

development of bowel ischemia. Primary outcomes were survival to discharge, 30-day and 1-year survival in patients with LVAD who subsequently develop bowel ischemia. Secondary outcomes included characteristics of patients who survive to discharge after bowel ischemia and those who do not. These included markers of patient condition prior to surgical/endoscopic intervention such as lactate levels, ICU admission, ventilator dependence, vasopressor and renal replacement requirements, as well as presence of sepsis. Of these, we predicted that lactate levels and white blood cell count would be significantly elevated pre- and post-operatively in patients who do not recover from bowel ischemic event. We used Mann-Whitney U Test to examine lactate levels between the two groups as our sample size was <30 and therefore necessitated the use of non-parametric testing. METHODS/STUDY POPULATION: In this single-center retrospective study, we analyzed all patients who underwent durable, CF-LVAD implantation at Duke University Medical Center (DUMC) between January 2008 and November 2018. Patients were screened using CPT codes for abdominal surgical exploration or ICD codes for intestinal vascular insufficiency. Final cohort was selected with confirmed diagnosis of intestinal ischemia based on surgical exploration or endoscopic intervention. Patient characteristics including pre-LVAD comorbidities, indication for LVAD implant, and clinical picture prior to bowel ischemic event were collected. Specific characteristics related to bowel ischemia were summarized, including diagnostic imaging, time from imaging study to operative intervention, and intraoperative details. Patient outcomes including survival to discharge, 30-day-, and 1-year survival were summarized. Patients were stratified based on survival to discharge status. Continuous variables were reported as median and interquartile range and compared using Mann-Whitney U test. Categorical variables were reported as proportions and compared using Fisher's exact test as appropriate. RESULTS/ANTICIPATED RESULTS: A total of 754 patients underwent durable, CF-LVAD implant at DUMC, of which 21 subsequently developed intestinal ischemia (incidence 2.8%). The majority were male (81%) and treated as destination therapy (76.2%). Ten patients (50%) survived to discharge (one remains hospitalized). The proportions of patients receiving HeartMate II (60% vs. 50%, $p=1.0$), HeartMate III (20% vs. 10%, $p=1.0$), and HeartWare (20% vs. 40%, $p=0.6$) were not significantly different between patients who survived to discharge and patients who did not. Median time from LVAD implant to diagnosis of bowel ischemia did not vary significantly between the patient groups (11.5 days, IQR 34.75 vs. 16.5 days, IQR 173.8; $p=0.40$), nor did the median time from diagnosis to surgical intervention (264.5 minutes, IQR 497.8 vs. 323 minutes, IQR 440, $p=0.82$). In the 48 hours leading to diagnosis and intervention, renal replacement therapy (50% vs. 0%, $p=0.033$) was more prevalent in patients who did not survive to discharge. Differences in pre- and post-operative lactate levels were not significantly different in patient groups. A similar pattern of diagnostic study preference emerged from both groups, with CT being the most common (76.2%) followed by KUB (42.9%). Upper endoscopy/colonoscopy was performed in 7 patients (33.3%), of which 5 also had operative exploration. A total of 19 patients underwent abdominal exploration (90.5%). Nine had large bowel resection (42.9%) while 14 had small bowel resection (66.7% with average 75cm removed). Overall survival at 1-year was 33%. For those making it to discharge ($n=10$), one year survival was 60%. DISCUSSION/SIGNIFICANCE OF IMPACT: This is the first institutional study to our knowledge to describe intestinal ischemia in patients receiving CF-LVAD therapy. Intestinal ischemia in patients receiving CF-LVAD therapy is associated with high mortality and morbidity. Diagnosis of bowel ischemia should be considered in patients

presenting with clinical symptoms of bowel ischemia in addition to requirement of renal replacement therapy. Imaging modalities used were dependent on the clinical situation and were not always necessary prior to intervention. Further investigation is warranted to identify predictors of this morbid complication.

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Breast Cancer Surgical Management: Novel Surgical Trends, Appropriate Axillary intervention, and associated Complications

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OBJECTIVES/SPECIFIC AIMS: Treatment of breast cancer surgery can be classified into two overall groups: Breast-Conserving Therapy (BCT) (including partial mastectomy (PM) and oncoplastic surgery (OS)) and MAST (including mastectomy (M) and M with breast reconstruction (M+R)). Breast reconstruction (OS or M+R) offers patients an improved quality of life by aesthetically symmetric breast, higher patient satisfaction and reduced re-excision rates. Furthermore, subgroups of M+R, mastectomy with implant placement (M+I) has doubled to 21%, meanwhile mastectomy with muscular flap reconstruction (M+MF) has declined to only 2% of overall breast cancer intervention. Furthermore, in patients with ductal carcinoma in situ (DCIS), published national guidelines recommend that sentinel lymph node biopsy (SLNB) should be offered when treated with M and should not be offered when treated with BCS. Overall complication rates for breast cancer surgery vary depending on short-term or long term outcome but are approximately 2-40%. Mortality and overall morbidity are overall low in less than 5% of cases. Known wound or infectious complications have been associated with smoking, radiation, obesity and diabetes. Nevertheless, other patient comorbidities and surgical predictors influencing acute postoperative complications are contentious. Single institutional studies or reviews compared single or two groups of breast cancer interventions for post-operative complication rates. Few studies with large enough patient cohort to analyze all possible variables influencing post-operative acute complications following all breast cancer surgeries. Understanding surgical complications is crucial to patient safety and improving health outcomes. Therefore, this study examines the 30-day postoperative complication rates in breast cancer patients who underwent a PM, M, M+R, or OS. Using the NSQIP database, we aim to elucidate these surgical trends and complications trends, while expanding our understanding of predictive surgical factors. We also examined appropriate axillary management associated with surgical interventions between 2005 and 2016. METHODS/STUDY POPULATION: A retrospective cohort analysis was conducted using the ACS-NSQIP database from 2005 to 2017. All participant user files (PUF) were obtained and approved by ACS NSQIP. The Tufts Medical Center Institutional Review Board deemed this study exempt from institutional review, given ACS NSQIP database is a de-identified data set. Inclusion criteria for this study were women with classified post-operative diagnosis of invasive breast cancer (IBC) or ductal carcinoma in-situ (DCIS) breast cancer who underwent either any BCT or any MAST procedure. Post-operative diagnosis was classified according International Classification of Diseases Ninth/Tenth Revision (ICD-9/10) code for IBC or DCIS. Surgical (M, PM, OS, M+R) and axillary lymph node categorization were done using CPT codes known for each intervention. Exclusion criteria included males, benign breast surgery, surgery for benign

breast disease, lobular carcinoma, patients undergoing breast cancer surgery with 2 CPT codes with ambiguous category placement and septic patients at time of surgery. For each intervention, a total of 16 complications were clustered into 8 groups and examined over the 13-year period. ALN management was categorized as follows: no intervention on ALNs, or ALN surgery (SLNB or ALN dissection (ALND)). Chi-square tests were performed for demographic and complication rate analysis. Smoothed linear regression and non-parametric Mann- Kendall test assessed complication trends. Uni-variate and multivariate logistical regression were computed to associate odd's ratio for comorbidities, surgical predictors and patients demographics. RESULTS/ANTICIPATED RESULTS: A total of 226,899 patients met the inclusion criteria. Annual breast surgery trends changed as follows: PM 45.6% to 45.9 (p=0.21), M 36.8% to 25.5% (p=0.001), M+R 15.7% to 23.6% (p=0.03) and OS 1.8% to 5.0% (p=0.001). Analyzing the patient cohort who underwent breast conservation, categorical analysis showed a decreased use of PM alone (96% to 90%) with an increased use of OS (4% to 10%). For the patient cohort undergoing mastectomy, M alone decreased (69% to 52%); M+R with muscular flap decreased (9% to 2%); and M+R with implant placement increased (20% to 41%) – all 3 trends p<0.0001. The rate of ALN management has changed as follows: SNLB or ALND significantly increased in mastectomy patients from 53.6% to 69.5% (SS 1.5%, R2 0.69, p < 0.01), while it changed little in the BCS population: 22.5% to 26.4% (SS 0.4%, R2 0.18, p=0.09). Complication rates have steadily increased in all mastectomy groups (p< 0.05) but not in BCT. Cumulative complication rates between surgical categories were significantly different in each complication cluster (all p<0.0001). Overall complication rates were: PM: 2.25%, OS: 3.2%, M: 6.56%, M+MF: 13.04% and M+I: 5.68%. The most common predictive risk factors were mastectomy interventions, increasing operative time, ASA class and BMI, smoking, recent weight loss, history of CHF, COPD and bleeding disorders (all p<0.001). Patients who were non-diabetic, younger (<60) and treated as outpatient all had protective OR for an acute complication (p<0.0001). DISCUSSION/SIGNIFICANCE OF IMPACT: The modern era of breast surgery is identified by the increasing use of reconstruction for patients undergoing breast conservation (in the form of OS) and mastectomy (in the form of M+R). Despite national recommendations for the management of axillary lymph nodes in patients undergoing breast surgery for DCIS, nearly 30% of cases continue to be mismanaged: more than 30% of patients with DCIS undergoing mastectomy fail to receive SLNB, and more than 26% of DCIS patients undergoing BCS are still receiving axillary lymph node surgery. Our study provides data showing significant trends that will impact the future of both breast cancer surgery and breast training programs. We also provide data comparing nationwide acute complication rates following different breast cancer surgeries that can be used to inform patients during surgical decision making.

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Do cancer survivors understand their risk factors for recurrence and the value of coordinated care between an oncologist and a primary care physician? A survey of endometrial and cervical cancer patients

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OBJECTIVES/SPECIFIC AIMS: To evaluate gaps in knowledge for women who are cancer survivors regarding the impact of

comorbidities and lifestyle behaviors on endometrial and cervical cancer risk, and to assess prevalence of established care with a primary care physician (PCP) among patients and evaluate acceptability of referral to a PCP METHODS/STUDY POPULATION: Single institution cross-sectional study examining all women aged 18 or older with a diagnosis of cervical or endometrial cancer who present for care by a gynecologic oncologist at Barnes-Jewish Hospital/Washington University in St. Louis School of Medicine. Patients will be invited to complete a survey specific to cancer diagnosis that includes questions on participant background and socio-demographic information, knowledge of risk factors for their specific cancer site, and whether or not the patient has a primary care provider and the acceptability of referring RESULTS/ANTICIPATED RESULTS: Majority of women will be unaware of how comorbidities affect cancer risk and treatment outcomes. For women without a PCP, we anticipate that they will be accepting towards the notion of being referred to one for establishing care. DISCUSSION/SIGNIFICANCE OF IMPACT: Pilot information from this study will 1. Allow providers to improve cancer survivorship care plans by increasing collaboration between PCPs and oncologists to provide ongoing care, and 2. Afford information for providers on where gaps in knowledge exist so as to better education patients.

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Examining the association between inpatient opioid prescribing and patient satisfaction.

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OBJECTIVES/SPECIFIC AIMS: Research overview: Providing patient-centered care is increasingly a top priority in the U.S. health-care system.1,2 Hospitals are required to publicly report patient-centered assessments, including results from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) patient satisfaction surveys.3 Furthermore, clinician and hospital reimbursements are partially determined by performance on patient satisfaction measures.3 Consequently, hospitals and clinicians may be incentivized to improve patient satisfaction scores over other important outcomes.4 Paradoxically then, the pursuit of patient-centered care may lead clinicians to fulfill patient requests for unnecessary and potentially harmful treatments.5 Opioid prescribing during hospitalizations may be particularly affected by clinicians' seeking to optimize patient satisfaction scores.6,7 Satisfaction with pain care is an important predictor of overall patient satisfaction in the HCAHPS surveys,8,9 and clinicians report increased pressure to fulfill patient requests for immediate pain-relief.10,11 Therefore, clinicians may prescribe opioids to avoid receiving lower patient satisfaction scores.12,13 Furthermore, clinicians lack clear guidance on opioid prescribing for some populations, including non-surgical inpatients, who represent almost half of all hospitalizations.14 To reduce clinicians' incentive to prescribe opioids as a means of achieving patient satisfaction, the Center for Medicare and Medicaid Services (CMS) temporarily removed questions related to patient satisfaction with pain care from the clinician and hospital reimbursement formulas beginning in 2018.15 Importantly, prior research16-20 has not rigorously tested the hypothesis implied by the CMS policy change: that certain opioid prescribing practices in inpatient pain care are associated with higher patient satisfaction. Objectives: The purpose of this study was to evaluate the association between the receipt/dose of opioids during non-surgical hospitalizations and