Conclusions: The immune microenvironment is actively changing during tumor involution. Most immune gene expression changes occur late in chemotherapy and correlate with a dampening of the immune response. Early in chemotherapy immune genes are upregulated, specifically B-cell associated genes suggesting an important role of humoral immunity in the tumor MIV. Signals of robust immune activation, as reflected by increased quantitative tumor-specific antibodies (α-MUC1) and tertiary lymphoid structures, may be MIV markers of longer survival.

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Poster #46

Quantitative computed tomography image feature analysis predicts response to immune checkpoint inhibitors in gynecologic cancers

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Objectives: To investigate the role of applying quantitative image (QI) feature analysis computed from computed tomography (CT) images for early prediction of tumor response to immune checkpoint inhibitors (ICPI) amongst patients with recurrent gynecologic cancer.

Methods: We conducted a retrospective review of 56 patients with gynecologic cancer at a single institution who received an ICPI for management of recurrent disease. Each patient had CT images prior to and after the initiation of therapy. A computer-aided detection scheme was applied to segment metastatic tumors previously tracked by radiologists on CT images and image features were computed. A QI feature pool was built and a features selection method was applied to select optimal features; an equal-weighted fusion method was used to generate a new quantitative imaging marker for each pool to predict 6-month progression-free survival (6PFS). The prediction accuracy between quantitative imaging markers and the response evaluation criteria in solid tumors version 1.1 (RECIST) criteria and immune RECIST criteria (iRECIST) were also compared. Complete response (CR), partial response (PR), stable disease (SD) and progressive disease (PD) were assessed by RECIST criteria.

Results: Of the 56 patients identified, 29 patients (51.8%) had ovarian cancer, 16 patients (28.6%) had cervical cancer, and 11 patients (19.6%) had uterine cancer. Thirty-eight patients (67.9%) received a programmed death 1 (PD-1) inhibitor, 11 patients (19.6%) received a programmed death-ligand 1 (PD-L1) inhibitor, 5 patients (8.9%) received a combination of PD-1 inhibitor and cytotoxic lymphocyte antigen-4 (CTLA-4) inhibitor, and 1 patient (1.8%) received anti-cell immunoglobulin and ITIM domain protein (TIGIT) and 1 patient (1.8%) received a GITR-agonist resulting in 1 CR, 9 PR, 9 SD, and 20 PD.

The area under the receiver operating characteristic curve (AUC) is 0.95 when using QI feature analysis to predict 6PFS and 0.81 when using RECIST criteria. The QI feature analysis resulted in a prediction accuracy level of 92.3% versus 61.5% when using RECIST criteria versus 70.9% when using iRECIST criteria.

Conclusions: Quantitative CT image feature analysis accurately predicts response to ICPI in patients with recurrent gynecologic cancer. This technology is a promising tool to predict the clinical benefit of ICPIs early in the course of treatment of gynecologic cancers.

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Poster #47

A cost-effectiveness analysis of universal genetic testing for common hereditary cancer mutations in women compared with family-history based testing

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Objectives: Identifying patients who would benefit from hereditary cancer genetic testing by family history alone can miss a significant portion of both BRCA and Lynch mutation carriers. The purpose of this study is to determine whether population-based testing with a common hereditary cancer panel in all women regardless of family history is a cost-effective cancer prevention strategy.

Methods: A Markov decision-analytic model was constructed to estimate life expectancy with universal testing versus family history-based testing. The model was run from age 20 to 85. Testing was performed at age 35. The option of risk reducing surgery was factored in for ovarian, breast, and uterine cancer. The model considered estimates of cancer development and death based on current screening guidelines for known and unknown BRCA and Lynch mutation carriers as well as non-compliance with recommendations for genetic testing and risk reducing surgery. In addition, known rates of tubal ligation, hysterectomy and bilateral salpingo-oophorectomy for non-malignant conditions were taken into account in both groups. The model calculated the development of and mortality from breast, ovarian, colon, and uterine cancer.

Results: The improvement in overall life expectancy with universal genetic screening compared with testing based on family history is 710 life-years per 100,000 persons screened, assuming a pathogenic BRCA mutation rate of 0.67% and Lynch syndrome related mutation rate of 0.23%. Universal genetic screening would save 52.8 deaths from cancer per 100,000 women screened (8.6 breast, 3.7 colon, 25.6 ovary, and 14.8 uterine). Testing would reduce the overall number of deaths from ovarian cancer by 3%. Based on the real-world cost of the common hereditary cancer panel of $250 per screen, the calculated benefit would be $35,162 per life year saved by universal genetic testing. When considering QOL (quality-of-life) utility adjustments for cancer, the undiscounted benefit of universal testing was $20,725 per QALY (quality-adjusted life year).

Conclusions: Universal genetic testing appears to be an effective cancer prevention strategy. At current costs, universal genetic testing appears to be within the range of acceptable cost effectiveness under real world conditions. The benefit of screening is mainly due to the prevention of deaths from gynecologic cancers.

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Poster #48

Use of bowel preparation does not reduce post-operative infectious morbidity following minimally invasive or open hysterectomies

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Objectives: Bowel preparation (BP) is a controversial element within enhanced recovery protocols, and literature investigating its efficacy in gynecologic surgery is scarce. Our aim was to determine if mechanical bowel preparation (MBP) alone, oral antibiotics (OA) alone or a combination are associated with decreased rates of surgical site infections (SSI) or anastomotic leaks (AL) compared to no bowel preparation following benign or malignant hysterectomy.

Methods: We identified women who underwent hysterectomy between 01/2006-07/2017 using OptumLabs, a large US commercial

health plan database. Inverse propensity weighing was used separately for benign and malignant groups to balance baseline characteristics. Primary outcomes of 30-day SSI, AL and major morbidity were assessed using multivariate logistic regressions that adjusted for race, census region, household income, diabetes and other unbalanced variables following propensity weighting.

Results: A total of 224,687 hysterectomies (benign 186,299; malignant 38,388) were identified. Median age was 45 years for the benign and 54 years for the malignant cohort. Type of surgery was as follows: benign - laparoscopic/robotic 27.2%, laparotomy 32.7%, vaginal 40.2%; malignant - laparoscopic/robotic 28.8%, laparotomy 47.6%, vaginal 23.6%. Bowel resection was performed in 0.4% of the benign and 2.8% of the malignant cohort. Type of bowel preparation was as follows: benign - none 93.8%, MBP only 4.6%, OA only 1.1%, MBP+OA 0.5%; malignant: none 87.2%, MBP only 9.6%, OA only 1.8%, MBP+OA 1.4%. Use of BP did not result in decreased SSI, ALs or major morbidity following benign or malignant hysterectomy (**Table 1A.**). Among malignant abdominal hysterectomies, there was no difference in the rates of infectious morbidity between MBP alone, OA alone, or MBP with OA compared to no BP (**Table 1B.**).

Conclusions: BP does not protect against SSI or major morbidity following benign or malignant hysterectomy, regardless of surgical approach, and may be safely omitted.

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Poster #49

The gender authorship gap in Gynecologic Oncology research

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Objectives: Women now outnumber men in obstetrics and gynecology, which has the highest proportion of female faculty members (58%) among all specialties. From 1970-2004, female first authorship and senior authorship in *Obstetrics and Gynecology* increased from 6.7% to 40.7% and 6.8% to 28.0%, respectively. However, gender-specific publishing data are lacking within gynecologic oncology, which has smaller proportions of female faculty members. We examined contribution by gender to the subspecialty's flagship journal over time to identify gaps in gender representation.

Methods: We identified original articles from *Gynecologic Oncology* for the years 1972-73, 1980, 1990, 2000, and 2014. We determined sex for the first and last authors of each article. We used chi-square tests to compare gender distributions within and between the first and last years studied (1972-73 and 2014) as well as linear regression to model trends over time. All analyses were performed using R.

Results: We reviewed 1201 publications. In 1972-73, women comprised 11% of first authors (3/27, $\chi^2=16.3$, $p<0.01$) and 0% of senior authors (0/20). In 2014, 58% (232/398, $\chi^2=10.9$, $p<0.01$) of first authors and 37% (144/389, $\chi^2=26.2$, $p<0.01$) of senior authors were female. Female first and senior authorship increased significantly from 1972 to 2014 (first: $\chi^2=20.9$, $p<0.01$; senior: $\chi^2=9.9$, $p<0.01$). The number of female first authors increased markedly after 2000, while male first authors declined (Fig 1). Female senior authors were more likely to have female first authors than male senior authors (54.2% vs. 28.7% across all years); furthermore, the proportion of female senior authors with female first authors (as opposed to males) has increased over time ($T=10.5$, $p<0.01$).

Conclusions: The publication gender gap in gynecologic oncology's journal has reversed among first authors and narrowed among senior authors. A substantial divide remains between men and women at the senior author level. Other fields have reported a similar pattern of increases in both first and senior authorship over time, with the latter lagging behind the former. We observed that papers with female senior authors were more likely to have female first authors, possibly illustrating the effects of mentoring by women in senior roles. Subspecialty-wide gender equity initiatives should encourage continued mentorship of women by female colleagues.

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