P01. Obesity Paradox in patients with necrotizing soft tissue infections: A Validation Study

Ricardo Fonseca; Jose A Aldana; Rohit Rasane; Christina X Zhang; Javier Rincon; Qiao Zhang; Adrian Coleoglou Centeno; Kelly Marie Bochicchio; Obeid Ilahi; Grant Bochicchio;

Background: The “Obesity Paradox” is well-studied and documented in chronic diseases. Recent studies have reported an association between obesity and reduced in-hospital mortality in patients with soft tissue infections. The purpose of this study was to validate those findings.

Hypothesis: We hypothesize that obesity is associated with a protective benefit in necrotizing soft infections (NSTI).

Methods: Patients with NSTI were identified from a prospectively maintained Acute and Critical Care Surgery (ACCS) database from 2008-2018. We then categorized patients according to their Body Mass Index (BMI) into non-obese [BMI <30], obese [BMI >=30] and morbidly-obese [BMI >=40]. Demographics, Charlson Score (CS) and outcomes were compared using Pearson's chi-squared test ($\chi 2$), Fisher's Exact Test and Student’s t-test. Linear regression analysis was used to determine an association between obesity and outcomes [Surgical Intensive Care Unit (SICU) admission, Length of Stay (LOS) and ventilator days].

Results: A total of 335 patients were diagnosed with NSTI (non-obese = 149, obese = 100, morbid-obese = 86). There was no difference in demographics or CS among any groups. Obesity did not impact mortality, even when comparing non-obese against morbidly-obese (odds ratio [OR] = 1.140; 95% confidence interval [CI] = 0.41 to 3.20; P=0.94). SICU LOS was greater with increasing BMI (3.6 ± 5.7 vs 4.8 ± 7.1 vs 6.0 ± 7.7 days) when comparing non-obese, obese and morbidly-obese patients respectively. Morbidly-obese patients had a significantly longer SICU LOS than non-obese patients (P=0.012).

Conclusions: Obesity did not provide any protective benefits to NSTI patients. In contrast to recent reports in support of the obesity paradox, we found that morbidly-obese patients had a worse outcome. Further research is needed to validate our findings.

P02. Methicillin Resistance Does Not Impact Disease Severity in S. aureus Necrotizing Soft Tissues Infection

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Background: Staphylococcus aureus is one of the most common pathogens identified in necrotizing soft tissue infection (NSTI) with the incidence increasing over the last few decades. The objective of this study was to evaluate if there were differences in presentation or increased disease severity associated with Methicillin Resistant S. aureus (MRSA) compared to Methicillin Sensitive S. aureus (MSSA) NSTI.

Hypothesis:

Methods: Retrospective review of all adult patients (age > 18) with NSTI at our county funded, academic medical center over a seven-year period (2008-2015). Patients with positive wound

cultures for MSSA or MRSA were compared.

Results: Of the 228 patients with an NSTI, 81 patients (35.5%) had S. aureus in their wound cultures; 54 (23.7%) had MSSA and 27 (11.8%) MRSA. Forty-six (20.1%) of the NSTIs were monomicrobial S. aureus, with MSSA identified as a single agent in 25 (10.9%) and MRSA in 21 (9.2%). Patients with MSSA were more likely to have polymicrobial infections (53.7% vs 22.2%, p=0.007), diabetes mellitus (74.1% vs 50.0%, p=0.03), higher admission glucose levels (335 versus 171 mg/dL, p=0.04), and higher white blood counts (WBC) (18.5 versus 13.6 K/mm3, p=0.02). In a sub-analysis of monomicrobial MSSA versus MRSA NSTI, the only trend to remain was a higher WBC in MSSA group (18.8 vs. 13.5 K/mm3, p=0.03). Patients with monomicrobial MRSA infections were more likely to have an NSTI in the pelvic/perineum region (38.1% vs 8.0%, p=0.03). No other differences in admitting vitals, laboratory values, physical exam findings, or outcomes (see table) were identified between monomicrobial isolates.

Conclusions: Staphylococcus aureus is involved in a large percentage of NSTI and was the single causative agent in 20% of NSTI in this series. MSSA and MRSA are clinically indistinguishable, though MSSA was found more frequently in polymicrobial infections. Methicillin resistance does not portend increased disease severity in NSTI due to S. aureus.

P03. The impact of culture site on length of stay among burn patients

Sarah Rehou; Shahriar Shahrokhi; Marc Jeschke

Background: Thermal destruction of the protective skin barrier coupled with the immune response leads to the ideal environment for bacterial growth. Pseudomonas aeruginosa is a gram-negative organism that can grow a mature biofilm in about 10 hours. It is an opportunistic human pathogen and one of the most prevalent causes of sepsis and pneumonia in burn patients.

Hypothesis: We hypothesized that patients with P. aeruginosa in systemic sites blood and/or sputum would have worse outcomes compared to patients with P. aeruginosa in localized sites.

Methods: We included all adult (≥ 18 years) patients with an acute burn admitted to our burn centre between 2010 and 2016. Only patients with positive microbiology cultures of P. aeruginosa from wound swabs, biopsies, catheter tips, blood, and sputum sources were included. Clinical outcomes included morbidity, mortality, and hospital length of stay. We compared patients that had P. aeruginosa in localized sites like swabs, biopsies, and/or catheter tips to those that had P. aeruginosa in systemic sites like blood and/or sputum.

Results: We studied 100 patients, mean age 51 ± 20 years and 33 ± 18% total body surface area (TBSA) burn, with 59 patients in the localized group and 41 in the systemic group. Demographics and injury characteristics were not significantly different among the localized and systemic group: mean age was 52 ± 19 versus 50 ± 22 (p=0.646) and 34 ± 20% versus 31 ± 15% TBSA burn (p=0.345), with the exception of the proportion of inhalation injury 22 (37%) versus 25 (61%) (p=0.025), respectively. The days to first P. aeruginosa culture post-injury was also not significant 16 ± 9 versus 16 ± 11 days (p=0.860). Length of hospital stay was significantly longer in the localized group, median 63 days (IQR 36-95 days) compared to the systemic group at median 41 (29-61 days) (p=0.007). Additionally, LOS/TBSA was also significantly longer in the localized group: 2.1 days per percent TBSA burn (IQR 1.5-2.9) versus 1.5 days per percent TBSA burn (IQR 1.1-2.5 days) (p=0.019).

Conclusions: Patients with P. aeruginosa cultured from localized sites like swabs, biopsies, and/or catheter tips had significantly prolonged hospitalization compared with those that had P. aeruginosa

in systemic sites of blood and/or sputum. This may be due to loss of skin grafts or impaired wound healing.

P04. Hypoalbuminemia is Not a Predictor of Mortality in Patients with Necrotizing Soft Tissue Infections

Manuel Castillo-Angeles; Sean Hickey; Mehreen Kisat; Deepika Nehra; Stephanie Nitzschke; Ali Salim; Reza Askari

Background: Necrotizing soft-tissue infections (NSTIs) are surgical emergencies associated with high morbidity and mortality. Risk factors associated with poor outcomes need to be identified as they play an important role in counseling patients. Emergency patients with hypoalbuminemia are known to have increased mortality. However, no previous studies have assessed the predictive value of low albumin on mortality in patients with NSTIs. We aimed at assessing the predictive power of hypoalbuminemia on in-hospital mortality in a cohort of NSTI patients.

Hypothesis: We hypothesize that low albumin levels will be associated with an increased risk of mortality in patients with NSTI.

Methods: This is a retrospective cohort study of NSTI patients admitted from 1995 to 2014 to two urban, tertiary-care, academic hospitals. Operative and pathology reports were reviewed to confirm all cases. Patients were divided into two groups according to their admission plasma albumin levels (<2.7 g/dL=low, >=2.7g/dL=normal). Primary outcome was in-hospital mortality. Multivariate logistic regression was performed to assess the association between albumin levels and in-hospital mortality. For sensitivity analysis, plasma albumin was used as a continuous variable in the model.

Results: There were 420 patients with available albumin levels, 57.6% males and a median age of 57 years (IQR 46.6–67). 105 (25%) were immunocompromised. Overall in-hospital mortality was 16.9%. There was no significant difference in gender, body mass index (BMI), and comorbidities. Patients with hypoalbuminemia were older ($p<0.05$). In-hospital mortality rate was similar between patients with low or normal albumin (18.8 vs. 15.0%, $p=0.297$). After multivariate analysis, albumin levels were not independently associated with increased in-hospital mortality when used as a categorical (Odds ratio [OR], 1.1; 95% Confidence Interval [CI], 0.53-2.13, $p=0.84$, AUROC 0.83) or continuous variable (OR 0.73, CI 0.44 – 1.21, $p=0.23$, AUROC 0.83).

Conclusions: Hypoalbuminemia is not associated with increased risk of in-hospital mortality in patients with Necrotizing soft-tissue infections. Other measures of nutritional status as well as inflammatory markers should be studied to identify NSTI patients with higher likelihood of poor outcomes.

P05. Prevalence and Predictors of Opioid Prescription at Discharge after Necrotizing Soft Tissue Infections (NSTIs)

Manuel Castillo-Angeles; Mehreen Kisat; Sean Hickey; Deepika Nehra; Stephanie Nitzschke; Ali Salim; Adil Haider; Reza Askari.

Background: The prevalence of moderate-to-severe pain after hospital discharge in patients with Necrotizing Soft Tissue Infections (NSTIs) is high, and opioids are a predominant analgesic agent used to treat pain in this population. Recent data has shown that the rates of opioid prescription after Emergency General Surgery (EGS) are approximately 13%. There is paucity of data about

prescribing-patterns in the NSTI population. Our aim was to study the proportion and predictors of opioid prescription in patients with NSTI at discharge.

Hypothesis: We hypothesize that the proportion of opioids prescribed to patients with NSTI will be higher than that reported for EGS patients.

Methods: The 2007-2015 TRICARE insurance database was queried for opioid-naive patients 18-64 years, with a diagnosis of NSTI (identified through ICD-9 diagnosis codes). Prescription of opioid analgesics at discharge was the outcome of interest. Data collection included patient demographics and clinical characteristics. Logistic regression models were used to determine the predictors of opioid prescription at discharge.

Results: 1, 280 patients met our inclusion criteria where 327 (25.55%) received an opioid prescription at discharge. In unadjusted analysis, older patients, male gender, higher rank, being retired, and having a history of depression were less likely to be prescribed opioids at discharge. In multivariate analysis, pre-existing comorbidities (Charlson Comorbidity Index ≥ 1, OR: 2.63, CI: 1.53 – 4.53, p=<0.001) were associated with higher likelihood of opioid prescription. Older patients (>=35 years, OR: 0.47, CI: 0.26 – 0.86, p=0.014) were associated with decreased likelihood of opioid prescription. Race, gender, marital status, rank, beneficiary category, region, history of depression or anxiety and length of hospitalization (LOS) were not significant predictors of opioid prescription.

Conclusions: The rate of opioid prescription in NSTI patients was almost twice the reported rate for EGS procedures. There was a higher opioid use at discharge in patients with comorbidities. Further studies are needed to understand and optimize pain management strategies for this group of high-risk patients.

P06. A Randomized, Controlled Trial on the Efficacy of Perioperative Antibiotics in Grafting After Thermal Injury

Robert Ball; Lauren Nosanov; Melissa McLawhorn; Anna Day; Lauren Moffatt; Jeffrey Shupp

Background: After thermal injury, the limited use of antibiotics for clear signs of infection is well accepted among burn care providers. Use of perioperative antibiotics for grafting procedures in an uninfected wound, however, remains largely institution and surgeon specific. Although previous studies have proposed increased graft take with perioperative antibiotics, these conclusions rely on small patient populations. Unnecessary use of perioperative antibiotics can lead to patient specific complications and will contribute to the development of drug resistant organisms. The primary objective of this study is to quantify the effects of a single dose of perioperative antibiotics on the bacterial concentration of a graft site following thermal injury.

Hypothesis: Perioperative antibiotics do not significantly reduce bacterial concentration in a thermal wound bed after grafting procedure.

Methods: Patients expected to undergo a single grafting procedure after thermal injury less than 10% TBSA were approached for enrollment. Patients were randomized to receive weight-based cefazolin perioperatively or to receive no antibiotics. Patients with infected wounds were excluded from the study. Skin biopsies (3mm) and swabs for culture from the wound bed were obtained intraoperatively before and after excision of unviable tissue. Repeat biopsies and swabs of the site after grafting were taken at the first dressing takedown. A final culture swab was obtained at the postoperative follow-up visit.

Results: Eight patients have completed the study thus far, and enrollment is ongoing. Three patients were randomized to receive antibiotics. In the antibiotic group, 2/3 patients had no growth of bacterial in both swab and culture at the first dressing takedown, while one patient had an increase from no growth intraoperatively to 6.0x104 CFU/g in the biopsy. In the control group, 2/5 patients had no growth at the dressing takedown with three patients having an increase (average 1.2x109 CFU/g in biopsies). All eight patients had clinically insignificant concentrations of bacteria from wound swabs obtained at the follow-up visit with no appreciable difference in graft take.

Conclusions: Although a trend towards temporary reduction of bacterial concentration with antibiotics was noted, preliminary data does not support a clinically significant difference in bacterial load of burn wounds after grafting regardless of the use of perioperative antibiotics. Continued enrollment and analyses will support or refute this conclusion and allow for investigation of secondary outcomes, such as the effect of antibiotics on donor sites and the microbiome of the patient.

P07. Risk Factors Associated with Readmission following Surgical Management of Necrotizing Soft Tissue Infections

Hayoung Park; Ashkan Moazzez; Chris de Virgilio; Brant Putnam; Angela L. Neville M.D.; Dennis Kim

Background: Aggressive surgical debridement remains the mainstay of therapy for patients with necrotizing soft tissue infections (NSTIs). The complex pathophysiology of NSTIs, together with host and healthcare associated factors, place patients at an increased risk for postoperative complications, including readmission to hospital.

Hypothesis: The objective of this study was to identify potentially modifiable risk factors associated with readmission following surgical management of NSTIs.

Methods: Patients with a postoperative diagnosis of necrotizing fasciitis, gas gangrene or Fournier's gangrene were extracted from the NSQIP database from 2011-2016. Patients who underwent an elective, outpatient or non-emergent operation were excluded. Bivariate and multiple logistic regression analyses were performed to evaluate patient, clinical, and perioperative variables associated with readmission.

Results: There were 2,325 patients who underwent operative management of NSTI, of which 168 patients (7.2%) were readmitted to hospital. On bivariate analysis, there were no significant differences between groups regarding demographics, comorbidities, transfer status, premorbid functional status, or discharge disposition. Patients who were readmitted had a shorter overall length of stay (LOS, days) (17 ± 15 vs. 12 ± 6, $p<0.001$) and experienced a greater number of postoperative complications including superficial surgical site infection (sSSI) ($p=0.02$), pulmonary emboli (PE) ($p=0.003$), urinary tract infection ($p<0.001$), and postoperative sepsis ($p=0.008$). On mutivariate logistic regression analysis, sSSIs (OR 2.7; 95% CI 1.1-6.4, $p=0.03$), PE (OR 7.6; 95% CI 2.4-24.3, $p<0.001$), postoperative sepsis (OR 1.7; 95% CI 1.2-2.4, $p=0.006$), and LOS (OR 0.95, 0.94-0.97, $p<0.001$) were independently associated with an increased risk of readmission. Recurrent NSTI, infectious wound complications and PE were the most common diagnoses for readmission.

Conclusions: Venous thromboembolic events and postoperative infectious complications are associated with an increased risk of 30-day readmission following surgical management of NSTIs. Future studies should consider evaluating thromboembolism prophylaxis and antimicrobial stewardship practices among surgeons caring for patients with NSTIs in an effort to decrease hospital readmissions and improve outcomes.

P08. The susceptibility of sporadic nonpuerperal breast infections: a changing epidemiologic distribution!

Morgan Lane; Jason Sciarretta; John Davis

Background: Nonpuerperal breast abscesses (NPBA) traditionally isolate aerobic and facultative bacterial cultures however changing biograms have altered therapy. Our study investigates the variation in bacteriology of sporadic nonpuerperal breast infections, compares antibiotic susceptibility, and reviews patient risk factors.

Hypothesis: We hypothesize that the changing variability in cultured pathogens in nonpuerperal breast infections requires expanded antimicrobial coverage as patients are at risk for inadequate coverage with initiation of empiric antibiotics.

Methods: Our institutional National Surgical Quality Improvement Project (NSQIP) database was queried during a 4-year period (2015-2018), from which surgical patients completing an incision and drainage of the breast were identified. Data collected included age, gender, race, body mass index (BMI), number of risk factors, location of abscess (central versus peripheral), and culture isolates.

Results: Eleven patients were identified in the study. The median age was 31 ± 14 years (range, 23-69) and patients were predominately caucasian (72.7%). Identified risk factors included: smoking tobacco (45.5%), polysubstance abuse (27.3%), diabetes (27.3%) and obesity with a median body mass index (BMI) of 29.4 kg/m2 (range, 22 - 57 kg/m2). One patient had no reported medical history. Incision and drainage was most commonly right sided (63.6%), commonly supra-areolar (54.5%) while the remaining were sub-areolar/inframmmary (45.5%). None of the abscesses recurred on 30 day follow-up. Intraoperative cultures were predominately a single organism (54.5%), most commonly MRSA (66.7%). Mixed anaerobes were identified in four patients (36.4%), including Finegoldi and Prevatella sp. One patient developed Finegoldi magna bacteremia (9%). No deaths occurred in these subset of patients. Two patients failed outpatient oral antibiotic prior to inpatient surgical consultation. Initial antibiotic coverage did not account for adequate anaerobic coverage in four patients (27.3%).

Conclusions: A small subset of patients with nonpuerperal breast infections demonstrated anaerobic isolates and therefore broader empire antibiotic therapy should be strongly consider in this patient population.

P09. Adding Infectious Insult to Traumatic Injury in End-of-Life Discussions

Elizabeth Tindal; Charles Adams, Jr.; Eric Benoit; Michael Connolly; Daithi Heffernan; Andrew Stephen; Stephanie Lueckel

Background: Traumatic injuries place patients at increased risk of infection but it is not known how this affects goals-of-care decision making. We sought to determine if infectious complications impact the transition to comfort measures only (CMO).

Hypothesis: We hypothesized that development of an infection would decrease the time to withdrawal of care (WOC).

Methods: A retrospective review from a level one trauma center from April 2015 to June 2017. We included all adult patients (age ≥ 18) who were made CMO, had a length of stay over 1 day and did not have a pre-existing advance directive. Charts were reviewed for patient demographics, injury

patterns and hospital course including assessing for occurrences of any infections. Patients were divided into two groups – those who developed an infection and those who did not. Subgroup analysis was done comparing those patients who developed a single infection and those who developed multiple infections. The primary endpoint was time to death or discharge (TTD).

Results: Among the 232 patients who transitioned to CMO, 72 (31%) developed an infection prior to WOC. Pneumonia was the most common infection (24.2%), followed by urinary tract infections (UTI) (8.2%). Those in the infection group had a significantly longer TTD (19.3 vs 3.8 days, $p<0.01$) despite no significant difference in age (69.9 vs 69.7 years), gender (72.2% vs 65.6% male), injury severity score (ISS) (20.3 vs 22.5), rate of head injury (31.9% vs 24.4%) or rate of dementia (18.1% vs 10.0%). The infection group was further divided into those who developed multiple infections (N=34) versus those who had only a single infection (N=38) prior to WOC. Patients with multiple infections had a significantly longer TTD (26.7 vs 12.7 days, $p<0.01$) despite no significant difference in age (69 vs 70.6 years), ISS (22.5 vs 18.3), rate of head injury (32.4 vs 31.6%) or rate of dementia (8.8% vs 26.3%).

Conclusions: Our findings do not show that development of an infection will decrease the time to WOC. There is no doubt that a longer length of stay in the hospital increases the risk of developing an infection. However, we believe that the increased TTD in the setting of multiple infections and equivalent patient populations is a marker of a family's baseline resistance to WOC. Infectious complications play a complicated role in end-of-life discussions for trauma patients.

P10. Temporary Abdominal Closure is Associated with Increased Risk for Fungal Intraabdominal Infections in Trauma Patients

Christina X Zhang; Rohit Rasane; Qiao Zhang; Ricardo Fonseca; Jose A Aldana; Kelly Marie Bochicchio; Javier Rincon; Maya Sorini; Grant Bochicchio; Jennifer Leonard; Obeid Ilahi.

Background: Fungal infections are associated with increased morbidity and mortality. Few studies have examined risk factors associated with post-operative (post-op) fungal intraabdominal infections (FIAIs) in trauma patients after exploratory laparotomy (ex-lap).

Hypothesis: We hypothesize that trauma patients undergoing exploratory laparotomy are at an increased risk of developing post-op FIAIs.

Methods: This was a retrospective analysis of trauma patients admitted from 2005 to 2018 who underwent ex-lap and subsequently developed intraabdominal infection (IAI). Demographics, comorbidities, culture data, antimicrobial/fungal usage, ISS scores, and clinical outcomes were abstracted. All post-op IAIs were evaluated and stratified as either bacterial, fungal, combined, and with or without colonization. All groups were compared. Risk factors for the development of post-op IAI and clinical outcomes were analyzed by student's t-test and chi-square test.

Results: 1675 patients were identified as having undergone a trauma ex-lap in which 161 were suspicious for post-op IAI. A total of 105 patients (6.2%) were diagnosed with IAI. 40 (38%) of these patients were diagnosed with FIAIs. The most common fungal pathogens were unspeciated yeast (62.5%) followed by c. albicans (60%), c. glabrata (7.5%), c. dubliniensis (5%), and c. tropicalis (5%). There were no significant differences in demographics, comorbidities, and percentage of gastric perforations between FIAI and bacterial IAI (BIAI) groups. However, patients with FIAIs had a 75% temporary abdominal closure (TAC) rate compared to 51% in BIAIs ($p=0.01$). The FIAI group had higher ISS (27 vs. 22, $p=0.03$), longer hospital (34 vs 25, $p=0.02$) and ICU days (17 vs 9, $p=0.006$), and ventilator days (8 vs 4, $p=0.02$) when compared to BIAI. The FIAI group also had a 5 fold greater

mortality. Logistic regression identified TAC as an independent risk factor for the development of post-op FIAIs (OR 4.5, CI 1.1-17.4, p=0.01).

Conclusions: FIAI following ex-lap was associated with greater morbidity and mortality. TAC was independently associated with increased risk of FIAI after trauma ex-lap. Clinicians should have a high index of suspicion for fungal infections in patients who develop post-op IAI after using TAC techniques for trauma patients undergoing ex-lap.

P11. The effect of traumatic brain injuries on the development of pneumonia in the critically ill patient.

Patrick Knight; Robert Sawyer

Background: The potential effect of traumatic brain injury (TBI) on the microbiome of a critically ill patient is an area of study without clear results at this time. With this in mind, this study was designed to evaluate for any differences in TBI versus non-TBI trauma patients from an infectious standpoint with a focus on pneumonia.

Hypothesis: Our hypothesis is that the TBI group would demonstrate a unique pathogen set and greater in-hospital mortality.

Methods: Data collected prospectively on critically ill trauma patients requiring admission and treatment in an intensive care unit at a single institution from 1997 to 2017 were reviewed to identify those with ICU-acquired pneumonia based on CDC criteria. Patients were separated into two groups based on the presence of TBI defined as an acute intracranial abnormality identified on computed tomography (CT) found on admission after trauma. Continuous variables were compared using Student's t-test and categorical variables were compared using chi-square analysis.

Results: Among the 2723 trauma patients who developed ICU-acquired infections, 1224 developed pneumonia during their hospital course. Of these, 508 had CT evidence of an acute intracranial process, with the remaining 716 patients comprising the control group. Comparison of these groups revealed a mean APACHE II score of 17.1 ± 0.3 in the non-TBI group versus 19.6 ± 0.3 in the TBI group, $p < 0.0001$. Crude in-hospital mortality was similar between groups: 9.1% versus 9.1%, $p = 0.99$. By logistic regression analysis, in-hospital death following the diagnosis of pneumonia was associated with age and APACHE II score at the time of diagnosis, but not the presence of TBI (Odds Ratio = 0.83, 95% CI = 0.53-1.30, Hosmer-Lemeshow test $p = 0.48$, C statistic = 0.83). On review of the organisms isolated on culture, an increased incidence of Acinetobacter was seen in the TBI group (7.2% vs 3.2%, $p < 0.05$), while other pathogens were isolated at similar rates between the two groups.

Conclusions: The presence of TBI in critical care patients with pneumonia was not shown to have an effect on the overall outcome. Although there was an increased incidence in Acinetobacter in the TBI group, the mechanism and significance of this finding is unclear and TBI does not appear to be associated with a large change in the lung microbiome.

P12. Direct peritoneal resuscitation in trauma patients results in similar rate of intra-abdominal infectious complications

Jacob Edwards; Marissa Bare-Burchette; Nathaniel Poulin; William Irish; Eric A Toschlog

Background: Trauma patients undergoing damage control surgery (DCS) have a propensity for

complicated abdominal closures and intra-abdominal complications. Studies show that management of open abdomens with direct peritoneal resuscitation (DPR) reduces intra-abdominal complications and accelerates abdominal closure. This novel study evaluates intra-abdominal complication rates and the effect of when DPR is initiated on patient outcomes.

Hypothesis: Intra-abdominal complications such as abscesses, fistulae, and hernias would be reduced with the use of DPR in the trauma patient.

Methods: A retrospective chart review was performed on 120 patients who underwent DCS. Fifty patients were identified as DCS with DPR, and compared to 70 controls who were similar by gender, race, age, BMI, past medical history, mechanism of trauma, and injury severity score.

Results: The two groups of patients "-DPR" and "+DPR" were similar in their clinicodemographics. The +DPR group was more likely to have a mesh closure than the –DPR (14% and 3%; p=0.022). The +DPR group had a longer interval to final closure (3.5±2.6 days vs 2.5±1.8; p=0.020). Infectious complications and mechanical failure of the closure technique were similar among the two groups. Delayed initiation had no effect on closure type but did increase the number of days to closure (initiation at first operation 2.8±1.8 days vs initiation at subsequent operations 6.0±3.3 days; p=<0.001).

Conclusions: The use of DPR did not result in different outcomes in trauma patients. Traditional DCS may not be inferior to DCS with DPR. When choosing to use DPR, initiating it at the first operation could significantly reduce the number days to closure.

P13. Is There a Difference in the Incidence of UTI and Outcome Between Emergency General Surgery and Trauma Patients?

Jose A Aldana; Ricardo Fonseca; Rohit Rasane; Christina X Zhang; Adrian Coleoglou Centeno; Christopher Horn; Javier Rincon; Qiao Zhang; Kelly Marie Bochicchio; Obeid Ilahi; Grant Bochicchio

Background: Urinary tract infection (UTI) is associated with significant morbidity and mortality in hospitalized patients. To our knowledge, there is an absence of data evaluating whether there is a difference in both incidence of UTIs and the virulence of the causative pathogens and outcome between emergency general surgery (EGS) and trauma patients.

Hypothesis: We hypothesize that UTIs are more common and are associated with more virulent pathogens in trauma patients due to the emergent nature of Foley catheter insertions as well as multisystem injury.

Methods: EGS and trauma registries spanning years 2008 to 2018 were retrospectively queried for patients with diagnosis of UTI and catheter-associated UTI (CAUTI) using ICD 9 and 10 codes. Patients were divided into 2 cohorts (EGS and trauma patients). Demographics, culture data, and outcomes were abstracted. Student's T-test was used for continuous variables and Chi-square test was used for categorical variables.

Results: Out of 15475 EGS and 37293 Trauma patients, 1175 and 2683 patients were diagnosed with UTI respectively. There was no significant difference in the incidence of UTI between EGS and trauma patients (7.59% vs 7.19% respectively p=0.2488). EGS females had a significantly higher UTI rate (13.66% vs 9.84% p=<.0001). Trauma patients were older (70.00±20.16 vs 57.83±18.57 p=<.0001) and had a higher Charlson comorbidity index (4.76±2.95 vs 4.39±3.16 p=0.0004). EGS patients had more Foley catheter days (4.86±9.13 vs 3.43±8.15 p= <0.0001), longer hospital length of

stay (LOS) (12.11±13.45 vs 9.81±12.59 p= <0.0001) and mortality (6.30 % vs 4.36% p=0.0107). On logistic regression with mortality as outcome, UTI was significantly associated with a greater mortality in EGS but not Trauma (OR 1.72, 1.30 to 2.26 p=0.0001). Candida and Acinetobacter UTIs were significantly higher in EGS patients (10.90% vs 4.77% and 1.33% vs 0.38% p= <.0001).

Conclusions: Despite similar incidence of UTI in EGS and Trauma patients, there were significantly greater hospital and ICU days and mortality in EGS patients. This may be the result of greater Foley catheter days and associated virulent pathogens. Further prospective research is required to validate these findings.

P14. Differential long term survival following decortication for empyema and non-infectious etiologies.

Christopher Towe; Sudershan Srinivasan; Vanessa Ho; Stephanie G. Worrell; Malavika Kesavan; Katherine Wu; Yaron Perry; Philip Linden

Background: Long-term outcomes for patients undergoing pulmonary decortication and the association with underlying medical conditions is largely unknown.

Hypothesis: We hypothesize that mortality after decortication is associated with whether the indication for decortication was infection and that 30-day outcomes underestimate the mortality burden of decortication.

Methods: A prospective database of consecutive pulmonary decortications from 1/1/2010 to 10/1/2017 was reviewed and categorized as empyema or non-infectious disease (NID). NIDs are were performed for complex pleural effusions, hemothorax, or malignancy. Follow-up data was recorded for all patients. Kaplan Meier Survival estimates and Cox proportional hazard estimates were performed.

Results: 312 decortication patients were identified (185 (59%) empyema and 127 (41%) NID). Preoperative variables differed between NID and empyema in several ways, including age (64 v 58, p=0.001), hypertension (61% v 49%, p=0.04), congestive heart failure (17% vs 9%, p=0.03), coronary artery disease (28% v 12%, <0.001), and diabetes (24% vs 14%, p=0.01). Post-operative variables were similar between NID and empyema, including length of stay (14 v 14.4 days, p=0.82) and rate of complications (32% v 35%, p=0.60). Median follow-up was 33.5 months (IQR 7.2-82.6), and was shorter among NID patients (30.5 vs 37.2 months, p=0.03). Decortication for empyema had a 30-day survival of 95%, 91% at 1-year, and 88% at 3-years, see Figure 1. Decortication for NID was associated with worse survival at all time points (p<0.01); 88% at 30-days, 76% at 1-year, 69% at 2-years, and 66% at 3-years. In a Cox proportional hazard analysis adjusting for decortication etiology, age, hypertension, CHF, CAD, and diabetes, NID (HR 2.34, p=0.005) and age (HR 1.02, p=0.007) were associated with mortality.

Conclusions: Despite considerable perioperative mortality after decortication, decortication for empyema has less risk of long-term mortality than for NID, likely due to the association of malignancy or other comorbid medical conditions. Poor perioperative outcomes after decortication suggest ongoing need to improve post-operative care.

P15. Reintubation does not Increase Pneumonia Rates when Controlled for Ventilator Time

Jessica Weaver; Andrew Young; Jason Saucier; Patrick Reilly; Carrie Sims

Background: Reintubation in the intensive care unit (ICU) is a common occurrence and is associated with increased rates of pneumonia, longer hospital stays and increased mortality in multiple studies. However, it is not clear whether this increased morbidity comes from the reintubation itself, or the result of a longer ventilator course.

Hypothesis: We hypothesized that when ventilator time was controlled for, complications rates would be the same in both groups.

Methods: All patients intubated in the trauma ICU between 1/1/2012 and 6/30/2018 were considered for this retrospective case-control series. Patients intubated within 48 hours of extubation were considered "reintubated," and a total of 164 reintubated patients were found. Patients were matched for exact number of ventilator days, gender, blunt versus penetrating injury, ISS range, and age within 10 years. Sixty-eight patient pairs were identified. Odds ratios were calculated using SPSS (IBM).

Results: After matching by total number of ventilator days (average 7.3 days in both groups), the reintubated and not reintubated groups were similar, including percent female (both 16.2 %), age (48.5±21.0 vs 47.8±21.3), and ISS (22.3 vs 21.7). Complications were equivalent between groups other than a higher rate of substance withdrawal among the reintubated patients. Reintubation was associated with a lower mortality (OR 0.12, CI 0.03-0.43).

Conclusions: When patients were matched for total ventilator time, reintubation was not associated with increased pneumonia or other complications. This suggests that risk of pneumonia is due to the increased ventilator time rather than the reintubation itself. Unexpectedly, mortality was also significantly decreased in the reintubation group, though further study is needed to understand the mechanism behind this difference. Our findings suggest that our fears associated with "failed extubation" may be exaggerated, a more aggressive extubation strategy may be beneficial.

P16. First case of acute cholecystitis due to Gemella morbillorum

Hugo Bonatti

Background: Gemella morbillorum is a Gram positive coccobacillus rarely implicated in human disease. Cases of blood stream infection, joint infection and liver abscesses have been described.

Hypothesis: Gemella morbillorum may be isolated from bile in the case of acute cholecystitis.

Methods: We report on a 69 year old woman with acute cholecystitis caused by a novel rare pathogen.

Results: The patient presented with acute right upper quadrant pain to the ER. Her WBC was elevated, her LFTs were normal and imaging showed acute calculous cholecystitis. She was given 2g of cefotetan, pain control was achieved and she was stable. No acute OR and no hospital bed were available and she agreed to be discharged on oral Augmentin with a plan for early elective laparoscopic cholecystectomy (LC) within three days. LC was done with two 5mm ports (LUQ, umbilicus) and a mini lap grasper (LUQ) in a modified dome down technique. The Gallbladder (GB) was acutely inflamed and distended; 80ml bile were evacuated using a puncture needle and a portion was sent for microbiology.. The patient developed a bile leak from an accessory bile duct from segment 5 which was successfully managed by ERCP and stenting and she had no other complications. The bile culture grew Gemella morbillorum; oral antibiotics were continued for a total of five days.

Conclusions: We report the first case of acute cholecystitis involving Gemella morbillorum. The pathogen should be added to the ever expanding spectrum of pathogens involved in this common disorder. In patients with acute cholecystitis it may be advisable to send intraoperative specimens for microbiologic testing.

P17. Acute cholecystitis in a gastric bypass patient complicated by Takotsubo cardiomyopathy

Hugo Bonatti

Background: Gallbladder disease is a common condition after gastric bypass surgery. Even after weight loss many bariatric patients continue to suffer from comorbid conditions. Takotsubo cardiomyopathy is a rare condition that mimics acute cardiac ischemia but seems to be caused by a catecholamine storm triggered by intense stress.

Hypothesis: Takotsubo cardiomyopathy may complicate acute cholecystitis.

Methods: We present a case of acute cholecystitis complicated by a rare condition.

Results: A 62 year old female presented with acute right upper quadrant (RUQ) pain to the ER. She had a history of laparoscopic gastric bypass 5 years ago and had been non compliant for 2 years missing follow up appointments, gaining weight which caused poorly controlled DM and she did not take her vitamin supplements. Her WBC was elevated, her LFTs were normal and imaging showed acute calculous cholecystitis. She was admitted and started on antibiotics with plans for laparoscopic cholecystectomy. The next day she developed acute chest pain and troponins were elevated with ST changes on EKG. Echocardiography showed a ballooned left ventricle indicative for Takotsubo cardiomyopathy. Symptomatic treatment including antibiotics, betablocker and thiamin infusion was initiated. At three months follow up, ejection fraction had improved from <20% to >50%. The patient underwent interval laparoscopic cholecystectomy, which was technically very challenging due to severe ongoing acute and chronic cholecystitis. There were no cardiac issues but the patient developed an abscess in the gallbladder fossa, which was successfully treated with oral antibiotics.

Conclusions: Takotsubo cardiomyopathy complicating acute cholecystitis has thus far not been reported. Our patient had a history of gastric bypass and was non compliant with vitamin supplementation. B-1 (thiamine) deficiency may have contributed to the cardiac condition (wet beriberi).

P18. Case Report: Vascular Graft Infection Presenting 40 Years After Index Operation

Amani Politano; Erica Mitchell

Background: Background: Vascular graft infections can be challenging to manage. Degree of prosthetic involvement, options for reconstruction, bacterial speciation with the need for long-term antibiotics, and associated morbidity are all considerations for vascular surgeons treating patients who present with graft infections.

Hypothesis:

Methods: Method: We present a case report of a chest wall graft infection occurring forty years after

the index operation, including the diagnosis, revascularization, and etiology of the infection.

Results: Results: A 73 year-old immunosuppressed, oxygen-dependent woman presented to our clinic with concern for exposed chest wall graft material. Her history was significant for a gunshot wound to the right chest forty years prior with resultant arterial injury, for which she underwent repair via a left-subclavian-to-right-axillary-artery bypass with woven graft. At the time of her presentation, her physical exam demonstrated a mid-sternal wound with exposed graft material. Treatment of the graft infection consisted of a right-carotid-to-right-brachial-artery bypass utilizing cryopreserved great saphenous vein with near total removal of the existing graft material. Intra-operative gram stain of the wound and graft was negative, therefore the tissue was debrided, irrigated with antibiotics, and covered with a wound vac. Post-operative cultures grew Listeria monocytogenes requiring removal of all graft material for treatment cure. This required right axillary artery ligation and left subclavian artery vein patch angioplasty. She received intravenous antibiotics for six weeks post-operatively and wound vac management of the sternal wound.

Conclusions: Conclusion: We present a case of an extra-anatomic chest wall vascular graft infection successfully treated with cryovein bypass and graft excision. This case is unique in the nature of the infection, the longevity of the index bypass, and the initially negative intraoperative cultures that guided the initial and subsequent treatment paradigm.

P19. Gastric Perforation Secondary to Invasive Gastric Mucormycosis: A Case Report

Oscar A. Olavarria; Karla Bernardi; Hanadi S. El-Achi; Darryl Duncan; Joshua Person; Stefanos Millas; Tien Ko; Lillian Kao; Mike Liang

Background: Mucormycosis is a rare opportunistic fungal infection associated with high mortality in immunocompromised patients. Rhinocerebral and pulmonary infections are the most common, while primary gastrointestinal (GI) mucormycosis is unusual and rarely presents as gastric perforation.

Hypothesis: We report a rare case of gastric perforation secondary to invasive gastric mucormycosis.

Methods: N/A

Results: A 54 year-old female with diabetes mellitus (glycosylated hemoglobin of 6.9%), hypoalbuminemia (albumin of 0.8mg/dL), and chronic kidney disease, presented with 4 days of headaches, photophobia and phonophobia. The patient was diagnosed with miliary tuberculosis (TB) and TB meningitis through a positive quantiferon gold test, diffuse micronodular pulmonary lesions on computed tomography (CT), and multiple ring-shaped lesions on magnetic resonance imaging of her brain. She was started on a combination of anti-TB drugs and dexamethasone. Following 30 days of admission, the patient developed acute abdominal pain which progressed to peritonitis. CT abdomen/pelvis demonstrated a large fluid collection posterior to the stomach and free intraperitoneal air. On emergent exploratory laparotomy the stomach was found to be necrotic with a perforation along the greater curvature. Upper endoscopy confirmed full-thickness necrosis of the stomach but normal esophagus and duodenum. A total gastrectomy was performed but due to hypotension and coagulopathy, the GI tract was left in discontinuity and the patient was transferred to the ICU with a temporary abdominal closure. Broad spectrum antibiotics and antifungal were added. In 48 hours a diverting loop cervical esophagostomy, jejunostomy tube placement, and abdominal wall closure were performed. Surgical pathology was consistent with angioinvasive mucormycosis, therefore, patient was switched to amphotericin B. However, despite aggressive efforts, the fungus continued to disseminate, and the patient ultimately expired of sepsis and multiorgan failure.

Conclusions: Despite aggressive surgical intervention, antimicrobial therapy and critical care, GI mucormycosis has a rapid progression and is associated with high mortality.

P20. Intraperitoneal Extra-Intestinal Clostridium Difficile: A Rare Case

Serena Murphy; Megan Barnett ; Christos Colovos; Margaret Tandoh; Ajai Malhotra; Gary An

Background: Clostridium difficile is a gram positive, spore forming anaerobic bacteria that causes opportunistic infections. C. difficile infections (CDI) overwhelmingly affect the intra-luminal colon; however, extra-intestinal infections have been reported in the blood, wounds, and peritoneum. Taken together CDI result in healthcare costs of $6.3 billion annually. Risk factors associated with extra-luminal CDI include recent antibiotic use, surgery that violates the gastrointestinal tract, and proton pump inhibitors.

Hypothesis:

Methods: A 49 year old male with decompensated alcoholic cirrhosis presented with acute perforated diverticulitis and septic shock. He underwent a Hartmann's procedure and received a course of broad spectrum IV antibiotics. A persistent leukocytosis prompted a CT scan on POD#26, which revealed a perisplenic abscess. The abscess was drained percutaneously and cultures from the abscess were significant for C. difficile. Concurrent and subsequent fecal tests were negative for C. difficile. He was started on IV Metronidazole and subsequently discharged to physical rehabilitation with a continued course of PO Metronidazole.

Results: In this review of previously published case reports and available literature, it is clear that extra-luminal CDI is a rare clinical entity. The pathophysiology of extra-luminal CDI is not well understood. Patients may seed extra-intestinal sites from active colonic C. difficile, which is more frequently reported in patients with peritoneal dialysis. Alternatively in cases of colonic perforation, the peritoneal cavity is seeded with non-pathogenic colonic C. difficile.

Conclusions: The clinical consequences of extra-luminal C. difficile are unclear and result in uncertain antibiotic treatment duration and isolation precautions. With increasing comorbidities in the surgical population, more research needs to be done to clarify clinical treatment guidelines for this entity in order to avoid unnecessarily prolonged treatment courses with attendant risks of antimicrobial resistance.

P21. Quaternary Ammonium Salt Gauze Impregnated Reduces Bacterial Colonization of Surgical Drains After Breast Reconstruction

David A Jansen; Madeline Jansen; Abigail Chaffin.

Background: Surgical site infection after breast reconstruction is associated with increased length of hospital stay, readmission rates, cost, morbidity, and mortality. Identifying methods to reduce surgical site infection without the use of antibiotics may be beneficial at reducing antimicrobial resistance, reserving the use of antibiotics for more severe cases. Quaternary ammonium salts have previously been shown to be a safe and effective antimicrobial agent in the setting of in vitro and in vivo animal experiments.

Hypothesis: Our hypothesis was that the use of the quaternary ammonium salt, 3-trimethoxysilyl

propyldimethyloctadecyl ammonium chloride (QAS-3PAC; Biospear), will reduce surgical drain site colonization and infection after breast reconstruction (deep inferior epigastric perforator flap reconstruction or tissue expander placement).

Methods: In this prospective study, twenty patients were enrolled, with 14 surgical drains covered with nonimpregnated gauze and 17 surgical drains covered with QAS-3PAC impregnated gauze, for the purposes of investigating bacterial colonization. Antibiotic sensitivity analysis was also conducted when bacterial cultures were positive.

Results: The overall incidence of bacterial colonization of surgical drains was lower in the treatment group compared with the control group (17.6% vs 64.3%, respectively; P = 0.008). QAS-3PAC impregnated gauze reduced the incidence of bacterial colonization of surgical drains during the first (0.0% vs 33.3%) and second (33.3% vs 87.5%; P = 0.04) postoperative week. Furthermore, no enhanced antibiotic resistance was noted on drains treated with QAS-3PAC impregnated gauze.

Conclusions: The results of this study suggest that QAS-3PAC impregnated gauze applied over surgical drains may be an effective method for reducing the incidence of bacterial colonization.

P22. Prophylactic incisional vac in spine surgery

Kyle Mueller; Nirali Patel; Karen Evans; Nathan Nair

Background: Surgical site infections in spine surgery result in significant patient morbidity as well as increased healthcare cost. Obesity, diabetes, and multiple levels are known to increase a patient's risk for developing a surgical site infection.

Hypothesis: We aimed to investigate whether the prophylactic application of closed incisional negative pressure therapy at the time of surgery led to a reduction in the development of infections in high-risk patients.

Methods: We prophylactically placed an incisional wound vac on the closed incision at the time of surgery for patients undergoing spine surgery who had at least one of the following indications: suprafascial distance >3cm, obesity, risk factors for wound healing, limited mobility, >3 operative levels or increased tension needed to close the fascial layer (“pull test”). Incisional wound vacs were set at 125 mmHg continuous for 7 days. Durotomy was a contraindication to placement. Wound complications up to 60 days following surgery were recorded.

Results: A total of 65 patients underwent ciNPT. No patient developed a deep surgical site infection requiring a return to the operating room. 1 patient required one week of antibiotics during the outpatient setting for a small non-union at the inferior aspect of a posterior cervical incision secondary to continuous collar wearing.

Conclusions: Prophylactic ciNPT resulted in no surgical site infections requiring a return to the operating room for debridement in high-risk patients. This measure can be used to reduce SSI rates and improve the value of spine care.

P23. Microbiology and outcomes of hospitalization with intra-abdominal infections in the US: A retrospective cohort study

Marya Zilberberg; Brian; Kenneth Lawrence; Kristen Ditch; Melanie Olesky; Andrew Shorr

Background: Complicated intra-abdominal infections (cIAI) represent a major reason for hospital admission. Both source control and appropriate antibiotic therapy are central to successful management. Since anti-infectives are routinely given empirically, clinicians need to be aware of the current microbiology of this syndrome. It is also important to appreciate the burden of cIAI on the healthcare system.

Hypothesis:

Methods: We performed a multicenter retrospective cohort study in the Premier database of approximately 180 hospitals, 2013-2017. Using an ICD-9/10 based algorithm including a requirement for a laparotomy/laparoscopy, we identified all adult patients hospitalized with cIAI and included those with a positive blood or abdominal culture. We examined the microbiology of these infections and the associated outcomes.

Results: Among 4,453 patients with cIAI, 3,771 (84.7%) had a gram-negative (GN) and 1,782 (40.0%) had a gram-positive (GP) organism identified. Candida spp. were noted in 3.1% of cases. The majority of cases (n=2,941, 66.0%) were monomicrobial. Among patients with a polymicrobial infection, 1,118 (25.1%) had two organisms while 394 (8.8%) had three or more pathogens. Carbapenem resistance (CR) was present in 2.2% of all GN pathogens, and resistance to 3rd generation cephalosporins (C3R) occurred in 7.6%. The most common GN pathogens were E. coli (2,624, 58.9%; 0.3% CR, 4.9% C3R) and K. pneumoniae (774, 17.4%; 1.6% CR, 2.5% C3R). Enterococcus spp. (1,072, 24.1%) were the most common GP. Hospital mortality was 7.6%, and 11.2% of survivors were readmitted within 30 days of discharge. The median [interquartile range] length of stay was 6 [3, 12] days and median total cost was $21,148 [$12,051, $43,637].

Conclusions: Among patients hospitalized with a cIAI, 1/3 of the infections were polymicrobial, and the majority were GN. Among them, rates of CR and C3R were similar to those reported in other serious infections. cIAI hospitalizations are associated with substantial resource utilization and substantial morbidity and mortality. The low prevalence of polymicrobial infections may be due to under-recovery of anaerobic pathogens in clinical practice.

P24. Factors that Impact Duration of Antibiotic Therapy from Phase 3 Studies of Eravacycline for Intra-Abdominal Infection

Kenneth Lawrence; Erin Mathias; Philip Barie; Larry Tsai

Background: Results from 2 trials (STOP-IT, DURAPOP) showed that, for patients with adequate source control (SC) for complicated intra-abdominal infection (cIAI) short DoRx was associated with similar outcomes compared to longer DoRx. This post-hoc analysis of 2 pooled Phase 3 studies assessed the impact of identified parameters on DoRx and clinical success.

Hypothesis: Parameters associated with DoRx differed for patients with and without complicated appendicitis (cA), but that clinical outcomes stratified by DoRx are similar.

Methods: Patients with cIAI were randomized (1:1) to eravacycline or a carbapenem. DoRx was discretionary up to 14d. Clinical outcome (at test of cure) was the primary endpoint in the microbiological-intent-to-treat (micro-ITT) population. Groups were categorized based on DoRx: <5d, 6-8d and >8d. Statistical analysis assessed the association of several collected patient variables, treatment allocation, and operative diagnosis (multi-group C2, $p<0.05$). Logistic regression controlled for all parameters having a univariate association ($p<0.20$) with DoRx

Results: Clinical success rates were higher for patients with complicated appendicitis (cA) and unaffected by DoRx. Amongst all patients, those who received longer DoRx were older (p=0.004), sicker (p<0.001), less likely to have cA (p<0.001) and underwent open surgery (p<0.001). For cA patients, open surgery and polymicrobial infection were associated with DoRx (p<0.001), whereas non-cA patients with longer DoRx were more likely to have open surgery and prior antibiotics (both, p=0.001), and to be sicker (p=0.029). Independent predictors of longer DoRx (logistic regression) are shown (Table) (odds ratio, 95% confidence interval; age was not an independent factor).

Parameter	Overall	cA	Non-cA
APACHE II >10	1.52 [1.07-2.15]	1.47 [1.01-2.14]	
Open procedure	2.11 [1.60-2.79]	2.79 [1.75-4.45]	1.90 [1.34-2.70]
Non-cA	2.68 [2.68-3.59]		
Polymicrobial isolate			3.02 [1.62-5.62]

Conclusions: Patients receiving longer DoRx for cIAI were generally sicker and underwent open surgery for non-cA. It is unclear why polymicrobial bacterial isolates (a laboratory artifact, as all cases are polymicrobial) drive longer DoRx of cA. With adequate SC, longer DoRx for cA demonstrably does not affect clinical success. Further research may elucidate why longer DoRx is still chosen and whether certain populations (e.g., failed SC) would benefit from longer DoRx.

P25. Analysis of Antibiotic Treatment Regimens for Hirschsprung's Associated Enterocolitis

Jonathan Vacek; Julia Grabowski

Background: Hirschsprung's associated enterocolitis (HAEC) is a leading cause of morbidity and mortality in patients with Hirschsprung's disease (HD). The etiology of this process is unknown and the symptoms are often non-specific. The treatment of HAEC is typically supportive in nature and consists of intravenous fluid resuscitation, antibiotics, and rectal irrigations. Though consensus guidelines for treatment of HAEC have been developed, these guidelines have not been studied in a prospective manner and are variably applied. The aim of our study was to review our institutional experience with HAEC focusing specifically on the antibiotic regimens prescribed and evaluate practice patterns and outcomes.

Hypothesis: Patients with HAEC are treated with a wide variety of antibiotic regimens.

Methods: A single center retrospective review was performed of all patients with a diagnosis of HD who were admitted from 1/2013-12/2015. From this cohort, antibiotics regimens of patients who also had an associated ICD code for enterocolitis during their admission were reviewed. Demographic data were collected including age, sex, and ethnicity. A descriptive analysis was then performed.

Results: A total of 207 patients with a known diagnosis of HD were admitted during this time period. Of these patients 51 (25%) developed HAEC. The mean of age upon initial development was 3.1 years with a range of 0-18 years. Male predominance was discovered with a total of 33 patients (65%). White-Non Hispanic ethnicity was most common with 25 patients (49%) developing HAEC. Of the patients who developed HAEC the average readmission was one with eleven patients (22%) requiring more than one admission. A total of 12 different antibiotic regimens were identified with the most common being intravenous ampicillin, gentamicin, and flagyl. This regimen had an odds ratio (OR) of 2.3. The average duration for parenteral antibiotic regimens was one day with a range of 0-2 days. Probiotics were used in one patient (2%).

Conclusions: We have described the demographic associations of HAEC and the practice pattern variation for treatment. A high degree of variability in antibiotic regimens exist for treatment of HAEC.

This study highlights the need for a prospectively validated antibiotic regimen to decrease the morbidity associated with the disease.

P26. 2017 Global Surveillance of the in vitro activity of eravacycline against clinical isolates from GI infections

Kenneth Lawrence; Stephen Hawser; Nimmi Kothari; Federica Monti; Sophie Magnet; Corey Fyfe; Ian Morrissey

Background: Eravacycline is a fully-synthetic fluorocycline antibacterial of the tetracycline class that has recently received the Food and Drug Administration's and European Commission's approval for the treatment of complicated intra-abdominal infections (cIAI) in patients ≥18 years of age. It retains activity against the most common tetracycline-specific acquired resistance mechanisms (i.e., efflux and ribosomal protection). Eravacycline has shown activity against a broad range of Gram-negative, Gram-positive and anaerobic bacteria. In the present study, we report the in vitro activity of eravacycline and comparators against globally collected clinical isolates from gastrointestinal sources during 2017.

Hypothesis: From an ongoing multi-infection surveillance study, non-duplicate, non-consecutive, single-patient gastrointestinal isolates collected in 2017 from hospitals globally were analyzed.

Methods: From an ongoing multi-infection surveillance study, non-duplicate, non-consecutive, single-patient gastrointestinal isolates collected in 2017 from hospitals globally were analyzed. Minimum inhibitory concentrations (MICs) were determined by CLSI broth microdilution

Results: Eravacycline Tigecycline Group / Species (n) MIC50 (µ/mL) MIC90 (µ/mL) MIN MIC (µ/mL) MAX MIC (µ/mL) MIC50 (µ/mL) MIC90 (µ/mL) MIN MIC (µ/mL) MAX MIC (µ/mL) Enterobacteriaceae (1028) 0.25 1.0 0.06 16.0 0.5 4.0 0.12 32.0 ESBL-producing (59) 0.25 1.0 0.06 4.0 0.5 4.0 0.12 16.0 E. coli (171) 0.12 0.25 0.06 1.0 0.25 0.5 0.12 4.0 C. freundii (121) 0.25 0.5 0.12 2.0 0.5 2.0 0.25 4.0 E. cloacae (171) 0.25 0.5 0.12 8.0 0.5 2.0 0.25 8.0 K. oxytoca (179) 0.12 0.25 0.06 16.0 0.5 1.0 0.12 32.0 K. pneumoniae (115) 0.25 1.0 0.12 8.0 0.5 2.0 0.25 8.0

Conclusions: Overall, eravacycline exhibited consistent and potent activity against the vast majority of Enterobacteriaceae isolates from a gastrointestinal source, including those that produced ESBL, with 2 to 4-fold greater activity than tigecycline. These data suggest eravacycline could play a role in the treatment of cIAI in patients who harbor or are at risk for infections due to resistant Enterobacteriaceae pathogens. Continued surveillance of the activity of eravacycline is merited.

P27. Is a shorter duration of antibiotic therapy associated with more resistant secondary infections?

Cole Kircher; Robert Sawyer

Background: Background: One theoretical benefit of shortening duration of antibiotic therapy for hospital-managed infections is decreased risk of resistant superinfections. We hypothesized that a review of published, randomized trials of duration of antibiotic therapy would demonstrate a lower rate of resistant secondary infections in patients randomized to a shorter duration versus a longer duration of treatment.

Hypothesis:

Methods: Methods: PubMed was searched for all human, clinical, controlled trials where randomization was used to determine duration of antimicrobial therapy in a population of hospital-managed infections. Resistant superinfections were defined as a documented resistant infection, other than the initial infection being treated, that occurred during or immediately after each study's designated treatment period. The definition of resistant was that used by the investigators in the original studies.

Results: Results: Thirteen studies met inclusion criteria. Pneumonia was the most common infection studied, followed by intra-abdominal infections and urinary tract infections. In 5 studies, duration of therapy was pre-designated, in 5 studies duration was determined by changes in procalcitonin levels, and in 3 studies one arm had a fixed duration of therapy and was compared to one determined by biological parameters. A total of 5437 patients were included, 2685 in a short duration arm and 2752 in a long duration arm. Mean days of therapy were 6.7 days in the short duration arm and 10.5 days in the long duration arm. Despite receiving, on average, 3.8 fewer days of therapy, the short duration patients had increased numbers of resistant superinfections, 322/2685 patients (11.99%) versus 271/2752 patients (9.85%), p = 0.011 by chi-square analysis.

Conclusions: Conclusions: A shorter duration of antibiotic treatment in randomized, controlled trials unexpectedly appeared to be associated with a higher rate of resistant superinfections. It is possible that damage to the host microbiome occurs within the first few days of therapy and future emphasis should be placed on avoiding the initiation of any antibiotics where unnecessary rather than shortening therapeutic courses.

P28. Efficacy of Eravacycline in Non-Appendiceal Complicated Intra-Abdominal Infections: An Analysis of Two Phase 3 Trials

Vanessa Grant-DiFelice; Larry Tsai; Joseph Solomkin; Sergey Izmailyan

Background: In clinical practice, complicated intra-abdominal infections (cIAI) are a significant cause of morbidity and mortality. Compared to complicated appendicitis, cIAIs of non-appendiceal etiology carry a higher risk for initial treatment failure, prolonged treatment duration and increased mortality. Eravacycline (ERV) is a fully-synthetic fluorocycline antibiotic approved by the FDA and EMA for the treatment of cIAI in adults. It has broad in vitro activity against Gram-negative, Gram-positive and anaerobic pathogens. In two Phase 3 clinical trials, eravacycline demonstrated non-inferiority to carbapenems in patients with cIAI. The objective of this post-hoc analysis was to compare clinical outcomes in non-appendiceal subgroups from these trials.

Hypothesis: Patients with non-appendiceal cIAI treated with eravacycline have similar clinical outcomes compared to carbapenems.

Methods: IGNITE1 and IGNITE4 were randomized, doubled-blinded, multicenter, prospective non-inferiority phase 3 trials that evaluated the efficacy and safety of eravacycline vs ertapenem and meropenem, respectively, for the treatment of cIAI. Clinical response at the test of cure (TOC) visit was the primary efficacy endpoint in the micro-ITT population. A post-hoc analysis of patients diagnosed with cIAI of non-appendiceal origin was performed to determine comparative clinical outcomes.

Results: In the micro-ITT population, 415 patients received eravacycline and 431 patients received comparator therapy. Clinical cure rates in patients diagnosed with complicated appendicitis were 89.0% and 88.6% in ERV and comparators respectively; in those with non-appendicitis, rates were

88.8% and 89.7% respectively. Across the non-appendiceal subgroups, clinical outcomes between ERV and comparators were similar (Table 1).

Conclusions: Overall, clinical cure rates observed in eravacycline and carbapenem comparators were similar among the patients diagnosed with non-appendiceal cIAI. This pooled analysis suggests that eravacycline is an effective empiric treatment option for cIAI, especially in those at greater risk for treatment failure.

P29. Tuberculosis and the acute abdomen: an evaluation of the National Inpatient Sample

Joseph Forrester; Lakshika Tennakoon; Kristan Staudenmayer

Background: Tuberculosis, an infection caused by Mycobacterium tuberculosis, can cause acute abdominal pathology requiring surgery. While most cases of tuberculosis resolve with appropriate anti-mycobacterial therapy, surgery may still be required.

Hypothesis: To describe the modern epidemiology of acute abdominal complications associated with tuberculosis in the United States.

Methods: We retrospectively analyzed the 2010-2014 National Inpatient Sample for all admissions associated with International Classification of Disease-Ninth Revision-Clinical Modifier diagnosis codes for tuberculosis and acute abdominal pain. A case of acute abdominal tuberculosis was defined as any inpatient admission with a diagnosis of tuberculosis and a diagnosis of acute abdominal pain. Outcomes of interest included need for an abdominal operation and mortality after surgery. Adjusted analyses accounting for survey methodology were performed.

Results: There were 66,034 inpatient admissions associated with tuberculosis infection of which 3,638 (6%) had acute abdominal pain. Among cases, 1,578 (43%) were 45-64 years of age and 2,344 (64%) were male. Most cases were Hispanic (n=1,090, 30%) or Black (n=924, 25%) and were in the lowest quartile of income by zip code (n=1,367, 38%). Most cases had a primary diagnosis of pulmonary (n=1,928, 53%), miliary (n=522, 14%) or abdominal (n=482, 13%) tuberculosis. Of the 347 (0.5% of total) cases who underwent surgery, 111 (32%) underwent an abdominal exploration. Other procedures included repair or resection of a hollow viscus (n=122, 35%), or biopsy (n=136, 39%). In adjusted analysis, an association between a diagnosis of tuberculosis and receiving surgery was found to depend upon the type of tuberculosis infection (odds ratio [OR]=1.17 for intestinal, peritoneal, or genitourinary tuberculosis vs. other types, 95% confidence interval [CI]=[1.12-1.22]) and whether the patient was of white or Asian race vs. black and Hispanic (OR=1.11, 95%CI [1.02-1.21]). Thirty-nine (11%) of the 347 cases who underwent surgery died during hospitalization. After controlling for known confounders, increased mortality after surgery was associated with hypertension (OR=12.11, 95% CI [1.33-110.00]) and coagulopathy (OR=22.56, 95%CI [2.46-207.08]).

Conclusions: Surgery may still be required for patients with tuberculosis presenting with acute abdominal pain. Black and Hispanic patients are less likely to receive surgical intervention than White or Asian races. The in-hospital mortality from acute abdominal pain requiring surgery among patients with tuberculosis is high.

P30. Increased disease severity in patients with appendicitis who grow Streptococcus anginosus

Allison R. Wilcox; Olivia Sacks; Laura Baumann; Eleah Porter; Kenneth Burchard; D. Josh Mancini.

Background: Streptococcus anginosus (SA), formerly S. milleri, are a subgroup of normal gut flora with pathogenic propensity toward abscess formation. There is a paucity of published literature on the clinical significance of growing SA in the context of intra-abdominal infection, and the preponderance of data is both in pediatric populations and in Europe. The aim of this study was to evaluate the clinical significance of SA in the setting of appendicitis at a tertiary care center in New England.

Hypothesis: We hypothesized that patients who grow SA on intra-abdominal or pelvic fluid culture associated with appendicitis will experience worsened disease severity, defined by increased length of stay, higher readmission rate, and/or longer antibiotic duration.

Methods: Single-institution, retrospective, case-control study of all adult patients (≥18) with International Classification of Diseases - 9th and 10th Revision code for appendicitis, and corresponding intra-abdominal or pelvic fluid culture from 10/1/2012-9/30/2017. Charts were reviewed to confirm clinical evidence of appendicitis and if none found, patients were excluded. Study end-point was set at one year from initial encounter at our institution and those with insufficient data were excluded. Univariate analysis of disease severity measures and positive culture for SA [SA(+)] was performed.

Results: Eighty-one patients met inclusion criteria, of whom 28 (34.5%) were SA(+). There was no significant difference between SA(+) and SA(-) patients in terms of age or gender. Although we found no difference in the initial encounter length of stay between groups, SA(+) patients were significantly more likely to be readmitted (53.6% vs 20.8%, $p=0.005$) and undergo longer antibiotic duration (22.0 vs 11.9 days, $p<0.001$) (Table 1).

Conclusions: The growth of SA in an appendicitis-related intra-abdominal or pelvic fluid culture is significantly associated with a higher readmission rate and longer duration of antibiotics. Further analysis of intra- and post-operative complications that may be associated with the growth of SA is warranted.

P31. Microbial Epidemiology of Acute and Perforated Appendicitis in Adults Treated with Appendectomy or Percutaneous Drain

Sinong Qian; Georgia Vasileiou; Andreas Larentzakis; Rishi Rattan; Tanya Zakrison; Chris Dodgion; Haytham Kaafarani; Martin Zielinski; Nicholas Namias; Daniel Yeh

Background: A recent observational study described significant practice variation in antibiotic treatment for appendicitis, ranging from short-course narrow spectrum to long-course broad-spectrum. Appropriate empiric antibiotic selection depends upon a sound understanding of the most likely organisms involved in the infection. To our knowledge, there has not been a recent epidemiologic description of the microbial spectrum in adults in the United States. We sought to describe the modern microbial epidemiology of acute and perforated appendicitis in adults in order to help inform empiric coverage and support antibiotic stewardship initiatives.

Hypothesis:

Methods: In this post hoc analysis of a prospective, multicenter (n=28), observational study of appendicitis in American adults conducted from 01/17-06/18, we included all subjects with a positive microbiologic culture during primary or secondary (rescue after medical failure) appendectomy or percutaneous drainage.

Results: Out of 3,597 total subjects, 3,471 subjects underwent intervention; 230 (7%) had cultures performed, and 179/230 (78%) had positive results. Cultures were less likely to be positive in low-grade (AAST EGS Operative Grade 1 or 2) compared to high-grade (AAST EGS Operative Grade 3, 4, or 5) appendicitis, 2/18 (11%) vs. 61/70 (87%), p< .001. The distribution of microbial growth by intervention (Table 1) and AAST EGS Operative Grade (Table 2) are reported.

Conclusions: Culturing low-grade appendicitis is low yield. E. coli is the most commonly cultured microbe in acute and perforated appendicitis. The bacterial epidemiology for appendicitis subjects selected for percutaneous drainage differs from those selected initially for operative treatment. These data help inform empiric coverage for both antibiotics alone and antibiotics as an adjunct to operative or percutaneous intervention.

P32. Lipopolysaccharide Decreases Expression of the Farnesoid X Receptor and its Downstream Products

Michael Philippe-Auguste; Michelle Nguyen; Christopher P. Gayer

Background: Farnesoid X receptor (FXR) is a nuclear bile acid receptor that has been shown to play a role in intestinal barrier integrity. Our lab has previously shown that lipopolysaccharide (LPS)-induced intestinal injury seen in wild type mice is attenuated in FXR knock out mice. Fibroblast growth factor 15/19 (Fgf15/19) and small heterodimer partner (SHP) are downstream FXR products that may be involved in the mechanism through which this attenuation occurs.

Hypothesis: We hypothesized that LPS leads to FXR activation and upregulation of its downstream products Fgf15/19 and SHP.

Methods: IEC-6 cells were treated with 100 uM GW4604, a potent FXR activator or 2 ng/mL LPS for 30 minutes, one, two, six and 24 hours. RNA was extracted with Trizol. Real-time PCR was used to measure mRNA expression of FXR, Fgf15/19 and SHP. IEC-6 cells were then treated with combined 100 uM GW4064 and 2 ng/mL of LPS for six hours. RNA extraction was performed with subsequent RT-PCR analysis.

Results: IEC-6 cells treated with GW4064 showed an increase in mRNA expression of Fgf15/19 compared to control that peaked at six hours (40% increase, $p<0.05$). Cells treated with LPS showed a 90% decrease ($p<0.0005$) in Fgf15/19 expression compared to controls at six hours as well, which was opposite of what we expected since LPS had no effect on the barrier of FXR KO mice. We also noted a 50% decrease in FXR expression ($p<0.05$) with LPS treatment, but not until 24-hours. Interestingly, SHP mRNA expression decreased 70% ($p<0.05$), but at two hours with LPS administration. Finally, LPS blunted the effect of GW4064 on both Fgf15/19 and SHP expression when treated in combination

Conclusions: These data suggest that LPS treatment blunts the activation of FXR as evidence by decreased expression of FXR and its downstream products Fgf15/19 and SHP, although this occurs at different time points. Future investigations will focus on how these effects alter intestinal barrier integrity during injury.

P33. Burn Patients with History of Kidney Transplant Experience Increased Incidence of Wound Infection

Ahmed Elfadaly; Helen Zhang; Jorge Ortiz M.D.; Weikai Qu; Michael Cooper; Munier M Nazzal

Background: Objective: To determine if history of previous kidney transplant is an independent risk factor for increased incidence of wound infection and other morbidities in burn patients. While the goal of immunosuppression post-organ transplantation is to prevent graft rejection, it is often associated with significant adverse effects such as increased susceptibility to infection, drug toxicity, and malignancy. Burn injuries lead to a dysregulated hypermetabolic state and a compromised cutaneous barrier which predisposes the body to infection and delayed wound healing.

Hypothesis: We surmise that a history of kidney transplant increases the risk of wound infection in in-hospital burn victims.

Methods: A retrospective analysis was performed on 57,948 adults diagnosed in-hospital with a burn injury between 2008-2014, obtained from the Nationwide Inpatient Sample (NIS) by Healthcare Cost and Utilization Project (HCUP).

Results: In total, 103 burn victims (0.2%) with a history of kidney transplant (HTx) were identified. Compared to burn patients without a history of transplant (No-HTx), they were older (54.3±13.8 vs 49.8± 18.7; p=0.001), more likely to have Medicare insurance (69.9% vs 31.1%; p<0.001), and less likely to have Medicaid insurance (5.8% vs 17.2%; p=0.002). There were no significant differences in hospital characteristics and severity of burn between the two groups. HTx had a higher in-hospital mortality index score compared to non-HTx with p<0.001. The incidence rates of complications such as wound infection (33.0 vs 16.3; p<0.001) and acute renal failure (18.4 vs 7.7; p<0.001) were significantly higher in the HTx group. After adjusting for confounding factors in multivariable analysis, the incidence rate of wound infection remained significantly higher than that of the no-HTx group.

Conclusions: History of kidney transplant is an independent risk factor for increased incidence of wound infection in burn patients.

P34. Infection-related Hospital Readmissions after Heart Transplantation

Georgia Vasileiou; Joshua Parreco; Michelle Mulder; Sarah Eidelson; Valerie Hart; Daniel Yeh; Nicholas Namias; Rishi Rattan

Background: There are no national studies on heart transplant (HTx) readmissions that include different hospital readmission. Postoperative different hospital readmission occurs in up to one third of patients, with infection a common cause. We examined infection-related readmissions, including to different hospitals, of HTx recipients nationwide.

Hypothesis:

Methods: The 2010-2014 Nationwide Readmissions Database was queried for 30-day (30d) and 1-year (1y) readmission rates after HTx. Using ICD-9 principal diagnosis codes, subgroup analysis of the patients readmitted within one year with infection was performed. Multivariate regression analysis identified readmission risk factors.

Results: Of 9,840 patients undergoing HTx, readmission rate was 21% (n=2,070) at 30d and 41% (n=4,082) at 1y. Readmission risk factors are reported in Table 1 and included lowest income quartile and Medicare. Of note, private insurance was the primary payer for 48% (n=4,722). HTx-related complications were the most common reason for readmission at 30d (30%) and 1y (26%) followed by infection (16% and 21%, respectively). Notably, infection was the most common reason for readmission to a different hospital within 1y (19.2%). Independent risk factors for infectious 1y

readmission are reported in Table 2 and include: index admission to a public hospital and Medicaid.

Conclusions: Postoperative infections, a core quality indicator, are a major cause of post-HTx readmission. Further, infection was the most common reason for readmission to a different hospital and these patients are missed by current quality metrics. Risk factors included hospital type and socioeconomic factors and are distinct from risk factors for readmission overall. These findings have implications for the accuracy of outcomes measurement, reimbursement, and interventions designed to prevent fragmentation of care.

P35. Acute Acalculous Cholecystitis associated bacteremia has worse outcomes

Javier Rincon; Rohit Rasane; Jose A Aldana; Christina X Zhang; Ricardo Fonseca; Qiao Zhang; Kelly Marie Bochicchio; Obeid Ilahi; Grant Bochicchio

Background: Acute Acalculous Cholecystitis (AAC) is an inflammation of the gallbladder in the setting of critical illness without gallstones, and represents 2-15 % of acute cholecystitis. Bacteremia is associated with increased morbidity and mortality in patients in the ICU. The incidence of bacteremia in acute calculous cholecystitis (ACC) has been described, however the incidence of bacteremia in AAC is not established.

Hypothesis: We hypothesized that patients with Acute Acalculous Cholecystitis have higher bacteremia rates and worse outcomes.

Methods: Prospectively collected Acute Care Surgery institutional database from 2008 through 2018 was queried for patients diagnosed with Acute Cholecystitis using ICD 9 and 10 codes. Demographics, microbiology and outcomes were extracted. Only patients with positive blood cultures were included in the study. Based on the cultures, we defined 2 cohorts: AAC with bacteremia and ACC with bacteremia. Student's T-test was used for continuous variables. Chi-square and Fisher exact test were used for categorical variables. Multivariable regression was applied. Statistical significance was set at $p < 0.05$.

Results: Of 323 patients with Acute Cholecystitis , 57 (17.6%) patients had AAC and 266 (82.4%) had ACC. Of the 19 patients who had a blood culture, 11 (57.8%) were positive. Patients with positive blood culture had a mean age of 56.7 ± 15.3 and BMI of 26.7 ± 4.9 . The incidence of bacteremia was significantly higher in AAC (6, 10.5% vs 5, 1.9 %, p=0.005) and the time of diagnosis of bacteremia from admission was similar in both groups(1.2 ± 1.1 vs 0.2 ± 0.5, p= 0.128). AAC patients with bacteremia were younger (53.8 ± 19.2 vs 60.2 ± 8, p= 0.021) and had a longer Intensive care unit (ICU) length of stay (LOS) (12.6 ± 7.2 vs 1.3 ± 2.1, p=0.006). However, there was no difference in mortality between groups (2, 33.3% vs 1, 20.0 % , p= 1.000). After adjusting for age, gender, BMI and Charlson comorbidity index, bacteremia in AAC patients was found to be an independent variable for increased ICU LOS (OR 8.8; 1.7 - 15.9, p=0.024).

Conclusions: Incidence of bacteremia in patients with Acute Acalculous Cholecystitis is five times higher with 8 days longer ICU length of stay when compared to Acute Calculous Cholecystitis.

P36. Acute inflammation induced coagulopathy (AIIC) is a/w an increase in mortality in patients with acute pancreatitis

Rohit Rasane; Christina X Zhang; Qiao Zhang; Jose A Aldana; Ricardo Fonseca; Javier Rincon; Kelly Marie Bochicchio; Obeid Ilahi; Grant Bochicchio

Background: Acute pancreatitis (AP) is a life-threatening disease associated with significant inflammation and potential infection. Most deaths in acute pancreatitis result from sepsis and multiorgan failure. To our knowledge, there is a paucity of data evaluating the impact of acute inflammation induced coagulopathy (AIIC) in this patient population.

Hypothesis: We hypothesize that AIIC (the combination of admission platelet count ≤1,500,000/mcL and INR > 1.4) are a predictor of worse outcome in acute pancreatitis.

Methods: Acute and Critical Care Surgery (ACCS) registry spanning years 2008 to 2018 was retrospectively analyzed for patients with AP. Demographics, laboratory values and outcomes were collected. Patients were divided into 2 cohorts based on the presence or absence of the diagnosis of AIIC on admission. The primary outcome of the study was AP related mortality and its correlation with AIIC. We also evaluated whether acute platelet drop was associated with a greater mortality in the first 48 hours in patients with AIIC. Daily optimal cut-off value for percentage drop in platelets was calculated by using the receiver operating characteristic (ROC) curve analysis. Student's T-test was used for continuous variables and Chi-square test was used for categorical variables.

Results: Total 406 patients were diagnosed with AP. The mean age of AP patients was 53.0±17.2 yearsTwenty (4.9%) patients met our criteria for AIIC on admission. AP patients with AIIC had a higher Charlson comorbidity index (4.9±2.6 vs 3.2±2.9 p=0.006), significantly lower platelet count (143.9±71.7 vs 285.0±142.6 p<0.0001) and higher INR (1.8±0.3 vs 1.7±1.1 p=0.0002) on admission. These patients also had longer hospital (20.1±16.5 vs 11.9±16.2 p=0.044) and ICU days (11.3±13.0 vs 4.0±11.9 p=0.023), as well as mortality (40% vs 4.2% p<0.0001). When comparing the daily platelet percentage drop from baseline, the platelet percentage drop on day 2 was most significant (0.22 ± 0.21 vs 0.11 ± 0.18, p= 0.013). When controlling for age and Charlson comorbidity index, INR ≥ 1.4 (OR 7.9, 2.8 to 22.9, p= 0.0001) and platelet percentage drop (OR 12.9, 1.1 to 156.5, p= 0.045) on day 2 were significant predictors of mortality.

Conclusions: AIIC was associated with worse outcomes in AP patients. In addition, a platelet decrease of 30% on day 2 was most predictive of mortality. This cohort may benefit from early thrombomodulin therapy.

P37. Heart rate variability in human endotoxemia as potential marker for immune response using a practical wearable device.

Mats Koeneman; Rebecca Koch; Matthijs Kox; Hary VanGoor; Sebastian Bredie

Background: Researchers in the Radboudumc developed trials to learn about human endotoxemia. For example, they proved with intravenous bacterial lipopolysaccharide (LPS) challenges in healthy volunteers the development of endotoxin tolerance, exemplified by a severely blunted immune response upon a second LPS challenge. In a follow-up trial one secondary research question was if theimmune response of the LPS could also be detected by changes in heart rate variability measured with a wearable device and whether this preceded the symptoms, haemodynamic responses and possible even the cytokine levels.

Hypothesis: Given the immune response after administration op LPS and the effect of the parasympathetic nervous system on HRV. An increase in LF:HF ratio could be used as a marker for the immune response in human endotoxemia.

Methods: Healthy participants received either bacterial endotoxin [Escherichia coli-derived

lipopolysaccharide (LPS)] or placebo intravenously. Flu-like symptoms were scored every 30 min resulting in a total score of 0–25. TNF-α, IL-6, and IL-10 were measured in plasma samples using a simultaneous Luminex assay. Next to the regular bedside monitoring HRV was calculated using a continuously single-lead HealthPatch ECG recording.

Results: LPS administration resulted in increased plasma cytokine levels. Preliminary results in the HRV measurements show significant increase in LH:HF ratio and decrease in RMSSD in the intervention group. Whether these changes occur before the onset of symptoms, haemodynamic or cytokine responses will be tested next. An example of a response of HRV compared to the TNF-α and symptom score is given in Figure 1.

Conclusions: Changes in HRV after LPS administration can be detected with a straightforward wearable device. If the sensitivity and speed of these changes are high enough to be useful in clinical practice remains to be seen. Single results show potential in early detection of an immune response in human endotoxemia.

P38. Amicidin-alpha and Amicidin-beta: Synthetic proteins engineered to prevent and treat infections in surgery and trauma

Joseph Solomkin; George Babcock; Tara Riddle; Caitlin Nurik; Daniel Huang; Shalyn Lane; Doug Looker; Michael Bevilacqua

Background: Amicidins are synthetic proteins, purpose-built for application to exposed tissues of surgery and trauma. Amicidin-alpha combines barrier properties of structural proteins (keratins, collagens) with microbicidal activity of antimicrobial proteins (cathelicidins, defensins). It is intended for intraoperative use, especially in clean and clean-contaminated procedures, to protect against microbial invasion and thereby decrease risk of surgical site infection. Amicidin-beta combines microbicidal activity with biosurfactant properties. It is for intraoperative and post-operative use, especially in procedures with heavily contaminated or infected tissue, to reduce microbial load and block progression to sepsis. Both products are in GMP manufacturing; Phase 1 clinical trials are planned. Data presented here focus on a rodent orthopedic surgical model used to assess Amicidins.

Hypothesis: Amicidin-alpha and Amicidin-beta will help prevent and treat surgical site infections, as well as reduce the use of antibiotics.

Methods: A surgical wound is created on Sprague-Dawley rats to expose the femur and a steel suture placed. Assessments at 24, 48, or 72h include gross observation, histology, and microbiology of wounds, adjacent muscle, and distant organs.

Results: Amicidin-alpha applied intraoperatively was effective in preventing microbial contamination, as well as in blocking local infection and progression to sepsis. By example with MRSA (107), the combination of intraoperative Amicidin-alpha and systemic cefazolin completely blocked muscle tissue invasion at 24h, whereas cefazolin alone had very modest effect. Amicidin-alpha alone was also found to be highly effective in studies with MRSA and P. aeruginosa. Amicidin-beta applied intraoperatively (post-contamination) and post-operatively demonstrated multi-log CFU reductions in wound-adjacent muscle and blocked progression to sepsis. By example with P. aeruginosa (107 CFU), Amicidin-beta showed 4 log CFU reduction in muscle at 24h. With a second treatment at 24h, >6 log CFU reduction in P. aeruginosa in muscle tissue was observed at 48h; no microbes were recovered from distant organs. Amicidin-beta with systemic cefazolin was also highly effective.

Conclusions: Amicidin-alpha with its barrier and microbicidal properties and Amicidin-beta with its

anti-biofilm (biosurfactant) properties demonstrated a high level of effectiveness in this model, which mimics the human condition with rapid progression of organisms into adjacent and then remote organs.

P39. Predictors of and Mortality from Resistant Infections in ICU Patients

Laura Stearns; Robert Sawyer

Background: Resistant infections are a source of healthcare utilization and cost, and are especially problematic in the intensive care unit (ICU). Specific risk factors for these infections are still unclear.

Hypothesis: We hypothesized that the risk factors for resistant Gram-negative rods (rGNR), resistant Gram-positive cocci (rGPC), and fungal infections (inherently resistant to empiric antibacterial therapy) would be similar in a cohort of ICU-acquired infections.

Methods: Data were collected on patients requiring intensive care from 1997 to 2017 in a single university surgical-trauma ICU. Patients with ICU-acquired infections were analyzed, conditioned on the presence of rGNR, rGPC, or fungi. Continuous variables were compared using Student's t-test and categorical variables were compared using the chi-square test. Independent predictors of the presence of a resistant pathogen and mortality were determined by logistic regression analysis.

Results: 4319 ICU-acquired infections were identified; 1998 were considered resistant and 2321 were considered non-resistant. Identification of any resistant organism was significantly associated with female sex, non-trauma diagnosis, APACHE II score, liver disease, steroid use, history of any prior infection, and history of a resistant infection, but not days of prior antibiotic use (all $p \leq 0.02$, $C = 0.72$, H-L test = 0.001). Infections with rGNR were associated with days of therapeutic antimicrobials given for a previous infection but not total prior antimicrobial days during hospitalization, rGPC infections were associated with both days of therapeutic antimicrobials given for a previous infection and total prior antimicrobial days during hospitalization, and fungal infections were not associated with any measure of prior antimicrobial exposure. Controlling for severity of illness and demographics, resistant infections were not associated with mortality compared to non-resistant infections (OR = 1.12, $p = 0.17$, $C = 0.74$, H-L test = 0.08).

Conclusions: Demographic and treatment risk factors for resistance to antibacterial agents vary by resistant pathogen class. The likelihood of rGNR infection appears to be most closely linked to recent antimicrobial exposure, while rGPC infection appears to be associated with totality of prior antimicrobial exposure. Fungal infections may not be associated with prior exposure. These findings suggest disparate mechanisms of dysbiosis for different classes of resistant pathogens.

P40. Readmissions Following Necrotizing Fasciitis, Both Common and Costly

Addison May; Victor B Talisa; Wayne Dankner; David Wilfret; Andrew Bernard; Eileen Bulger; Sachin Yende

Background: Improvements in hospital-related mortality following necrotizing soft tissue infections (NSTI) have increased the number of survivors at risk for long-term sequelae.

Hypothesis: To determine the burden of readmissions and associated healthcare spending in patients who survived admission for necrotizing fasciitis, a common form of NSTI.

Methods: Retrospective analysis of the 2014 Nationwide Readmissions Database (NRD), a unique database designed to support analyses of national readmissions rates that includes insured and uninsured patients, was undertaken. We identified index admissions for NF using ICD-9 CM codes in 10 discharge diagnoses fields. To ascertain readmissions, we identified a sub-cohort of patients>18 years, alive during the index admission, not discharged against medical advice, hospitalized before October1st, and with complete patient-level data. We examined patient clinical characteristics and outcomes (readmissions and costs). We conducted sensitivity analyses using alternate criteria to identify NF (limiting ICD-9 codes to either 3 or 5 fields and using DRG codes) and compared 90 day readmission rate for NF to common medical conditions.

Results: There were 3739 admissions that met the sub-cohort definitions. Average age was 52 years, 60% were men, and 90% had one or more comorbidities. Approximately 10% had shock and 22% met criteria for acute kidney injury. The median length of stay was 10 days (interquartile range (IQR):6-19 days). The 30, 60, and 90 day readmission risk was 17% (n=650), 25% (n=931), and 29% (n=1083), respectively. Most readmissions (89%) were not for planned procedures and 65% had an ICD-9 infection code. Of the readmitted patients (n=1083), 70% (n=759) were readmitted once, 22% (n=237) twice, and 5% (n=58) more than twice in 90 days. In comparison, 90 day readmissions were similar for common medical conditions: burns (17%), acute MI (23%) and pneumonia (28%). The median cost/readmission was $10,577(IQR: $5,935-$20,228). The risks of readmissions and median costs were similar in sensitivity analyses using more stringent criteria to identify NF.

Conclusions: Readmission are common after NF and similar to other publicly available quality measures. They occur in over 1 in 4 survivors over 90 days and are associated with high healthcare spending. Comorbidity was high and may contribute to subsequent infection and readmission.

P41. Mechanisms Behind Impaired Wound Closure in Elderly Burn Patients

Abdikarim Abdullahi; Marc Jeschke; Robert Yao; Nancy Yu; Saeid Amini-Nik

Background: Advancements in burn care, such as early excision and grafting, and adequate nutrition to curtail post-burn hypermetabolism, have markedly decreased themortality of paediatric and adult burn patients over the last three to four decades. Despite these major advances, burn patients over the age of 65 years still have unacceptability higher mortality rates, with the Lethal Dose 50 (LD50) in this population remaining unchanged in the last three decades. Impaired skin wound healing has been implicated in mediating poor outcomes in elderly burn patients, as it both facilitates persistent hypermetabolism and increased risk of infection. However, the underlying mechanisms responsible for impaired wound closure in this sup-population remains unclear.

Hypothesis: We hypothesize that delayed wound healing in the elderly after a burn injury, is likely due to alterations in the characteristics of progenitor cells in the skin of these patients.

Methods: To unravel the mechanisms of deficient wound closure after a burn injury, we compared skin-healing characteristics of Young (8weeks old) and Aged mice (>52 weeks) subjected to 30% full thickness burn that was monitored up to two weeks post burn injury.Additionally, we assessed both the migratory capacity and stem cell progenitor pools in skin derived from elderly and adult burn patients admitted to the Ross Tilley Burn Center.

Results: Here, we show that skin from aged post-burn mice are deficient in mesenchymal progenitor cells marker (Sca-1) and show impaired migration to the wound bed. Similarly, skin from elderly burn patients show impairments in wound healing due to profound changes in their stem cell niche such as blunted responsiveness to tissue injury (deficient migration of mesenchymal stem cells (MSCs) and a

decline in mesenchymal progenitor cells (Stro-1 positive) in their skin. Taken together, our clinical and rodent findings suggest that impaired wound closure in the elderly after a burn injury is mediated by reduced stem cell pool and deficient migration of MSCs to the wound bed.

Conclusions: Our data provide insights into the mechanisms behind impaired wound closure in elderly patients after a burn injury, and in this context, suggest therapies that exert a dual function – namely increasing MSC proliferation and migration to improve healing.

P42. The Revolving Door of Hospital Admissions for Diabetic Foot Infections In The United States

Gabriel Ruiz; Joshua Parreco; Georgia Vasileiou; Howard Lieberman; Rishi Rattan

Background: The Centers for Medicare and Medicaid Services (CMS) has recently been reducing hospital compensation for readmissions. The purpose of this study was to evaluate the risk factors for hospital readmissions for patients with diabetes, peripheral circulatory disorders, and infected wounds including readmissions to different hospitals across the United States.

Hypothesis: It was hypothesized that limb salvage procedures would be associated with an increased risk for repeated hospital readmission in patients with diabetes, peripheral circulatory disorders, and infected wounds.

Methods: The Nationwide Readmissions Database for 2010-2014 was queried for all patients aged 18 years or older with a diagnosis code for diabetes with peripheral circulatory disorders, and a lower extremity wound. Univariable analysis was performed using 45 patient and hospital variables for the outcomes of readmission within one year and more than one readmission. Multivariable logistic regression was performed for each outcome using all significant ($p<0.05$) variables on univariable analysis. Results were weighted for national estimates.

Results: There were 321,465 patients during the study period admitted with a diagnosis code for diabetes with peripheral circulatory disorders and a lower extremity wound. The one year readmission rate was 52.2% and the highest readmission rate was found in patients who underwent percutaneous angioplasty during the index admission (58.9%, $p<0.01$). Multivariable logistic regression revealed that PTA was associated with an increased risk of readmission (OR 1.27, $p<0.01$) and amputation during the index admission was protective against readmission (OR 0.73, $p<0.01$). From the readmitted patients, 51.0% had more than one readmission. The strongest risk factors for more than one readmission was renal failure (OR 1.17, $p<0.01$) and PTA (OR 1.12, $p<0.01$).

Conclusions: Patients suffering from diabetes with peripheral circulatory disorders have among the highest readmission rates in the United States. Limb salvage with PTA and open vascular procedures are associated with the highest risk for readmission and multiple readmissions. Patient outcome and cost improvement measures should focus on these at-risk patients.

P43. Is Initial Management of Morel-Lavallee Lesions Associated with Subsequent Infection?

Shuyan Wei; Christopher Goodenough; Matthew Greives; Jessica Rose; Gabrielle Hatton; Paul Deramo; Charles Wade; Lillian Kao

Background: Morel-Lavallee Lesions (ML) are closed degloving injuries that disrupt interfascial lymphovasculature between soft tissue and muscle because of shearing forces commonly seen with

blunt trauma. Infected ML can require multiple operative debridements and complex reconstruction. No treatment guidelines currently exist, thus it is unknown if initial management strategy has any effect on risk of ML infection.

Hypothesis: We hypothesized that initial debridement as compared to observation is associated with a reduction in subsequent infection.

Methods: We conducted a single-center retrospective cohort study of ML in adult trauma patients from 2012 – 2018. ML diagnoses, ML infection status, patient demographics and hospital outcomes were collected from our trauma registry and by chart review. Univariate frequentist analysis was performed.

Results: A total of 9 (15%) ML infections were found in 61 patients, of whom 34 (56%) underwent initial surgical debridement. Baseline demographics were similar between treatment groups, with the exception of increased admission blood transfusion volume in the initial surgery group (Table). Twenty-three (38%) patients were successfully observed and did not require debridement. ML infection contributed to 1 (11%) death, 3 (33%) intensive care admissions, 3 (33%) hospital readmissions, and significantly greater number of surgical debridements (4 [2-10] vs 2[1-3] debridements, $p = 0.05$). Initial surgery patients had longer hospital length of stay (LOS [median 16 vs 8 days, $p = 0.006$]), but there were no significant differences in ML infection rate (18% surgery vs 11% observation, $p = 0.48$).

Conclusions: Initial surgical debridement of Morel-Lavallee lesions was not associated with decreased subsequent infection and led to more surgeries and increased hospital LOS in this small study. Given the significant morbidity and increased healthcare burden associated with infected ML, greater awareness is needed to identify these lesions and to monitor them for subsequent infection, regardless of initial management strategy.

P44. The Costs and Complications Associated with Infected Ventral Hernia Repair Mesh

Margaret Plymale; Daniel Davenport; Jordan Hess; Willliam Griffiths; Seth Walsh Blackmore; Mary Plymale; Crystal Totten; John Roth

Background: Mesh hernia repair is widely accepted due to the associated reduction in hernia recurrence compared to suture-based repair. Despite initiatives to reduce risk, mesh infection and mesh removal are a significant challenge. In an era of healthcare value, it is essential to understand the global cost of care including the incidence and cost of complications. The purpose of this study was to identify the outcomes and costs of care of patients that required removal of infected hernia mesh.

Hypothesis: Costs and complications associated with infected mesh are significantly greater than those associated with non-complicated ventral hernia repair.

Methods: A review of databases from 2006 through June 2018 identified patients that underwent both ventral hernia repair (VHR) and reoperation for infected mesh removal. Patient demographic and operative details for both procedures including age, body mass index, mesh type, amount of time between procedures, and information regarding interval procedures was obtained. Clinical outcome measures included length of hospital stay, hospital readmission, wound and non-wound complications, and reoperation. Hospital cost data was obtained from the cost accounting system and was combined with the clinical data for a cost and clinical representation of the cases.

Results: 37 patients had VHR and removal of infected mesh material over the 12 year time frame: average age at VHR was 49 years (+/- 14) and 17 patients (46%) were female. Following VHR, 13 patients (35%) experienced wound complications within 90 days postop which ranged from superficial surgical site infection to evisceration. A median of 217 days (IQR 36-1,104) passed between procedures. After mesh removal 17 patients (46%) experienced further wound complications, and 24 (65%) patients had at least 1 readmission. 21 patients (57%) required a minimum of one additional operative procedure after mesh removal. Median hospital costs nearly doubled ($p < .001$) for the mesh removal (25,495, IQR 13,635 – 45,081) compared to the VHR admission (13,802, IQR 8,776 – 27,175) not accounting for readmission costs. A majority experienced hernia recurrence subsequent to mesh removal.

Conclusions: Mesh infection following hernia repair is associated with significant morbidity and costs. Hospital readmission, reoperations and recurrences are common among these patients resulting in increased healthcare resource utilization. Development strategies to prevent mesh infection, identify patients most likely to experience infectious complications, and define best practices for care of patients with mesh infection are needed.

P45. Necrotizing Fasciitis: On the Rise

Kelsey Musgrove; Melissa LoPinto; Gerald Hobbs; Brian Hendricks; Eric Lundstrom; Kimberly Bailey

Background: Background: Cases of necrotizing fasciitis have been historically rare, with 0.3-15 cases per 10,000 depending on state. Review of electronic health records from West Virginia (WV) University's Ruby Memorial Hospital revealed a dramatic increase over what was expected given national trends over the last decade. The purpose of our case review study was to examine national trends and compare with what we have observed in WV.

Hypothesis:

Methods: Methods: Retrospective record review was done for WV for patients treated at WV University from 1995, and nationally using the Healthcare Cost and Utilization Project (HCUP) data from 2000-2011. Patients were identified using ICD9/10 code M72.6. Regression and spatial cluster analyses were estimated using state-level rates per 100,000 for 2000-2010.

Results: Results: All data show an increase in rates of necrotizing fasciitis over the last 5-15 years. National rates increased from as low as 0.85 per 100,000 in 2001 to 1.13 per 100,000 in 2011. Thematic mapping revealed general trends in geographic distribution of cases, with higher reporting on both U.S. coasts, while reports decreased in Middle America. Despite observed trends, no significant spatial clustering of cases was detected using Global Moran's I ($I = 0.031$, $P = 0.25$). WV specific regression analyses indicated a trend towards more cases of polymicrobial infection without evidence of changing patient demographics.

Conclusions: Conclusion: National and WV specific incidence increased over time. Increased rates in disease coincided with increasing trends in obesity and diabetes at the national and state level. No apparent effect was observed between necrotizing fasciitis and rate of Strep Group A infection. Preliminary work suggests the etiology for the infection is most likely multi-factorial. More research is required to understand and compose interventions to mitigate this concerning trend.

P46. Surgical outcomes in Patients with Late Debridement of Long Bone Fractures of Lower Extremities in Penetrating Injury

Nasim Ahmed; Stuart Campbell

Background: The American College of Surgeons' Committee on Trauma has a quality indicator regarding open long bone fractures in lower extremities that states that the irrigation and debridement (I & D) of the fracture should be performed within 8 hours of the patient's injury. Therefore, the purpose of this study was to see the impact of the timing of I & D for cases of open femur, tibia, and fibula fractures following penetrating traumatic injury on the occurrence of surgical site infections (SSI), wound disruption, and sepsis.

Hypothesis: late debridement can lead to increased infection rate

Methods: Patients from the 2007–2010 National Trauma Data Bank who sustained a penetrating injury and were diagnosed with an open femur, tibia, or fibula fracture and also underwent an I & D within 24 hours of arrival to the hospital were eligible for inclusion in the study. The patients' characteristics and outcomes were compared between two groups: I & D within 8 hours (Group 1) and between 8-24 hours (Group 2). Initial patient measures and outcomes were compared between the two unmatched groups followed by propensity score matching.

Results: A total of 1,014 patients qualified for the study and of those, 736 (72.6 %) patients underwent an I & D within 8 hours (Group 1). There were significant baseline differences between the two groups regarding race (white vs. nonwhite, P=0.001) and the mechanism of injury (firearm: 91.8% vs. 96.8%, P=0.01). In order to better balance the groups, 277 patients from each group were pair-matched on age, sex, race, injury severity score (ISS), Glasgow coma scale (GCS), initial systolic blood pressure (iSBP), and the mechanism of injury; after, there were no significant differences observed between the groups for the matching variables. When examining the patient outcomes, no significant differences in the occurrence of SSIs, sepsis, or wound disruptions between the two groups. Additionally, Group 1 had a significantly longer hospital length stay (Median [IQR]: 5.0 [3.0, 10.0] vs. 4.0 [3.0, 7.0], P<0.001).

Conclusions: For nearly all the patients who were analyzed, a firearm was the cause of the open fracture in their lower extremity, and around 70% of the patients underwent an I & D within 8 hours of hospital arrival per ACS guidelines. There were no significant differences identified in SSI, wound disruption, and sepsis rates, or the proportion of patients who went home without any follow-up services needed. However, the median hospital length of stay was longer for those who had their I & D within 8 hours.

P47. Association between hollow viscous injury and invasive candidiasis in critically ill trauma patients.

Mehreen Kisat; Manuel Castillo-Angeles ; Adil Haider; Ali Salim; Reza Askari

Background: Invasive candidiasis is associated with high mortality in critically ill patients. The use of empiric antifungal therapy is controversial in patients with traumatic injury to the gastrointestinal tract (GI).

Hypothesis: We hypothesized that injury to the proximal bowel (stomach, duodenum) is associated with a greater risk of invasive candidiasis than more distal bowel injury.

Methods: Adult ICU patients (≥ 16 years) in the National Trauma Data Bank (2010-2015) were categorized by site of injury to the gastrointestinal tract (stomach, duodenum, jejunum, colon/rectum).

The primary outcome was a diagnosis of invasive candidiasis. Multivariable logistic regression was used to determine associations between the site of injury and invasive candidiasis while controlling for patient (age, gender), injury (injury severity score, injury type) and clinical characteristics (hypotension, ventilator dependency, need for blood transfusion, total parental nutrition, and dialysis).

Results: Among the 835,024 patients included, 0.02% (n=142) had invasive candidiasis, with an associated mortality rate of approximately 11%. Patients with gastric injury were more likely to have invasive candidiasis (Table 1). Other factors independently associated with invasive candidiasis were hypotension, ventilator dependency, need for transfusion and dialysis. Table 1: Adjusted odds ratios for predictors of Candidiasis using site of GI injury as a covariate (n=819,156). Invasive Candidiasis Logistic Regression OR (95% CI) Age 16-25 1 26-35 0.65 (0.33-1.25) 36-45 1.32 (0.84-2.08) 46-55 1.12 (0.64-1.97) 56-65 0.76 (0.37-1.56) 66-75 1.26 (0.61-2.57) 76-85 1.14 (0.49-2.66) >85 0.58 (0.15-2.21) Male gender 1.19 (0.76-1.86) ISS 0-8 1 9-15 1.03 (0.49-2.17) 16-24 1.35 (0.65-2.81) 25-75 1.82 (0.81-4.12) Hypotensive on arrival to ED 1.73 (1.16-2.58) Penetrating Injury 1.34 (0.90-1.99) Site of GI injury Stomach 2.88 (1.17-7.07) Duodenum 1.06 (0.36-3.12) Jejunum 1.53 (0.77-3.05) Colon, Rectum 1.80 (0.82-3.96) Need for ventilator 3.79 (1.93-7.43) Transfusion 2.01 (1.11-3.63) Parenteral Nutrition 1.07 (0.25-4.52) Dialysis 3.72 (1.52-9.12)

Conclusions: Invasive candidiasis is associated with significant mortality in trauma patients with hollow viscous injury. Gastric injuries are associated with increased risk of invasive candidiasis. These results highlight strong consideration for empiric antifungal therapy in trauma patients with gastric injuries and the other known risk factors.

P48. Appendicitis in Pregnancy

Georgia Vasileiou; Ahmed Eid; Sinong Qian; Gerd Pust; Rishi Rattan; Nicholas Namias; Andreas Larentzakis; Haytham Kaafarani; Daniel Yeh

Background: To compare the presentation, management, and outcomes of appendicitis in pregnant and non-pregnant females of childbearing age (18–45 years).

Hypothesis:

Methods: This was a post-hoc analysis of a prospectively collected database (01/17-06/18) from 28 centers in America. We compared pregnant and non-pregnant females' demographics, clinical presentation, labs, imaging, management, and clinical outcomes.

Results: Out of 3,597 subjects, 1,010 (28%) were females of childbearing age, and 41 (4%) were pregnant: mean age was 30± 8 years at median gestational age 15 [10-23] weeks. The two groups had similar demographics and clinical presentation, but there were differences in management and outcomes (Table 1 and 2). In pregnant subjects, abdominal ultrasound (U/S) plus MRI was the most frequently used imaging (41%) followed by MRI alone (29%), U/S alone (22%), CT (5%), and no imaging (2%). Despite similar AAST EGS Clinical and Imaging Grade at presentation, pregnant subjects were more likely to be treated with antibiotics alone (15% vs 4%, p=.008). Pregnant subjects were less likely to have simple appendicitis and were more likely to have complicated (perforated or gangrenous) appendicitis or a normal appendix. With the exception of index hospital length of stay, there were no significant differences between groups in clinical outcomes at index hospitalization and at 30-days.

Conclusions: Almost 1 in 20 women of childbearing age presenting with appendicitis is pregnant. Appendicitis most commonly affects women in early- to mid-pregnancy. Compared to non-pregnant

women of childbearing age, pregnant women presenting with appendicitis undergo non-operative management more often and are less likely to have simple appendicitis. When compared to non-pregnant patients, they have similar clinical outcomes at both index hospitalization, and 30-days post discharge.

P49. Are the Benefits of Rapid Source Control Laparotomy (RSCL) Realized Following Acute Colonic Perforation?

Mattheew Rosenzweig; Yen Hong Kuo; John Davis; Ayolola Onayemi; Jason Sciarretta; John Davis; Nasim Ahmed

Background: Rapid Source Control Laparotomy (RSCL) in general surgery is an extension of damage-control laparotomy (DCL) in trauma. Studies have shown a mortality benefit in trauma patients with temporizing surgery in patients with the lethal triad of acidosis, hypothermia, coagulopathy, followed by aggressive resuscitation and definitive fascial closure. The benefits of RSCL in general surgery has not been extensively studied.

Hypothesis: We hypothesize that the patients with RSCL will have a poorer outcome than those treated with conventional surgery.

Methods: Three years of data (2014-2016) from The American College of Surgeons National Surgical Quality Improvement Program (ACSNSQIP) was assessed. The patient populations were separated into Group 1: patients with no fascial closure after the initial operation and Group 2: patients with fascial closure. The primary outcome of the study was thirty-day mortality, with secondary analyses evaluating complications and length of stay. Univariate analysis was initially performed followed by propensity score matching.

Results: Out of 1,381 patients, who satisfied the inclusion criteria, 396 (29%) patients were in group 1 and 985 (71%) patients were in group 2. There were significant differences between the groups on univariate analysis regarding the following comorbidities: diabetes, P=0.008, ascites, P=0.035, congestive heart failure, P <0.001, renal failure requiring dialysis, P <0.001, weight loss P=0.023, bleeding disorder, P=0.028, preoperative requirement for blood transfusion, P<0.001 , presence of septic shocks, P<0.001 and mechanical ventilation, P <0.001. After propensity score matching, only the following significant differences were found. The presence of septic shock (52.1% vs 34.7%, P<0.001) was significantly higher in Group 1. The median hospital length of stay was longer (median [95% CI] 20[18-22] versus 14 [13-16], P<0.001) in Group 1 and Group 2 respectively. A larger number of patients in Group 1 went to a rehabilitation facility than in Group 2 ([18.7%] versus [11.2%], P=0.006). The paired matched analysis showed significant 30 days mortality in patients when the fascia was not closed group1 (32.6%) compared to when the fascia was closed group 2(16.9%), P<0.001.

Conclusions: Patients presenting with acute colonic perforation and having RSCL had a higher rate of septic shock, prolonged hospital stay, were more likely to be discharged to an extended care facility and had a mortality rate twice as high as patients whose fascia was closed. These data provide evidence to suggest that RSCL may not be beneficial for the routine use perforated colon surgery.

P50. An analysis of mortality in patients with colorectal carcinoma undergoing elective versus emergent colectomies

Shalwa Mohidul; Keely Muertos; Jason Sciarretta; John Davis

Background: The purpose of this study was to examine the differences in outcomes of emergent and non-emergent colectomies in patients with colorectal carcinoma (CRC) using data collected by the American College of Surgeons National Surgery Quality Initiative Program (ACS-NSQIP).

Hypothesis: We hypothesize that there are independent risk factors that contribute to increased mortality in patients with colorectal cancer who require emergent colectomies.

Methods: The ACS-NSQIP database was queried for all CRC cases who underwent colectomies in 2016, and a total of 14,392 patients were identified. There were a total of 129 cases who subsequently expired, of which 90 cases were non-emergent and 39 cases were emergent. These 129 cases were reviewed for the presence of risk factors associated with postoperative mortality. Continuous variables were compared using a Wilcoxon-Mann-Whitney U-test while categorical variables were compared using X2 or Fisher's exact, as appropriate. Continuous data is expressed as mean ± standard deviation (X±SD). All p values of less than 0.05 were considered significant.

Results: Emergent colectomy cases were 7.3 times more likely to expire (39 patients, 4.66%, OR: 7.31, 95% confidence interval: 4.99 - 10.72) compared to non-emergent (90 patients, 0.66%) colectomy cases (p value < 0.001). The 39 patients undergoing emergent colectomies had an overall shorter operative time (100.0 ±57.7 minutes, p value <0.001), compared to those undergoing non-emergent colectomies (179.5 ± 111.1 minutes). The emergent colectomies cohort had more statistically significant predisposing risk factors (6 versus 1). These risk factors, present at the time of surgery, include: ventilator dependent (p value of 0.030), disseminated cancer (p value of 0.002), history of renal failure (p value of 0.030), sepsis (p value <0.001), septic shock (p value < 0.001), and a class 4 dirty/contaminated wound (p value < 0.001).

Conclusions: Emergent surgery is known to have poorer overall outcomes. A history of ventilator dependence, disseminated cancer, renal failure, and evidence of sepsis at the time of presentation, should be considered as significant risk factors in patients with a history of CRC, who require colectomies. Optimizing these factors prior to the time of surgery may result in improved outcomes, and overall decreased mortality rates.

~~P51. Oncologic colorectal surgery and concomitant inflammatory bowel disease: NSQIP analysis of C. Diff infection.~~

~~Jason Sciarretta; John Davis; Georgina Alizo~~

~~**Background:** Clostridium difficile infections (CDI) are associated with serious complications with approximately 453,000 cases of CDIs and 29,000 deaths identified each year in the United States. Specific risk factors of C. difficile colonization in hospitalized colorectal cancer (CRC) and inflammatory bowel disease (IBD) patients remains unclear.~~

~~**Hypothesis:** This study aimed to evaluate the incidence of CDI on the after colectomy for CRC in IBD patients and determine those at risk during the preoperative period.~~

~~**Methods:** We queried the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) 2016 database for all colorectal surgery for CRC with concomitant IBD. These patients were then reviewed for CDI infection. Cases were recorded as emergent and elective. Standard statistical analysis, including multivariate regression, was performed to determine factors associated with complications.~~

Results: 55,236 colorectal surgeries (CRS) were reported at > 800 participating ACS-NSQIP hospitals. A total of 841 patients were identified with CDI of which 247 (29.3%) reported complications following CRS for neoplasm. Of these, fifty patients (20.2%) were identified with a history of IBD: 41 (82%) Crohn's disease and 9 (18%) ulcerative colitis. Overall median age was 73.5 ± 16.3 years (range, 24 to >90), with 33 (66%) females and 82.0% identified as Caucasian. Majority of patients underwent elective surgery (66%), most commonly partial colectomy w/removal of terminal ileum & ileocolonic anastamosis ([n=39, 78%], CPT: 44160). Patients requiring emergency surgery were more likely to be males (p=0.042), have preoperative hypoalbuminemia (p=0.003) and longer hospital length of stays (LOS) (p=0.014). Wound classification was predictive of increased LOS (p= 0.049). We found no differences with transfusions (p= 0.677), age (p=0.935), diabetes (p= 0.700), and BMI (p=0.093). All patients were discharged alive following CRS however two deaths (4%) did occur the same year (p=0.044) in the emergent Crohns patients.

Conclusions: Patients with underlying IBD completing CRC surgery are at risk for developing acute CDI. Crohns patients have a highest incidence of CDI following emergency CRC surgery. Further research is needed to investigate the attributable risks of surgery due to CDI among patients with Crohn's disease.

P52. Non-abdominal imaging: a marker of illness severity and outcome in elderly patients needing emergency abdominal surgery

Lavina Malhotra; Charles Adams, Jr.; Michael Connolly; Daithi Heffernan; Andrew Stephen; Eric Benoit

Background: Sepsis is known to cause neurologic and pulmonary dysfunction, but the elderly are exceptionally susceptible due to their limited reserve in these systems. This concept is largely the basis of the qSOFA scoring system, which aims to identify patients with sepsis earlier. Many elderly patients with abdominal sepsis undergo unrevealing non-abdominal imaging on presentation and it is unknown whether this predicts illness severity or outcomes.

Hypothesis: We hypothesize that elderly patients with abdominal sepsis that undergo extra-abdominal imaging present with a greater burden of illness.

Methods: We conducted a 4 year retrospective review of patients greater than age 65 that underwent emergency abdominal surgery for abdominal sepsis after presenting to the emergency room. Charts were reviewed for emergency room workup and patients were divided into two groups: those with only abdominal CT imaging(abdCT) and those with abdominal CT and non-abdominal CT imaging(extraCT). Chief complaints, presenting laboratory values, qSOFA, and comorbidities were reviewed in all patients. Indications for and results of the non-abdominal CT workups were recorded. Outcomes reviewed included time to the OR, need for the ICU, infectious complications, and mortality.

Results: Of the 130 patients, 100 had abdCT and 30 extraCT. The abdCT and extraCT patients were similar age (75.1 vs 75.7 years; $p>0.05$). Chief complaints charted by the ER staff and surgical consultant were more often disparate in the extraCT group(63% vs 14%; $p<0.001$). Presenting WBC was higher in the extraCT group(15.9 vs 11.7; $p=0.002$) and qSOFA was more often positive(33% vs 7%; $p<0.001$). Among the 38 extraCT imaging tests, none of the head CT scans was positive, and only 2 of the chest CTs were noted to have a positive finding. Only two of 38 non-abdominal CTs did not have a clinical indication. Delivery of surgical care was unaffected as time to the operating room was similar in the two groups. Outcomes were worse in the extraCT group with increased need for

the ICU (70% vs 31%; p<0.001), higher mortality (33% vs 6%; p<0.001), and higher rate of infectious complications (46% vs 25%; p=0.04).

Conclusions: Among elderly patients who require emergency abdominal surgery non-abdominal CT imaging may be a marker of severity of the abdominal process and indicate presence of extra-abdominal manifestations of abdominal sepsis. Additionally, it may indicate decreased neurologic and pulmonary reserve in the elderly.

P53. Prophylactic Drainage After Appendectomy for Perforated Appendicitis in Adults

Sinong Qian; Georgia Vasileiou; Gerd Pust; Tanya Zakrison; Rishi Rattan; Martin Zielinski; Mohamed Ray-Zack; Muhammad Zeeshan; Nicholas Namias; Daniel Yeh

Background: We sought to assess the efficacy of prophylactic abdominal drainage to prevent postoperative complications after appendectomy for perforated appendicitis.

Hypothesis: Prophylactic abdominal drainage doesn't prevent postoperative complications after appendectomy for perforated appendicitis.

Methods: In this post hoc analysis of a prospective multicenter study of appendicitis in adults (≥18 y), we included patients with perforated appendicitis diagnosed intra-operatively. Subjects were divided into groups based on receipt of prophylactic drains. Demographics and postoperative outcomes including surgical site infection (SSI), intra-abdominal abscess (IAI), Clavien-Dindo complications, secondary interventions, and hospital length of stay (LOS) were analyzed. Multivariate logistic regression for cumulative 30-day incidence of IAI was performed controlling for age, Charlson Comorbidity Index (CCI), antibiotic duration, presence of drains, and Operative AAST Grade.

Results: A total of 634 subjects were included in the analysis. In comparing Drain (n= 159) vs. No-Drain (n=475) groups, there was no difference in male gender (61% vs. 55%, p= 0.168), weight (87.9±27.9 vs. 83.8±23.4 kg, p= 0.071), Alvarado score (7[6-8] vs. 7[6-8], p= 0.591), WBC count (14.8±4.8 vs. 14.9±4.5, p= 0.867), or CCI (1[0-3] vs. 1[0-2], p= 0.113). The Drain group was significantly older (51±16, 48±17 yrs, p= 0.017). Drain use increased as AAST EGS Appendicitis Operative Severity Grade increased: Grade 3 (62/311, 20%), Grade 4 (46/168, 27%), and Grade 5 (51/155 33%), p= 0.007. For index hospitalization, the Drain group had a higher complication rate (43% vs 28%, p= 0.001) and longer LOS (4[3-7] vs 3[1-5] d, p< 0.001). We failed to detect a difference between groups in incidence of SSI, IAI, or secondary interventions (Table 1). There was no difference in 30-d ED visits, readmissions, or secondary interventions. Multivariable logistic regression showed that only AAST Grade (OR: 2.7, 95% CI (1.5-4.7), p= 0.001) was predictive for cumulative 30-d incidence of IAI.

Conclusions: Prophylactic drainage after appendectomy for perforated appendicitis in adults does not appear to prevent complications and is associated with increased hospital LOS. The Operative AAST Grade is a strong predictor of intra-abdominal infections up to 30-days.

P54. Concomitant HIV/AIDS Infection Worsens Clinical Outcomes in Patients with Acute Diverticulitis

Tiago Finco; Bishoy Zakhary; Xiaofei Zhang; Megan Brenner; Raul Coimbra

Background: Patients with HIV/AIDS can be predisposed to increased morbidity from common acute

surgical diseases such as acute diverticulitis (AD).

Hypothesis: Patients with AD and HIV/AIDS have worse clinical outcomes than AD patients without HIV/AIDS.

Methods: The Nationwide Inpatient Sample (NIS) database was queried from 2012-2014. AD patients were abstracted from the database and divided into the following groups: no HIV/AIDS (NoH/A), HIV, and AIDS. These cohorts were further classified based on treatment for AD: lap colectomy (LC), open colectomy (OC) and no colectomy (NoC). Clinical outcomes including mortality, hospital length of stay (HLOS), cost, and surgery-related infections were compared between groups. Chi Squared Analysis and ANOVA were used for comparison for categorical and continuous dependent variables.

Results: A total of 234,575 patients with AD were identified: 234,366 NoH/A, 50 HIV, and 159 AIDS. Overall, mean age (± SD) was 65 (± 16) years and most patients were female (56.9%). The majority of AD patients were White, while the majority of patients with AD and HIV/AIDS were Black (41.6%). There was no difference in mortality across treatment groups in patients with HIV. Treatment with OC in patients with AIDS resulted in a significantly higher mortality rate than NoC [16.7% vs 2.3%; $p = 0.003$]. Patients in the NoH/A group also had a higher mortality rate if treated with OC than NoC (3.9% versus 1.2%, $p < 0.05$). Sepsis was significantly higher in OC vs NC across all three groups ($p < 0.001$). Additionally, in patients with AD and AIDS, rates of pneumonia and PE/DVT were both higher in OC vs NoC ($p = 0.001$). Patients who underwent LC or OC had a longer HLOS and higher cost than NoC across all groups ($p < 0.001$).

Conclusions: Patients treated surgically for AD incur a higher financial burden than those managed non-operatively, regardless of disease status. Compared to LC, OC results in worse outcomes for patients with AD, with or without HIV/AIDS. Patients with HIV and AD have similar outcomes regardless of treatment option, and those with AIDS and AD have higher rates of infectious and thrombotic complications after open surgical intervention compared to patients who are managed non-operatively.

P55. Lights Off, Camera On! Laparoscopic Cholecystectomy Improves Outcomes in Cirrhotic Patients with Acute Cholecystitis

Tiago Finco; Xiaofei Zhang; Matthew Firek; Megan Brenner; Raul Coimbra.

Background: The clinical outcomes of acute cholecystitis (AC) in liver cirrhosis patients treated either by open (OC) or laparoscopic cholecystectomy (LC) have not been fully investigated in large patient populations to determine best practices, particularly in patients presenting with decompensated cirrhosis (DC).

Hypothesis: In patients with AC, LC leads to better clinical outcomes when compared to OC, independent of severity of liver cirrhosis.

Methods: The National Inpatient Sample (NIS) database was queried from 2012 to 2014 to identify AC patients which were stratified into three groups: no cirrhosis (NC), compensated cirrhosis (CC), and DC. Each group was classified according to the treatment: no cholecystectomy (NoC), OC, and LC. Demographic data and other baseline characteristics of each group were collected. Outcome measures included mortality, hospital length of stay (HLOS), cost, and surgical complications. Chi Square Analysis and ANOVA were used to compare categorical and continuous variables, respectively. Multiple logistic or linear regression analyses were performed to determine risk factors

associated with outcomes. A p value of < 0.05 was considered significant.

Results: A total of 273,499 AC patients were identified: 263,693 had NC, 4,652 had CC, and 5,154 had DC. LC was accompanied by significantly lower mortality than OC in both CC (1.0% versus 4.7%) and DC (5.0% versus 13.2%) patients. Similarly, HLOS was significantly shorter following LC in both CC (5.5 ± 5.1 versus 10.8 ± 14.8 days) and DC (9.7 ± 12.7 versus 16.7 ± 15.4 days) patients. Cost of LC was significantly lower than OC in both CC ($16,387 ± 13,456 versus $34,208 ± 39,887) and DC ($25,967 ± 29,702 versus $66,629 ± 78,570) patients. Compared with LC, logistic regression analyses revealed that both NoC and OC were risk factors associated with higher mortality (OR = 5.65 and 7.07, respectively). OC had a positive, while NoC had a negative correlation to total cost (coefficients of 15661 and -1519, respectively). Surgery related complications such as peritonitis, biliary tract disorder, and surgical infection had less or equal incidence in LC than OC regardless of the severity of cirrhosis.

Conclusions: Cirrhotic patients with AC treated with LC had superior outcomes compared to OC regardless of the severity of cirrhosis. LC led to lower mortality, and decreased HLOS and cost. Our data confirms that LC is feasible and safe even in patients with decompensated liver cirrhosis.

P56. Robotic Cholecystectomy in Acute Care Surgery—More Money, Less Problems?

Kirollos Malek; Joshua Farnsworth; Kaushik Mukherjee; Matthew Surrusco; Xian Luo-Owen; Jeffrey Quigley; Daniel Srikureja;

Background: Robotic techniques have the potential for improved visualization and improved instrument control. We sought to determine if utilizing robotic techniques could reduce the rate of conversion for cholecystectomy (CCY), with concomitant decrease in length of stay and complications.

Hypothesis: We hypothesized that using robotic surgery would result in increased operative cost but decrease the rate of conversion to open CCY.

Methods: We reviewed a prospectively collected Acute Care Surgery registry at a large (>500 bed) adult university hospital over 18 months. Cases from three surgeons with privileges for open, laparoscopic, and robotic cases were included. Operative technique (laparoscopic versus robotic) could not be randomized as trained robotic personnel are available only on weekdays. We collected data on demographics, indication for surgery, nutritional status, comorbidities, OR time, postoperative complications, length of stay, and operating room costs. We analyzed our data in SPSS 22 (IBM Inc., Armonk NY) and utilized Student's T test and Chi-Square analysis. We also performed a linear regression analysis to determine the effect of OR time, robotic surgery, diagnosis, age, ASA score, and body mass index on operating room costs and postoperative length of stay.

Results: 120 laparoscopic and 28 robotic CCY were performed. Demographic parameters (age, gender, medical comorbidities, preoperative albumin and BMI, surgical history and smoking) were comparable. Primary diagnosis was significantly different (Chi-square 0.02), driven by more acute cholecystitis in the laparoscopic group. 0/28 robotic cases and 7/120 (5.8%, p = 0.348 by Fisher's exact test) laparoscopic cases were converted to open (4 for adhesions and 3 for visualization of anatomy). There was no difference in the incidence of postoperative complications. Operative time was similar (146±49 min [robot]vs. 127±74 min [lap], p = 0.101). Postoperative length of stay was 2.1 days in both groups. Robotic procedures had higher unadjusted OR costs ($3979±$1333 vs. $2484±$1282, p < 0.001). After multivariable analysis, robotic surgery was associated with a $1131 increase in costs [95%CI $723, $1540, p < 0.001]; OR time and BMI were also associated with

increased cost. ASA score and BMI were associated with increased postoperative length of stay.

Conclusions: Robotic CCY can be safely performed on an ACS service with minimal risk of conversion, although a larger study would be required to determine if robotic CCY independently reduces the risk of conversion. Further study to optimize the cost efficiency of robotic surgery may be beneficial.

P57. Prehabilitation Before Abdominal Surgery: A Systematic Review of the Literature and Meta-Analysis

Karla Bernardi; Oscar Olavarria; Julie Holihan; Nicole Lyons; Alexis Milton; Deepa Cherla; Tien Ko; Lillian Kao; Mike Liang

Background: Patients who are obese or have poor fitness are at increased risk for complications, such as surgical site infections (SSI), following abdominal surgery. For this reason, there has been substantial interest in the role of prehabilitation, or preoperative exercise and nutritional counseling, in reducing surgical complications.

Hypothesis: We hypothesized that prehabilitation prior to abdominal surgery is associated with a decreased rate of SSIs among patients undergoing abdominal surgery.

Methods: A Systematic Review of the literature was performed using PubMed, Embase, and Cochrane Library following the PRISMA guidelines. Two independent reviewers identified randomized controlled trials (RCTs) regarding prehabilitation with an exercise regimen and/or nutritional counseling prior to non-bariatric abdominal surgery compared to usual care. Only manuscripts reporting their rate of SSIs were included. Cumulative analysis was performed with Fishers exact test. Meta-analysis was performed using a fixed effects model and heterogeneity was assessed using Higgins I-square.

Results: A total of 153 titles were screened to identify a potential of 27 manuscripts. After review, four RCTs evaluating 340 patients met criteria to be included for analysis. Prehabilitation was associated with improvements in fitness and weight loss in all studies. There were no difference in SSI when comparing prehabilitation and usual care on both cumulative analysis (5.5% vs 5.0%, p=1.00) and meta-analysis (relative risk = 1.00; 95% confidence interval = 0.95-1.05, I-square=0.0%) (Figure).

Conclusions: Surprisingly, prehabilitation is not associated with a decreased rate of SSIs in patients undergoing non-bariatric abdominal surgery. While substantial interest exists in prehabilitation and its potential benefits, the value of these programs remains unclear. Future studies should assess a composite prehabilition regimen, which include risk reduction strategies for SSI including smoking cessation and glycemic control.

P58. The Impact of Surgical Care Improvement Project Compliance on Surgical Site Infection in a Trauma Population

Adel Elkbuli; Alyssa Eily; Brianna Dowd; Shaikh Hai; Mark McKenney; Dessy Boneva

Background: Surgical site infections (SSIs) are a critical, possibly preventable, threat to patient safety and are one of the most common healthcare-associated infections. The Surgical Care Improvement Project (SCIP) was established to increase standardization, improve patient safety, and

reduce SSIs. National benchmark metrics are established by the Trauma Quality Improvement Program (TQIP). We sought to assess the rate of SSIs in our trauma population, associated with SCIP compliance against a national benchmark.

Hypothesis: Adherence to SCIP guidlines is associated with reduced SSI rates.

Methods: A four-year review between February 2014 and December 2017 of operative trauma procedures, which complied with the SCIP guidelines using our level I Trauma Center's registry. Patients were categorized based on total SSI and also into superficial SSI (SSSI), deep SSI (DSSI), and Organ/Space SSI. Chi-squared analysis was utilized to compare our rate of SSIs to the TQIP benchmark.

Results: Overall, 13,052 SCIP compliant trauma operations were reviewed. Patients ranged from under 1 to 105 years-old with a mean age of 49.7 years. There were 34 SSIs out of 13,052 operations for a rate 0.26%. This rate is significantly lower than TQIP benchmark for 2016-2017 (0.26% vs. 0.75% vs. 0.70%, 95%CI=1.47-1.70, $p<0.0001$).

Conclusions: SCIP adherence was associated with an 65% reduction rate of SSIs compared to the TQIP benchmarks for trauma patients. The SCIP guidelines are effective in decreasing the rate of surgical site infections in trauma patients.

P59. A Successful Multipronged Approach to Reducing Infectious Complications to Zero Following Colon Surgery

Lael King; Nancy Robinson; Nancy Khardori

Background: For 3 years (2015-2017) our level one trauma, teaching hospital with a bed capacity of 525 experienced less than optimal outcomes for colon surgical procedures. Since 2015 the report from the National Healthcare Safety Network for our institution showed us in the lowest 25th percentile amongst similar acuity hospitals. The standardized infection ratio was greater than 2 every year from 2015 to 2017.

Hypothesis: Multiple variables could be leading to this unfavorable outcomes profile associated with our colon surgeries.

Methods: The infection preventionists directly observed the process in the operating rooms during colon surgeries. The focus was around maintaining sterility including consistently changing gown and gloves before anastomosis, and isolating the closing instruments. Upon review of prior cases it was found that cefoxitin was the default antimicrobial agent in the perioperative setting unless contraindicated. After review of the colon surgical cases since 2015, it was recognized that the use of cefoxitin was associated with infectious complications and in cases using a combination of ceftriaxone and metronidazole no infections occurred. It was decided to make the change within the operating room carts to have ceftriaxone and metronidazole as the default antibiotic in place of cefoxitin.

Results: The focus around sterility did not lead to a significant reduction in infections, still maintaining standardized infections ratios over 2 in 2017. The antimicrobial intervention was the last to be instituted in December 2017. As of 10 months post intervention (October 2018) there have been no reportable infections in this patient population. Currently the standardized infection ratio for our institution is 0, placing us amongst top rated colon surgery hospitals.

Conclusions: The initial approach of vigilance around sterility although useful, did not impact the incidence of post colon surgical infections. The association of infected cases with the use of the "workhorse standard of care" systemic antimicrobial therapy led us to make the change to ceftriaxone and metronidazole. As shown in the results, this simple intervention resulted in a 100% reduction in infections following colon surgeries.

P60. Intraoperative enteral nutrition does not increase the incidence of aspiration pneumonia in adult burn patients

Julia Cartwright; Anna Krzak; Jill Cherry-Bukowiec

Background: Estimated energy needs of thermal injury patients can increase by 200 -300% with protein needs of more than 2.0 gm/kg/d for large TBSA injuries. Enteral nutrition (EN) is usually necessary to provide adequate nutrition. EN is frequently interrupted for wound care and operative interventions due to concern for aspiration regardless of feeding tube location. Recent studies found that EN interruptions result in a 48% caloric deficit and that 66% of interruptions are avoidable. Underfeeding predisposes patients to poor wound healing, decubitus ulcers, and infection. Incidence of aspiration is decreased by changing the level of EN infusion from the stomach to the small bowel (SB). In an effort to limit interruptions in EN delivery, we investigated the incidence of aspiration in thermal injury patients receiving SB feeding through the entire perioperative period.

Hypothesis: Intraoperative SB EN does not increase the incidence of aspiration pneumonia in burn patients.

Methods: A retrospective chart review was performed for patents (>18 years old) admitted to the burn unit in 2015 at a tertiary academic hospital/verified burn center. Patients admitted with a burn diagnosis who received SB EN and required operative intervention were included. Exclusion criteria were: contraindications to intraoperative feeding, including EN via gastric feeding, intraoperative prone positioning, or history of aspiration. Each operative case was reviewed for evidence of perioperative or intraoperative aspiration event(s).

Results:

Conclusions: When applied appropriately, continuation of SB EN during the entire perioperative period does not increase incidence of aspiration pneumonia in thermal injury patients.

P61. Mandatory Brief Operative Wound Classification Alone Does Not Increase Accuracy of Nursing Wound Classification

Samuel Zolin; Joseph Golob Jr M.D.; Brian Young; Vanessa Ho; Esther Tseng; Jeffrey Claridge

Background: Accuracy of nurse-documented surgical wound classification (NDWC) is critical. These data are used to calculate hospital standardized infection ratios, which are utilized for a variety of quality programs, including national quality metrics, hospital quality comparisons, and compensation incentive programs. In February 2018, our hospital added a mandatory wound classification field to the surgeon's brief operative note (BONWC) with the goal of improving documentation accuracy.

Hypothesis: We hypothesized that mandatory BONWC would be associated with improved accuracy of NDWC.

Methods: A single-center retrospective cohort study was performed on all adult patients undergoing colon operations from January 2017 to August 2018. Colon cases were selected given variation in wound classification (WC) and use in quality metrics. For each case, the final dictated operative note was reviewed to determine the correct WC by Centers for Disease Control criteria and was considered the gold standard. The BONWC and NDWC were compared to the wound class derived from review of the operative note to calculate overall accuracy of each WC. We used Fisher's exact test to compare NDWC accuracy before and after mandatory documentation and Cohen's kappa to determine inter-rater reliability of BONWC and NDWC.

Results: A total of 386 operations were performed by 25 surgeons, with 125 (32.4%) occurring after BONWC became mandatory. Surgical indication was 52.3% elective, 28.2% emergency, and 19.4% trauma-related. NDWC was more accurate for elective cases than for emergency and trauma cases (69.8%, 49.5%, and 53.5% respectively, $p < 0.001$). Of 151 cases with misclassified NDWC, 91 cases (60.3%) were under-classified, with actual wound class higher than NDWC, while 60 (39.7%) were over-classified. BONWC accuracy was 72.5%, with 26 cases (78.8%) under-classified and 7 (21.2%) over-classified. Weighted kappa for NDWC and BONWC was 0.67, indicating moderate agreement. NDWC accuracy did not change significantly with mandatory BONWC (65.6% with BONWC vs 58.6% without, $p = 0.22$).

Conclusions: NDWC and BONWC agreement was imperfect, and mandatory BONWC was not associated with a statistically significant increase in NDWC accuracy. Both surgeons and nurses tended to under-document wound class, potentially leading to underestimation of expected institutional surgical site infection volumes. Further work is needed to ensure that accurate wound classifications are available for use in hospital quality metrics.

P62. Implementation of a perioperative enteral nutrition guideline in the intensive care unit

Julia Cartwright; Talya Lorenz; Anna Krzak; Jill Cherry-Bukowiec; Mike Korona

Background: The goal of adequate nutrition is to minimize the loss of lean body mass associated with the catabolic stress response seen in critical illness. Enteral nutrition (EN) supplementation has been shown to reduce complications, shorten length of stay, and improve patient outcomes. Critically ill adults are at increased nutritional risk secondary to delays in EN initiation and frequent cessation of EN for procedures. The use of evidence-based nurse-driven fasting guidelines may help mitigate the cumulative nutrition deficits caused by unnecessary EN interruptions.

Hypothesis: Implementation of a peri-procedural EN guideline in critically ill patients undergoing operative interventions will reduce negative caloric balance accumulation without increased incidence of aspiration pneumonia

Methods: Preliminary data involved a retrospective chart review performed in 2013 and 2015 for adult, burn patients undergoing operative intervention at an academic hospital and verified burn center. This review demonstrated zero aspiration events or post-operative aspiration pneumonia in 27 patients (69 operative cases, TBSA rang 3-80%) who received post-pyloric, perioperative EN. Prospective data was then collected from 2016-2018 in patients meeting the same inclusion criteria. Data was collected regarding the nature of surgical procedure, airway assessment, location of feeding tube, perioperative EN infusion, events of intra-operative witnessed aspiration and post-operative aspiration pneumonia.

Results: There were zero aspiration events and no evidence of post-operative aspiration pneumonia in burn patients who received peri-procedural feedings from 2016-2018. Given the demonstrated

safety, a draft protocol was designed to include critically ill surgical patients in need of procedural interventions. This draft protocol was created and implemented in the surgical ICUs with multidisciplinary input.

Conclusions: Perioperative feeding is safe for burn patients with secure airways receiving post-pyloric EN during supine, operative procedures. Implementation of a perioperative feeding protocol for eligible, critically ill patients at nutrition risk should be further studied for safety and nutrition-related patient outcomes.

P63. Preliminary Outcomes of Perioperative Glucose Management in Elective Surgical Patients at a Community Hospital

Abdel Salous; Karen Sweeney; Chris D'Adamo; Vanita Ahuja, MD

Background: Perioperative hyperglycemia was identified as a common risk factor for increased post-operative morbidity, including surgical site infections, in patients with diabetes mellitus (DM) at Sinai Hospital of Baltimore.

Hypothesis: Better periperative glycemic control will decrease post-surgical complications, including 30 day readmission and surgical site infections.

Methods: A multidisciplinary team was assembled and educational seminars were held and a standardized multi-phasic protocol was created, streamlined, and approved for the management of preoperative patients with DM . Perioperative glucose management was assessed and treated at multiple phases and by multiple providers using a unified electronic medical record order set platform. Continuous refinement of the protocol was achieved by incorporating feedback from care providers and team members. Data was collected from the ACS NSQIP database prior to and following the intervention.

Results: Data was collected and reviewed for a total 198 diabetic patients (108 pre-intervention and 90 post-intervention) who underwent elective general surgical procedures. Our preliminary data analysis showed pre-intervention glucose range was 35-419 while post-intervention range was 65-317. The mean pre-op glucose was 148.6 in the pre-intervention group and 144 for the post-intervention group. The post-op glucose mean was 181.8 in the pre-intervention group and 185.2 in the post-intervention group. None of these differences reached statistical significance in t-tests ($p>0.05$). Surprisingly, the post-intervention group had a significantly longer duration of surgery (8.1 days vs 5.4 days; $p=0.0173$) and significantly longer duration of surgery (277.7 minutes vs. 218.9 minutes; $p=0.0063$). Readmission within 30 days decreased from 16.7% to 12.2% following the intervention ($p=0.27$).

Conclusions: A novel multidisciplinary protocol was designed and implemented to monitor perioperative hyperglycemia in elective surgical patients. While the short-term outcomes (blood glucose measurements) were not significant, potentially secondary to increased duration of surgery and duration of stay, the long-term outcome measures showed improvement (decreased readmission). Future efforts will include formally assessing intervention compliance and covariate-adjusted regression analyses adjusting for factors (comborbidity, length of surgery, etc.) that may be confounding the effectiveness of the intervention.

P64. Surgical Site Infection in Patients Undergoing Laparoscopic Appendectomy: A Single Center Review.

Emily Stock; Jackson Baril; Luke McCutcheon ; James Glover; Catherine Statz; Victor R. Vakayil; Robert Bulander; James Harmon

Background: The treatment of acute appendicitis is evolving with an interest in avoiding surgical complications. Current literature notes a range of surgical site infection (SSI) rate after laparoscopic appendectomy (LA), ranging from 2.3% to 5.8%. As a part of a quality improvement surveillance initiative, we report the rates of SSI following LA for uncomplicated acute appendicitis at a single tertiary center.

Hypothesis: Laparoscopic appendectomy is associated with low postoperative infectious morbidity.

Methods: We performed a single-center review of adult patients undergoing laparoscopic appendectomy from 2011 to 2017. National Healthcare Safety Network definitions were used to evaluate 30-day postsurgical site infections. We performed a univariate analysis of baseline characteristics and identified variables associated with an increased rate of SSI.

Results: 878 patients underwent LA with an overall SSI rate of 1.9% (N=17) including two SSIs from 13 LA cases converted to open appendectomy. Mean age of the patient population was 34.1 ± 14.8 years with a BMI of 26.3 ± 5.9. ASA score was ≥3 in 8.8% of patients, and 39% had a wound class ≥3. Chlorhexidine-gluconate operative scrub was used in 97.8% of patients without infection and 92.3% of patients with SSI. On univariate analysis of the 865 LAs not converted to open, those who developed SSI (N=15) tended to be male (N=12, P=0.03), older (43.0 ± 15.7 years, P=0.04), have higher wound classification score (Median=3, P=0.009), and longer operative times (81.9 min ± 33.5, P=0.003). A total of 47% (N=7) of LA SSIs had positive wound cultures, 33% of which were Escherichia coli (Figure1). There were no isolates of Staphylococcus aureus. Excluded from this analysis is one SSI among 24 patients who underwent open appendectomy in the reporting period.

Conclusions: We report a low rate of SSIs (1.9%) among patients who had LAs. We note a significantly increased rate of SSIs among patients of the male sex, higher BMI, and longer operative times.

P65. Reducing Surgical Site Infections in C-Section Using a Novel Silver-Plated Dressing

Sue Grant; Amanda Budak

Background:
Surgical Site Infections (SSI) after caesarean section have been reported from 3-15 percent in the published literature. There are multiple ramifications to a SSI in an early post-partum mother, including but not limited to: extended pain, additional cost of managing the infection, and the potential for re-hospitalizations to treat the infection.

Hypothesis:
Changing the clinical protocol for managing wounds from a silver chloride dressing to a silver plated nylon dressing will decrease the incidence of post c-section wound infections.

Methods:
The study was performed at a community-based hospital in Pennsylvania that performs approximately 750 deliveries annually with a 31.3% C-Section rate. The hospital has reported a monthly SSI rate of 3-10% on an ongoing basis. When plotted and analyzed over time, there appeared to be a trend toward sustained higher infection rates. This led the facility to evaluate current post-surgical wound dressing and infection prevention protocols. The hospital followed a

standardized SSI prevention bundle which included the use of a silver chloride impregnated dressing (Aquacel AG) over the surgical incision.

Due to increasing infection rates, and patient reports of discomfort and difficulty removing the silver chloride impregnated dressing (Aquacel AG), and based on the body of published evidence, the hospital elected to switch to a silver-plated nylon dressing. Retrospective data were gathered to confirm the specific protocol used for skin prep during the baseline period in which the silver chloride impregnated dressings were used, and additional patient data were gathered including age, BMI, type of c-section procedure (elective versus emergent), size of delivered infant, and the presence of co-morbidities, and pre-eclampsia. Upon switching to the silver-plated nylon dressing, all other aspects of the SSI prevention protocol were unchanged.

Results:
After the change in protocol to the silver-plated dressing, and over the course of twelve consecutive months, the department of labor and delivery reported zero surgical site infections.

The findings of this retrospective analysis demonstrate the effectiveness of a silver-plated nylon dressing as part of a bundle to help prevent SSI in c-section patients. While small in scope, these findings suggest use of Silverlon silver-plated nylon dressings has a positive impact on SSI rates associated with c-section, and the need for a larger study to demonstrate statistically significant results.

Conclusions:
Switching to a silver plated nylon dressing decreased the overall incidence of post operative surgical site infections.