 5% clear cell component of gynecologic origin from 2006-2016. Representative cases of endometrioid and serous carcinoma were included for comparison. Tissue microarrays (TMAs) were generated and underwent immunohistochemical staining with: ER, p53, Napsin A, HNF1-beta, AMACR, glypican-3, and WT1. Stains were independently scored by 2 pathologists and statistical analysis performed (p<0.05 considered significant). CCC and mixed epithelial carcinomas were combined into a single group for analysis.

RESULTS: We identified 28 cases of gynecologic CCC (21 ovarian, 3 endometrial, 4 other), 12 cases of mixed epithelial carcinoma with at least 5% clear cell component (6 ovarian, 5 endometrial, 1 other) and 5 cases each of endometrioid and serous carcinoma (3 ovarian, 2 endometrial). Fisher’s exact test showed a significant difference between clear cell carcinoma and other histotypes for Napsin A (57.1% positive for CCC, 10% for others; p=0.012), ER (42.9% vs 100%; p=0.001), and p53 (8.6% vs. 40.0%; p=0.03). No significant difference was found for other stains. When each histologic type (clear cell + mixed, serous, endometrioid) was compared using the Kruskal-Wallis test, WT1, ER and p53 showed a significant difference in staining with serous showing higher levels (p=0.01).

CONCLUSIONS: The most useful panel of stains to differentiate CCC from endometrioid or serous carcinoma is Napsin A, p53 and ER, with the possible inclusion of WT1. While other stains, including glypican-3 and AMACR, may be supportive of the diagnosis, they must be used as part of a panel. These results highlight the challenges of utilizing immunohistochemistry as a diagnostic tool and the need for correlation with histologic findings. Further investigation should include analysis of clinical data in combination with immunohistochemical findings, as well as assessment of additional markers such as PTEN, which may have clinical treatment implications.

LEARNING OBJECTIVE: State the most useful panel of immunohistochemical markers to differentiate clear cell carcinoma from serous or endometrioid carcinomas
POSTER #38: Postoperative Outcomes in Gynecologic Oncology Patients using a Multimodal Analgesia Regimen with Liposomal Bupivacaine

K. Handley, A. Nakahara, M. Gastanaduy, R. Kline, R. Gala, K. Wade, J. Estes  Ochsner Clinic Foundation, New Orleans, LA.

OBJECTIVES: Enhanced recovery after surgery (ERAS) pathways aim to improve postoperative outcomes using a multimodal approach. Success in other surgical specialties has led to their application in gynecologic oncology. In this study we sought to assess the impact of a multimodal analgesia regimen with liposomal bupivacaine compared to an opioid-based patient controlled analgesia (PCA) regimen on postsurgical outcomes in gynecologic oncology patients undergoing laparotomy.

METHODS: We conducted a retrospective chart review of gynecologic oncology patients undergoing exploratory laparotomy between July 2015 and October 2015. Patients receiving a multimodal analgesia regimen including intraoperative administration of liposomal bupivacaine with narcotic pain medication available for breakthrough pain were compared to those receiving an opioid-based PCA regimen. The primary outcome measures were postsurgical opioid consumption and hospital length of stay (LOS). Secondary outcome measures included time to flatus and presence of postoperative ileus through day 30. Intergroup comparisons were conducted using Wilcoxon two sample test with one-sided p-values for continuous variables and Fisher’s exact test with two-sided p values for categorical variables. P less than 0.05 was considered statistically significant.

RESULTS: Hospital records were reviewed for 47 gynecologic oncology patients who underwent exploratory laparotomy during the defined study period. Of these patients, 26 received a multimodal analgesia regimen including intraoperative administration of liposomal bupivacaine and 21 received an opioid-based PCA regimen. The multimodal analgesia regimen was associated with a significant decrease in opioid use at 0-24 hours postoperative (15.8 MME [morphine milligram equivalents] v. 31.5 MME, P=0.02) and 24-48 hours postoperative (14.7 MME v. 29.9 MME, p=0.049), and days to flatus (mean, 2.6 days v. 3.4 days, p=0.04). There was no significant difference in opioid use 48-72 hours postoperative (18.7 MME v. 22.2 MME, p=0.45). The postsurgical LOS was not significantly different between groups (99.5 hours v. 116 hours, p=0.18) and the incidence of ileus was not significantly different between groups (11.5% of patients v. 19% of patients, p=0.68).

CONCLUSIONS: A multimodal analgesia regimen including intraoperative administration of liposomal bupivacaine appears to improve post-surgical outcomes by significantly reducing opioid use in the first 48 hours postoperatively. Additionally there was earlier bowel function recovery with a significant decrease in time to flatus postoperatively. These findings support the use of a multimodal analgesia regimen as a means to improve patient outcomes through an enhanced recovery pathway, though it remains clear that hastened patient recovery is multifactorial. A larger cohort is pending for further analysis and a prospective evaluation is currently ongoing at our institution.

LEARNING OBJECTIVE: At the end of this presentation, the learner will be able to identify differences in the postoperative course between Gynecologic Oncology patients undergoing Exploratory Laparotomy receiving had received the multimodal analgesia regimen including intraoperative administration of liposomal bupivacaine and those receiving an opioid-based patient controlled analgesia (PCA) regimen.
POSTER #39: Cardiovascular Risk Factors and Their Influence on Stage and Treatment Modalities in Type 2 Endometrial Cancers

K. Laus, J. Ross, C. Liao, I. Alsaden, M. Javellana, S.D. Yamada, N. Lee  University of Chicago Medical Center, Chicago, IL

OBJECTIVES: To define the frequency of cardiovascular disease (CVD) risk factors in women with type II endometrial cancer and to evaluate the effect of these factors on cancer treatment.

METHODS: In this single center retrospective cohort study, we identified women with type II endometrial cancer (T2EC) from 1/1/2004 to 8/1/2014. Diagnosis of diabetes mellitus type 2 (DM2), hyperlipidemia (HLD), and hypertension (HTN) at the time of cancer diagnosis were abstracted via physician documentation and verified by respective pharmacological therapy. Chi-squared analyses were used to evaluate each of these CVD factors with malignancy stage at presentation (I/II vs II/IV), primary surgery type (pelvic lymph node dissection (PLND) vs para-aortic and pelvic lymph node dissection (PPLND)), utilization of post-operative adjuvant chemotherapy, and/or post-operation adjuvant radiation (whole pelvic radiation vs brachytherapy vs both).

RESULTS: Type II endometrial cancer was identified in 244 surgically staged patients with a mean age of 66.4 ±10.3 and a mean BMI of 32.0 ± 7.8. Among these patients, 24.6% (N=60) had DM, 26.6% (N=65) had HLD, and 69.3% (n=169) had HTN. 79 (32.4%) patients had ≥ 2 comorbid conditions. DM status was not related to adjuvant radiation, adjuvant chemotherapy, or stage at time of diagnosis. Among the 198 patients who underwent a LND, those without DM were more likely to receive PPLND compared to patients with DM (81.1% vs 64.4%, p < 0.05). HTN status was not related to adjuvant radiation, adjuvant chemotherapy, or stage at time of diagnosis. Again, among those who underwent a LND, those without HTN were more likely to receive PPLND compared to patients with HTN (86.6% vs 72.5%, p < 0.05). HLD status was not related to adjuvant radiation, adjuvant chemotherapy, stage at time of diagnosis, or initial surgery.

CONCLUSIONS: CVD risk factors traditionally associated with Type I EC were seen in a large portion of patients with T2 EC and affected surgical treatment. Patients with DM or HTN were less likely to undergo a PPLND in their initial surgical management as compared to those without these CVD risk factors. However, these CVD risk factors were not associated with stage or adjuvant therapy use.

LEARNING OBJECTIVE: Learner will be able to identify cardiovascular risk factors and their contribution to stage at time of diagnosis and treatment modalities in patients with type 2 endometrial cancers.
POSTER #40: Use of Hormone Replacement Therapy After Risk Reducing Salpingo-oophorectomy and Risk of Malignancy in High Risk Genetic Mutation Carriers: A Pilot Study

K.A. Mills, M.F. Meyer, J.C. Cripe, K.C. Fuh, P.H. Thaker  Washington University School of Medicine, St. Louis, MO

OBJECTIVES: To assess the effect of hormone replacement therapy (HRT) on the incidence of subsequent malignancies in patients with genetic mutations predisposing to Mullerian cancers who have undergone risk reducing salpingo-oophorectomy (RRSO).

METHODS: Women age 18-51 years with confirmed high risk genetic mutations who underwent RRSO between 1995 and 2016 were included in this IRB approved retrospective cohort study. Patients with a malignancy diagnosis prior to RRSO were excluded. Demographic and clinical data were abstracted from medical record, and patients who had no documented contact for the year prior to study cessation were called to confirm duration of hormone use as well as occurrence of secondary outcomes. HRT included any combination of estrogen and progesterone given orally, transdermally, or vaginally. Categorical and continuous variables were analyzed using chi-square or Fisher’s exact test and student t test or Mann-Whitney-U test as appropriate.

RESULTS: 70 patients met inclusion criteria. 38 (54%) received HRT, of which 21 (55%) received oral estrogen and progesterone formulations. The median duration of follow up after RRSO was 6 years. Identified mutations included BRCA1 (n=42) and BRCA2 (n=25), Lynch family (n=2), and RAD51 (n=1) and were not significantly different between groups. There was no difference in race, BMI, mutation type, history of hysterectomy or years since RRSO between groups. Patients who received HRT were younger (38.3 versus 43.8 years, p<0.01) and more frequently underwent additional risk reduction surgery (76.3% versus 50%, p=0.02). There was no significant difference in incidence of malignancy between groups (10.8% vs. 6.2%, p=0.68). All subsequent malignancies identified were breast carcinomas. Outcomes including osteoporosis, stroke, myocardial infarction, venous thromboembolism and death were rare and not different between the cohorts.

CONCLUSIONS: In this single institution retrospective chart review, there was no statistically significant difference in incidence of malignancy after RRSO in patients with high risk genetic mutations treated with HRT. Further large scale studies confirming long-term safety and clarifying provider and patient motivation for use of HRT in all types of high risk mutation carriers are warranted.

LEARNING OBJECTIVE: Identify the absence of increased risk of malignancy with use of hormonal therapy following risk reduction salpingo-oophorectomy for all high risk indications at a single institution. Justify need for further studies in this area.
POSTER #41: Fertility Preservation in the Setting of Gynecologic Malignancy

K. Kennedy, T. Gadomski, W. Robinson  Tulane University, New Orleans, LA

OBJECTIVES: As preservation of fertility is widely recognized as a key quality of life issue for many women with cancer, the purpose of this study is to examine the impact and utility of pursuing assisted reproductive technology for fertility preservation (FP) in the setting of gynecologic cancer.

METHODS: Patients with a history of localized cervical, ovarian, and endometrial cancers were included in this study. All of the patients had their cancer diagnoses diagnosed at a busy, urban, outpatient clinical cancer center. Patients were counseled on the likely effects of the various treatment options on their future fertility and then patients were referred to the reproductive endocrinology division within the same institution for FP management. On an individual basis, once patients completed their FP, they resumed treatment for their gynecologic malignancy.

RESULTS: 20 women were included in this study. The mean age was 34.55 years and malignancies represented were as follows: 10 patients with cervical cancer, 6 with endometrial cancer, 2 with ovarian cancer, 1 with vulvar cancer and 1 patient with an embryonal rhabdomyosarcoma. 18 of these patients elected for FP (only 8 of 10 patients with cervical cancer pursued FP), with 13 pursuing oocyte cryopreservation and 5 opting for embryo cryopreservation. Of the women who received FP, 17 of the 18 patients had no evidence of disease following treatment and 1 patient was lost to follow up. The mean time from cancer diagnosis through REI referral and FP management to cancer treatment was 2.5 months. 0/18 women who received FP have used either their cryopreserved oocytes or embryos to date.

CONCLUSIONS: Fertility preservation is a key survivorship issue for many women with gynecologic cancer. This data demonstrates that harvesting and freezing tissue is feasible in a short period of time and does significantly delay start of cancer treatment. In this small cohort, there does not seem to be a negative impact on treatment outcomes, as 17/18 patients who pursued FP had no evidence of disease at the end of treatment. Given the fact that none of the patients in this sample have used the cryopreserved embryos or oocytes, one must balance the risks, costs and time commitment implicit to FP against patient preference and likelihood of regret if FP is not pursued.

POSTER #42: N-Acetylation and Ovarian Cancer: A study of the Metabolomic Profile of Ovarian Cancer Compared to Benign Counterparts.

K. Dessources (1), J. Cohen (1), K. Sen (1), S. Ramadoss (1) and G. Chaudhuri(1) University of California Los Angeles Department of Obstetrics and Gynecology, Los Angeles, CA (1)

OBJECTIVES: To identify novel biomarkers associated with metabolic pathways in ovarian cancer patients.

METHODS: Ovarian venous and systemic arterial samples were collected from 40 patients undergoing surgery for various gynecologic conditions including ovarian cancer. Ovarian tissue, both malignant and non-malignant, was collected to confirm whether metabolomic differences observed in plasma were tumor-associated. Global metabolomic analysis of arterial and venous samples was performed with liquid and gas mass spectometry to identify differential metabolite expression between benign and malignant tumors of the ovary. Statistically relevant differences were ascertained employing one-way ANOVA, Welch’s two-Sample t-test and Matched Pairs-t-tests.

RESULTS: Samples from 16 patients with benign ovarian pathology (median age 63) and 21 patients with malignant pathology (median age 55) were included. Ovarian cancer patients had the following histologies: 14 (66.7%) high grade serous, 2 (9.5%) endometrioid, 2 (9.5%) clear cell and 3 (14.3%) mixed histology. A significant change in global N-acetylation of metabolites was observed. Significantly increased N-acetylation of aromatic amino acids such as tryptophan (>20 fold) and tyrosine (>11 fold), as well as N-acetylation of polyamines such as N-acetyl putrescine, were evident in the ovarian cancer tissues and in the venous blood from ovarian cancer patients when compared to their benign counterparts (p-value<0.001). In addition, metabolomic analysis indicate significantly increased levels of several fatty acyl carnitines in ovarian cancer tissues compared with benign ovarian tissue.

CONCLUSIONS: In the metabolome of patients with ovarian cancer there were increased levels of the following: (i) Global N-acetylation, indicated by significantly increased N-acetyl putrescin and N-acetyl tryptophan (believed to be an anti-apoptotic agent in neurons) (ii) acyl carnitines indicative of enhanced fatty acid oxidation. These metabolomic differences may serve as novel biomarkers in epithelial ovarian cancer.

LEARNING OBJECTIVE: Identify novel biomarkers associated with metabolic pathways in ovarian cancer patients. Demonstrate the utility of metabolomic investigations into ovarian malignancies. Predict the contribution of global N-acetylation and acyl carnitines no cancer pathogenesis
POSTER #43: Medicaid payer status is associated with increased cancer-related mortality among stage IA cervical cancer patients

K. Clair (1), K. Pfaendler (1), J. Chang (2), A. Ziogas (2), R. Bristow (1), K. Penner (1)

OBJECTIVES: The objective of this study was to identify risk factors associated with cervical-cancer specific mortality in patients with stage IA cervical cancer in California.

METHODS: This is a retrospective population-based cohort of incident stage IA cervical cancer cases diagnosed and reported to the California Cancer Registry from 1/1/1995 to 12/31/2009 with follow up data through 2015. Cox proportional hazards models were used to examine the relationships between patient, tumor and hospital characteristics and cervical cancer-specific mortality.

RESULTS: Among 4064 incident cases identified, socioeconomic status was skewed toward the lower quintiles (lowest 25.1% and lower-middle 20.6%), but nearly half (45.6%) had Managed care while only 21.3% had Medicaid and 10.1% were uninsured. The majority were healthy; 2479 (61.0%) had a Charlson comorbidity score of 0. In the Cox proportional hazards model, we found that Medicaid payer status (HR 4.31) and grade 2 and 3 histology (HR 5.83 and 6.62, respectively) were independently associated with increased mortality. Race, socioeconomic status, and co-morbidities were not significant factors. Medicaid payer status (HR = 4.31, 95% CI 1.45-12.83, p < 0.0087) was the only characteristic predictive of cervical cancer-specific mortality. There were no significant differences in cervical-cancer specific mortality according to tumor histology or according to volume of patients treated annually at each hospital.

CONCLUSIONS: Amongst patients with stage IA cervical cancer, medicaid payer status had a significantly increased risk of cancer-related mortality. Further research is necessary to understand why results are disparate amongst patients with different forms of insurance and whether this is a proxy for other unidentified patient features.

LEARNING OBJECTIVE: Learners will be able to identify the risk factors associated with cervical cancer specific mortality among patients with stage IA cervical cancer in California. Moreover, they will be able to discern that Medicaid payer status and tumor grade histology are each associated with increased cancer specific mortality.
POSTER #44: Extending the Platinum-Free Interval: The Impact of Omitting 2nd Line Platinum Chemotherapy in Intermediate Platinum-Sensitive Ovarian Cancer

L. Dockery, A. Rubenstein, K. Ding, S. Mashburn, W. Burkett, D. Asher, K. Moore, C. Gunderson The University of Oklahoma Health Sciences Center, Oklahoma City, OK.

OBJECTIVES: Patients (pts) with platinum-sensitive ovarian cancer (EOC) experiencing recurrence between 6-12 months (mos) after primary platinum chemotherapy (CT) are felt to possess worse prognosis than those with disease recurring in >12 mos. Artificially prolonging the platinum-free interval (PFI) with cytotoxic CT was tested in MITO-8 with poor outcomes. The objective of this study was to determine the impact of using non-platinum based CT in the 2nd line for pts with EOC recurring between 6-12 mos after completion of primary platinum-based CT at an institution where targeted therapies are routinely used in this setting.

METHODS: A retrospective review of 71 pts with recurrent EOC and PFI of 6-12 mos following primary CT treated at a single institution was performed comparing those receiving platinum-based CT in the 2nd line and those not. PFI1 was defined as the date of last CT to date of recurrence. PFS2/3 were defined as start of 2nd or 3rd line CT to start of subsequent line. Survival times were summarized using the Kaplan-Meier method and compared between groups using log-rank tests.

RESULTS: Of 71 pts included, median age at diagnosis was 61 yrs. The majority of pts were Caucasian (87%) and all had high-grade serous histology. Primary cytoreductive surgery (CRS) was more common (83.1% CRS vs. 16.9% iCRS). Median PFI1 was 8 mos (95% CI 7 – 9 mos). Second line platinum CT was omitted in 42% of pts. Bevacizumab was used in 2nd line therapy in 15% of pts and 37% received other targeted therapies. Median PFS2 for those receiving platinum CT was significantly longer than those not receiving platinum (9.5 vs 4 mos, p=0.0012). There was no difference in PFS2 for those receiving bevacizumab vs. other targeted therapies. 6 patients received platinum chemotherapy in 3rd line that did not 2nd line. PFS3 by platinum status was not significant but suggests improved outcome with platinum (9 vs 5.5 mos p=0.4391). Median overall survival (OS) was 41.4 months (95% CI 33.1 – 48.6 mos). OS for platinum in 2nd line vs. no platinum was 46.6 vs. 31.9 mos (p= 0.0877).

CONCLUSIONS: While limited by small numbers and retrospective methods, this study suggests that use of non-platinum chemotherapy, including targeted therapies, in pts with EOC recurring between 6–12 mos leads to worse survival. Our results confirm existing prospective data and demonstrate that even with use of targeted therapies, attempts to artificially prolong the PFI are not likely beneficial.

LEARNING OBJECTIVE: The learner will be able to evaluate the impact of utilizing non-platinum chemotherapy as 2nd line therapy in platinum-sensitive ovarian cancer recurring between 6 and 12 months of platinum chemotherapy.

*Figure for Poster #44 on next page*
Progression Free Survival 2

Logrank p=0.0012
POSTER #45: Bony metastases as identified by PET/CT in early stage and advanced endometrial cancer

Laurin Cristiano (1)*, Linda Hong (1)*, Rebecca Gonzalez (1), Sara Abu-Tabikh (1), Julia Unternaehrer (2), Yevgeniya Ioffe (1) Obstetrics and Gynecology (1), Department of Basic Sciences (2), School of Medicine, Loma Linda University  *co-first authors

OBJECTIVES: Recurrences of endometrial cancer are typically confined to the pelvis with distant recurrences primarily seen in lymph nodes, lung, or liver. Bone metastases in endometrial cancer are thought to be rare. As such, studies of bone metastasis in endometrial cancer are few, and there is little data to guide management. In this study we aimed to quantify the rate of bony metastasis in endometrial cancer as stratified by histology.

METHODS: 220 charts of patients with the diagnosis of endometrial cancer presenting as new consults to a single institution gynecologic oncology academic practice between 2013-2016 were reviewed. Abstracted data included age at diagnosis, treatment received, imaging modalities used for surveillance, symptoms leading to imaging, treatment received for bony metastases, overall survival (OS), and survival from diagnosis of bony metastases. Abstracted data was analyzed with descriptive statistics.

RESULTS: 10/219 (5%) patients were found to have bony metastases. 7 patients diagnosed with bony metastases had stage IV disease, 2 patients had stage I clear cell or serous cancer, 1 patient had stage II grade 2 endometrioid cancer. Bone metastases were detected by PET/CT in 9/10 (90%) cases, 1 with CT scan alone. 5/10 patients were asymptomatic from bony metastases, 4 had back or hip pain, 1 had urinary retention and gait instability. Overall, 59/219 patients presented with at least stage III disease, 7/59 (12%) patients with stage III-IV disease were found to have bony metastases, with 6/7 cases detected by PET/CT. At time of follow up, 2/10 patients were dead of disease, with survival post bony metastases diagnosis ranging from 3-17 months, OS ranging from 3-68 months. Treatment modalities were multi-disciplinary including hospice/palliation (4 patients), radiation alone (1 patient), surgery alone (1 patient), radiation alone (1 patient), denosumab (1 patient), and multi-modality treatment of surgery, radiation, and denosumab (2 patients, OS 68 months and OS not reached).

CONCLUSIONS: Bony metastases may be more prevalent in advanced endometrial cancer than previously believed, with higher detection rate by imaging via PET/CT scans. Treatment modalities are variable, with preferred treatment course yet to be determined. Further data on a larger scale is forthcoming regarding incidence of bony metastases in endometrial cancer, OS, and preferred treatment.

LEARNING OBJECTIVE: Learners will be able to describe the suspected bony metastases rate in endometrial cancer. Learners will explore the roles of CT vs PET/CT in detection of endometrial cancer. Learners will be able to describe treatment approaches for patients with endometrial cancer and bony metastases.
OBJECTIVES: Uterine papillary serous carcinoma (UPSC), a subset of endometrial cancers, accounts for less than 10% of cases, but disparately accounts for 50% of uterine cancer related deaths. Prior reports indicate an association between UPSC and BRCA 1 germline mutations. Our objective was to compare the survival of patients with UPSC with and without a family history of breast, ovarian, uterine, colon, pancreatic, melanoma or GU cancers (Multiple Organ Hereditary Cancers or MOHC).

METHODS: We extracted all genetic alterations in the commonly tested genes during genetic panel testing, progression free survival (PFS), and overall survival (OS) from The Cancer Genome Atlas (TCGA) in all patients with UPSC. We performed a retrospective review of all patients who were diagnosed with UPSC at our institution from 2006 to 2014. Demographics and clinic-pathologic data were obtained. Disease progression was defined by RECIST criteria. Statistical analysis was performed using the Kaplan-Meier Survival Analysis.

RESULTS: Genetic alterations in the following commonly tested genes were extracted from TCGA in UPSC patients: BRCA1, BRCA2, CHEK2, BRIP1, RAD51C, BARD1, TP53, RAD50, RAD51D, ATM, NBN, PALB2, MRE11A, MSH6, MLH1, MSH2, PMS2. A significant difference in PFS and OS was seen among patients with advanced (stage III/IV) UPSC with a genetic alteration of the above genes versus those without (PFS of 4.0 versus 1.6 years and OS of 4.2 versus 2.5 years; P = 0.005 and P = 0.01). This data was applied our population. Sixty-six patients with UPSC were included in the analysis. 45% of the patients had a personal history of or first degree relative with MOHC. One third of these patients had a personal history of MOHC. When comparing survival between patients with and without a personal history of and/or a first degree relative with MOHC, there was a difference in median PFS of 3.2 versus 1.2 years (P = 0.06) and OS of 4.9 versus 2.2 years (P = 0.03) respectively. A difference in survival was seen among patients with advanced UPSC with a family or personal history of MOHC versus those without (PFS of 1.5 versus 0.6 years and OS of 2.6 versus 0.6; P = 0.05 and 0.04, respectively).

CONCLUSIONS: Women with UPSC with a personal and/or family history of MOHC have improved survival compared to those without. Identification of genetic predisposition and higher mutational burden, may improve treatment options and outcomes in this subgroup of patients. Genetic testing should be considered in patients with UPSC.

LEARNING OBJECTIVE: Define Multiple Organ Hereditary Cancers (MOHC) in context of the research. Illustrate the genetic alterations patients with UPSC have and their relationship with progression free and overall survival. Identify patients with UPSC who will have improved survival based on family history.
POSTER #47: Patients with Sarcopenia Benefit from Neoadjuvant Chemotherapy in Advanced Ovarian Cancer

LB Conrad, S Schmidt, AA Bailey, M Carlson, S Kehoe, D Richardson, DS Miller, JS Lea

OBJECTIVES: Neoadjuvant chemotherapy has been investigated as an alternative to primary debulking surgery to avoid adverse outcomes in patients with significant disease burden, poor performance status, or certain medical co-morbidities. Pre-treatment core muscle size has been associated with prognosis in several cancers. We sought to identify ovarian cancer patients with decreased pre-treatment core muscle size (i.e. sarcopenia), who may benefit from receiving neoadjuvant chemotherapy over initial primary debulking surgery.

METHODS: We identified patients with stage III-IV epithelial ovarian cancer from 2008-2016 who underwent neoadjuvant chemotherapy (NACT) or primary debulking surgery (PDS). Psoas muscle cross-sectional area at the superior endplate of L4 (cm2) was measured and normalized for height (m2) to determine the core muscle index (CMI). Sarcopenia was defined as below the mean CMI (2.8 cm2/m2) for the cohort. The primary outcome was progression-free survival (PFS). Secondary outcome was overall survival (OS). Cox proportional hazards model was used to identify variables that contribute to survival. Kaplan-Meier survival curves were constructed and differences compared using log-rank test. A p-value < 0.01 was considered significant.

RESULTS: 212 women had advanced ovarian cancer. 102 patients underwent PDS and 31 patients had NACT. Median age was 54 y/o (range 23-83), Median follow-up was 25 months (range 1-90) and 85% had high-grade serous histology. Median PFS for patients with sarcopenia undergoing NACT vs PDS was 22 mo. vs 15 mo. (p=0.08). Median PFS for patients without sarcopenia was 14 mo. vs 16 mo. (p=0.86). Core muscle size did not impact OS regardless of primary treatment. Variables contributing to survival were stage and interval debulking status for NACT, and platinum status for PDS.

CONCLUSIONS: Patients with sarcopenia benefited from NACT. Our findings identify an additional indication for NACT in advanced ovarian cancer.

LEARNING OBJECTIVE: Define sarcopenia. Identify an additional role for neoadjuvant chemotherapy in advanced ovarian cancer.
POSTER #48: Preclinical investigation of DNA histone deacetylase inhibition in ovarian cancer.

L. Minion, F. Liu-Smith, V. Sarin, F. Meyskens, L. Randall

OBJECTIVES: Women with chemoresistant ovarian cancer continue to have limited therapeutic options and poor clinical outcomes. Histone deacetylase inhibitors (HDACi’s) have been proposed as an alternative therapy in patients with gain-of-function p53 mutations that have incomplete response to standard therapy. HDACi’s have demonstrated growth arrest, apoptosis of tumor cells, and reversal of epigenetic silencing by methylation. One such agent, romidepsin (FK228) has been Food and Drug Administration approved for the treatment of cutaneous and peripheral T-Cell lymphomas. We investigated the in vitro effects of romidepsin with carboplatin, and luteolin, a natural compounds that keep romidepsin in its reduced form.

METHODS: Human ovarian cancer cell lines SKOV3ip1, OVCAR4 (p53mut), and COV362 (p53mut, BRCA1mut) were incubated under standard conditions: 5% CO2 at 37°C. Romidepsin and luteolin were obtained from Selleck Chemicals. In vitro drug exposures were carried out with increasing concentration of drugs at serial dilution of 2-folds. For combination treatment, the ratio between romidepsin and the second drug was kept constant for all ranges. Colorimetric cell viability assays were performed after a 72-hour incubation using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT). All experiments were conducted in triplicate. The half maximal inhibitory concentration (IC50) and combination index for synergy was calculated by Calcusyn software.

RESULTS: The IC50 for romidepsin in SKOV-3 was 1.93 ± 0.28 nM, OVCAR4 3.92 ± 0.7 nM, and COVR362.4 13.74 ± 1.88 nM. Combination treatment with romidepsin, and luteolin produces a greater growth inhibition than either agent alone in all cell lines, i.e., exhibiting synergistic effect. The combination index at 50% effective dose for romidepsin and luteolin was 0.54 for SKOV-3, 0.43 for OVCAR4, and 0.37 for COV362.4. The combination index at 50% effective dose for romidepsin and carboplatin was 0.49 for SKOV-3.

CONCLUSIONS: We have observed substantial synergistic effect between romidepsin with carboplatin and between romidepsin with luteolin. We are actively investigating the molecular mechanism underlying the observed synergistic effect between romidepsin and these compounds, and we propose this effect might be due to the maintenance of romidepsin in its reduced, most effective form. Further investigation of these drug combinations is warranted, and experiments with these compounds in cell lines are ongoing.

LEARNING OBJECTIVE: Learners will be able explain the therapeutic rational of investigated agents.
POSTER #49: Incidence of Urinary Tract Injury and Utility of Routine Cystoscopy during Total Laparoscopic Hysterectomy for Endometrial Cancer

M. Hom, H. Machida, A. Shabalova, S. Mostofizadeh, T. Takiuchi, J. Garcia, L. Muderspach, K. Matsuo
Los Angeles County + University of Southern California Medical Center, Los Angeles, CA

OBJECTIVES: Current literature reports indicate an incidence of 0.7-4.0% for urinary tract injuries during minimally-invasive hysterectomy. However, there is limited information for urinary tract injuries for patients undergoing these procedures for gynecologic malignancy. The objectives of this study were to determine incidence and characteristics of urinary tract injuries during TLH for endometrial cancer and the utility of routine cystoscopy.

METHODS: This retrospective study examined stage I-IV endometrial cancer cases treated with TLH (including robotic-assisted) at one academic center between December 2008 and February 2016. All identified urinary tract injuries were collected for 30 days following hysterectomy. Routine cystoscopy was defined as cystoscopy following completion of TLH with no suspicion of urinary tract injury prior to cystoscopy.

RESULTS: In 464 cases of planned TLH for endometrial cancer, urinary tract injuries were seen in 9 women (1.9%, 95% confidence interval [CI] 0.7-3.2): 4 (0.9%, 95%CI 0.0-1.7) ureteral and 5 (1.1%, 95%CI 0.1-2.0) bladder injuries. Five (55.6%) of these 9 urinary tract injuries were diagnosed prior to completion of TLH based on suspicion and recognition by the surgeon and did not undergo routine cystoscopy. Of the 417 women who completed TLH, routine cystoscopy was not performed in 16 cases. Of the 401 cases who underwent routine cystoscopy after completion of TLH, 4 (1.0%, 95%CI 0.0-2.0) unsuspected urinary tract injuries were identified which represents 44.4% (4 of 9) of all urinary tract injuries: 1 (0.2%) ureteral and 3 (0.7%) bladder injuries. All injuries were repaired intraoperatively and no further urinary tract injuries were noted in the 30-day postoperative period. No common patient and tumor factors were identified. When cystoscopy cost is assumed as $530, a total of $53,000 will be estimated to identify one urinary tract injury.

CONCLUSIONS: This study provides information on urinary tract injuries related to TLH performed for endometrial cancer. Routine cystoscopy during TLH for endometrial cancer identified all the unsuspected urinary tract injuries in this series. In this era of cost-effective medicine, further study is warranted.

LEARNING OBJECTIVE: To assess the utility of routine cystoscopy during total laparoscopic hysterectomy (TLH) in the management of women with endometrial cancer.
POSTER #50: Intrauterine Manipulator Use During Minimally Invasive Hysterectomy and Risk of Lymphovascular Space Invasion in Endometrial Cancer

M. Hom, H. Machida, C. Adams, S. Eckhardt, J. Garcia, K. Matsuo  Los Angeles County + University of Southern California Medical Center, Los Angeles, CA

OBJECTIVES: To determine whether intrauterine manipulator (IUM) use is associated with increased frequency of lymphovascular space invasion (LVSI) in women with endometrial cancer undergoing minimally invasive hysterectomy.

METHODS: A retrospective case-control study was conducted among stage I-IV endometrial cancer patients who underwent hysterectomy performed at one academic center from 2008-2015. Medical records were reviewed for patient demographics, surgical details, and tumor characteristics. Women who underwent total laparoscopic hysterectomy (TLH) with IUM were compared to women who underwent total abdominal hysterectomy (TAH). A systematic literature review with pooled analysis was also performed to examine frequency of LVSI stratified by IUM use.

RESULTS: There were 687 hysterectomies for endometrial cancer identified. Of those, 419 cases of TLH with IUM (TLH-IUM) and 194 cases of TAH met eligibility criteria for analysis. The most common type of minimally invasive hysterectomy was conventional laparoscopy (78.5%), followed by robotic-assisted (21.5%). The most frequently used IUM was the VCare (89.5%). There was no statistically significant difference in the frequency of LVSI between the two groups: 15.1% for TLH-IUM vs. 19.9% for TAH (p = 0.14). Type of IUM was not associated with LVSI (15.5% for VCare vs. 11.6% for other types, p = 0.51). After propensity score matching, frequency of LVSI was similar between the two groups: 21.2% for TLH-IUM vs. 19.6% for TAH (p = 0.78). Systematic literature review identified 1,371 cases of TLH-IUM and 1,246 cases of TAH performed for endometrial cancer. LVSI frequency was again similar between the two groups, respectively: 15.0% vs. 13.6% (p = 0.31).

CONCLUSIONS: Our study suggests that IUM use during TLH for endometrial cancer is not associated with increased frequency of LVSI.

LEARNING OBJECTIVE: To evaluate the use of intrauterine manipulator placement in minimally invasive hysterectomy for endometrial cancer.
**OBJECTIVES:** Endometrial cancer is the most common gynecologic malignancy and is diagnosed at an early stage up to 70% of the time. The utility of comprehensive surgical staging in patients with low grade, minimally invasive disease has been questioned, and to date there is no reliable preoperative predictive model to identify these patients. The objective of this study is to create a prediction model to stratify patients into risk levels with clinical variables available pre- or intra-operatively.

**METHODS:** The Gynecologic Oncology Group has defined risk categories based on patient age, myometrial invasion, histologic grade, and lymphovascular space invasion. Patients were stratified into high (HR) or low risk (LR) categories based on these parameters. Clinical and pathological data were available for 82 patients diagnosed with endometrioid endometrial cancer (EEC) at our institution. After institutional review board approval, clinical data were extracted from patient charts. Univariate and multivariate analyses were performed to identify variables associated with recurrence, survival, and risk levels. Prediction models were constructed using significant variables available at baseline and intra-operatively, analyzed with the lasso regression method, and measured with area under the curve (AUC). Prediction models were compared to those created with clinical and molecular data from The Cancer Genome Atlas (TCGA).

**RESULTS:** 5-year survival for LR patients was 97% compared to 77% for HR patients (P=0.02). Prior analysis using data from TCGA patients with EEC showed that risk levels were associated with recurrence and survival. On univariate analysis, age, body mass index (BMI), Charlson morbidity index, myometrial invasion, histologic grade, and positive progesterone receptor were significantly associated with risk levels. The clinical prediction model was built and optimized using age, BMI, grade, and myometrial invasion. It had an AUC of 91% (95% CI of 88-93%) for detecting high risk EEC patients. This validates and improves models utilizing TCGA clinical data (AUC of 90%) in EEC patients.

**CONCLUSIONS:** We validated previous TCGA clinical models to predict risk in patients with EEC in an independent clinical database. The performance of the model was reliably over 90%. Integration of molecular data to this clinical model is likely to improve its performance over 95%, as we observed in TCGA data, resulting in a model that could be translated into a clinical test.

**LEARNING OBJECTIVE:** Stratify risk of endometrial cancer. Predict risk in endometrial cancer to help guide surgical management. Identify clinical variables associated with high risk endometrial cancer.
AUC: 0.92 (95% CI: 0.96, 0.89)
POSTER #52: Single Nucleotide Polymorphism on Codon 72 of the P53 Gene is Significantly Associated with Tumor Grade in Endometrioid Endometrial Cancers

M.D. Miller, E. Salinas, D. Sharma, M. Keeney, M. McDonald, A. Newtson, M. Goodheart, J. Gonzalez-Bosquet, E. Devor  University of Iowa Hospitals and Clinics, Iowa City, IA

OBJECTIVES: Mutation in the p53 gene is the most common genetic phenomenon described in human cancers. Loss of tumor suppression function is associated with development of or aggressiveness of gynecologic malignancies. Unlike frank mutations of the p53 gene, single nucleotide polymorphisms (SNPs) have been described to be phenotypically silent and are generally expected to have a more modest effect on disease manifestation. Specifically, polymorphism of codon 72 in exon 4 of the p53 gene (P72R) has been observed to affect susceptibility in cancers. Three meta-analyses have evaluated this polymorphism in endometrial cancer and showed conflicting results regarding risk. However, data on cancer prognosis are scarce. The objective of this study is to investigate association between the P72R polymorphism and clinical outcomes of patients diagnosed with endometrioid endometrial cancer (EEC).

METHODS: Primary tumor tissues from 41 patients diagnosed with EEC at our institution were obtained after institutional review board approval. Clinical data were extracted from patient charts. High molecular weight genomic DNA (gDNA) was purified from each tumor. Exon-specific PCR amplification was carried out from gDNA aliquots. Sequencing of exon-specific PCR amplicons was then performed to determine the genotype at codon 72. Survival and recurrence analyses were performed with cox proportional hazard method. Univariate and multivariate logistic regression analyses to identify clinical variables associated with different genotypes of the P72R locus were performed. Significance level was considered as p-value < 0.05.

RESULTS: Fifteen tumors (36.5%) had a CC genotype at codon 72, 19 (46.3%) had a GG genotype, and 7 (17%) had a CG. In this limited cohort of patients, no singular genotype was significantly associated with survival or recurrence. However, presence of the GG genotype was significantly associated with higher tumor grade (p=0.009, see figure).

CONCLUSIONS: Although, there is some evidence to suggest that the P72R polymorphism portends an increased risk of developing certain cancers, no studies thus far have established a significant association with disease prognosis. Histologic grade in EEC is an important prognostic factor that can ultimately impact survival. Our study is the first to correlate P72R genotype with a prognostic factor for EEC.

LEARNING OBJECTIVE: Define the role of p53 single nucleotide polymorphism on codon 72 in endometrioid endometrial cancer. Establish the association between single nucleotide polymorphism on codon 72 of the p53 gene and clinical outcomes in endometrial cancer. Identify the single nucleotide polymorphism on codon 72 of the p53 gene role as a prognostic factor in endometrial cancer.

*Figure for Poster #52 on next page
p-value = 8.90x10^{-3}
OBJECTIVES: Notch receptors play an important role in cell differentiation, proliferation, and apoptosis. Evidence is available to suggest that Notch signaling is essential for the endometrial changes necessary during the menstrual cycle. It has also been implicated in pathogenesis in the endometrium and dysregulation of notch has been observed in various neoplastic processes. The aim of this study is to establish an association between NOTCH2 expression and clinical outcomes in endometrioid endometrial cancer (EEC).

METHODS: EEC tissues from 41 patients were obtained after approval by our institutional review board. Clinical data were extracted from patient charts. Total cellular RNA was purified from all 41 tumors. After evaluating RNA yield and purity, NOTCH2 gene expression was assessed via SYBR Green qPCR using previously validated primers. Survival and recurrence analyses were performed with cox proportional hazard method. Univariate and multivariate analyses with linear regression were performed to identify clinical variables associated with NOTCH2 expression. Significance level was considered a p-value < 0.05.

RESULTS: Univariate analysis revealed a statistically significant association between 2009 FIGO stage (p=0.003) and adjuvant treatment after surgery (p=0.041) with NOTCH2 expression. Positive peritoneal cytology (p=0.069) and presence of progesterone receptors by immunohistochemistry (p=0.084) showed a trend for significance in the univariate analysis. In the multivariate analysis only 2009 FIGO stage was confirmed as significantly associated with NOTCH2 expression.

CONCLUSIONS: The findings of this study raise the possibility of utilizing NOTCH2 as a molecular marker to assess risk of advanced stage disease at time of diagnosis. These findings also add to the growing body of evidence to suggest that the NOTCH signaling pathway shows promise as a therapeutic target in endometrial cancer.

LEARNING OBJECTIVE: Identify the role of NOTCH2 as a prognostic indicator in endometrial cancer. Demonstrate the association between NOTCH2 and FIGO stage in endometrial cancer. Justify potential use of NOTCH2 as a therapeutic target.

*Figure for Poster #53 on next page
*Figure for Poster #53

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009 FIGO Stage</td>
<td>-1.36</td>
<td>3.37E-03</td>
</tr>
</tbody>
</table>
OBJECTIVES: Endometrial cancer is the most common gynecologic malignancy. Most patients are diagnosed at an early stage and can be cured with surgery alone. Recurrence rates for early stage endometrial cancer are low. However, when it occurs treatment is not always curative. At the present, there is no accepted model to predict which patients are at risk to recur. The objective of this study is to use available clinical data at completion of treatment to predict recurrence of disease in endometrioid endometrial cancer (EEC) patients.

METHODS: Data from 82 patients diagnosed with EEC and available information about disease recurrence were included in the analysis. After approval by the institutional review board, patient charts were reviewed and clinical variables of interest were extracted. Univariate and multivariate cox regression hazard models to identify clinical variables associated with recurrence of disease were performed. Significance level was considered a p-value < 0.05 for both. Prediction models were constructed using only significant variables available at baseline (right after surgery), analyzed with the lasso regression method, and measured with area under the curve (AUC).

RESULTS: Five-year survival in patients without recurrence was 100%, compared to 52% in patients with recurrence (p 0.99). Univariate analysis revealed that white blood cell count (WBC; OR 1.31), positive pelvic (OR 1.56) and para-aortic (OR 12.6) lymph nodes, myometrial invasion (OR 1.03), lymphovascular space invasion (OR 11.68), positive peritoneal cytology (OR 3.33), stage (OR 1.74), risk level (OR 9.30), and adjuvant treatment (OR 4.31) were significantly associated recurrence of disease. On multivariate analysis, only positive lymph nodes (OR 35.06), and WBC (OR 1.47) were associated with recurrence. Finally, a prediction model using WBC, lymph node status, and risk level was created with an AUC of 86% (95% CI of 81% to 91%) for predicting recurrence after treatment in patients with EEC.

CONCLUSIONS: The clinical prediction model predicts EEC recurrence with an AUC of 86%. Predicting patients who are likely to recur may guide adjuvant treatment. Furthermore, we anticipate that the addition of molecular data to the current model will improve its performance. Prediction models that integrate clinical and molecular data could help us understand the characteristics of patients that experience recurrence, and may inform alternative targeted therapy for these patients.


*Figure for Poster #54 on next page*
Figure for Poster #54

AUC: 0.86 (95% CI: 0.81, 0.91)
POSTER #55 Dedifferentiated Endometrial Adenocarcinoma: Clinicopathologic Factors Associated with an Aggressive Subtype of Endometrial Cancer.

M. Buechel, S. Husain, S. Chen, K. Moore, L. L. Holman  University of Oklahoma Stephenson Cancer Center, Oklahoma City, OK

OBJECTIVES: Dedifferentiated endometrial carcinoma is a rare, aggressive form of endometrial cancer (EC). The tumor is morphologically characterized by an undifferentiated carcinoma with an associated low grade endometrioid component (FIGO I or II). Dedifferentiated carcinomas are under recognized, and often misdiagnosed as FIGO III endometrioid carcinoma or carcinosarcoma. There is limited literature consisting only of case reports and small patient series to help guide treatment decisions and provide prognostic information. Therefore, our primary objective was to investigate survival and clinical outcomes in a cohort of patients with dedifferentiated EC.

METHODS: A retrospective analysis of patients with dedifferentiated EC from 2010-2016 was performed. Demographic, clinical and pathologic data was collected and analyzed with descriptive statistics. Progression free and overall survival (PFS and OS) were estimated using the Kaplan-Meier method.

RESULTS: Twenty cases of dedifferentiated EC were identified. The median age at diagnosis was 64 with a median BMI of 33. Sixty percent of patients (pts) presented with stage I or II disease. The majority of pts had primary surgery (90%), and adjuvant therapy of these pts varied: 3 pts received no adjuvant therapy, 6 pts received adjuvant radiation therapy, 6 pts received adjuvant chemotherapy, and 3 pts received a combination of chemotherapy and radiation. Two of the 3 pts who did not receive adjuvant therapy progressed and died of disease before treatment could be started. All pts with stage III/IV disease received adjuvant chemotherapy. The greatest variation was the treatment of early stage disease, with 6 pts receiving adjuvant RT only, 3 receiving chemotherapy + vaginal cuff brachytherapy, and 1 pt receiving chemotherapy alone. The recurrence rate was 40% with a median PFS of 6 months. The median OS was 7 months. However, the median OS for pts that recurred was 5 months with 88% dying of disease within 3 months of recurrence. The median OS was 17 months for pts who did not recur with 100% alive without disease at the time of last follow-up.

CONCLUSIONS: Dedifferentiated adenocarcinoma of the endometrium is an aggressive subset of EC. Given the rapid progression at the time of recurrence, it is imperative we identify risk factors for recurrence and optimal up-front treatment strategies. We plan a multi-institutional analysis to delineate these factors with a larger subset of pts.

OBJECTIVES: To report the proportion of positive tests and to identify predictors of positivity among women undergoing self-collected HPV-DNA screening in Central Uganda.

METHODS: We carried out a community health campaign in Kiboga District as part of a larger prospective cohort study of women undergoing cervical cancer screening in a community health campaigns. After outreach and education, women were offered HPV DNA testing using self-collection. HPV-positive women were offered cryotherapy. Baseline demographic and health data were obtained and acceptability of the test was assessed.

RESULTS: Between April and June, 2016, 1033 participants completed self-administered HPV screening, of whom 22% (229) tested positive. Age, marital status, parity, and HIV serostatus were significant risk factors for HPV positivity in univariate analysis. In multivariate analysis, adjusted for age, marital status, parity, pregnancy and HIV serostatus, each additional year of age conferred about a 5% decrease in the odds of testing positive (95% CI 2-8%). HIV positivity also conferred 2.8 times the odds of HPV (95% CI 1.83-4.29). Other variables were not significantly associated with HPV positivity in multivariate analysis. Of note, although virtually all HIV positive women in the study were enrolled in care for their HIV, they were not statistically more likely than their HIV negative counterparts to have ever undergone cervical cancer screening previously, 10% versus 6%, respectively (OR 1.78, 95% CI 0.92-3.45).

CONCLUSIONS: Our HPV prevalence estimate matches limited population-based prevalence data in the region, suggesting a representative sample. Younger women and women with HIV had higher odds of testing positive. Prior to this study, HIV positive women were no more likely to have ever been screened for cervical cancer, missing a key opportunity for cervical cancer prevention. In the future, data will be compiled from similar campaigns in other districts to give more robust population-based estimates of HPV prevalence. Additionally, we will assess frequency and determinants of successful treatment acquisition for women with positive tests obtained in a community-based setting to determine the overall impact of campaign-based screening.

LEARNING OBJECTIVE: Learners will be able to identify risk factors for HPV positivity in Central Uganda. Learners will be able to describe baseline screening for cervical cancer in Uganda. Learners will be able to list opportunities for improving cervical cancer screening in Uganda.
POSTER #57: Evaluating the Use of a Modified Mayo Criteria for Early Stage Endometrial Cancer Surgical Staging

M. Zhang, R. Isaksson Vogel, C. Rivard  Department of Obstetrics, Gynecology and Women's Health, University of Minnesota Twin Cities

OBJECTIVES: To compare the use of the Mayo Criteria (MC) with a Modified Mayo Criteria (MMC) that excludes tumor size at intraoperative frozen section to guide lymph node dissection (LND) during endometrial cancer surgical staging.

METHODS: A retrospective chart review was performed to identify patients who underwent surgery for endometrial cancer at a large academic institution between March 2011 and December 2015. Data were summarized using descriptive statistics and compared by MC and MMC status using Chi-squared and Fisher’s Exact tests as appropriate for comparisons of node dissection and any positive nodes and Kruskal-Wallis tests for comparison of number of nodes removed and number of positive nodes.

RESULTS: Four hundred and twenty-nine patients were identified. Using the MC, 314 (73.2%) were categorized as high-risk and 79 (18.4%) were categorized as low-risk. This is compared to the MMC (excluding tumor size), 88 (20.5%) patients were classified as high-risk while 226 (52.7%) were classified as intermediate-risk based on tumor size but with no other high-risk characteristics. Using the MC, 54 (61.4%) had pelvic only and 35 (39.8%) had pelvic and para-aortic LND and 6 (11.1%) had positive pelvic and 5 (14.3%) had positive para-aortic nodes in the high-risk group. This compares to 212 (67.5%) undergoing pelvic only and 144 (45.9%) undergoing pelvic and para-aortic LND and 14 (7.1%) with positive pelvic and 7 (4.9%) with positive para-aortic nodes using the MMC classification. Using the MC, the low-risk group had 21 (26.6%) patients undergo pelvic only and 6 (7.6%) undergo pelvic and para-aortic LND and there were no positive nodes identified. This compares to 158 (69.9%) undergoing pelvic only and 109 (48.2%) undergoing pelvic and para-aortic LND with 9 (5.7%, p=0.22) positive pelvic and 2 (1.8%, p=0.01) positive para-aortic nodes in the MMC group.

CONCLUSIONS: Using the original MC for risk stratification, a high number of patients (92.9% and 95.1%) patients underwent unnecessary pelvic and para-aortic LND. After modifying the MC to exclude tumor size from consideration, there was no significant difference in the percentage of intermediate vs high-risk patients who underwent LND. There was, however, a statistically significant reduction in positive nodes found in the intermediate group on para-aortic but not pelvic LND. This demonstrates that this modification to the MC was partially successful in reducing unnecessary LND but needs further adjustment to achieve more optimal staging.

LEARNING OBJECTIVE: Evaluate the current rates of staging lymphadenectomy using the Mayo Criteria. Demonstrate the potential advantage of using a modified Mayo Criteria to reduce these rates without significant under-staging.
POSTER #58: Risk of Uterine Cancer in Women with Deleterious BRCA Mutations Who Undergo Risk Reducing Salpingo-oophorectomy (RRSO)

M. Hodeib(1), K. McMillen (1), A. Beavis (2), M. Zakhour (1), C. Walsh (1), BJ. Rimel (1) , A. Li (1) , B. Karlan (1), I. Cass (1) Cedars Sinai Medical Center, Los Angeles, Ca (1) Johns Hopkins Medical Center, Baltimore, Md (2)

OBJECTIVES: To report the relative risk and histologic features of uterine cancers in women with deleterious BRCA mutations who have undergone a risk reducing salpingo-oophorectomy (RRSO)

METHODS: With IRB approval, the records of 260 women with germline BRCA mutations who underwent RRSO between 1/1/2000 and 12/31/2014 were reviewed. All women were asymptomatic at the time of surgery, had normal physical exams, CA 125 levels and transvaginal ultrasounds and were followed for at least 24 months post-op. Censoring occurred at uterine cancer diagnosis or at last follow up. Relative incidence of uterine cancer was compared with rates expected from the Surveillance, Epidemiology and End Results database.

RESULTS: The cohort included 148 BRCA1 mutation carriers, 98 BRCA2, 6 NOS and 5 BRCA1 AND 2 mutation carriers. The median follow-up time was 72 months. 57% of women had a concomitant hysterectomy at time of RRSO. One BRCA1 mutation carrier had occult stage IIB uterine cancer diagnosed at RRSO and was subsequently treated with chemotherapy and vaginal cuff brachytherapy and remains without evidence of disease. 2 women, ages 69 and 51 had a hysterectomy at 79 and 41 months respectively post RRSO. During 120 women years of follow up, 2 (1%) incident uterine cancers were diagnosed and both patients had BRCA1 mutations. The two patients diagnosed with endometrial cancer after RRSO presented with abnormal uterine bleeding. Neither patient had used hormone replacement therapy, tamoxifen or had a prior diagnosis of breast cancer. Both uterine cancers were of endometroid histology, one was a grade 2 and the other was a grade 3.

CONCLUSIONS: In this cohort of 260 patients post RRSO, uterine cancer is rare (1%). Both women who developed endometrial cancer post RRSO were symptomatic and had early stage disease, and none had serous histology. The recommendation for concomitant hysterectomy at the time of RRSO should be balanced against the additional surgical risk of a hysterectomy.

LEARNING OBJECTIVE: Identify the risk of uterine cancer in patients with BRCA mutations.
**OBJECTIVES:** To elucidate the differences between women who survive type 2 endometrial cancer for greater than 5 years compared to those surviving less than 2 years to aid in understanding clinical and pathologic risk factors for a poor prognosis at time of initial treatment.

**METHODS:** Patients with type 2 endometrial cancer surviving less than 2 years and greater than 5 years from diagnosis were selected from a database of women treated for endometrial cancer at our institution between 1/1/2004-8/15/2014. Long-term survivors were compared to short-term survivors in two groups, early stage (1 and 2) and advanced stage (3 and 4). Mann-Whitney and Fisher’s exact tests were used due to small sample size.

**RESULTS:** 85 women were included in our analysis. In the long-term survivor (LTS) group (n=53), 35 (66%) were early stage and 18 (34%) were advanced stage. In the short-term survivor (STS) group (n=32), 12 (38%) were early stage and 20 (62%) were advanced stage. Histologic subtypes included Carcinosarcoma (39%), Serous (38%), Mixed (16%), and Clear Cell (7%). In advanced stage patients there was a trend towards younger age increasing survival (mean age LTS 65.2, STS 69.1, p=0.06). African-American race was associated with decreased survival in advanced stage patients (28% of LTS, 75% of STS, p=0.003), but white race was associated with decreased survival among early stage patients (34% of LTS, 58% of STS, p=0.01). Greater than 50% depth of invasion was associated with decreased survival in both early (24% of LTS, 67% of STS, p=0.013) and advanced (33% of LTS, 80% of STS, p=0.008) stage patients. Lymphovascular space invasion (LVSI) was associated with decreased survival in advanced stage patients (40% of LTS, 90% of STS, p=0.003). Receiving radiation during initial treatment was associated with increased survival in both early (82% of LTS, 42% of STS, p=0.01) and advanced stage (67% of LTS, 30% of STS, p=0.02) patients. Differences in BMI, diabetes, hypertension, histology, tumor size, and chemotherapy during initial treatment were not associated with length of survival in our data set.

**CONCLUSIONS:** Outside of stage, other important factors including race, depth of invasion, LVSI, and receiving radiation can be used to predict survival in patients with type 2 endometrial cancers. More data is needed to create a comprehensive model to better predict poor prognosis. Fostering increased understanding of factors contributing to diminished survival may help guide initial adjuvant therapy choices in the future.

**LEARNING OBJECTIVE:** Identify patient, pathologic, and treatment factors that contribute to prognosis in patients with type 2 endometrial cancers.
POSTER #60: Brain metastases from Uterine Cancer: Features, Treatment and Outcomes of a Rare Phenomenon

E.C. McClung (1), M. Shahzad (2) University at South Florida, Tampa, Fl (1), Moffitt Cancer Center Department of Gynecologic Oncology, Tampa, Fl (2)

OBJECTIVES: Brain metastasis of uterine cancer (UC) is a rare phenomenon and data describing features and outcomes are very limited. We present our experience with the management of endometrial carcinoma and sarcoma with brain involvement at a single institution.

METHODS: Following IRB approval, institutional databases were searched to identify all patients with a diagnosis of endometrial cancer who received a neurosurgery consultation, CT head or MRI brain from January 1, 1980 to June 1, 2016. A total of 329 medical records were reviewed and 21 patients meeting criteria were identified.

RESULTS: Of the 21 patients with brain metastases, median age at diagnosis of UC was 58 (range 37-76). The majority (52%) presented with stage IV disease, 19% were stage III, and 19% were stage I. The primary UC histology was determined was endometrial carcinoma (EC) in 13/21(62%), with 8/13 (62%) endometrioid type, 2/13(15%) serous type, and the remainder mixed. Of the total 13 patients with EC, 2/13 (15%) were grade 1, 2/13 (15%) grade 2-3, and 8/13 (62%) were grade 3. One patient had no grade documented. Other histologies included leiomyosarcoma in 5/21 (24%), carcinosarcoma in 2/21 (10%), and primary uterine sarcoma in 1/21 (5%). For the total 21 patients, median time from UC diagnosis to brain metastasis was 29.2 months (range 0.7-146.3). Solitary metastases occurred in 9/21 (43%). Biopsies were obtained in 9/21 (42.8%) and all were consistent with UC primary. Treatment approaches included radiation alone in 10/21 (48%), surgical resection in 5/21 (24%) and combined surgery and radiation in 3/21 (14%). Median overall survival for 13 patients with known cause of death was 27.8 months (2.8-83.3), and mean survival from brain metastasis to documented date of death was 4.2 months (0.8-16.2).

CONCLUSIONS: While rare, brain metastases may result from both uterine carcinoma and sarcoma. Brain metastases can be seen after treatment of early stage disease although more commonly associated with advanced stage disease. Treatment modalities are dependent on location and number of intracranial metastasis, and there is a wide variation in survival depending on extent of extracranial disease.

LEARNING OBJECTIVE: Describe the pathology, typical management and outcomes of uterine cancer with brain metastasis at a single institution.
POSTER #61: Optimizing Second Line Chemotherapy in Germline BRCA Positive Patients with Platinum Sensitive Recurrent Ovarian Cancer

M. Rowland (1), A.H. Freeman (2), S. Vesely (1), M. Frey (3), A.Y. Liu (4), A.K. Crim (1), J. Lester (4), E. Zantow (1), S.V. Blank (3), B. Powell (2), I. Cass (4) and K.N. Moore (1). The University of Oklahoma, Stephenson Cancer Center, Oklahoma City, OK (1), Kaiser Permanente San Francisco Medical Center, San Francisco, CA (2), New York University School of Medicine, New York, NY (3), Cedars-Sinai Medical Center, Los Angeles, CA (4)

OBJECTIVES: The absence of BRCA1/2 function leads to homologous-recombination repair deficiency and impaired ability to repair platinum-induced double-strand breaks by tumor cells. Given this deficiency, it has been hypothesized that patients with epithelial ovarian cancer (EOC) with BRCA 1/2 mutations may have better responses to DNA damaging agents such as pegylated-liposomal doxorubicin (D) or gemcitabine (G). This study evaluated the difference in progression free survival (PFS) among first recurrence platinum sensitive ovarian cancer (PSOC) patients with BRCA 1/2 mutations receiving treatment with a platinum agent with PLD or GEM (P/DG) compared with a platinum agent with paclitaxel (P/T).

METHODS: An IRB approved, multi-institutional retrospective chart review was performed. Patients with a diagnosis of EOC with a confirmed BRCA1/2 mutation were included. Demographic and clinical data were retrospectively collected from the electronic medical record. Descriptive statistics, univariate and multivariate analyses were performed in SAS v9.4.

RESULTS: 86 patients met inclusion criteria including: greater than 6 months since primary chemotherapy to recurrence and receiving P/DG or P/T for second line therapy. 38 (44%) received P/T. 66% had BRCA 1 mutations in the P/T group and 71% in the P/DG group (p=0.62). The groups were similar with regard to stage at diagnosis (p=0.11), race (p=0.21), histology (p=1.0) and grade (p=0.40). 97% of the patients had serous tumors with 94% being high grade. Median PFS was 746 (95% CI:490,1145) days in the P/T group and 487 (CI: 415, 687) days in the P/DG group (p=0.21). There was no significant difference in the Kaplan-Meier survival curves between treatment groups (see Figure 1, p=0.22).

CONCLUSIONS: Among BRCA mutation carriers undergoing first treatment of PSOC, no significant difference in PFS with the use of P/DG compared with P/T was found. There is a trend toward improvement with P/T which may not have been significant given the small sample size. Although limited in sample size and retrospective nature, this data suggests that there may be an overall sensitivity to chemotherapy in BRCA mutation carriers rather than a specific sensitivity to DNA damaging cytotoxic agents. The CALYPSO trial showed an improvement in survival for patients receiving P/T who had platinum free intervals of > 24 months. Perhaps the BRCA mutation population is most similar in characteristics to those with prolonged platinum free intervals.

LEARNING OBJECTIVE: Describe differences in response to various platinum doublets in second line therapy among BRCA germiline mutation + patient.

*Figure for Poster #61 on next page*
Figure 1: Progression Free Interval for Doublet Therapy with Paclitaxel or Other Doublet Therapy

Product-Limit Survival Estimates

+ Censored
Logrank p=0.2231

Survival Probability

PFSR1

chemo2  Platinum/taxol  plat/gem or plat/dox
OBJECTIVES: A Body Shape Index (ABSI) is a validated body measure shown to predict poor health outcomes. ABSI also strongly correlates with lower lymph node yield, increased blood loss, and wound complications in endometrial cancer patients. This study aims to evaluate whether ABSI values are associated with recurrence and survival of endometrial adenocarcinoma.

METHODS: From 5/2010 through 12/2011, the gynecologic oncology practice at our institution collected waist circumference, height, and weight for all patients undergoing robotically assisted surgery for endometrial adenocarcinoma. All patients received identical surgical technique and follow-up care. Study endpoints consisted of disease-free and overall survival measured over a minimum of 5 years. ABSI was calculated for each patient and categorized into low, middle and high values by dividing them into equal thirds. The data was limited to endometrioid histology to limit confounding and analyzed with log rank analysis to compare the recurrence and death rates between the three ABSI groups.

RESULTS: A total of 77 patients underwent a robotically assisted endometrial staging surgery during the study period. ABSI scores ranging from 0.0630 to 0.0908. During the follow-up interval there were 7 recurrences, 3 disease-specific deaths and 4 deaths of unrelated cause. A statistically significant difference between the recurrence rate of the low ABSI values compared to each of the upper groups was found (p<0.05). The low-ABSI (N=22) group had 5 recurrences, while the mid-ABSI (N=24) and high-ABSI (N=31) had 0 and 2 respectively. The low-ABSI values had 3 disease-specific deaths and 3 deaths from other causes, while the mid-ABSI group had no deaths, and the high-ABSI group third had 1 death unrelated to disease (p<0.05). Histologic grade was evenly distributed among the ABSI groups. Neither BMI nor waist circumference showed any association with the recurrence or survival rates in this patient cohort.

CONCLUSIONS: A correlation between lowest ABSI values and reduced disease free survival and overall survival was observed. This study suggests potential threshold levels that infer greater risk in endometrial cancer patients. Visceral adiposity as measured by ABSI again outperforms BMI in predictive ability. A more comprehensive evaluation of the predictive utility of ABSI is warranted.

LEARNING OBJECTIVE: What is the ABSI body index calculator? Correlation between body type using ABSI as a predictor and endometrial cancer recurrence and survival.
POSTER #63: When Advanced Ovarian Cancer is not Ovarian Cancer: Characteristics and Predictors of non-Ovarian Pathology in a Systematic, Laparoscopic-Based System

N. Fleming, R Coleman, S. Westin, A. Sood  The University of Texas MD Anderson Cancer Center, Houston, TX

OBJECTIVES: Tissue diagnosis of advanced ovarian cancer (OC) is not universally obtained prior to up-front surgery; this study sought to investigate non-OC cases discovered in the systemic laparoscopic workup of presumed advanced OC.

METHODS: A prospective cohort of presumed advanced OC patients (based on elevated CA-125 and/or imaging) presenting to our center without confirmed pathologic diagnosis. Patients were characterized by baseline demographic and clinical characteristics. Those with non-OC pathology confirmed in workup were compared to those with confirmed ovarian pathology using standard 2-sided statistical tests with alpha=0.05.

RESULTS: A total of 365 patients presented between 5/30/12 and 11/16/16. The cohort was mostly Caucasian (85.2%), elderly (median age 62), with a median Charlson Comorbidity Score 3 and ECOG performance score 1, with an elevated CA125 >35 (36%). A minority were of Hispanic ethnicity (10%), obese (36%), or had a prior malignancy (18%). A majority had ascites present on imaging (62%) though only 39% had a pleural effusion. Non-OC was found in 27 cases (7.4%), with histologies including benign ovarian pathology (48%), and malignant histologies including uterine (11%), breast (7%) and gastrointestinal (19%) cancers. Diagnostic laparoscopy or assessment at time of up-front surgery was the most common method used for diagnosis (77%). Non-OC cases were less likely to be confirmed by fine-needle aspiration or core biopsy (3.7%, p=0.01), were more common in Asian patients (p<0.001), had better ECOG scores (p=0.002), and had a lower CA-125 (p<0.001). Only 1 non-OC patient (uterine sarcoma on final surgical pathology) received neo-adjuvant chemotherapy prior to confirmed tissue diagnosis.

CONCLUSIONS: A systematic laparoscopic approach to advanced stage OC minimizes incorrect or inappropriate chemotherapy administration. Asian patients and those with low CA125 values are at highest risk of a false diagnosis of OC, but did not routinely have a diagnostic opportunity prior to systematic laparoscopy.

LEARNING OBJECTIVE: Define the population of women with advanced ovarian cancer. Outline the MD Anderson algorithm for management of unconfirmed advanced ovarian cancer. Identify characteristics of women presenting with advanced ovarian cancer who do not have advanced ovarian cancer.
OBJECTIVES: To delineate awareness and knowledge of HPV vaccinations among medically underserved women who attend health fairs and identify barriers to vaccine administration.

METHODS: Women attending community based health events were recruited to complete a questionnaire focusing on patient demographics, awareness of the HPV vaccine, knowledge of vaccination administration, and barriers preventing compliance with administration. A descriptive analysis was performed.

RESULTS: 115 women at three health events were approached at random to complete the questionnaire. 41 women were within the age range to have been offered the HPV vaccine. The majority of the patient population was made up of Hispanics (75.25%) and African Americans (12.86%). Of the women eligible to receive HPV vaccines, 73.17% had previously heard of the vaccine however only 14.63% had received at least one dose of the vaccine. When asked questions regarding vaccination knowledge, 26.82% did not know the vaccination gender recommendations, 34.14% did not know the recommended age group, and 53.65% did not know the number of vaccines needed to complete the series. Women surveyed identified top barriers to vaccination administration. Top barriers to vaccination administration were identified as: never being offered the vaccine (36.58%), lack of knowledge (17.07%), lack of available resources (9.75%) and concern for side effects (4.87%).

CONCLUSIONS: Hispanic and African American women have the highest incidence of cervical cancer. Increasing HPV vaccination rates will help reduce the burden of HPV-related cancers in the United States. Results from this study highlight the importance and need for effective patient and healthcare provider education in order to eliminate top barriers to HPV vaccination administration. Conducting a survey of the providers taking care of this population is recommended to see how we can improve education and communication.

LEARNING OBJECTIVE: To identify barriers preventing HPV vaccination administration. To highlight the importance of physician-patient communication.
POSTER #65: Prevalence of Sexual Health and Intimacy Concerns in Female Patients Referred to a Comprehensive Cancer Center.

S. Watson, E. Girda, A. Usher, V. Kennedy  University of California Davis, Sacramento, CA

OBJECTIVES: To assess the prevalence of sexual health and intimacy (SHI) concerns in patients referred to a Comprehensive Cancer Center and to describe associated demographic and disease characteristics.

METHODS: This is a retrospective cross-sectional study using electronic medical records for all women older than 18 who marked “Sexual Health and Intimacy Concerns” on a Supportive Care Screening survey administered at a Comprehensive Cancer Center between April 1st 2015 and March 31st 2016. Chart review abstracted all health, practical, and emotional concerns indicated on the survey, as well as patient age, smoking status, BMI, race, insurance, and cancer type, stage and date of diagnosis. Charts were then reviewed for evidence of provider discussion of SHI using key word searches and note review. The Fisher’s exact test was used to test for associations between provider discussion of SHI concerns and patient characteristics.

RESULTS: A total of 60 (5%) of the 1,113 women surveyed with and without cancer indicated that they had a SHI concern. Of these, 26% were evaluated for a gynecologic cancer, 21% for breast cancer, and 53% for another malignancy (e.g. soft tissue, pulmonary, endocrine). Of the 39 with a cancer diagnosis reporting SHI, 28% had not received any cancer treatment, while the remaining 72% had received some prior cancer treatment. The number of women with and without metastatic disease who noted a SHI concern was the same. Of women with a SHI concern, 22% had a provider document providing counseling, treatment or referral. Women seen by a Gynecologic Oncologist were statistically more likely to have their SHI concerns addressed, with provider documentation present in 75% of those encounters, compared to 0-30% in women seen by other cancer specialists (P=0.0005).

CONCLUSIONS: Women referred to a Comprehensive Cancer Center may present with SHI concerns. The prevalence in this single institution one-year study was 5%. Approximately half of women with SHI concerns were evaluated for breast or gynecologic cancer. Women evaluated by a Gynecology Oncologist had their concerns addressed more often than others. Results of the current study suggest that SHI concerns are not adequately addressed in women with cancer. Further investigation is needed to delineate the incidence of SHI concerns prior to treatment, understand the effect of treatment on SHI, and guide support and treatment.

LEARNING OBJECTIVE: Identify the prevalence of sexual health and intimacy concerns among women referred to a tertiary Cancer Center. Describe the patient population self-reporting sexual health and intimacy concerns in terms of demographic and disease characteristics. Demonstrate how often providers address sexual health and intimacy concerns.
POSTER #66: Complete Salpingectomy or Bilateral Tubal ligation: Change in Sterilization Practice in The United States

S. Simmons, A. Alabaster, M. Martin, C. Garcia, S. McBride-Allen, R. D. Littell, C. B. Powell   Kaiser Permanente San Francisco

OBJECTIVES: To evaluate the trend in uptake of salpingectomy for peripartum and interval sterilization procedures and assess physician attitudes towards the practice.

METHODS: A retrospective cohort study using the electronic medical record to identify women over the age of 18 years, undergoing surgical sterilization from June 2011 to May 2016 in a large integrated health care system. The primary outcome was the rate of adoption of salpingectomy over time for sterilization during cesarean deliveries, postpartum, and interval procedures. All Ob/Gyn physicians in the health system were sent an electronic survey assessing attitudes towards salpingectomy for sterilization.

RESULTS: A total of 10,741 peripartum or interval tubal sterilization procedures were identified. Overall there was an increase in performance of salpingectomies from 0.4% to 35.5% of sterilization procedures over the five year period (P < .0001). Salpingectomy instead of tubal ligation increased in the interval (non-partum) setting, from 1% to 78% (P < .0001); at cesarean delivery, from 0.1% to 9.2% (p <.0001); and in the postpartum setting, from 0% to 4.5% (P < .006) of sterilizations. Median operative time was increased with salpingectomy compared to tubal ligation across all settings: 3 minutes at interval sterilization [P<.001], 9.5 minutes at the time of cesarean section [P <.001], and 17 minutes for postpartum [P < .003]. Median blood loss at cesarean delivery and interval sterilization was similar for salpingectomy and tubal ligation but was 50 ml more for salpingectomy postpartum (P< .04). Of 249 Ob/Gyn physicians surveyed, 50% report offering salpingectomy at the time of cesarean section and 68% offer salpingectomy at the time of interval sterilization. Major perceived barriers to performing salpingectomy in the peripartum period included concern for increase in complications (39%) and lack of appropriate equipment (12%).

CONCLUSIONS: There was a significant increase in performance of salpingectomy for sterilization over the period 6/2011-5/2016. By study end, salpingectomy had replaced tubal ligation in 78% of interval sterilizations but performance lagged behind for peripartum procedures with salpingectomy accounting for fewer than 10% of tubal sterilizations. Real and perceived barriers in the peripartum setting should be examined to improve adoption of salpingectomy.

LEARNING OBJECTIVE: Demonstrate uptake of salpingectomy for sterilization from 2011-2016 in a large integrated health system in Northern California. Identify physician barriers to and experience with performing salpingectomy in the interval setting and peripartum period. Illustrate feasibility of salpingectomy in the peripartum period.

*Figure for Poster #66 on next page
Figure 1. Salpingectomy rates for sterilization from June 2011-May 2016 at the time of cesarean delivery, post vaginal delivery, or in the interval period.
OBJECTIVES: Although cervical cancer is a leading cause of death in women worldwide, it is ranked as the fourteenth most common malignancy in women in the United States. Advances in screening have led to a drastic decrease in cervical cancer incidence. One of the factors influencing the utilization of cervical cancer screening in the United States is marital status, and unmarried or single women are less likely to undergo screening. This study aimed to examine trends of single women with malignancy of the uterine cervix.

METHODS: A retrospective observational study was conducted to examine The Surveillance, Epidemiology, End Results Program. Institutional Review Board in our institution exempted this study. A total of twelve female malignancies were searched between 1973 and 2013 (n=3,294,208). Piecewise linear regression analyses were performed to examine temporal trends in the proportion of women with single marital status and each of the 12 malignancies.

RESULTS: During the study period, the proportion of single women significantly increased across all 12 examined female malignancies except melanoma. The number of single women with cervical cancer significantly increased, more than in any other malignancy (29.3%). Notably, there was a surge in the proportion of single women with cervical cancer starting in the early 1990s, exhibiting the largest annual percent change (APC) among all examined malignancies (1.8%, 95% confidence interval [CI] 1.6-2.0, P<0.001). Despite this increase, when single marital status was stratified by age, it was noted that the proportion of women aged <40 years with malignancy of the uterine cervix simultaneously began to decrease significantly (APC reduction 1.2%, 95%CI 1.0-1.4, P<0.001). In contrast, the proportion of single women aged ≥40 years with malignancy of the uterine cervix increased significantly starting in the early 1990s (APC 2.7%, 95%CI 2.3-3.2, P<0.001) but not in the younger counterpart (P=0.94).

CONCLUSIONS: The proportion of single women with malignancy of the uterine cervix has disproportionately increased in the past four decades. This drastic increase is particularly eminent in single women aged ≥40 years, and improving screening and prevention strategies in this population may help reduce the incidence of malignancy of the uterine cervix.

LEARNING OBJECTIVE: Communicate the complex data analysis used in a succinct and effective manner. Identify additional socioeconomic and physiologic factors that may contribute to increased mortality of single women with cervical cancer, regardless of stage. Familiarize myself with various presenting styles and the medical conference environment.
POSTER #68: Therapeutic Ultrasound as a Novel, Non-hormonal Treatment of Vulvo-vaginal Atrophy: a Pilot Phase II Study.

S MacLaughlan (1), H Rockweiler (2), R Krone (2), S Middleton (1), D Blayney (1) Stanford University School of Medicine, Stanford, CA (1), Madorra, Inc., Portland, OR

OBJECTIVES: Vulvo-vaginal atrophy is a bothersome quality of life issue for cancer survivors, many of whom cannot or will not use estrogen replacement. Delivery of therapeutic ultrasound applied to the vaginal introitus is safe and was shown to increase vaginal temperature and blood flow in a phase I study conducted at our center. The purpose of this study is to determine the efficacy of therapeutic ultrasound for the treatment of vulvo-vaginal atrophy.

METHODS: Postmenopausal women and breast cancer survivors with vulvo-vaginal atrophy were enrolled. A gynecologic oncologist supervised participants in application of a gel-pad equipped ultrasound head (Intelect TranSport, Chattanooga Group) to the vaginal introitus at an enrollment visit, and instructed women on self-application at home. Daily, 8 minute home treatment applications at 1 MHz, 50% duty cycle for 12 weeks were planned. Vaginal Maturation Index (VMI) and Vaginal Health Index (VHI) were recorded at study visits, and patients reported vaginal dryness and personal lubrication weekly on a Likert-type scale. Ultrasound dose was titrated as needed for comfort. Descriptive statistics were used in an intent-to-treat analysis.

RESULTS: From December 2015 to January 2016, 20 women were enrolled (7 breast cancer survivors). Mean baseline VMI was 25.1 and VHI was 12.8. There were no significant changes in these outcomes over 12 weeks (VMI and VHI were 21.4 and 14.1 respectively). Thirteen women (65%) reported an improvement in vaginal dryness after 12 weeks, nine of whom reported lasting benefit four weeks after completing treatment. Similarly, 10 women (50%) reported an improvement in personal lubrication after 12 weeks, including 6 women who had lasting benefit four weeks later. Notably, 45% of patients reported interest in using the device if/when available.

CONCLUSIONS: Self-application of therapeutic US to the vaginal introitus is safe and feasible, and the majority of users report an improvement in patient-reported outcomes. Phase III studies with a more convenient, customized device are planned.

LEARNING OBJECTIVE: Learners will be able to discuss the potential role for therapeutic ultrasound for treating vulvo-vaginal atrophy.
POSTER #69: L1 Cell Adhesion Molecule is a Potential Biomarker for Recurrence and Aggressive Endometrial Cancer Subtypes

I. Moisini, T. Pulver, J. Richter, R. Hellwegg, M. Klein, B. Winterhoff

OBJECTIVES: L1 cell adhesion molecule (L1CAM) is an axonal glycoprotein that has been implicated in development of malignant melanoma as well as tumors of gastrointestinal, genitourinary, and neural origin. The purpose of this study was to evaluate L1 cell adhesion molecule (L1CAM) as a biomarker for aggressive endometrial cancer subtypes.

METHODS: Formalin-fixed, paraffin-embedded slides from primary endometrial carcinoma tumors were stained with a monoclonal antibody specific for L1CAM. A numeric “H score” was assigned to each case based on the percentage and intensity of staining for each case. Each case was reviewed independently by three pathologists. Clinical data including recurrence and survival data were also collected for each case.

RESULTS: A total of 208 cases from two institutions were subjected to immunohistochemistry (IHC) for L1CAM. One subset of cases consisted of 73 cases with recurrence. The mean H score for the 48 recurrent cases with distant metastasis was 37.3 versus 13.8 for 25 cases with local recurrence only. In a second cohort of 126 consecutive cases of stage I endometrial cancers, 9 recurred. The mean H score for the recurrent cases was 38.9 versus 15.9 for the 117 non-recurrent cases.

CONCLUSIONS: Higher expression of L1CAM by IHC was associated with a higher likelihood for recurrence as well as a propensity for distant spread.

LEARNING OBJECTIVE: Learners will be able to recognize L1CAM as a potential biomarker for aggressive endometrial cancer subtypes.
POSTER #70: Surgical Staging for Mucinous Borderline Ovarian Tumors

T. Chen (1), Mara Rendi (1), Kathi Adamson (2), Chirag Shah (2), Renata Urban (1) University of Washington Medical Center, Seattle, WA (1), Swedish Medical Center, Seattle, WA (2)

OBJECTIVES: To investigate the prevalence of positive pathology in women undergoing surgical staging for mucinous borderline ovarian tumors and low-grade mucinous adenocarcinomas.

METHODS: This was a retrospective chart review of patients with mucinous borderline ovarian tumors or low-grade mucinous adenocarcinomas at two institutions between January 1990 and August 2016. Pathology databases were used to identify patients. Operative and pathology reports were reviewed to assess clinical and pathologic findings.

RESULTS: One hundred eleven patients were identified with a pathologic diagnosis of mucinous borderline ovarian tumor (113 patients) or low-grade mucinous adenocarcinoma (8 patients). Seventy-nine percent of patients were surgically staged while 21% underwent oophorectomy or cystectomy alone. Hysterectomy was performed in 67% of patients. Pelvic lymphadenectomy was performed in 51%, appendectomy in 69%, omentectomy in 65%, and peritoneal biopsies in 36%. No metastatic disease was found in the uterus, lymph nodes or appendix on final pathology. One patient had metastatic disease in the omentum and paracolic gutter; however, this patient’s disease was grossly positive at the time of surgery. From 2000-2010, 82% of women had surgical staging; from 2010-2016, 76% of women had surgical staging.

CONCLUSIONS: In our cohort of mucinous borderline ovarian tumors, the prevalence of metastatic disease was very low and surgical staging did not diagnose any occult disease. One patient was diagnosed with stage IIIIC disease but had positive gross findings at the time of surgery. Thus, in mucinous borderline tumors of the ovary, routine surgical staging may not be necessary.

LEARNING OBJECTIVE: Demonstrate the utility of complete surgical staging in patients with mucinous borderline ovarian tumors.
POSTER #71: Comprehensive Genomic Profiling of Rare Female and Lower Genital Tract Malignancies

Victoria Perkins MD (1), Julia Elvin MD (2), Kathleen Moore MD (1), Camille Gunderson MD (1)
1. Stephenson Oklahoma Cancer Center at the University of Oklahoma, Oklahoma City, OK
2. Foundation Medicine, Inc., Cambridge, MA

OBJECTIVES: Female lower genital tract malignancies (LGT) are often HPV-mediated and respond fairly well to primary treatment. However, conventional therapies have poor efficacy with recurrent disease. Other rare gynecologic cancers (ORGC) often have an aggressive course and are difficult to study given the paucity of patients and trials. This represents a prime opportunity for the application of targeted therapies, which is aided by comprehensive genomic profiling (CGP).

METHODS: DNA was extracted from 148 FFPE clinical specimens. Hybridization captured libraries of 405 genes, plus select introns frequently rearranged in cancer, which were sequenced to high (median 780x) uniform coverage. All classes of genomic alterations (base subs, small indels, rearrangements, and copy number alterations) were evaluated and reported. Clinically relevant genomic alterations (GA) were defined as alterations associated with on-label targeted therapies and targeted therapies in mechanism-driven clinical trials. Clinical annotation was achieved via IRB-approved retrospective review and statistical analysis done with SAS v9.4.

RESULTS: Of the 148 specimens profiled, 26 (17.5%) were LGT including cervix (12.8%), vulva (4.1%), and vaginal (0.7%) cancers; 24 were ORGC (16.2%). 100% of patients had at least one alteration. The most frequently altered genes with LGT were PIK3CA (35%), TP53 (23%), TERC (19%), and CDKN2A (19%). This contrasts to ORGC, which had TP53 (33%), FOXL2 (25%), RB1 (21%), CDKN2A (17%), and ATRX (17%) as the most frequently altered genes. Similar to the TCGA cervix data, PTEN (8% vs 11.5%) and ARID1A (7% vs 3.8%) had frequent GA with refractory LGT malignancies. Analysis of 6 long-term LGT survivors (≥30 months; range 30-81+) with incurable (stage IVB or recurrent) cervix cancer revealed frequent GA in PIK3A, PIK3R1, TERC, PRKCI, and SOX2 but variable tumor mutational burden (ranged 2.7-18).

CONCLUSIONS: Outcomes are poor with recurrent LGT and most ORGC following front line cytotoxic therapy. CGP-matched targeted therapies in LGT are under study (PI3Ki and I/O agents) and may offer prolonged benefit and inform development of future therapies. CGP for ORGC may identify therapeutic targets and appropriate candidates for basket trials.

LEARNING OBJECTIVE: Learners will be able to identify frequent genomic alterations in female lower genital tract malignancies and potential targetable pathways.
The Western Association of Gynecologic Oncologists (WAGO) awarded three attendance scholarships in honor of former WAGO member and valued gynecologic oncology professional, Dr. D. Scott McMeekin. The scholarships were awarded to:

**ANNA BEAVIS, MD, MPH**  
John Hopkins Hospital  
Baltimore, Maryland  

**KATHRYN MILLS, MD**  
Washington University  
St. Louis, Missouri  

**VICTORIA PERKINS, MD**  
University of Oklahoma Health Sciences Center  
Oklahoma City, Oklahoma
EXHIBITORS

Table-top exhibits will be on display during all breakfasts and scheduled breaks on Thursday, Friday, and Saturday in Salon 1 & 2, as well as the Welcome Reception on Wednesday evening.

AMBRY GENETICS          BOOTH # 11
ASTRAZENECA              BOOTH # 7
BARD DAVOL                BOOTH # 14
CARIS LIFE SCIENCES      BOOTH # 2
CLOVIS ONCOLOGY          BOOTH # 5
COOPERSURGICAL          BOOTH # 6
FOUNDATION MEDICINE, INC. BOOTH # 9
GENENTECH                BOOTH # 3
HOLOGIC, INC             BOOTH # 16
INTUITIVE SURGICAL, INC. BOOTH # 15
INVITAE                  BOOTH # 8
JANSSEN PRODUCTS, LP     BOOTH # 12
MYRIAD GENETIC LABORATORIES, INC. BOOTH # 13
PACIRA PHARMACEUTICALS, INC. BOOTH # 1
TESARO, INC              BOOTH # 4
TOSHIBA AMERICA MEDICAL SYSTEMS BOOTH # 10
SAVE THE DATE

WAGO 2018 Annual Meeting
June 13-16, 2018

Canyons Grand Summit Resort
Park City, Utah
ACKNOWLEDGEMENTS

WAGO EXTENDS APPRECIATION TO THE FOLLOWING COMPANY FOR ITS SUPPORT OF THE:

LUNCH & LEARN – MOLECULAR TUMOR BOARD: WHY AND HOW TO IMPLEMENT

FOUNDATION MEDICINE

CLOVIS ONCOLOGY
WAGO extends appreciation to the following company for its support of the President’s Reception and Wifi
WAGO EXTENDS APPRECIATION TO THE FOLLOWING COMPANY FOR ITS SUPPORT OF THE WELCOME RECEPTION

CLOVIS ONCOLOGY
WAGO extends appreciation to the following company for its support of the Networking Reception.