taxane. Patient demographics of the 2 groups were similar. Median number of NACT cycles was similar between the cohorts (2.9 DDP vs 4.1 taxane). Five DDP patients (19%) were unable to complete chemotherapy and were switched to standard taxane. Toxicity, predominantly hematologic and gastrointestinal (GI), was greater in the DDP group. However, there were no episodes of febrile neutropenia in either group, and the percentage of patients requiring blood transfusion was similar—26% DDP vs 15% taxane ($P = .24$). GI symptoms were manageable. After IDS, 11 patients (41%) in the DDP group had no residual disease compared with 11 patients (23%) in the taxane group ($P = .12$). Three patients (11%) in the DDP group had a pathologic complete response compared with 1 (2%) in the taxane group ($P = .13$).

Conclusions: Although associated with an increase in toxicity, DDP appears in this preliminary study to facilitate higher rates of no residual disease and pathologic complete response than taxane at the time of IDS. These results warrant further investigation of DDP for patients with advanced EOC undergoing NACT and assessment of its impact on long-term outcomes.

Table 1
Demographics and Outcomes.

Characteristic	Dose Dense (N=27) Number (%)	Standard (N=48) Number (%)
Median age (range)	65 (46-81)	71 (52-92)
Histology		
Papillary serous	24 (89)	41 (85)
Mixed	2 (7)	4 (8)
Unknown	1 (4)	3 (6)
Stage		
IIIB	0	1 (2)
IIIC	19 (70)	37 (77)
IV	8 (30)	10 (21)
Neoadjuvant regimen		
Taxol/Carboplatin	22 (81)	17 (35)
Taxol/Carboplatin + Avastin	5 (19)	1 (2)
Taxotere/Carboplatin	0	23 (48)
Carboplatin	0	7 (15)
Cycles received (dose dense)	3.48 (2.89)	4.13
Grade 3/4 Toxicity		
None	3 (11)	28 (58)
Anemia	11 (41)	13 (27)
Requiring transfusion	*7 (26)*	*7 (15)*
Neutropenia	18 (67)	5 (10)
Thrombocytopenia	4 (15)	3 (6)
Neurological	0	3 (6)
Gastrointestinal	7 (26)	8 (17)
Metabolic	1 (4)	7 (15)
Thrombosis	2 (7)	2 (4)
Infection	0	2 (4)
Other	0	1 (2)
Response after neoadjuvant therapy		
Complete pathologic response	3 (11)	1 (2)
Partial	22 (81)	37 (77)
Progressive	1 (4)	6 (13)
Unknown	1 (4)	4 (8)
Debulking status		
No-residual disease	11 (41)	11 (23)
Optimal	10 (37)	21 (44)
Suboptimal	4 (15)	7 (15)
Not debulked	2 (7)	9 (19)

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331 – Poster

Low intraperitoneal port placement rate in ovarian cancer patients: A population-based national assessment

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Objectives: We sought to determine the rate of intraperitoneal (IP) port placement in ovarian cancer patients in a population-based database maintained by the American College of Surgeons. Placement of IP ports can be used as an estimate of IP chemotherapy utilization.

Methods: We identified ovarian cancer patients and whether they received an IP port using ICD-9 and CPT codes in the National Surgical Quality Improvement Program database (NSQIP) from 2006 to 2012. Demographics, comorbidities, operative outcomes, and postoperative complications were abstracted. The *T* test, X^2 test, and univariable and multivariable regression models were used.

Results: A total of 2,733 ovarian cancer patients with no prior chemotherapy in the NSQIP were included. Only 144 patients (5.2%) had an IP port placed. Patients with higher body mass index were less likely to have an IP port placed ($P = .018$). Readmission rate was higher in the IP port group (13 vs 6.8%, $P = .012$). There was a trend toward a higher rate of postoperative abscess in the IP port group, though not statistically significant (4.7 vs 2.2%, $P = .101$). Assuming 60% of ovarian cancer patients present with stage II and III disease and the average national optimal debulking rate is 50%, 832 patients would have been candidates for IP chemotherapy in this cohort making the port placement rate 17% (144/832).

Conclusions: The National Comprehensive Cancer Network guidelines and National Cancer Institute recommend IP chemotherapy in optimally debulked stage II and III patients. Our results confirm a low rate of IP port placement and therefore IP chemotherapy for ovarian cancer in the United States. Further investigation is necessary to understand reasons for failure to adopt IP-based chemotherapy.

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332 – Poster

Improved clinical sensitivity detection of circulating tumor cell assays using a dual selection strategy in women with epithelial ovarian cancer

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Objectives: Little is known about the role of circulating tumor cells (CTCs) in epithelial ovarian cancer (EOC). Methods available for selecting and enumerating CTCs traditionally analyze cells based on expression of epithelial cell adhesion molecule (EpCAM) only. Fibroblast activation protein α (FAPα), a marker of activated stromal fibroblasts in tumors, is highly expressed in EOC. The goal of this study was to evaluate the sensitivity of adding FAPα as a selection marker for the isolation of CTCs in EOC, and to compare FAPα and EpCAM expressing CTCs in various subgroups of women with EOC.

Methods: To isolate CTCs, we used 2 microfluidic chips in series, one with antibodies specific to cells bearing FAPα ($CTC^{FAP\alpha}$), the other to EpCAM (CTC^{EpCAM}). For analysis, EOC patients were divided into 3 groups: patients with advanced-stage (III/IV) disease undergoing interval debulking after neoadjuvant platinum-based chemotherapy (A-EOC-chemo), patients with advanced-stage disease undergoing primary debulking without prior chemotherapy (A-EOC-no chemo), and patients with early-stage (stage I) disease. Blood specimens from 11 normal donors were also analyzed.

Results: Sixteen patients with EOC were enrolled in this study, 8 A-EOC-no chemo, 5 A-EOC-chemo, and 3 stage I (Fig. 1). Median CTC^{EpCAM} and $CTC^{FAP\alpha}$ count was 121 and 31 for stage I, 214 and 58 for A-EOC-no chemo, 48 and 28 for A-EOC-chemo, and 0.1 and 0.3 for normal donors, respectively. EpCAM and FAPα antigens were not

co-expressed in single CTCs. Using our dual selection strategy, the sensitivity of CTC detection was 100% for all cohorts, including stage I patients. A 3-fold decrease in median CTC^{EpCAM} count was observed for A-EOC-chemo patients compared with A-EOC-no-chemo patients ($P < .007$), but no differences were seen in median $CTC^{FAP\alpha}$ counts between these 2 groups.

Conclusions: We found that FAPα is not co-expressed with EpCAM in CTCs, resulting in high clinical yields of CTCs and dramatically improving clinical sensitivity. In addition, CTC^{FAP} is more resistant to conventional chemotherapy with paclitaxel/carboplatin than CTC^{EpCAM}. Thus, CTC^{FAP} may be a potential biomarker of chemoresistance in EOC, offering opportunities for unique clinical indications for CTCs that were not available using only CTC^{EpCAM} as a biomarker.

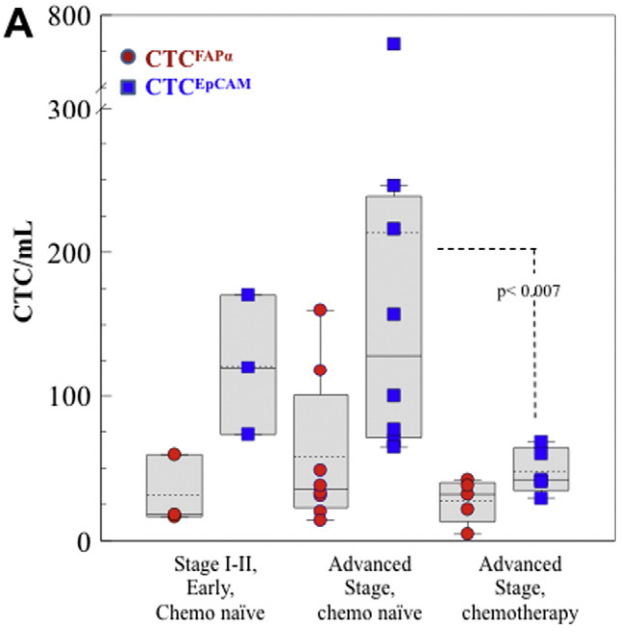

Fig. 1. Box Plot Data for CTCFAPα and CTCEpCAM Isolated from Blood of EOC Patients: Early Stage, Chemo Naïve, Advanced Stage, Chemo Naïve (A-EOC-no-chemo) and Advanced Stage, Following Chemotherapy Treatment (A-EOC-chemo). The solid lines in the box plots represent the median and the dotted line is the mean for the data shown.

Table 1
Average and median $CTC^{FAP\alpha}$ and CTC^{EpCAM} collected from EOC patients and normal donors.

Ovarian Cancer Stage and Treatment	$CTC^{FAP\alpha}$/mL avg (median)	CTC^{EpCAM}/mL avg (median)
Normal Donors (n=11)	0.3 (0.0)	0.1 (0.0)
Stage I (early), chemo naïve (n=3)	31.3 (18.0)	121.3 (120.0)
Advanced Stage, chemo naïve (n=8)	57.8 (35.5)	213.7 (128.5)
Advanced Stage, chemotherapy (n=5)	27.6 (32.0)	47.9 (42.0)

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333 – Poster

Who is referred to the gynecologic oncology clinic with an adnexal mass?

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Objectives: There are many strategies for determining which patients with an adnexal mass warrant referral to a gynecologic oncologist. The purpose of this study is to characterize the evaluation of patients with adnexal masses before referral to the gynecologic oncology clinic.

Methods: Review of the clinic schedule identified all patients referred to an academic gynecologic oncology outpatient clinic. Chart review identified demographic information, menopausal status, body mass index (BMI), imaging and laboratory results, presence of comorbid conditions, and pathology results after biopsy or surgical excision.

Results: Of 788 women referred to the gynecologic oncology clinic in 2013, 281 (36%) were evaluated for an adnexal mass. Tumor markers were drawn before referral in 171 women (60%), with CA-125 measured in 167 (59%), CEA in 46 (16%), HE4 in 3 (1%), and the multivariate index assay (MIA) in 3 (1%). Society of Gynecologic Oncology (SGO)/American College of Obstetricians and Gynecologists (ACOG) referral criteria were met by 127 women (45%). Surgical excision was undertaken in 194 patients (69%), revealing cancer in 52 women (19%) and borderline tumors in 16 (6%). Postmenopausal women were more likely to meet referral criteria than premenopausal women (58% vs 27%, $P < .0001$). Women with severe obesity (BMI >35) were significantly less likely to meet referral criteria (32% vs 49%, $P = .01$). There were no significant differences in whether women met SGO referral criteria with diabetes, heart disease, private insurance, an indication for anticoagulation, or nonwhite race. Patients meeting referral criteria were more likely to have cancer (38% vs 3%, $P < .0001$), but not borderline tumors (6% vs 6%, $P = 1$).

Conclusions: The incidence of malignancy among patients referred to the gynecologic oncology clinic was 19% in this series. This incidence of malignancy is similar to that seen in a group of women scheduled for surgery by generalist gynecologists in a recent multicenter, prospective study. The incidence is significantly lower than that seen in published reports from other gynecologic oncology divisions as recently as 5 years ago. Most patients referred did not meet SGO/ACOG referral criteria and severely obese patients were less likely to meet criteria. Utilization of the HE4 and MIA tests was rare. These data may reflect a shift in practice patterns toward a "refer all" strategy for management of adnexal masses.

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334 – Poster

Pediatric and adolescent pelvic masses: What is the role of the gynecologic oncologist?

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Objectives: Referral guidelines of the American College of Obstetricians and Gynecologists are available for premenopausal women with pelvic masses but are nonspecific for young women, adolescents, and children. A multidisciplinary team may be involved in the care of these young women, but the role of the gynecologic oncologist (Gyn/Onc) remains vague. The goal of this study was to compare clinical presentation and surgical outcome of women younger than 21 years with a pelvic mass, at a single institution with access to all pediatric and gynecologic subspecialty services, and determine utilization of the Gyn/Onc.

Methods: We reviewed the medical records of all women younger than 21 years undergoing primary surgery for a pelvic mass at a