

MO1. Trajectories in survivors and non-survivors differ in adult and older adult burn patients

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Background: Survival post-burn injury has improved over the past few decades. However, there are still a large proportion of patients that do not survive due to the complexity of the burn injury itself, pre-existing medical conditions, age, and complications.

Hypothesis: The purpose of this study was to characterize the phases of inflammatory and metabolic trajectories in survivors and non-survivors and to compare these in adults and older adults.

Methods: We included patients (aged ≥ 18 years) with a burn injury ($\geq 10\%$ TBSA) admitted to our burn centre between 2006 and 2020. Clinical outcomes, laboratory measures, and inflammatory biomarkers were compared among survivors (SV), non-survivors who died within four days ($NS\leq 4$), and non-survivors who died in five or more days ($NS\geq 5$) post-injury. These groups were also compared within age cohorts: adults aged ≤ 64 years and older adults aged ≥ 65 years. Measures were based on days post-injury: 0-1, 2-4, 5-10, 11-18, 19-28, ≥ 29 days.

Results: We studied 872 patients, median age 49 (35-63) years and median 19% (13-34) TBSA burn for survivors ($n=705$; 81%), $NS\leq 4$ days ($n=99$; 11%), and $NS\geq 5$ days ($n=68$; 8%). Demographics and injury characteristics were significantly different among SV and NS. Median age was 46 (33-59) years for SV, 62 (46-73) years for $NS\leq 4$, and 67 (54-76) years for $NS\geq 5$ ($p<0.0001$). Median % TBSA burn was 17 (13-26) for SV, 67 (43-88) for $NS\leq 4$, and 27 (18-44) for $NS\geq 5$ ($p<0.0001$). We saw evidence of organ dysfunction and a diminished inflammatory profile in older adult burn patients associated with adverse outcomes.

Conclusions: Survivors and non-survivors express distinct biomarker profiles post-injury; these were profoundly different in adults and older adults. Elucidating the differences in trajectories among early and late non-survivors will allow for the prediction and identification of patients at risk of mortality - a crucial step for personalized burn care.

MO2. Fever workups in a surgical ICU: an opportunity for diagnostic stewardship

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Background: Fever is common in surgical patients and often prompts an infectious investigation. Delay in the diagnosis and treatment of infection has a measurable mortality. However, in this population fevers may be caused by transfusions, alcohol withdrawal, drug reactions, or inflammation secondary to trauma or surgery.

Hypothesis: We hypothesize this extensive workup rarely finds infection as the cause and can add to patient morbidity and hospital cost through unnecessary testing, longer lengths of stay, and antimicrobial overuse.

Methods: A retrospective analysis of the fever workups in a surgical ICU was performed. Patients that had blood cultures obtained were identified and then further evaluated for baseline characteristics, risk factors for hospital acquired infections, studies ordered, and infections identified. A workup was considered positive if an infection was identified and treated with antibiotics.

Results: A total of 361 workups from 167 patients were reviewed. In addition to blood cultures, most workups included radiographic imaging, 298 (83%) chest x-rays and 146 (40%) CT scans. The most

common microbiologic studies were from urine (133, 37%) and respiratory tract (127, 35%). Less than half (164, 45%) of workups resulted in finding an infection with pneumonia identified most often in 70 patients (19%). Patients with a positive workup had longer median hospital (27 vs. 17.5 days, $p < 0.05$) and ICU (15 vs. 8 days, $p < 0.05$) lengths of stay and were more likely to require mechanical ventilation (OR 4.3, 1.9-9.9) for longer (13 vs. 4.5 days, $p < 0.05$). In a multivariate regression leukocytosis was associated with an increased likelihood of a positive workup for all patients (OR 1.1, 1.0-1.1), while temperature was associated with a positive workup for patients with traumatic brain injury (OR 2.5, 1.3-4.9). Surgeries involving head, face, and chest were all associated with negative workups (OR 0.3, 0.4, 0.4 respectively, all $p < 0.05$) suggesting these procedures in particular cause a non-infectious inflammatory response. Patients on antibiotics at the time of the workup were also more likely to have a negative workup (OR 0.6, 0.4-0.9). While respiratory cultures were most likely to be positive, there was a high rate of potential overtreatment with 23 (33%) patients receiving antibiotics but not having clinical or radiologic findings.

Conclusions: Critically ill surgical patients undergo many diagnostic tests when they experience a fever. However, fever remains a non-specific indicator of infection with less than half of workups identifying an infectious cause. Opportunities exist to focus testing within fever workups in the surgical ICU.

MO3. Wound Irrigation for the Prevention of Surgical Site Infections: Systematic Review and Network Meta-Analysis

Nathan Bontekoning; Hannah Groenen; Hasti Jalalzadeh; Marja Boermeester

Background: Surgical site infection (SSI) is one of the most common post-operative complications and is associated with significant morbidity and mortality. Prophylactic intra-operative wound irrigation (pIOWI) is widely used to reduce the risk of SSI. Nevertheless, a wide variation in irrigation solutions and application methods are currently used. Therefore, we aim to compare the efficacy of different types of incisional pIOWI in the prevention of SSI.

Hypothesis: We hypothesize that any type of pIOWI will reduce the number of SSIs compared to no pIOWI.

Methods: The PUBMED, Embase, CENTRAL and CINAHL databases were searched on November 21, 2022. We included randomized controlled trials (RCTs) comparing incisional pIOWI to either no pIOWI or incisional pIOWI using different types of solutions, with SSI as reported outcome. Studies investigating intra-peritoneal and mediastinal lavage were excluded. A frequentist network meta-analysis was conducted and relative risks (RR) with corresponding 95% confidence intervals (CI) were extracted.

Results: We identified 1495 articles, of which 26 RCTs were included in the systematic review, with 11972 patients reporting 1084 SSIs; an overall incidence of 9.1%. Compared to saline wound irrigation, antibiotic irrigation (RR 0.28, 95% CI 0.11-0.71) and aqueous povidone-iodine irrigation (RR 0.49, 95% CI 0.28-0.86) showed significant benefit in reducing SSI. Additionally, no irrigation showed no significant difference compared to saline irrigation (RR 1.10, 95% CI 0.62-1.93).

Conclusions: This network meta-analysis shows prophylactic intra-operative incisional wound irrigation using only an antibiotic or povidone-iodine solution is effective in reducing SSI.

MO4. VBI-S for the Treatment of Hypotension in Septic Shock

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Background: Septic shock leads to 11 million deaths per year worldwide, generating a need for more efficacious treatment options. A major challenge to treatment is a decrease in blood pressure that eventually becomes unresponsive to fluids and vasopressors. This problem is largely mediated by an overproduction of nitric oxide (NO). VBI-S is a patented fluid designed for the pathophysiology of septic shock. It consists of hydrophobic phospholipid nanoparticles that reversibly absorbs NO, a lipophilic molecule. VBI-S may reduce the bioavailability of NO, elevate blood pressure even when fluids and vasopressors are ineffective and redistribute NO without inhibiting its production and homeostatic interactions. The primary aim of this study is to test the safety and efficacy of intravenous infusion of VBI-S in elevating blood pressure in septic shock patients.

Hypothesis: We hypothesized that intravenous infusion of VBI-S in patients with severe septic shock will increase blood pressure by at least 10 mmHg. We further hypothesized a decrease in the dose of vasopressors required to maintain a mean arterial pressure (MAP) of 60-65 mmHg after VBI-S infusion.

Methods: The enrollment goal of this open-label phase IIa is twenty patients aged 18 years and above. Hypotensive septic patients in whom fluids have failed to elevate their MAP to 65 mmHg are given up to 1500 ml/24 hours of the test fluid which is VBI-S. Data are mean \pm SE.

Results: Fourteen patients have been enrolled so far. The mean SOFA score of the patients was 15, indicating severe sepsis. After VBI-S infusion, MAP increased from 64.29 ± 1.17 to 76.86 ± 1.22 mmHg ($p < 0.0001$). The volume of VBI-S needed to achieve the goal was 584.86 ± 103.86 mL. The average dose of vasopressors decreased from 42.65 ± 17.82 to 22.38 ± 13.43 ug/min post-infusion ($p = 0.032$). The time required to maximally reduce vasopressors was 15.50 ± 3.55 hours. Variable doses of VBI-S maintained the blood pressure for 32.04 ± 4.90 hours. Six patients were taken completely off Levophed within 48 hours. These patients had a mean dose of vasopressor as Levophed equivalents of 11.93 ± 2.99 ug/min. Those whose vasopressor dose was reduced to greater than zero had a pre VBI-S vasopressor dose of 87.02 ± 35.00 ug/min and a post VBI-S vasopressor dose of 45.64 ± 29.58 ug/min ($p = 0.018$).

Conclusions: Intravenous infusion of VBI-S in severely septic patients improved MAP after other fluids had failed and decreased reliance on vasopressors post-VBI-S infusion. No adverse effects of VBI-S were observed. These preliminary data support our hypotheses and suggest the efficacy of VBI-S as a potential treatment for the hypotension caused by the absolute and/or relative hypovolemia of septic shock. Further study is indicated regarding the effect of VBI-S in other organ systems.

MO5. Critical Illness Leads to More Extensive Fever Work-up, but Consensus is Lacking

Patrick Delaplain; Jeffrey Santos; Justin Dvorak; Tina Mele; Rondi Gelbard; Christopher Guidry; Philip Barie; Sebastian Schubl

Background: Despite the high prevalence of post-operative fever, consensus is lacking for the components of a fever work-up and when empiric antibiotics (abx) should be started.

Hypothesis: There is a lack of consensus surrounding many common components of a post-operative fever work-up.

Methods: Surgical Infection Society membership surveyed to determine practices surrounding post-operative fever work-up. Eight scenarios were posed in febrile (38.5°C), post-op general surgery (GS) or trauma (T) pts with 19 possible components of work-up (physical exam, CBC, fungal biomarkers, lactate, procalcitonin [PCT], cultures [cx], imaging) and management (abx). Each scenario was then reconsidered for ICU pts (intubated/hemodynamically unstable). Agreement on a parameter (< 1/3 or > 2/3 of respondents) achieved consensus, positive or negative. Parameters between had equipoise. Comparisons between averaged percentage of respondents is done with Wilcoxon test.

Results: The distribution of responses was similar between non-ICU GS and T patients, although the averaged % respondents who chose CBC and PCT was higher in GS patients (90% vs. 82%, $p=0.019$ and 23% vs. 18%, $p=0.025$). Across non-ICU GS and T scenarios, only physical exam (91%) and CBC (87%) achieved positive consensus. There was no consensus for blood cx (53%), urine cx (50%), CXR (65%) or empiric abx (Gram + [36%], Gram - [37%]). All other work-up components achieved negative consensus. Summarized averaged responses ($n = 47$) between ICU and non-ICU scenarios are shown below (Figure.) For ICU scenarios, there were no differences among parameters that achieved consensus (GS vs. T.) Physical exam (92%), CBC (91%), blood cx (70%), CXR (81%), and abx (Gram+ [68%], Gram- [69%]) achieved positive consensus. There was equipoise for PCT, lactate, urine cx, CT abdomen, and bronchoscopy/lavage. Figure. Percentage of respondents selecting individual elements of a fever work-up across ICU and non-ICU scenarios.

Conclusions: The initial operation had minimal impact on selected fever work-up among respondents. However, higher acuity (i.e., ICU scenarios) led to more components achieving positive consensus. Parameters with equipoise are potential candidates for formal guidance or pragmatic prospective trials.

MO6. Time to Abdominal Percutaneous Drain Placement is Not Associated with Complication

Jacob O'Dell; Andrew Dulek; Matthew Johnson; Aaron Rohr; Robert Winfield; Christopher Guidry

Background: Percutaneous drains, typically placed by interventional radiology (IR), are used to treat a variety of intra-abdominal processes, including infection. Increasing time to source control has been shown to predict worse outcomes in patients with intra-abdominal infections, but it is unclear whether this relationship is valid when the source control method is percutaneous drainage.

Hypothesis: Time from diagnostic imaging to drain placement will be associated with higher complication rates in a population of patients requiring IR percutaneous drainage for intra-abdominal, retroperitoneal, or pelvic processes.

Methods: Single institution, retrospective, case-control study. We identified all adult patients who received an IR placed percutaneous drain in the abdomen, retroperitoneum or pelvis from 2020-2021. We excluded peritoneal drains for ascites, biliary decompressions, urinary decompressions, and outpatient procedures. Demographics, comorbidities, and SOFA scores were collected. Multiple organ failure (MOF) was defined as derangement of two or more organ systems with a SOFA score of at least 3. The time interval from imaging to drain placement was also recorded. Patients were stratified based on our composite complication variable defined as the occurrence of any of the following: in-hospital mortality, subsequent IR drainage procedures, hospital readmission within 30 days of discharge, or surgery for same disease process within 30 days of drain placement. Standard statistical analysis and multiple logistic regression was performed.

Results: 184 patients were included, 94 of which developed a complication (51.1%). Time from imaging read to drain placement did not differ between the complication and non-complication groups (median 21 hours [IQR 16.9-31.1] vs. 23.9 hours [16.7-31.1]; $p=0.27$). 41 patients (22.3%) presented with MOF. Controlling for age, sex, comorbidity burden, immunosuppression status, and multi-organ failure (MOF), the time from imaging performance to drain placement was not associated with complication (OR 1.0; 95% CI: 0.98-1.01; $p=0.48$).

Conclusions: Time from diagnosis to percutaneous drain placement did not differ between patients with and without complications from their disease. The urgency of percutaneous drain placement should continue to be explored, with ramifications on patient outcomes and healthcare resource utilization.

MO7. The Pathobiome and Immunologic Function Following Blunt Splenic Injury: The Bad and the Good!

Samuel Coster; Kwame Akuamoah-Boateng; Zequan Yang; Aimee Zhang; Saad Shebrain; Robert Sawyer

Background: The severity of blunt splenic injury dictates management, ranging from a non-operative approach to splenectomy. The spleen has a crucial immunologic function.

Hypothesis: We hypothesized that blunt splenic injury is associated with changes in infectious organisms (pathobiome) and outcomes in post-splenectomized trauma patients.

Methods: Cases were extracted from a database prospectively collected between 1997 and 2017 that included all intensive care unit (ICU)-acquired infections in blunt trauma patients treated in a single, Level I trauma center. Patients were divided into three groups: No splenic injury/minor splenic injury < Grade 3 (group A), splenic injury \geq Grade 3 without splenectomy (Group B), and injury requiring splenectomy (Group C). ANOVA and Chi-square tests, followed by post-hoc analysis were performed to compare patient demographic characteristics and outcomes. Multivariable logistic regression analysis was performed to identify predictors associated with in-hospital mortality.

Results: 1843 infections were analyzed: 1,618 in group A, 88 in group B, and 137 in group C. Post-splenectomy infection was associated with younger age, higher APACHE II score, higher white blood cell count, and fungal etiology. Splenic injury without splenectomy was associated with the lowest mortality. Factors independently associated with increased in-hospital mortality included higher age, higher APACHE II score, male sex, lower temperature, and splenic injury \geq Grade 3 without splenectomy [OR = 0.28, CI (0.078-1.00), $p = 0.05$], with model AUROC C statistic = 0.84 and Hosmer-Lemeshow test = 0.17.

Conclusions: Microbiologically, splenectomy is associated with increased fungal infections, therefore, empiric anti-fungal therapy should be considered for septic, post-splenectomy trauma patients. Since the mortality rate was lowest in patients who had high-grade splenic injury but did not undergo splenectomy, activation of the inherent immunologic function of the injured spleen may serve as a protective factor in this patient group. Potential mechanisms for these findings, for example, those related to ischemia-reperfusion effects, should be explored.

MO8. A review of invasive fungal infections in a single center burn ICU

Naomi Hauser; Tina Palmieri

Background: Infection is the leading cause of death among patients admitted to the burn ICU and invasive mould infection is predictive of poor patient outcome. Patient factors such as age, comorbidities, and burn size contribute to the development of invasive mould infection and patient outcome. In California and other western states, wildfires are becoming and increasingly recognized risk factor for fungal exposure. We aimed to investigate the characteristics and risk factors associated the development of invasive mould infection in patients admitted to the burn ICU at our tertiary care center in Northern California, with specific focus on genus of mould identified, type of skin grafting, and mechanism of burn injury.

Hypothesis: We have two main hypotheses for the present study. First, we hypothesize that many patients who developed invasive mould infections are admitted during wildfire season. Second, we hypothesize that many of the patients will have undergone allografting for their burns.

Methods: We reviewed all patients admitted to the burn ICU at UC Davis Hospital and developed an invasive mould infection between September 2017 and August 2022 who are not currently still admitted to the hospital for their initial burn injury.

Results: There were 46 patients admitted to the burn ICU over the defined timeframe who developed mould infections and who are not currently still admitted for their initial burn injury. The average age of patients in the study was 40 years old, with a range of 19-76 years old. Twelve patients died over their admission. The average burn size was 52% with a range of 1-90% total body surface area burned. The month of August saw the largest number of admissions (nine) over the five years. The most common genus identified was *Aspergillus* (29 isolates) followed by *Fusarium* (19 isolates). The most common mechanisms of burn were vehicle and gasoline fires (nine patients each) followed by wildfires (six patients) and house fires (five patients). Out of the 46 patients in the study, 44 underwent autografting and 42 underwent allografting at some point during their hospital stay. All patients underwent some sort of skin graft.

Conclusions: Although the significance of invasive mould infections on burn patient outcomes has been investigated there is a deficit of research into the risk factors for these infections. We have found that the most common month for admission to our burn ICU is August, which is a high wildfire incidence month in California. Additionally, wildfires were the third leading cause of burn in patients admitted over our time period. The relationship between mould infections in burn patients and environmental factors at the time of burn can have real clinical significance and should be further investigated.

MO9. Sequential Mapping of the Post-Lung Transplant Metabolome: A Metabolomic Survey of the Respiratory Microbiome

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Background: The potential role of the lung microbiome in post-lung transplant disease is the subject of ongoing investigation, but there has been limited exploration of metabolites as a mediating factor in microbiota-host relationships.

Hypothesis: We analyzed sequential bronchioalveolar lavage fluid (BALF) samples to correlate the post-transplant lung metabolome and clinical course.

Methods: Excess BALF was obtained during surveillance bronchoscopies of lung transplant recipients from November 2021 to June 2022. Targeted metabolomics by gas chromatography-mass spectrometry (GC-MS) was performed on the collected fluid. From the GC-MS data, we compared the normalized relative abundance for 86 previously validated compounds between the BALF samples and a saline control. Raw feature peak areas were normalized by the average of two internal standards. Background signal was subtracted, and the peak areas were adjusted for BALF instillation volume. Compounds of interest (CI) were those enriched compared to the saline control; compounds of high interest (CHI) were identified by association with patient health status and BALF culture results.

Results: Six patients provided nine BALF samples. Of 86 possible compounds, 30 CI were identified. No patients experienced health status changes during the study period, however three patients had asymptomatic culture positive BALF samples yielding *Kloeckera* sp., *Pseudomonas aeruginosa*, or *Aspergillus* sp. There were no metabolite differences between patients with positive vs. negative cultures; however, 11 CHI were identified (5 tryptophan metabolites, 5 other amino acids, and 1 fatty acid) by sequentially comparing one patient whose BALF samples progressed from *Kloeckera* to *Pseudomonas* culture and two patients with negative culture samples (Figure).

Conclusions: We identified 11 CHI associated with microbiome-host cross-talk, dysbiosis, and inflammation in sequential comparison between samples from a patient with positive BALF cultures and two patients with negative cultures which were not identifiable on single time-point analysis. Ongoing studies in additional patients will determine whether this methodology could potentially identify novel biomarkers of post-lung transplant disease.

MO10. Comparing Patient Characteristics and Mortality of Gram-Negative versus Gram-Positive Ventilator-Associated Pneumonia.

William Wames; Saad Shebrain; Robert Sawyer

Background: Ventilator Associated Pneumonia (VAP) is a common and highly morbid occurrence within critical care units. VAP leads to increased morbidity including increased ventilator days, ICU days, hospital stay, cost, and mortality. Starting effective empiric treatment as early as possible with an appropriate antibiotic regimen is paramount in reducing the impact on patients.

Hypothesis: Given that VAPs can be caused by both gram-negative (GN) or gram-positive (GP) bacteria, we hypothesized that clinical features of patients could be used to differentiate GN from GP VAP and suggest different empiric antimicrobial choices. Furthermore, we hypothesized that patients with GN VAP have a higher mortality overall compared to those with GP VAPs.

Methods: Data were compiled from 1996-2022 from surgical critical care patients treated for CDC-defined, culture positive, monomicrobial VAP. GN and GP VAPs were compared using univariate analysis, and logistic regression including patient age, sex, race, trauma status, transfusion status, APACHE II score, maximum white blood cell count (WBC), maximum temperature (Tmax), days from admission to diagnosis, and era ('96-'04, '06-'14, '15-'22) were used to determine predictors of GN versus GP VAP. A second model including similar variables plus GN or GP status was used to define predictors of hospital mortality.

Results: Among 847 VAPs, 602 were GN and 245 GP. The three most common pathogens were *Staphylococcus aureus* (n=196), *Pseudomonas aeruginosa* (n=145), and *Enterobacter cloacae* (n=69). Independent predictors of GN VAP included prior transfusion (OR 1.7 [95% CI, 1.1-2.7], p=0.013) and days from admission to diagnosis (OR 1.02 [95% CI, 1.01-1.03], p<0.001), with a C-statistic of 0.65. No difference in crude mortality was found when comparing GN to GP VAP (19.6% v 18.8%, p=0.78). Independent predictors of mortality included age, APACHE II score, non-trauma diagnosis, high WBC, lower temperature, days from admission to diagnosis, shorter duration of therapy, and GP VAP (OR 1.7 [95% CI, 1.0-2.7], p=0.013), with a C-statistic of 0.86. GN VAPs were treated longer than GP VAPs (13.1±9.8 v 11.4±7.8 days, p=0.016).

Conclusions: Clinical characteristics poorly predict GN versus GP VAP and cannot be used to tailor empiric antimicrobial therapy. Although GN VAP is associated with prior transfusion and a longer hospital stay before diagnosis, after controlling for other factors, GP VAP is more deadly.

MO11. Evaluation of Vaccine Administration for Post-Splenectomy Patients Following Trauma

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Background: Patients who underwent emergent splenectomy require several vaccinations per current CDC ACIP recommendations due to overwhelming post-splenectomy infection risk. These include administration of Haemophilus influenza, Meningococcal, and pneumococcal vaccines. In 2015, these recommendations were updated to include an additional Meningococcal vaccination, serogroup B. Boosters of both meningococcal and pneumococcal vaccinations are also recommended. The purpose of this study was to evaluate the vaccination status of patients during index hospitalization and outpatient follow up as well as utilization of the enterprise electronic health record order set.

Hypothesis: We hypothesized that patients receive recommended vaccinations prior to discharge but that booster compliance is low.

Methods: This retrospective cohort study, included adults who presented to a trauma center for the treatment of traumatic splenic injury requiring splenectomy between 10/1/2017 to 5/31/2021. Those who died during admission or received both sets of vaccinations during index hospital stay were excluded. Subjects were identified from the adult trauma registry. Further data collection from Vizient and chart review included demographics, mechanism of trauma, intensive care unit length of stay (LOS), hospital LOS, vaccine orders, vaccine administration dates, including initial and booster doses, and hospital readmission within 30 days. The primary outcome was compliance with our post-splenectomy guideline for vaccine administration during index hospitalization. Secondary outcomes included the use of our enterprise EHR order set as well as compliance with booster vaccination.

Results: 117 patients were identified by adult trauma registry. 21 patients were excluded leaving 96 patients to be evaluated. Of the 96 patients included, 3 did not receive all initial vaccines per recommendations. There was only one incidence where the EHR order set was not used, but this patient received all vaccines. 16 patients received any vaccinations (16.7%) in follow up, while only 5 received all three recommended vaccinations requiring booster. Of those that did not complete the full series, pneumococcal 23 valent was most likely to be omitted from administration (62.5%).

Conclusions: Overall, post-splenectomy patients following trauma had a high compliance rate with initial vaccine administration during index hospitalization. There was also high utilization of the institutional EHR order set for these patients. Adherence to booster vaccines 8 weeks after initial vaccine administration, post-discharge from initial stay due to trauma was alarmingly low.

MO12. Racial Disparities in Management of Diverticulitis: Examining Elective and Nonelective Admissions

Andrew Tran; Maria Barahona; Caleb W. Curry; Allison Gasnick; Justin Brady; Justin Dvorak; Esther Tseng; Vanessa Ho

Background: Prior studies on patients with surgically managed diverticulitis have shown that Americans from minority race and ethnicity groups have higher mortality risk after adjusting for other factors. Differential application of operative management could help explain this disparity.

Hypothesis: There are racial and ethnic differences in the application of operative management in patients electively and urgently admitted for diverticulitis.

Methods: We utilized the 2016-2017 National Inpatient Sample and included all adults aged 18 and older with an admission diagnosis consistent with diverticulitis. Admissions were categorized as elective or urgent. The outcome of interest was an operation for diverticulitis, which included colectomy, colostomy, or anastomosis with ileostomy. Race was categorized as white, Black, Hispanic, or other. We also collected gender, age, Elixhauser comorbidities, and hospital variables as covariates. Adjusted logistic regressions were performed for the urgent and elective cohorts, to assess differences whether race and ethnicity was associated with the use of operative management.

Results: Among 344,256 individuals with diverticulitis (56% female, median age 70 [IQR 59-80]), of whom 48,502 (14%) were admitted electively. Operative management was utilized much more frequently in elective admissions (19%) than in urgent admissions (4%), $p < 0.001$. The proportion of patients who were Black was significantly lower in elective admissions (7%) than in urgent admissions (12%), $p < 0.001$. In both elective and urgent admissions, Black, Hispanic, and other minority patients were less likely to receive operative management after adjustment for other factors (Table).

Conclusions: In diverticulitis, elective surgery can mitigate the risk of urgent surgeries with high complication rates. Our data suggests that Black patients are not admitted electively as frequently as their counterparts, and represent a smaller proportion of both elective and urgent surgeries. These data suggest a racial and ethnic bias in patient selection for elective treatment of diverticulitis.

MO13. CLABSI Reduction in the SICU

Michael Dix; Hannah Musgrove; Abigail Ruby; Arielle Hodari Gupta

Background: Central line-associated blood stream infection (CLABSI) is a preventable medical condition. This healthcare-associated infection (HAI) is directly linked to increased morbidity and mortality. Each year there are thousands of deaths and billions of dollars added in healthcare cost due to CLABSIs. It is reported that CLABSI is the most expensive HAI, with an average cost of \$48,108. In efforts to prevent CLABSIs, healthcare organizations are encouraged to support a culture of safety, adhere to hand hygiene practices, utilize insertion and maintenance bundles, and remove central lines when they are no longer indicated. Despite improved compliance with these infection prevention interventions, the Surgical Intensive Care Unit (SICU) continued to experience high CLABSI rates in 2019 and 2020.

Hypothesis: A multi-disciplinary proactive approach to CLABSI will identify patients at risk for CLABSI and clinically assess for alternative infection sources which will decrease the number of National Healthcare Safety Network (NHSN) reportable CLABSI.

Methods: In February of 2021 a quality improvement project was implemented on the SICU. The SICU is a 40-bed unit at a tertiary care center. The team, which included the unit medical director, infection prevention and control, and the clinical nurse specialist, utilized a secure Halo texting group for easy communication. All patients with central access were screened daily for blood culture orders. Once blood cultures were collected on patients with central access, the team completed chart audits to identify infection source. Diagnostic imaging, procedure notes, and pathology and laboratory results were reviewed. When possible, patient assessments were completed. When alternative infection sources were identified, immediate follow-up was made with the patient care teams. Follow-up included collaboration and education on clinical documentation.

Results: Since February 2021, the team identified source infections in 36 patients with qualifying central access and positive blood cultures (2021 17, 2022 YTD 19). There has been a significant reduction in unit CLABSI rates when comparing data to previous years. Since the change in practice there have been 2 CLABSI in 20 months.

	# of CLABSI	CLABSI Rate per 1000 CL Days	Central Line Days
2019	12	1.92	6249
2020	11	1.64	6706
2021	4	.726	5510
2022	1	.212	4720

Conclusions: A multi-disciplinary approach with daily chart review can significantly decrease CLABSI rates in the SICU. Future steps include creating an automated way of alerting providers to positive blood cultures with qualifying central lines.

MO14. Blood Product Components and Nosocomial Infection Risk in Trauma Patients: A Retrospective Study Using the NTDB

Jacob O'Dell; Christopher McCoy; Robert Winfield; Sue Min Lai; Edward Ellerbeck; Christopher Guidry

Background: Packed red blood cell transfusion has been shown to increase nosocomial infection risk in the injured population; however, the infectious risk profiles of non-PRBC blood products in trauma are less clear.

Hypothesis: We hypothesized that fresh frozen plasma (FFP), platelet (PLT), and cryoprecipitate administration would not predict greater risk for nosocomial infection.

Methods: We performed a retrospective, matched, case-control study utilizing the American College of Surgeons National Trauma Data Bank (NTDB) data for 2019. We included all patients which received any volume of PRBC within 4 hours of presentation. Our outcome of interest was any infection. Controls were matched to cases using individual matching with a desired 1:3 case:control ratio. Univariate analysis, bivariate analysis according to infection status, and multi-variable logistic regression modeling the development of infection were then performed upon the matched data.

Results: 1,563 infectious cases were matched to 3,920 non-infectious controls. 1st 4-hour transfusion volumes for FFP, PLT, and cryoprecipitate in the infection group exceeded those in the control group. The 1st 4-hour FFP transfusion volume (per unit OR 1.02, 95% CI 0.99 – 1.04, $p = 0.28$) and cryoprecipitate transfusion volume (per unit OR 1.01, 95% CI 0.99 – 1.02, $p = 0.43$) did not predict infection. Platelet transfusion volume (per unit OR 0.92, 95% CI 0.86 – 0.98, $p = 0.01$) was protective for infection.

Conclusions: Adjusting for confounding, we demonstrated that FFP, and cryoprecipitate transfusion volumes were not associated with the development of nosocomial infection in a trauma population. PLT transfusion volume was protective for infection.

MO15. A marked difference in cost of care exist across races for patients admitted with diverticulitis.

Shih-Dun Liu; Daithi Heffernan; Chibueze Nwaiwu; Andrew Stephen

Background: Diverticulitis is an acute surgical disease often requiring admission and, at times, may require surgical intervention. In-patient care can be extremely costly. It is becoming recognized that significant racial and ethnic disparities exist with respect to delivery and outcome of surgical care and this may pose differential costs upon patients. We undertook an analysis of the cost of care for patients admitted with diverticulitis across races.

Methods: This is a retrospective review of the National In-Patient Sample, of patients aged 18 years and older, who were admitted for diverticulitis. The database was reviewed for demographics including age, sex and race, hospital course, medical comorbidities and outcomes including need for operation, length of stay and mortality. Patients were divided by race – White (W), Black (BL), Hispanic (HI) and Other (OT) – and whether they presented with perforated or non-perforated diverticulitis. SigmaPlot12.5 was used for statistical analysis.

Results: Overall, there were 50, 946 patients with an average age of 64.1 +/- 0.06 years, 44.1% were male and 36.1% presented with perforated diverticulitis. Within the group as a whole, 73.1% were White, 12.4% were Black, and 10.4% were Hispanic. Black patients were significantly less likely to present with perforated diverticulitis (W=37.8%, BL=24.3%, HI=38%, OT=34%; $p < 0.05$ BL vs all others). Among those with non-perforated diverticulitis, Black patients were significantly less likely to undergo operative intervention (W=12.9%; BL=4.9%; HI=11.3%; OT = 8.9%; $p < 0.0001$). Among those presenting with perforated diverticulitis, White patients were significantly more likely to undergo operative intervention (W=22.4%; BL=18.1%; HI=17.1%; OT=18.2%; $p < 0.001$ White versus all others). Among patients who presented with perforated diverticulitis who did not undergo any operative intervention, HI and OT patients had significantly higher cost of care compared to WH or BL pts (W=\$45,297; BL=\$45,754; HI=\$53,799; OT=\$49,578; $p < 0.001$). Among patients with perforated diverticulitis patients who did undergo operative intervention, White patients had the lowest cost of care compared to all other races (WH=\$110,507; BL=\$138,758; HI=\$136,166; OT=\$134,015; $p < 0.001$).

Conclusions: Great caution must be exercised in the delivery of care for patients with diverticulitis, given that cost of care discrepancies can have as profound an impact upon quality of life as much as medical or surgical complications.

MO16. Factors Associated with Increased Parkland Grading Scale for Cholecystitis in Urgent Cholecystectomies

Cristina Masten; Abigail Raiter; Melissa Harry; Krista Wilhelmson

Background: Gallbladder disease varies in degree of inflammation and can make cholecystectomy significantly more difficult. Preoperative prediction of difficult cases may help surgeons and patients set appropriate expectations.

Hypothesis: Increased gallbladder inflammation (measured by Parkland Grading Scale for Cholecystitis (PGC)) will be associated with worse outcomes, preoperative patient factors and imaging will predict PGC.

Methods: A prospective observational study of all urgent cholecystectomies (UC) performed between April 2021 and March 2022 at a level 1 trauma center was performed. Demographics, hospital data, operative data, pathology and PGC scores were evaluated. PGC scores were calculated by the operating surgeon at time of procedure and then scored by 2 independent surgeons, a surgical resident and medical student using intraoperative photos.

Results: 213 patients underwent UC during the study period. 0.5% of cases had a PGC of 1, 17% a PGC of 2, 47% a PGC of 3, 15% PGC of 4 and 21% PGC 5. The interrater reliability of PGC scores were excellent between the operating surgeon, two independent surgeons and different levels of trainees (intraclass correlation coefficient 0.97; 95% Confidence interval 0.96-0.98)). Severe inflammation (PGC score of 4/5) was significantly associated with older age, male sex, increased comorbidity scores and multiple admission laboratory results and vitals. (Table) Cholecystectomies performed with PGC scores of 4/5 had significantly longer operative times, increased rates of bile spillage and were more often converted to open. Postoperative hospital stays were longer in PGC 4/5 and complication rates higher. Wall thickening or 3 or more imaging findings noted in the table more likely in PGC scores of 4/5 but still were not sensitive predictors of intraoperative inflammation identified by elevated PGC scores.

Conclusions: PGC scores were highly reliable between surgeons and trainees. Most patients undergoing UC in our cohort had PGC scores of 3 and above. PGC scores are a useful tool to describe the severity of inflammation intraoperatively and estimate expected difficulty of the case and increased risk of complications. Preoperative prediction of PGC score remains difficult, some lab values correlated with PGC score, but few imaging findings on preoperative imaging were significantly associated with PGC severity.

MO17. Investigating the Rates of Pneumonia after Bronchoalveolar Lavage in Inhalation Injuries

Derek Riffert; Ronnie Mubang; Mina Nordness; Elizabeth Krebs; Christopher Guidry; Stephen Gondek; Robel Beyene

Background: Smoke inhalation injuries (SII) result in up to 10,000 deaths annually in the US. Fiberoptic bronchoscopy at admission is the gold standard for diagnosis of SII among intubated patients. The role of simultaneous bronchoalveolar lavage (BAL) remains controversial. We explored the relationship between admission BAL and development of pneumonia in patients with presumed SII.

Hypothesis: BAL at the time of admission is correlated with increased rates of pneumonia in patients with presumed SII.

Methods: We completed a retrospective analysis of intubated patients who underwent bronchoscopy on admission for presumed SII with or without BAL. Demographics and baseline characteristics (Table 1) were analyzed using chi-squared or Student's t-test analysis. Unadjusted and multivariable logistic regression assessing the effect of admission BAL on development of pneumonia were performed, adjusting for sex, length of stay, burn total body surface area (TBSA), and confirmed SII.

Results: Of 98 patients evaluated, 40 patients (40.8%) had BALs collected at admission, 16 (16.3%) of which were positive. The BAL group had significantly more men and more confirmed SII (Table 1). 36 patients were treated for pneumonia, of which 30 (83%) met the National Healthcare Safety Network (NHSN) diagnostic criteria for pneumonia. BAL patients were more likely to be treated for pneumonia later in the admission in both unadjusted (OR 5.75, 95% CI 2.35, 14.1, $p < 0.001$) and multivariate (OR 5.29, 95% CI 1.59, 17.64, $p = 0.007$) models. BAL patients were more likely to undergo a second bronchoscopy (52.5% vs 10.3%, $p < 0.001$), receive antibiotics (66.7% vs 24.1%, $p < 0.01$), and had a longer duration of antibiotics (6.16 vs 2.57, $p = 0.012$).

Conclusions: These findings suggest that for intubated patients presumed to have SII, BAL on admission is correlated with subsequent pneumonia during the same admission. We recommend against the routine use of BAL at admission and further investigation should be considered to determine the effects of routine BAL in this population.

MO18. A comparison of Surgical Infection Society (SIS) vs Internationals surgical site infection (SSI) prevention Guidelines.

Radwan Dipp Ramos; June Kim; Andrew Stephen; Daithi Heffernan; Matthew Swenson

Background: Surgical Site Infections (SSIs) are a significant cause of morbidity and mortality. Adherence to guidelines have been shown to decrease the incidence of SSIs. However, guidelines are often developed to be region, country or resource specific or can be heavily influenced by locoregional politics.

Methods: We used the SIS (Surgical Infection Society) guidelines as reference. The literature was reviewed for International non-SIS Guidelines (IGs). Individual component recommendations were divided into pre-operative, intra-operative and post-operative categories. The IGs were reviewed to identify whether they matched or were different from SIS prevention guidelines.

Results: We reviewed 11 IGs aimed at prevention of SSIs. Pre-operative bath recommendations appeared in 81.8% of IGs. There was considerable variation between timing and techniques for bathing. Glucose control was recommended among 72.7% of IGs. Only 19.2% of IGs recommend smoking cessation. Among intra-operative recommendations, 100% of all identified IGs recommended prophylactic antibiotics, however several IGs left of the choice of antimicrobial agent to the discretion of the surgeon. Further timing of administration of prophylactic antibiotics varied from 1 to 6 hours pre-operatively. Skin preparation, hand scrub, and normothermia were identified in 91%, 81%, and 72% of IGs respectively. Surprisingly, the use of double gloves and wound protector only were recommended in 54.5% and 36.3%. From the post-op recommendation wound, care was recommend in 63.4%. IG recommendations not mentioned in SIS /ACS guidelines included improvement of pre-operative nutritional status (36.3%) and alcohol cessation (9%). Among the intra-operative recommendation normovolemia was recommend in 36.3% of IGs and irrigation of the wound before closure was recommend in 27.3%. Pre-Operative Present in IGs Bathing 81.8% Glucose control 72.7% Smoking cessation 19.2% Intra-Operative Hair removal 91% Skin preparation 91% Hand scrubbing 81.8% Surgical Attire 63.6% Prophylactic antibiotics 100% Normothermia 72.7% Wound protectors 36.4% Antibiotic sutures 54.5% Double gloving 54.5% Supplemental oxygen 45.5% Post-Operative Wound Care 63.4%

Conclusions: Considerable international variation exists with respect to SSI prophylaxis guidelines. However, the literature on which guidelines are based is often difficult or expensive to access in low-income countries. We advocate that critical guidelines and their underlying literature should be freely available to improve world-wide peri-operative care.

MO19. Disadvantaged Neighborhoods are a Risk Factor for Hospital-Acquired Infections

Camden Gardner; Arielle Hodari Gupta; Ilan Rubinfeld; Jeffrey Johnson

Background: The Hospital-Acquired Condition (HAC) reduction program governs portions of hospital reimbursement to incentivize quality treatment. Healthcare quality programs also influence brand perception which is leveraged in marketing. Rooted in these strategies is the notion that the occurrence of hospital-acquired infections (HAIs) solely reflects the performance of the health system. However, the communities treated by these institutions are not equal regarding risk factors to wellbeing. Recognizing the influence social determinates have on patient health, we examined the potential relationship between neighborhood deprivation and our National Healthcare Safety Network (NHSN) labelled infections which define patient safety and healthcare quality for the Center for Medicare & Medicaid Services (CMS).

Hypothesis: Surgical patients with increased area deprivation index have a higher risk of NHSN labelled HAIs.

Methods: Surgical patients encountered between 2014 to 2022 were queried from a healthcare administration database spanning five hospitals. Demographic, baseline health, and case variables were analyzed in relation to area deprivation index (ADI) and the HAIs of CLABSI, CAUTI, and C. difficile infection. Univariate statistical tests and multivariate logistic regression were performed to highlight the relationship between patient variables, including transfer status, and the occurrence of HAIs. The dataset was deidentified and the project deemed exempt from IRB review. The analysis was produced with the R programming language.

Results: The cohort contained 161,444 surgical encounters with an average State ADI of five and a National ADI of 66. The overall rate of HAIs was 0.5% (874) with 198 (0.1%) cases of CLABSI, 222 (0.1%) cases of CAUTI, and 487 (0.3%) cases of C. difficile infection. The majority of demographic, baseline health, and case variables exhibited statistical significance across the occurrence of HAIs at the univariate level. Across the three HAIs of interest, both National and State ADI was higher in patients with CLABSI (p-value: <0.001), CAUTI (p-value: <0.001); C. difficile (p-value: <0.001). Multivariate analysis did not find ADI related to HAIs (State, OR 1.00; p-value: 0.85; National, OR: 1.00; p-value: 0.83).

Conclusions: Patients experiencing HAIs are likely to have increased area deprivation, but this correlation is not supported when adjusted for confounding variables. Potentially explaining the success of historical intrahospital quality initiatives.

MO20. The association of Social Determinants of Health and Necrotizing Fasciitis

Jennifer Hubbard; Daithi Heffernan; Chibueze Nwaiwu; Andrew Stephen

Background: Necrotizing Fasciitis (NecFasc) is a rapidly spreading soft tissue infection, requiring emergent and timely surgical intervention. Racial and social discrepancies exist with both delivery of health care and outcomes across many aspects of health care. However, to date there is no data addressing how socioethnic factors affect outcomes of patients with NecFasc.

Methods: This is a retrospective review of the National In-Patient Sample (NIS) of HCUP patients aged 18 years and older who were admitted with a diagnosis of NecFasc over a 3 year period. Data analyzed included demographics, (race and insurance status), teaching status of hospital, and hospital course and outcomes. The primary outcome was the effects of race and social determinants of health on surgical intervention, transfer status, and outcomes.

Results: A total of 2,410 patients were admitted with a diagnosis of NecFasc over the 3-year period. Of these patients, 856 patients (35.5%) were non-White race. White patients were slightly older (53.3 versus 50.5 years; $p<0.001$) but with no difference in sex. Non-White patients more likely had diabetes (59% versus 49.4%; $p<0.001$), hypertension (57.6% versus 52%; $p=0.01$), but had lower rates of COPD (6.9% vs 13.9%; $p<0.001$). Both non-White and White patients had a high rate of operative management (91.6% vs 90.8%; $p=0.07$) with no difference in time to operation. Non-White patients underwent more operations on average (5.1 versus 4.5; $p<0.0012$) compared to White patients. Reviewing transfer status, there was no difference in age, sex, or private insurance status between patients transferred into the hospital versus those who presented directly to an academic hospital. Transferred patients were more often non-White (30.7% vs 13.5%; $p=0.02$) versus non transferred patients. With respect to outcomes, length of stay was longer for non-White (13.5 versus 11.9; $p=0.04$) versus White patients. Average cost of stay was more for non-white (\$183,556 versus \$139,073; $p=0.0016$) versus White patients. Adjusting for age and comorbidities Non-White patients had higher mortality in rural hospitals (OR=1.58 (95%CI=1.1-2.5), a finding that was not present in urban teaching hospitals (OR=0.6 (95%CI=0.4-1.1).

Conclusions: Despite similar operative interventions, non-white patients had higher mortality. Healthcare systems should target modifiable risk factors that would prevent chronic comorbidities that may be drivers of mortality among critically ill patients with necrotizing fasciitis infection.

MO21. Characterization of Early and Late Deaths for Surgical Patients with Sepsis

Anahita Jalilvand; Whitney Kellett; Holly Baselice; Megan Ireland; Wendy Wahl; Jon Wisler

Background: It is unclear whether timing of mortality following sepsis impacts causes of death (COD) in critically-ill surgical patients. The primary objective of this study was to characterize differences in COD by timing of mortality for patients admitted to the surgical ICU (SICU) with sepsis.

Hypothesis: We hypothesized that early mortalities would demonstrate a distinct pattern of COD compared to later deaths.

Methods: A single-institution retrospective analysis of patients admitted to the SICU with sepsis was performed (2014-2019, n=1401). Inpatient mortalities (n=325) were reviewed to determine COD and classified by primary etiology (cardiac, respiratory, intra-abdominal not amenable to source control, multisystem organ failure with source control (MSOF), neurologic, musculoskeletal, or secondary infections). Early mortality was defined within 7 days of admission, and later deaths occurred beyond one week from admission. Baseline characteristics and COD were compared between mortality cohorts. A p value <0.05 was considered statistically significant.

Results: Eighty-eight patients experienced an early death, accounting for 27% of all inpatient mortalities. Compared to later deaths, early mortalities had higher baseline serum lactates, comparable admission SOFA scores, but were less likely obese (20% vs 38%, p=0.001). The distribution of COD between groups was significantly different (p=0.002), and early deaths were more often from cardiac causes (12% vs 7%), or musculoskeletal (8% vs 2%) and intra-abdominal etiologies (36% vs 23%) not amenable to source control. A larger proportion of late mortalities were due to respiratory (22% vs 9%, p=0.002) or secondary infections (6% vs 1%, p=0.002).

Conclusions: Most deaths following admission to the SICU occurred later in the hospitalization. These mortalities exhibited a distinct pattern of COD from early deaths, with a higher preponderance of respiratory and secondary infections in the later time point. Further studies should focus on the contribution of post-sepsis immunosuppression and chronic critical illness to late sepsis mortality.

MO22. A Meta-Analysis Investigating Incisional Negative Pressure Wound Therapy for the Prevention of Surgical Site Infection

Hannah Groenen; Hasti Jalalzadeh; Stijn de Jonge; Niels Wolfhagen; Ricardo Orsini; Anne Eskes; Marja Boermeester

Background: Prophylactic use of negative pressure wound therapy on primary closed incisional wounds (iNPWT) has increasingly been used for the prevention of postoperative wound complications, including surgical site infections (SSI). Current international guidelines for the prevention of SSI made recommendations regarding this topic. However, since publication of these guidelines, an enormous amount of new randomized controlled trials (RCTs) have been conducted, which have not been implemented in their recommendations. In this study, we have multiple aims. Primarily, we provide an overview of all available evidence and conduct an update of a previous systematic review and meta-analysis. Furthermore, we aim to explore additive value of new RCTs with a trial sequential analysis (TSA).

Hypothesis: We hypothesize that iNPWT is an effective intervention for the prevention of SSI over a broad range of surgical procedures.

Methods: For the overview of all available evidence, we identified existing systematic reviews and meta-analyses of RCTs, including those conducted for guideline development, comparing iNPWT with standard dressings in all types of surgery. PubMed, Embase and Cochrane CENTRAL databases were searched on November 1, 2022. For the meta-analysis, we used the same literature search and screening method to identify RCTs. We calculated relative risks (RR) with corresponding 95% confidence intervals (CI) using a Mantel-Haenzsel random-effects model. TSA was used to assess the risk of random error. The certainty of evidence was evaluated using the Cochrane Risk of Bias-2 tool and GRADE approach.

Results: In the systematic review, 58 RCTs with 13,716 patients were included. Meta-analysis showed, with high-certainty of evidence, a reduction of SSI rate with iNPWT compared to standard dressings (RR 0.67, 95% CI: 0.59-0.76). For TSA of all trials in the meta-analysis, the cumulative Z-curve crossed the trial sequential monitoring boundary for benefit. We identified eight previously published systematic reviews including meta-analyses investigating the effect of iNPWT on SSI and compared the results.

Conclusions: GRADE assessment showed high-certainty evidence, through the great number of included RCTs and patients, that iNPWT is effective in reducing SSI. Compared to previous meta-analysis, the RR stabilized and the confidence interval narrowed indicating less uncertainty in the evidence. Furthermore, TSA indicated that new RCTs are unlikely to meaningfully change the effect estimate.

MO23. Trends in Gender Disparities in Outcomes Among Adult Burn Victims

Savannah Skidmore; Caroline Corley; Heather Evans; Deepak Ozthathil

Background: Gender disparities in outcomes in trauma patients is well described in the literature. Our study aims to assess these differences within the burn-trauma population. Individual institutions are limited in the number of burn victims they care for each year, this is particularly true for institutions that are not dedicated burn centers. We used a commercially available multi-institutional dataset derived from electronic health record data to assess the relationship between gender status and wound infections, urinary tract infections(UTI), pneumonias, critical illness or sepsis, hemorrhage and mortality in burn victims.

Hypothesis: We believe that there will be a significant difference in risk of the above-mentioned endpoints between our gender-based cohorts.

Methods: Our study utilized a commercially available national dataset. Inclusion criteria identified all thermal burn victims (T20-25, T31) over the age of 18 that suffered a burn within the last twenty years (2002 – 2022). This cohort was stratified by gender and propensity score matched for race, age, Total Body Surface Area of injury, hypertension, diabetes, obesity, inhalation injury, malnutrition, and the use of antibiotics. Endpoints were wound infection, UTI, pneumonia, critical illness/ sepsis, acute blood loss anemia, deep venous thrombosis (DVT) and mortality within 90 days of injury.

Results: Our cohorts had 177,442 males and 157,997 females. Propensity matched cohorts contained 140,629 patients each. The relative risk of mortality was 0.371% (RR: 1.487, 95% CI 1.377-1.607; $p < 0.0001$), pneumonia was 0.479% (RR:1.337, 95% CI 1.262-1.416; $p < 0.0001$), wound infection was 1.386% (RR: 1.352, 95% CI 1.307-1.399; $p < 0.0001$), UTI was -1.369 (RR:0.447, 95% CI 0.421-0.474; $p < 0.0001$), DVT was 0.237 (RR:1.386, 95% CI 1.270-1.512; $p < 0.0001$), sepsis was 0.442% (RR: 1.584, 95% CI 1.468-1.711; $p < 0.0001$), and acute blood loss anemia was 0.421% (RR: 1.596, 95% CI 1.475-1.727; $p < 0.0001$). Therefore, males are at increased risk of mortality, pneumonia, wound infection, DVT, sepsis and acute blood loss anemia, whereas females incur an increased risk of UTI after burn injury.

Conclusions: Gender differences in burn patients present an area for further investigation in trauma care. Evidence based protocols have grown substantially in the field of trauma, but personalized medicine for gender could potentially improve outcomes. More investigation is needed to assess the underlying causes of the differences identified.

MO24. Does Negative Pressure Wound Therapy Impact the Outcome of NSTI patients Infected with Anaerobic Bacteria?

Hussain Afzal; Erin Andrade; Ricardo Fonseca; Leonardo Diaz; Melissa Canas; Alejandro De Filippis; Leonardo Diaz; Kelly Bochicchio; Jennifer Leonard; Grant Bochicchio

Background: Negative pressure wound therapy (NPWT) has improved the management of necrotizing soft tissue infection (NSTI) wounds. There continues to be debate among clinicians regarding efficacy of NPWT for removal of bacteria as compared to traditional wet to dry dressings. Recent studies have shown NPWT leading to oxygen deprivation effects in the underlying wound tissue but there remains a lack of clinical studies evaluating the impact of decreased oxygen on soft tissue infections with anaerobic bacteria.

Hypothesis: We hypothesized that patients with NSTI infected only by anaerobic bacteria and treated with NPWT will have worse outcomes as compared to patients infected with other types of bacteria.

Methods: Our prospectively maintained Acute and Critical Care Surgery database spanning 2008-2022 was queried for patients with the diagnosis of necrotizing fasciitis, Fournier's gangrene, or gas gangrene with a positive wound culture taken during initial debridement and who received NPWT treatment. Co-morbidities, operative management, and clinical outcome were collected. Patients were stratified based on wounds infected with anaerobic vs various groups of bacteria i.e. polymicrobial, aerobic, etc. Data were analyzed using ANOVA, chi-squared, and multiple regression.

Results: A total of 112 patients with NSTI treated with NPWT were included. We identified 16 (14.3%) patients with anaerobic (only) NSTI. The remaining patients 96 (85.7%) had a combination of either aerobic, facultative, or polymicrobial NSTI. The initial size of wounds in both groups was not significantly different. Anaerobic NSTI patients treated with NPWT had a higher number of debridement [3 (1-9) vs 2(1-4); $p=0.012$] and 30-day readmission rate [50% vs 10%; $p<0.01$] as compared to patients that received NPWT for non-anaerobic only NSTIs. When analyzed by logistic regression, NSTIs infected by anaerobic bacteria treated with NPWT had 11 times greater 30 day readmission rate [OR=10.94, 95% CI: 2.94-40.61, $p<0.001$].

Conclusions: NSTI patients with anaerobic bacteria (only) required a greater number of debridement and were 11 times more likely to be readmitted within 30 days when compared to NSTI patients infected with other types of bacteria. Further prospective studies aimed at identifying additional risk factors and treatment options for patients diagnosed with an anaerobic only NSTI are recommended.

MO25. Smoking is Associated with a Higher Risk of Surgical Site Infection after Lower Extremity Fasciotomy

Alejandro De Filippis; Leonardo Diaz; Ricardo Fonseca; Melissa Canas; Hussain Afzal; Jennifer Leonard; Mark Hoofnagle; Kelly Bochicchio; Grant Bochicchio

Background: Acute compartment syndrome (ACS) of the lower extremity is a surgical emergency seen in trauma patients where the elevated intra-compartmental pressure leads to inadequate oxygen perfusion producing necrosis. Fasciotomy is the standard of care treatment for this condition despite the high rate of post-operative infection. Current smoking has been shown to increase the risk of surgical site infection (SSI) in other surgical procedures.

Hypothesis: We hypothesize that active smokers have a higher incidence of SSI after therapeutic fasciotomy of the lower extremity.

Methods: Our prospectively maintained Acute and Critical Care Surgery database spanning 2018 to 2022 was queried for patients admitted to our level-1 Trauma Center who required fasciotomy for lower-extremity trauma complicated by ACS. Demographics, mechanism of injury (MOI), operative and clinical management details, culture results, and clinical outcomes were collected. Patients were stratified based on our primary outcome of SSI, which was confirmed by a clinical team diagnosis and a positive wound culture. We excluded patients treated with prophylactic fasciotomy and/or previous infection within this hospitalization.

Results: We identified 61 patients with ACS requiring fasciotomy. A total of 11 patients (18%) developed a SSI. Of all patients with fasciotomy smokers made up a significantly larger proportion of the infected than non-infected groups (54.5% vs 18%, $P=0.011$). SSI patients received negative pressure wound therapy much longer (11.9 ± 9.6 vs 6.1 ± 4.6 days, $P < 0.002$) and had a longer time from surgery to closure (TSC) [19.8 ± 23 vs 4.5 ± 3 days, $P < 0.001$]. Hospital Length of Stay (LOS) was also higher in this group (22.8 ± 24.9 vs 10.3 ± 8.8 days, $P < 0.001$). There was no significant difference in the bacteriology between smokers and non-smokers. When analyzed by multi-logistic regression controlling for smoking; TSC, age, obesity, and MOI with primary outcome defined as infection, smoking was found to have a 10-fold increase in SSI (OR 10.33; CI 95% 1.09-97.8; $P=0.042$).

Conclusions: Fasciotomy remains a life-saving procedure for ACS associated with a high incidence of post-operative complications. Patients who smoke have a 10-fold increase risk for SSI after having a fasciotomy due to ACS. We suggest a more aggressive approach be considered in patients with a smoking history requiring a fasciotomy for ACS. Future studies need to focus on optimizing patients who are current smokers.

MO26. Outcomes of Oral Ibrexafungerp in Subjects with Intraabdominal Candidiasis from a Phase 3 Study (FURI)

Thomas Chen; Nkechi Azie; David Kriesel; Thomas Chen; Nkechi Azie

Background: Intraabdominal Candidiasis (IAC) is the second most common form of invasive candidiasis after candidemia. *Candida albicans* is still the most common organism causing IAC, but the number of non-*albicans* *Candida* species causing IAC is growing. Tissue penetration has been identified as a limitation of echinocandin treatment.

Hypothesis: Ibrexafungerp (IBX) is a glucan synthase inhibitor with excellent tissue penetration and oral bioavailability. We review outcomes of 17 subjects with IAC from the FURI study (NCT03059992).

Methods: FURI is an ongoing Phase 3 open-label single-arm study of oral IBX for the treatment of adult subjects with fungal diseases, refractory, resistant to or intolerant of Standard of Care (SoC) antifungal therapies. IAC subjects were eligible for enrolment if they had proven or probable invasive candidiasis with or without candidemia and met protocol defined criteria for refractoriness, resistance or intolerance. Subjects received a loading dose of oral IBX 750 mg BID for 2 days followed by 750 mg QD with a duration of therapy for a minimum of 14 days and up to 180 days. Global response at End of Treatment (EOT) was adjudicated by an independent data review committee (DRC).

Results: 17 subjects had a diagnosis of IAC. 82% (14/17) were enrolled based on refractoriness to current treatment, and 71% (10/14) of refractory patients had previously failed to an echinocandin therapy. There were 19 *Candida* isolates identified in the 17 subjects. The predominant organism was *C. glabrata* 42% (8/19) with non-*albicans* *Candida* isolates (*C. glabrata*, *C. krusei*, *C. tropicalis*) predominant 67% (12/19). Outcomes for these subjects were as follows: Complete or Partial Response was 53% (9/17), Stable Disease was 41% (7/17) and Progression of Disease 6% (1/17). One subject died during the study and was attributed to other causes and not their fungal disease.

Conclusions: Preliminary analysis of these 17 cases indicate that oral IBX is a promising orally available option for the treatment of IAC patients with limited therapeutic options.

MO27. The Burden and Risk Factors of Postoperative C. difficile Infection in Surgical Patients in the US: The Hospital Effect

Dias Argandykov; Jefferson Proaño-Zamudio; Angela Renne; May Abiad; Casey Luckhurst; Jonathan Parks; Charudutt N. Paranjape; David King; John Hwabejire; George Velmahos; Haytham Kaafarani; Michael P. DeWane

Background: Clostridioides difficile infection (CDI) is a common postoperative complication. While patient-level CDI risk factors have been well-established, there remains a lack of studies examining hospital-level characteristics associated with postoperative CDI.

Methods: The National Readmission Database 2019 was utilized to identify adult patients who developed postoperative CDI following general surgery (GS) procedures. Patients with CDI undergoing colectomy/ileostomy in the absence of any other GI condition were excluded. Propensity score matching was performed to compare outcomes between patients with and without CDI. The main outcomes were in-hospital, 30 & 90-day mortality, readmission rates, and costs. Logistic regression was performed to identify patient-, procedure-, and hospital-level factors associated with CDI.

Results: A total of 362,631 GS patients were identified. The incidence of postoperative CDI was 0.38%. After propensity matching, there was no difference in in-hospital mortality between patients with and without CDI (5.1% vs. 5.6%, $p=0.56$). However, patients with CDI had increased length of stay, costs and higher rates of unplanned 30 & 90-day readmission [Table 1]. Older age, weight loss, paralysis, higher severity of illness, and specific surgical procedures such as small bowel resection and ileostomy/colostomy placement, were associated with a higher risk of CDI. Among hospital-related characteristics, private investor-owned hospitals were associated with a decreased risk of CDI [Table 2].

Conclusions: CDI is associated with increased costs, readmissions and length of stay in GS patients, and is less common in investor-owned hospitals. Future studies are needed to examine how differences in antimicrobial stewardship programs, infection control measures, and complication reporting may differ across hospitals and may represent potential targets for improvement efforts.

MO28. Incidence of Bloodstream Infection with the Use of Parental Nutrition

Alexandra Wiegand; Sara Parli; Barbara Magnuson Woodward

Background: Parental nutrition (PN) is used in several patient populations for the provision of nutrition support while hospitalized if compelling indications are present. A primary concern of TPN includes increased risk of bacterial and fungal bloodstream infections (BSIs), which may lead to significant morbidity and mortality. While rates of infection with PN have declined over the past 10 years due to improvements in standard of care, the risk of infection remains. A medication use evaluation was conducted to examine the incidence of BSIs while receiving PN at a quaternary care academic medical center.

Hypothesis: The use of PN increases the incidence of BSIs in hospitalized patients.

Methods: This was a retrospective review of adult patients ≥ 18 years old admitted to University of Kentucky HealthCare from January 1st, 2020 to July 31st, 2021 who received PN at any point during their hospital admission. Patients were excluded if they were admitted with an infection from their home PN. Clinical data was collected utilizing Vizient data and completed using retrospective chart review. The primary outcome of this review was incidence of BSI after initiation of PN. Secondary outcomes examined included PN duration and type of bacterial or fungal organism.

Results: A total of 378 adult patients received inpatient PN, of which 67 (17.7%) patients had PN stopped for concern for infection. In the patients whom PN was stopped for infection, the most common indications for PN were ileus, short bowel syndrome, and anastomotic leak. Incidence of positive blood cultures occurred in 30 patients (7.9%), with a total of 32 occurrences due to two patients with multiple occurrences during their admission. In patients whom PN was stopped for infection, patients with positive blood cultures had longer mean TPN duration compared to those with negative blood cultures (12.4 days vs 7.4 days). The incidence of gram positive and gram negative organisms were similar and occurred more frequently than fungemia. There were seven occurrences of multi-organism blood cultures.

Conclusions: In 1.5 years of PN use at a quaternary care center with high adherence to ASPEN guidelines for PN use, 7.9% of patients developed a BSI after PN was initiated during their hospitalization. While rates of infection with PN have decreased over the years, PN may still contribute to development of BSIs. For this reason, providers should ensure appropriate indications are present prior to initiation of PN, and infection prevention should continue to be addressed in all patients receiving PN.

MO29. Anemia Recovery After Lung Contusion, Hemorrhagic Shock and Chronic Stress is Sex-Specific

Gwendolyn Gillies; Jennifer Munley; Lauren Kelly; Preston Coldwell; Kolenkode Kannan; Letitia Bible; Philip Efron; Alicia Mohr

Background: Severe trauma and hemorrhagic shock lead to anemia that persists despite resuscitation and cessation of bleeding. Biologic sex is known to modulate inflammatory responses following trauma and hemorrhagic shock, however, the impact of sex on anemia recovery after injury remains unknown. The aim of this study was to identify sex-specific differences in anemia recovery following injury, hemorrhagic shock, and chronic stress.

Hypothesis: We hypothesized that female sex, in a rodent model of polytrauma, is associated with improved anemia recovery following injury, hemorrhagic shock, and chronic stress.

Methods: Male and proestrus female Sprague-Dawley rats (n=8/group) aged 9-11 weeks were subjected to lung contusion and hemorrhagic shock (LCHS) or LCHS with daily chronic stress (LCHS/CS) and compared to naïve controls. Weight change, serum iron, bone marrow erythroid progenitor (CFU-GEMM and BFU-E) colony growth and liver transcription of bone morphogenic protein (BMP)4 and BMP6 were measured on day 7. ANOVA comparisons between male and female groups and between naïve, LCHS, and LCHS/CS within each sex were performed with GraphPad. Significance was defined as *p<0.05 vs. naïve; **p<0.05 vs. male counterpart.

Results: Males lost more weight following LCHS and LCHS/CS compared to naïve (-1.338%* and -3.446%* vs. +7.228%), while female LCHS rats started to recover weight by day 7 compared to naïve. Hemoglobin levels in male LCHS and LCHS/CS rats remained lower at day 7 compared to naïve males and females following LCHS and LCHS/CS. Male LCHS and LCHS/CS rats had reduced CFU-GEMM and BFU-E when compared to naïve and females following LCHS and LCHS/CS. Females had higher serum iron than males in naïve, LCHS and LCHS/CS groups (387** vs. 190 ug/dL, 328* vs. 245 ug/dL, 272** vs. 186 ug/dL). Liver transcription of BMP4 and BMP6 was significantly lower in female LCHS and LCHS/CS groups compared to male LCHS and LCHS/CS.

Conclusions: Following trauma with or without chronic stress, females demonstrate improved recovery from anemia, reduced weight loss, and reduced suppression of bone marrow erythroid progenitor growth compared to males. These findings suggest that sex is an important variable that may influence outcomes after severe trauma and critical illness.

MO30. Use of VV-ECMO in Patients with ARDS due to fungal pneumonia

Jillian Wothe; Danika Evans; Jacob Braaten; Bridget Dillon; Angela Phillips; Kristiana Sather; Matthew Prekker; Ramiro Saavedra-Romero; Melissa E Brunsvold

Background: Patients with rare fungal pneumonias such as blastomycosis and pneumocystis sometimes progress to acute respiratory distress syndrome (ARDS). Mortality has been reported as high as 50-90% in this group. Venovenous extracorporeal membrane oxygenation (VV-ECMO) can be used to support such patients, however due to the rare nature of these pneumonias, outcomes are not well understood.

Hypothesis: In this study we report outcomes of patients treated with VV-ECMO for ARDS due to rare fungal pneumonias at three ECMO centers.

Methods: This was a retrospective study across three ECMO centers in the United States during a period from 2013-2022. Data was extracted from the electronic medical record and stored in a RedCap database. Basic descriptive statistics were performed.

Results: A total of 22 out of 346 (6%) adult VV-ECMO patients were treated for ARDS due to fungal pneumonia. The majority (68%) were male and the mean age was 45 years (SD 11). By type of fungal infection, 15 (68%) had blastomycosis, 5 (22%) had pneumocystis, 1 (5%) had cryptococcus, and 1 (5%) had *Candida krusei* infection. The overall survival rate was 73%: 67% for blastomycosis, 80% for pneumocystis, and 100% for *Cryptococcus* and *Candida krusei*. Patients with pneumocystis had longer ECMO runs compared to those with blastomycosis, with a median of 30 days (IQR 20-42) and 11 days (IQR 9-12) respectively. These patients also had a longer duration between intubation and cannulation for VV-ECMO, median 10 (IQR 2-12) days for pneumocystis compared to median 3 (IQR 2-5) days for blastomycosis.

Conclusions: Our findings support the use of VV-ECMO for ARDS due to rare fungal pneumonias. While survival was high, patients with pneumocystis required longer ECMO runs compared to patients with blastomycosis.

MO31. Modified Frailty Index 5 (mFI-5) Score as a Predictive Tool for Post-traumatic Empyema in Geriatric Trauma Patients

Ricardo Fonseca; Melissa Canas; Leonardo Diaz; Alejandro De Filippis; Hussain Afzal; Mark Hoofnagle; Jennifer Leonard; Kelly Bochicchio; Grant Bochicchio

Background: As life expectancy continues to increase, the incidence of geriatric trauma has risen proportionately. Traumatic chest injuries are among the most frequent injuries incurred in this population. Empyema, despite its low incidence, remains a serious post-traumatic infectious complication in this population. While few studies have described an association between chest tube placement and increased risk for post-traumatic empyema in the geriatric population, we suspect that additional risk factors such as immunosenescence related to frailty may have a more important role than age alone. The modified 5-item frailty index (mFI-5) is a risk-stratification tool that has been shown to predict adverse outcomes in geriatric populations.

Hypothesis: We hypothesized that a higher mFI-5 score would be associated with an elevated risk for post-traumatic empyema in the geriatric population.

Methods: We queried our prospective Trauma Registry from 2010-2018 for patients with thoracic trauma. Patients younger than 55 years old were excluded and the cohort was stratified based on the diagnosis of empyema during the hospital stay. Empyema was confirmed by imaging evidence, clinical evaluation, and/or microbiology. Demographics, thoracic procedures, and outcomes were collected. The mFI-5 scores were calculated based on the presence of congestive heart failure, diabetes mellitus, chronic obstructive pulmonary disease, and dependent functional status.

Results: A total of 626 geriatric trauma patients with a mean age of 68 years old were included. The overall empyema rate was 4.6% (n=29). Empyema patients had a significantly higher mFI-5 Score [2.1 ± 2 vs 1.1 ± 1.6 ; $p < 0.001$], AIS chest score [3.7 ± 0.9 vs 3.2 ± 0.9 ; $p = 0.003$], and a higher incidence of chest tube insertion [75.9% vs 40.7%; $p < 0.001$]. Empyema patients also had a significantly longer Hospital Length of Stay (LOS), ICU LOS, and ventilator days [28.2 ± 7.8 vs 27.7 ± 6.5 ; 19.5 ± 15.3 vs 7.6 ± 11.1 ; 12.9 ± 20.4 vs 7.1 ± 7.7 ; $p < 0.001$]. When controlling for age, mFI-5 score, rib fracture, mechanism of injury, ventilator days, AIS chest score, and chest tube insertion; a multivariate logistic analysis demonstrated that mFI-5 was the only independent risk factor for empyema [OR 16.44, 95% CI (1.38-195); $p = 0.027$]. In a similar logistic regression model, we categorized the mFI-5 score by >2 and found a 3-fold increase in risk for empyema [OR 3.1, 95% CI (1.06-8.82); $p = 0.039$].

Conclusions: An mFI-5 score >2 was associated with a 3-fold increase in post-traumatic empyema in geriatric patients with thoracic trauma. We recommend using the mFI-5 score as a simple tool to predict adverse outcomes in this high-risk study population.

MO32. Considerable variations exists in SSI incidence by WHO geographic regions

June Kim; Radwan Dipp Ramos; Daithi Heffernan; Andrew Stephen; Charles Chesnut

Background: Surgical site infections (SSIs) pose tremendous burdens upon health care systems worldwide. Considerable healthcare disparities exist between high- and low-income countries which leads to differing risks for post-operative complications including SSIs. However, given the ever increasing globalization of healthcare, it is critical to review published rates of SSIs across a diverse spectrum of worldwide regions.

Methods: We sampled manuscripts from geographic regions, focusing on systematic reviews or national databases when available. The published rates of SSI were compared with American cited rates of SSI. Articles included a wide variety of procedure types across multiple specialties including general surgery, orthopedic surgery, cardiovascular surgery, and obstetrics and gynecology and encompassed both elective and emergency surgeries.

Results: Overall, we reviewed the 6 geographic regions as defined by the World Health Organization (WHO). Patient sample sizes ranged from 100 to almost 6 million patients with an average population of 245,475 per study. The rates of SSIs reported differed considerably across different regions. The lowest rate was reported in the US (2.0%). The highest rate was reported within the African region (11.5%) and the lowest non-US region was noted in Europe (4.0%). Interestingly reported rates of SSI were inversely related to number of surgeons per country as reported by WHO. Approximately half of non-US based studies did not divide SSI rates by type of operation (clean versus dirty) making transnational comparison difficult. Within low-income countries, most publications were single centered, with a scarcity of meta-analyses. Interestingly, meta-analyses that were done based on patients from low-income countries were most often undertaken by research organizations with international focuses rather than from individual hospitals.

WHO Region	Number of Sources	n=population	SSI Rate
Africa	5	23,416	11.5%
Western Pacific	9	299,284	4.5%
Americas (non-US)	7	211,274	4.3%
Americas (US)	3	9,240,944	2.0%
Europe	5	776,388	4.0%
South-east Asia	10	110,107	5.9%
Eastern Mediterranean	5	139,468	11.2%

Conclusions: There exists a wide range of incidences of surgical site infection internationally. This is likely attributable to a multitude of factors including variability in reporting, follow-up, resources, or patient population. Further studies into geographic-specific risk factors for surgical site infection should be considered.

MO33. Changes in Serum Bicarbonate Level as a Predictor of Mortality in Surgical Intensive Care Patients

Maria Barahona; Andrew Tran; Rubayet Hossain; Esther Tseng; Nimitt Patel; Laura Brown; Vanessa Ho; Caleb W. Curry

Background: The surgical and trauma intensive care units (ICU) treat a variety of time-sensitive life-threatening disorders. To optimize patient outcomes, early identification of patients who are at risk for deterioration is paramount. Serum bicarbonate (HCO_3) level is a standard test which can provide useful prognostic value in the prediction of mortality. Change in HCO_3 (ΔHCO_3) may be a proxy for the quality and adequacy of early resuscitation in a patient with acidosis. It is unknown whether ΔHCO_3 would have prognostic value.

Hypothesis: ΔHCO_3 , defined as (HCO_3 at ICU admission)-(HCO₃ in the Emergency Department), would be associated with mortality.

Methods: We performed a retrospective chart review of admitted patients to the surgical and trauma ICUs between February 2014 and March 2022 at our hospital—a large, urban, tertiary care academic center. We examined variables including age at admission, gender, race, basic metabolic panel components at hospital arrival and ICU admission. Our main outcome of interest was in-hospital mortality; we also examined 30-day and 90-day mortality. The ΔHCO_3 was calculated from serum chemistry results. We performed logistic regressions with ΔHCO_3 , treated as a continuous variable, as the main predictor variable and in-hospital, 30-day, and 90-day mortality as the response variables; adjusting for age, gender, and race. We calculated odds ratios (OR) and 95% confidence intervals (95% CI).

Results: A total of 433 patients were identified. Patient demographics include mean age 56.1 ± 21.2 years; proportion male 68.1%. The race distribution in our study was White 73.0%; proportion Black 21.2%; and proportion Asian 1.2%. In our regression model, ΔHCO_3 was a statistically significant predictor of reduced in-hospital mortality (OR: 0.916; 95% CI: [0.852, 0.982]; $p < 0.05$), 30-day mortality (OR: 0.921; 95% CI: [0.858, 0.987]; $p < 0.05$), and 90-day mortality (OR: 0.908; 95% CI: [0.845, 0.973]; $p < 0.05$).

Conclusions: An increase in ΔHCO_3 which occurred between the Emergency Department and ICU admission was associated with better in-hospital survival and survival up to 90 days. The improvement in mortality with correction of acidosis likely corresponds to better resuscitation, especially in sepsis. Our finding potentially highlights the use of ΔHCO_3 as a cheap, minimally invasive, and early predictor of patient outcomes.

MO34. Use of Antibiotics in Reconstruction with Sternal Rigid Plate Fixation

Alexandra Blake; Vineet Mehan

Background: Sternal infection is a serious complication after cardiac surgeries. Patients with infection have increased 1-year mortality and average hospital stays. While antibiotics have their place in infection prevention, abuse and eventual resistance are still a major concern. If a patient does not already have an infection, the recommendation is for no more than 48 hours of prophylactic antibiotics. The purpose of this study is to examine the effects of antibiotic use and their association with post-reconstruction infection, specifically in patients who did not previously have infection.

Hypothesis: We hypothesized that duration of antibiotics makes no difference in the development of post-reconstruction infection.

Methods: This is a retrospective study of patients who underwent sternal rigid plate fixation (SRPF) by a single plastic surgeon from April 2013 to January 2022. We evaluated different characteristics of antibiotic usage in patients who received SRPF, including duration of antibiotics, use of main antibiotic classes, number of antibiotics and antibiotic classes used, as well as wound culture results, along with characteristics related to infection status both before and after reconstruction. Inclusion criteria- sternal reconstruction with SRPF, at least 6 months follow-up/post-reconstruction. Exclusion criteria- reconstructed without plates, addition and removal of plates multiple times. 106 patients were included.

Results: There was no difference in duration for those with post-reconstruction infection and those without overall (25.93 \pm 20.63 vs 28.29 \pm 21.91, $p=0.696$), or among the 72 initially infected patients (35.85 \pm 18.51 vs 38.60 \pm 16.72, $p=0.664$), but among the 34 initially clean patients, those who did not develop infection had longer antibiotic courses (8.14 \pm 9 vs 3.4 \pm 2.19, $p=0.021$). The duration of antibiotics was also significantly different when comparing patients based on number of surgical washouts, number of antibiotics given, and number of antibiotic classes used ($p < 0.001$, 0.002, < 0.001 , respectively). There were no significant differences related to wound culture results or whether or not the patient had a listed penicillin allergy.

Conclusions: Antibiotic duration in initially infected patients did not have any change in outcome, while a longer course among clean/primarily plated patients is associated with not having post-reconstruction infection. More research is needed, however, since the subset of clean patients from this sample is small.

MO35. SPINAL EPIDURAL ABSCESS PATIENT FOLLOW-UP: ANOTHER CRITICAL TREATMENT PLAN CONSIDERATION

Rhett MacNeille; Johnson Lay; Jacob Razzouk; Shelly Bogue; Gideon Harianja; Evelyn Ouro-Rodrigues; Caleb Ting; Omar Ramos; Jennifer Veltman; Olumide Danisa

Background: Spinal epidural abscess (SEA) is a rare process with significant risk for morbidity and mortality. Treatment includes an extended course of antibiotics with or without surgery depending on the clinical presentation. Both non-operative and surgically treated patients require close follow-up to ensure resolution of the infection without recurrence and/or progression of neurologic deficits. No previous study has looked specifically at follow-up in the SEA population, but review of the literature does show evidence of varying degrees of difficulty with follow-up for these patients.

Hypothesis: Patients presenting with spinal epidural abscesses are at-risk for failure to follow-up

Methods: This retrospective review looked at follow-up for 147 patients with SEA at a single institution from 2012 to 2021. Statistical analyses were performed to assess differences between groups of surgical versus non-surgical patients and those with adequate versus inadequate follow-up.

Results: 62 of 147 (42.2%) patients had inadequate follow-up (<90 days) with their surgical team, and 112 of 147 (76.2%) patients had inadequate follow-up (<90 days) with infectious disease (ID). The primary statistically significant difference between patients with adequate versus inadequate follow-up was found to be surgical status with those treated surgically more likely to have adequate follow-up than those treated non-operatively.

Conclusions: Perhaps, improved follow-up in surgical patients should be considered as a factor when deciding on surgical versus non-operative treatment in the SEA patient population. Extra efforts coordinating follow-up care should be made for SEA patients.

MO36. Photo-crosslinking double modified silk fibroin-gelatin hydrogel for open abdominal wound healing

Ye Liu; Xiuwen Wu; Jianan Ren

Background: Open abdomen is currently an effective treatment for abdominal trauma and severe abdominal infections, which is achieved via the use of polymeric materials such as polypropylene mesh and polyethylene patches to temporarily close the abdomen. However, these meshes alone are prone to cause abrasion and rupture of the intestine, leading to adhesions and serious complications such as intestinal fistulas and chronic trauma, which seriously affect the patient's outcome. Therefore, the development of materials with trauma protection is a major research direction. Hydrogels hold tremendous promise for applications in wound healing based on their natural similarity to the extracellular matrix.

Hypothesis: The GelMA-SilMA hydrogel has good mechanical properties and self-healing properties.

Methods: Herein, a biofunctional composite hydrogel for open abdominal wound protection was developed by combining GelMA and SilMA.

Results: In vitro cellular experiments have shown that the hydrogels are biocompatible and provide a good promote healing effect, in addition, the hydrogels also have advantages in terms of pro-angiogenesis. In the in vivo experiments, compared to commercially available polypropylene patches used in clinical practice, the designed hydrogel teaches to promote increased abdominal wall tissue thickness and integrity by polarising macrophages, promoting collagen formation, inducing neovascularisation, inhibiting oxidative stress, and suppressing inflammation by reducing IL-6, TNF- α , and IL- β expression.

Conclusions: The results suggest that this bio-multifunctional hydrogel has great potential for the protection and repair of open abdominal.

MO37. Alternation in acyl proteome after burn injury

Shayahati Bieerkehazhi; Lauar De Brito Monteiro; Charlotte Volk; Anna Matveev; Carly Knuth; Dalia Barayan; Marc Jeschke

Background: Severe burns cause a persistent hypermetabolic response that is associated with increased energy expenditure, which further results in detrimental consequence such as adipose tissue browning, lipolysis, liver steatosis, increased risk of infections, multi-organ disfunctions and even death. Protein S-acylation is a reversible post-translational modification of cysteine residues with long-chain fatty acids via a labile thioester bond. S-acylation can govern protein function by altering its structure, stability and intracellular localization.

Hypothesis: In this project we will test the innovative hypothesis that the modulation of the acyl proteome machinery that possibly alters post-burn metabolic dysfunction and adverse outcomes.

Methods: Here, we use a murine burn model and burn patients adipose tissue to determine whether changes in acyl proteome play a mechanistic role for adverse outcomes after burn injury. Acyl-biotin exchange (ABE) is one of the extensively used biochemical methods for capture and identification of S-acylated proteins, which is based on selective cleavage of the thioester bond between the acyl group and the cysteine residue by neutral hydroxylamine. The liberated thiol groups are then captured with a thiol-reactive biotin derivative. The generated biotinylated proteins are then affinity-purified using streptavidin agarose and analyzed by immunoblotting.

Results: Our data demonstrates that burn results in alternations in DHHC1/9/13/16/21/23 mRNA expression in both adipose tissue and liver. Burn results in increased activation of endoplasmic reticulum (ER) stress marker and lipolysis signaling pathways, reflected by significantly increased accumulation of phospho-ERK1/2, phospho-HSL (ser660), FGF21 and ATGL ($P < 0.05$). Most importantly, we found significantly increased S-acylation of proximal ER stress markers (ERK1/2, cleaved-ATF6), and lipolysis signaling proteins (HSL, FGF21 and ATGL) both adipose tissue and liver in mice, similar results were found in humans as well, as evidenced by increased S-acylation of ERK1/2, eif2a, ATGL and FGF21 ($P < 0.05$ or $p < 0.01$).

Conclusions: Our data indicates that protein S-acylation might promote the protein activation profile that drives hypermetabolism, and targeting protein S-acylation could be a strategy to mitigate the adverse outcomes in response to burn.

MO38. Prolonged intraarterial catheter therapy for diabetic gangrene of the lower limb

Alisher Okhunov; Fayzrakhmon Abduralhmanov

Background: Diabetic gangrene of the lower extremities is one of the most common causes of death in intensive care units. Although understanding of its pathogenesis has improved, this has not affected the management of these patients.

Hypothesis: To improve the results of treatment of patients with diabetic gangrene of the lower extremities by developing a pathogen-based regimen of long-term intra-arterial catheter therapy (PIACT).

Methods: The results of treatment and examination of 267 patients with diabetic gangrene of the lower extremities were analyzed. All patients underwent early surgical intervention with the use of vacuum therapy in the postoperative period, and complex drug therapy was prescribed. After the operation, the catheter was placed into the arterial bed of the affected limb using PIACT. The composition of the administered infusion in patients of group I (control - 126 patients) included drugs whose action was aimed at relieving spasm and intoxication, improving the rheological properties of blood and microcirculation, as well as broad-spectrum antibiotics. Patients of group II (basic - 141 patients) were added glucocorticoids in doses of 60-180 mg/day and albumin, 100-200 ml of 10% solution.

Results: Persistence in group I of a high proportion of complications associated with sepsis (22.3%) and mortality (4%) indicates the need to revise the traditional PIACT regimens, taking into account the phases of the course of inflammation. The proposed pathogenically substantiated PIACT regimen with the jet administration of antibiotics and albumin at the early stages of treatment (24–48 hours) and the addition of a prednisolone solution to the infusion composition for 2–5 days makes it possible to regulate the course of the inflammatory process with the relief of exudation and tissue edema in the affected area.

Conclusions: The inclusion of the improved PIACT scheme in the complex of therapeutic measures in the treatment of severe pyoinflammatory diseases made it possible to reduce the incidence of complications to 2.8%, mortality to 1.45% and reduce the duration of treatment from 30.1 ± 0.6 days to 11.8 ± 0.6 days.

MO39. Prediction and prevention of sepsis in patients with necrotizing fasciitis on the background of diabetes mellitus

Alisher Okhunov

Background: Diagnosis and treatment of surgical infections remains one of the urgent problems of modern surgery. Evidence of this is the high mortality rate in severe forms of purulent-inflammatory diseases of soft tissues, which ranges from 28–56%, and with the development of sepsis - over 90%. Purulent-inflammatory diseases of soft tissues against the background of diabetes mellitus proceed atypically and rather aggressively. Those norms that are inherent in acute soft tissue infections without diabetes mellitus can have a contradictory effect on the fate of patients with concomitant diabetes mellitus.

Hypothesis: To improve the results of treatment of patients with severe forms of purulent-inflammatory diseases of soft tissues against the background of diabetes mellitus by developing a prognosis and prevention of the generalization of the process.

Methods: The results of treatment of 182 patients with necrotizing fasciitis associated with diabetes mellitus (93 patients in the control group, 89 patients in the main group) were analyzed. The mean age of the patients was 52.9 ± 11.7 years. To predict the likelihood of sepsis (high, moderate, low), the following indicators were determined: pro-inflammatory cytokines (IL-1b, IL-6 and TNF- α), the presence of signs of SIRS, the area of prevalence of the purulent-inflammatory process, the level of microbial contamination of the wound with procalcitonin.

Results: Based on the results of predicting the likelihood of developing sepsis, we developed an algorithm using a drug based on granulocyte colony-stimulating factor (Filgrastim). With a high likelihood of developing sepsis, Filgrastim was used by subcutaneous injection at a dose of 5 $\mu\text{g}/\text{kg}$ of body weight for at least 5 days. With a moderate probability - Filgrastim was administered at a dose of 5 $\mu\text{g} / \text{kg}$ of body weight for another 2 days. The drug was not used with a low probability.

Conclusions: The use of Filgrastim on the basis of the diagnostic and treatment algorithm developed by us contributed to a decrease in the number of patients with sepsis on the 5th day of treatment compared with the control group of patients by 18.3 times. The effectiveness of the use of Filgrastim was also proven by the fact that among the patients of the main group on the 7th day of treatment there were no cases with a septic course of necrotizing fasciitis on the background of diabetes mellitus. The proportion of positive results in the main group of patients was higher by 11.3%, and mortality decreased by 4.5%

MO40. Decrease Wound Dehiscence with Closed-Suction Drains: A Single Facilities Experience in An Overweight Patient Population

Chander Hinson; Hayden Alford; Wilson Huett; Melody Zeidan; Ronald Brooks

Background: With trends of obesity increasing within the United States, plastic surgeons are being challenged at resecting larger weights from larger patients. Published literature has demonstrated the association between BMI and resection weight to post-surgical complications; however, these relationships are unclear in a population that is primarily overweight or obese. The purpose of this study is to determine if closed-suction drains decrease the rate of wound dehiscence after breast reduction in a patient population with a high body mass index.

Methods: We reviewed electronic medical records to identify a cohort of 182 patients who received bilateral reduction mammoplasties at our single institution over a 4-year period. A multivariable analysis was conducted to assess the association between closed-suction drains and wound dehiscence.

Results: Within the study cohort, 95% of the patients were either overweight or obese. Wound dehiscence was the most common complication, occurring in 36.36% of the patients. No patients developed hematomas and only one patient developed a seroma. Results from the multivariable analysis are shown in Table 1. The results from our analysis challenge current recommendations by demonstrating a protective association in using closed-suction drains in preventing wound dehiscence. In our facility, some surgeons consistently use drains while others are more selective in their use of drains. Decisions to use drains are based on resection volumes and nipple elevation. A possible explanation for the protective factor in using drains in preventing wound dehiscence is the reduction in postoperative edema immediately after surgery. While our facility operates on a patient population with a high prevalence of obesity, the larger reductions require greater resections, leaving larger dead spaces for filling by postoperative edema. Larger resections require longer operative times, increasing the inflammatory response leading to postoperative swelling.

Conclusions: As the prevalence of obesity rises, plastic surgeons will be resecting larger weights from larger patients. The results of this studies challenge the current literature about the use of closed-suction drains after surgery, suggesting that drains can be a protective factor in preventing wound dehiscence by allowing drainage of the postoperative edema. We believe this finding can help provide guidance to plastic surgeons about limiting common postoperative complications in larger patients receiving a breast reduction.