P01.
Antibiotic Prophylaxis for Endoscopic Endonasal Skull Base Surgery: the Loyola Experience

Stephen Johans, Loyola University Medical Center;Kevin Swong, Loyola University Medical Center;Chirag Patel, Loyola University Medical Center ;Anand Germanwala, Loyola University Medical Center

Background:

Endoscopic endonasal approaches to the skull base provide minimally invasive corridors to intracranial lesions. Initially, these approaches were criticized due to infection concerns since the approach corridor passes through nonsterile sinonasal cavities; however, this has not been shown to be the case with documented infection rates equal to that of a standard craniotomy. Previous reports have shown that postoperative cerebrospinal fluid (CSF) leakage following endoscopic endonasal skull base surgery (EESBS) is the most important risk factor for postoperative meningitis.

Hypothesis:

The use of a vascularized nasoseptal flap to reduce the incidence of postoperative CSF leak coupled with our antibiotic prophylaxis protocol has likely reduced the risk of infection from these approaches.

Methods:

A retrospective review of consecutive patients undergoing EESBS by the same neurosurgeon and otolaryngologist was performed. Antibiotic regimens, patient demographics, reason for surgery, presence of an intraoperative or postoperative CSF leak, sinusitis, meningitis, and/or intracranial abscess were analyzed.

Results:

39 patients underwent a total of 41 EESBSs with a mean age of 46 years (range 8-79 years) were identified. The most common pathologies treated were pituitary adenomas (n= 15, 37.5%), spontaneous CSF leaks (n= 11, 27.5%), and skull base meningiomas (n=3, 7.5%). All patients received intravenous ceftriaxone perioperatively (2 grams) and this was continued at a meningitis prophylaxis dose (2 grams BID) until discharge (mean 5 days, range 2-14 days). A vascularized nasoseptal flap was used for dural reconstruction when high flow CSF leaks were encountered intraoperatively (n=17); otherwise, reconstruction mostly consisted of avascular or free mucosal grafts (n=19). Patients were discharged on PO Augmentin or Keflex until nasal packing was removed. There were zero postoperative cases of CSF leaks, meningitis, or intracranial infection. 4 patients (10.2%) had postoperative sinusitis that required a course of oral antibiotics for 10-14 days without any further clinical sequelae.

Conclusions:

Our current antibiotic prophylaxis protocol coupled with the use of variable dural reconstruction techniques dictated by intraoperative findings has led to low rates of postoperative CSF leaks, intracranial infections, and meningitis. The practice of antibiotic prophylaxis for patients undergoing EESBS is quite variable and this study should provide the impetus for multi-institutional comparison studies.

P02.
Assessment of a New Antibiotic Protocol in the Surgical Intensive Care Unit

Jonathan Imran, University of Texas Southwestern Medical Center;Tarik Madni, University of Texas Southwestern Medical Center;Madhu Subramanian, ;Audra Clark, University of Texas Southwestern Medical Center;Michael Cripps, University of Texas Southwestern Medical Center;Jojo Koshy, UT Southwestern Medical Center;Cory Kacir, UT Southwestern Medical Center;Christian Minshall, UT Southwestern Medical Center

Background:

Optimizing antibiotic use in the intensive care unit (ICU) can be challenging. Antimicrobial stewardship programs have been shown to be effective in reducing inappropriate antibiotic therapy. To improve evidence based antibiotic utilization in our surgical ICU we recently developed a protocol that aimed to standardize antibiotic use for the most

commonly encountered diagnoses that we treat. The objective of this study was to assess the compliance of our newly developed protocol with regards to appropriate antibiotic choice and duration.

Hypothesis:

Our hypothesis was that the appropriate choice and duration of antibiotic therapy would improve after the new protocol was instituted in our surgical ICU.

Methods:

In July 2016 we instituted a standardized antibiotic protocol, which was developed based on best practice guidelines with the aide of our full-time ICU pharmacists and critical care physicians. Patients with traumatic injuries, necrotizing soft tissue infection, urinary tract infection, pneumonia, intraabdominal contamination and rib plating procedures were included in the protocol. The new protocol was reviewed bi-monthly with oncoming residents, fellows and other clinical staff to ensure proper compliance and understanding. Adherence to the protocol was prospectively evaluated in 52 patients and was subsequently compared to 54 patients with similar diagnoses in the pre-protocol period from 2014-2015. Pre and post-protocol cohorts were analyzed using Pearson's chi-squared test.

Results:

Over the 4-month study period, 73% of patients received the appropriate duration of antibiotics compared to 46% of patients in the pre-protocol period ($p = 0.005$). In addition, 67% of patients had the first line antibiotic given based on best practice guidelines, versus 48 % of patients in the pre-protocol cohort ($p = 0.046$). The most common diagnoses for which patients required antibiotics in the post-protocol period were pneumonia (27%), open fractures (19%), facial fractures (21%), intraabdominal contamination (10%) and necrotizing soft tissue infection (10%).

Conclusions:

The development and implementation of a standardized antibiotic protocol improved antibiotic utilization in our surgical ICU. Additionally, based on these results a more expansive protocol should be developed to better provide appropriate antibiotic therapy for non-trauma and acute care surgery patients.

P03.
Antimicrobial Activity of Ceftolozane/Tazobactam When Tested against Gram-negative Isolates from Intra-abdominal Infections in United States (US) Medical Centers (2013-2016)

Dee Shortridge, JMI Laboratories;Mariana Castanheira, JMI Laboratories;Rodrigo Mendes, JMI Laboratories;Leonad Duncan, JMI Laboratories;Helio Sader, JMI Laboratories;Robert Flamm, JMI Laboratories

Background:

Ceftolozane/tazobactam (C/T) is a combination antipseudomonal cephalosporin/beta-lactamase inhibitor. C/T was approved by the US Food and Drug Administration in 2014 for complicated urinary tract infections, acute pyelonephritis and complicated intra-abdominal infections (IAI). The Program to Assess Ceftolozane/Tazobactam Susceptibility (PACTS) monitors resistance of C/T and comparators to Gram-negative (GN) isolates worldwide.

Hypothesis:

Unique GN (n=1,791) isolates from patients with IAI were collected during 2013-2016 from 31 US medical centers (MC) and tested for susceptibility by CLSI broth microdilution method.

Methods:

Antibacterials tested were C/T, amikacin (AMK), cefepime (FEP), ceftazidime (CAZ), colistin (COL), levofloxacin (LVX), meropenem (MER), and piperacillin/tazobactam (TZP). Carbapenem-resistant Enterobacteriaceae (CRE), extended-spectrum beta-lactamase (ESBL, non-CRE), ceftazidime nonsusceptible *Pseudomonas aeruginosa* (PSA, CAZ-NS), meropenem nonsusceptible PSA (MER-NS), and multidrug-resistant (MDR) phenotypes were determined. CLSI (2016) breakpoints were used.

Results:

The top 5 GN isolates were *Escherichia coli* (EC, n=745; 41.1%), *Klebsiella pneumoniae* (KPN, 289; 16.1%), PSA, (229; 12.8%), *Enterobacter cloacae*, (113; 6.3%) and *K. oxytoca* (KOX, 82; 4.6%). For Enterobacteriaceae (ENT; n=1,497), 93.7% were susceptible (S) to C/T at £2 µg/mL, 99.5%S to AMK, 89.1%S to FEP, 85.7%S to CAZ, 81.1%S to LVX, 98.1%S to MER and 90.2%S to TZP. An ESBL(non-CRE) phenotype was identified in 180 EC, KPN, and KOX; 88.3% of the ESBL isolates were S to C/T, 98.8%S to AMK, 30.6%S to FEP, 30.6%S to CAZ, 30.0%S to LVX, 99.4%S to MER, and 77.2%S to TZP. Only 26 isolates (1.7%) were CRE, <8.0% were S to any β-lactam tested. For 120 ENT MDR isolates (8.0%), MER (76.7%S) and AMK (93.3%S) were the most active, 54.2% were S to C/T, and remaining β-lactams were £35%S. For PSA, 98.7% were S to C/T at £4 mg/mL, 99.6%S to AMK, 89.1% S to FEP, 88.2%S to CAZ, 99.1%S to COL, 77.3%S to LVX, 80.7%S to MER, and 83.8%S to TZP. Only 35 PSA were MDR (15.3%); the most active drugs were AMK (97.1%S), COL (97.1%S), and C/T (91.4%S). For 27 CAZ-NS PSA, 88.9% were S to C/T, 100%S to AMK and 96.3%S to COL. For 44 MER-NS PSA, 95.5% were S to C/T, 97.7%S to AMK, and 100%S to COL.

Conclusions:

C/T had potent *in vitro* activity against ENT isolated from IAI in US MC with 93.7% of ENT S to C/T. For PSA, C/T was the most active β-lactam and had similar activity to COL and AMK.

P04.
Broad Spectrum Antibiotics are Required to Empirically Cover Acute Pilonidal Abscesses

Marlon Torres, Washington University School of Medicine;Dajun Tian, Washington University School of Medicine;Christopher Horn, Washington University School of Medicine;Jarot Guerra, Washington University School of Medicine;Rohit Rasane, Washington University School of Medicine;Brendan Wesp, Washington University School of Medicine;Obeid Ilahi, Washington University School of Medicine;Isaiah Turnbull, Washington University in Saint Louis;Grant Bochicchio, Washington University School of Medicine;John Kirby, Washington University School of Medicinee

Background:

Pilonidal abscess represents 35%-40% of complications of chronic pilonidal disease. Urgent Incision and drainage (I+D) is the standard of care for acute abscesses of pilonidal tracts. Due to the chronic nature of pilonidal tracts and proximity to the anus, pilonidal tracts are at risk of fecal contamination and super-infection with gut-associated organisms, complicating the choice of empiric antibiotic therapy. To determine the appropriate empiric antibiotic regimen for acute pilonidal abscess, we reviewed a cohort of patients who underwent I+D for acute pilonidal abscess.

Hypothesis:

Acute pilonidal abscess is frequently caused by mixed microorganisms including gram-negative and anaerobic gut-associated flora.

Methods:

A prospectively maintained Acute and Critical Care Surgery (ACCS) database spanning 2008-2015 and including over 11,000 patients was queried for patients requiring operative treatment for acute pilonidal abscess. Microbiologic data, demographics and antibiotic treatment regimens were abstracted.

Results:

58 patients with pilonidal abscess were identified; all had antibiotic data and 42 had microbiologic data for analysis. In the total cohort the average age was 30 years and 58% of patients were female; the average BMI was 33 kg/m^2. 40/42 of the abscess cultures were positive. More than half grew mixed aerobic and anaerobic microorganisms (26/42; 62%). Of the speciated cultures, 14/58 (33%) grew gram-positive organisms, 4/42 (10%) grew gram negative organisms, and 7/42 (17%) grew anaerobic organisms. Among the gram positive isolates, *Staphylococcus* species were rarely encountered (3/42, 7%) and only 1/42 (2.4%) grew methicillin-resistant *Staphylococcus aureus* (MRSA). In our cohort, we identified 17 unique initial antibiotic regimens. All included gram-positive coverage, and 29/58 (50%) covered MRSA; 41/58 (71%) covered gram-negative organisms, and 42/58 (72%) covered anaerobes; 19/58 (33%) included antipseudomonal coverage.

Conclusions:

In contrast to other skin and soft tissue infection where S*taphylococcal* infections predominate, pilonidal abscesses frequently involve mixed organisms and infection by anaerobes and gram negative bacteria. This likely reflect the chronic nature of pilonidal tracts and the increased risk of fecal contamination. There is no consensus regarding empiric antibiotic therapy but appropriate antibiosis should include coverage for gram-positive, gram-negative, and anaerobic organisms. However, empiric MRSA or anti-pseudomonal coverage for is not required.

P05.
Antimicrobial Activity of Ceftazidime-avibactam When Tested against Aerobic Gram-negative Organisms Isolated from Intra-abdominal Infections in United States (US) Hospitals (2014–2016)

Helio Sader, JMI Laboratories;Mariana Castanheira, JMI Laboratories;Rodrigo Mendes, JMI Laboratories;Dee Shortridge, JMI Laboratories;Robert Flamm, JMI Laboratories

Background:

Avibactam is a non-β-lactam β-lactamase inhibitor that inhibits Ambler classes A (e.g., ESBL and KPC), C (AmpC) and some D enzymes, and ceftazidime-avibactam (CAZ-AVI) is approved by the US-FDA and by the EMA (Europe) for treatment of intra-abdominal (IAI) as well as other infections.

Hypothesis:

To evaluate the activity of ceftazidime-avibactam tested against contemporary isolates causing IAI in US hospitals.

Methods:

1,352 isolates (one per patient) of aerobic Gram-negative (GN) bacteria were collected in 29 US hospitals from patients with IAI in 2014-2016. Susceptibility testing was performed by reference broth microdilution methods and Enterobacteriaceae isolates with an ESBL-phenotype were evaluated for the presence of genes encoding CTX-M, TEM, SHV, KPC, NDM and transferable AmpC enzymes by microarray-based assay.

Results:

The most common aerobic GN were *E. coli* (n=586; 43.3%), *Klebsiella* spp. (293; 21.7%), *P. aeruginosa* (180; 13.3%) and *Enterobacter* spp. (158; 11.7%). The most active agents against Enterobacteriaceae were CAZ-AVI ($MIC_{50/90}$, 0.12/0.25 µg/mL; 99.9% susceptible [S]), amikacin ($MIC_{50/90}$, 2/4 µg/mL; 99.7% S); tigecycline ($MIC_{50/90}$, 0.25/0.5 µg/mL; 99.6% S); and meropenem ($MIC_{50/90}$, ≤0.015/0.06 µg/mL; 98.4% S). An ESBL-phenotype was observed among 21.0% of *E. coli* and 12.3% of *Klebsiella* spp. isolates. All *E. coli* and *Klebsiella* spp. isolates were S to CAZ-AVI and S rates among ESBL-phenotype *E. coli* and *Klebsiella* spp. were 97.6 and 80.6% for meropenem and 82.9 and 52.8% for piperacillin/tazobactam (P/T), respectively. CAZ-AVI was active against *Enterobacter* spp. ($MIC_{50/90}$, 0.25/0.5 µg/mL; 99.4% S), including ceftazidime-non-S strains (97.5% S). Only one Enterobacteriaceae

isolate (*E. cloacae*) was non-S to CAZ-AVI and had negative results for all β-lactamases tested. CAZ-AVI ($MIC_{50/90}$, 2/4 µg/mL; 97.8% S), amikacin ($MIC_{50/90}$, 2/8 µg/mL; 99.4% S) and colistin ($MIC_{50/90}$, 1/2 µg/mL; 98.9% S) were the most active compounds tested against *P. aeruginosa*, and CAZ-AVI retained activity against most meropenem-non-S (90.9% S), P/T-non-S (87.1% S) and ceftazidime-non-S (82.6% S) isolates.

Conclusions:

CAZ-AVI demonstrated potent in vitro activity against aerobic GN organisms isolated from IAI in US hospitals. CAZ-AVI overall coverage (98.8% inhibited at ≤8 µg/mL) was greater than that observed for meropenem (95.6% S) and P/T (89.5% S).

P06.
What is the best choice of empiric antibiotic for buttock abscesses requiring urgent operative intervention?

Eden Nohra, Washington University in St. Louis;Adrian Coleoglou, Washington University in St. Louis;Rohit Rasane, Washington university at St. louis;Christopher Horn, Washington University in St. Louis;Dajun Tian, Washington University in St. Louis;Marlon Torres-Barboza, Washington University in St. Louis;Wen Hui Tan, Washington University in St. Louis;Obeid Ilahi, Washington University in St. Louis;Isaiah Turnbull, Washington University in St. Louis;Grant Bochicchio, Washington University in St. Louis

Background:

In complicated skin and soft tissue infections, empiric antimicrobial therapy for buttock abscesses is advised for *Staphylococcus aureus*, other gram-positive bacteria, and possibly gut-associated flora. There is limited microbiologic data to guide the choice of empiric antimicrobial therapy for buttock abscesses with respect to expected microorganisms and resistance profiles.

Hypothesis:

We hypothesize that the microbiology of buttock abscesses will include predominantly gram- positive bacteria and some anaerobic organisms, that source control is followed by precipitous hospital discharge, and that drugs of last resort need not be used empirically.

Methods:

A prospectively maintained Acute and Critical Care Surgery (ACCS) database spanning 2008-2015 and including over 11,000 patients was queried for patients with buttock abscesses requiring acute surgical drainage. Perirectal and perianal abscesses were excluded. Demographics, outcomes and antibiotic susceptibilities were abstracted.

Results:

208 patients surgically treated buttock abscess were identified; complete data including abscess culture and sensitivity was available for 83 patients. The average age was 45, 57% of the patients were female, and diabetes was present in 32.5% of the cohort. The median length of stay was 2 days and 79% of patients were discharged within 3 days. 1 patient died of septic shock. Abscess culture showed that 72/83 (87%) had isolated gram positive organisms. Results were 47/83 MRSA (57%), 17/83 MSSA (20%) and 14/83 (17%) *Streptococcus spp.,* and 5/83 (6%) *Escherichia coli* or mixed. Of note, 4/64 (6%) of the *Staphylococcus aureus* isolates had intermediate sensitivity to Vancomycin. 7 *Streptococcus spp.* did not have clindamycin susceptibility data. Clindamycin and vancomycin would cover 90% and 94% of gram- positive isolates, respectively. 7/83 (8%) of patients also had anaerobic flora. Anaerobic susceptibility profiles are not done in our microbiology laboratory.

Conclusions:

Gram-positive organisms are the predominant cause of infection in buttock abscesses, followed by anaerobes. Vancomycin may not be indicated for the majority of patients with buttock abscess as they recover quickly after surgical treatment. Additionally, there is a growing concern for vancomycin-intermediate *Staphylococcus aureus*.

Clindamycin may be a better empiric choice as an effort in antibiotic stewardship with coverage of 90% of gram-positive isolates.

P07.
Urinary Tract Infection Sensitivities in an Intensive Care Setting: A Potential for Novel Antibiotic Treatment

Victor Vakayil, University Of Minnesota;Samantha Saunders, University of Minnesota;Jeana Houseman, University of Minnesota;Dawn England, University of Minnesota;Melissa Quinn, University of Minnesota;Kristine Mulier, University of Minnesota;(Helen) Tracy Davido, University of Minnesota

Background:

Urinary tract infections(UTI's) are the most common nosocomial infections associated with catheter use. Additionally, microbe resistance to frequently used antibiotics remains a significant problem in managing hospitalized patients. In critical care units (ICUs), nearly all patients have urinary catheters and are at risk for resistant UTI's. Traditionally, prescribed IV antibiotics are demonstrating high rates of resistance and are ineffective choices of treatment leading to increased morbidity and hospitalization costs.

Furthermore, since 2008, the Centers for Medicare and Medicaid Services no longer reimburse hospitals for the additional costs of caring for patients who develop catheter-associated urinary tract infections (CAUTI).

IV forms of antibiotics are substantially more expensive than oral forms. In our institution, IV Ciprofloxacin is over 12 times the cost of a tablet despite the oral from having 96% bioavailability. Other antibiotics evaluated demonstrate similar disparities between IV and PO dosing costs.

Hypothesis:

We hypothesize in many cases of CAUTI, a less expensive oral antibiotic may be an appropriate initial treatment of choice. As most ICU patients have gastrointestinal (GI) access within 48 hours of admission, oral antibiotics can be administered without the need for conversion from an initial IV form of administration.

Methods:

A retrospective review of electronic patient charts data in a tertiary academic medical center's Medical and Surgical ICU patients was performed from January 2014 through March 2016. The data points included 1. Presence of CAUTI, 2. Causative Organism, 3. Presence of GI access and type (ie: Nasogastric (NG), post-pyloric (PPFT), jejunostomy (JT) or gastrostomy (GT) feeding tube, 3. Sensitivities of microorganism, particularly to oral agents.

Results:

A total of 43 CAUTIs were diagnosed between January 2014 and March 31, 2016, in our Medical and Surgical ICUs. The most common causative organism was E Coli with 16 events, but a wide variety of organisms were isolated and recorded. This is shown in the graph attached. Antibiotic sensitivity and resistance are shown in the attached bar graph. Sensitivities and resistance rates of to various oral antibiotics(Levofloxacin, Trimethoprim/Sulfamethoxazole) are comparable to commonly used I.V antibiotics.

Conclusions:

CAUTIs are a major source of patient morbidity and increased hospitalization cost. Use of oral antibiotics in patients with GI access may be a cost-effective strategy in an ICU setting.

P08.
Amicidins: Novel synthetic biologics for prevention and treatment of wound infections in trauma and surgery

Michael Bevilacqua, MD, PhD, Amicrobe, Inc.;Carl Edwards, III, Amicrobe, Inc.;Shalyn Lane, Amicrobe, Inc.;Daniel

Huang, Amicrobe, Inc.;Timothy Deming, PhD, University of California at Los Angeles;Joseph Solomkin, MD, Amicrobe, Inc.

Background:

Surgical antisepsis is a growing challenge. Neither systemic antibiotics, nor directly-applied antibiotics / antiseptics are adequate to address the rise of aggressive and antibiotic-resistant microbes. Amicidins are a new class of directly-applied biologics that combine broad antimicrobial activity with beneficial physical properties to enhance intra-wound performance. Amicidin-α combines microbicidal activity with persisting barrier properties to prevent infection. Amicidin-β combines microbicidal activity with superior anti-biofilm properties to treat infections, especially those involving foreign bodies, such as orthopedic hardware.

Hypothesis:

Amicidins are highly effective as directly applied antimicrobials at concentrations that cause little, if any, tissue toxicity.

Methods:

Synthesized using “one pot” living polymerization, Amicidins are greater than 100 amino acids in length, arranged as one cationic segment (lysines) and one hydrophobic segment (leucines). Antimicrobial activity is measured in 5 and 60 minute time-kill assays. Microbial barrier and anti-biofilm properties are measured using porcine skin *ex vivo*, as well as in standard *in vitro* assays. Porcine open wound and rodent closed wound with foreign body (mesh) models assess activity *in vivo*. Preliminary safety studies include dermal irritation and sensitization, oral toxicity, and intraperitoneal toxicity.

Results:

In 5 and 60 min time-kills, Amicidin-α and Amicidin-β at 10 to 100 µg/mL show 99.9-99.9999% reductions in colony forming units (CFU) of Gram-positive and Gram-negative bacteria, as well as yeast, including multidrug-resistant strains. At higher concentrations, Amicidin-α forms viscous solutions and hydrogels that are microbial barriers on porcine skin *ex vivo*, as well as porcine full-thickness open wounds and rodent closed wounds with foreign body *in vivo*. Pretreatment prior to microbial inoculation results in multi-log reductions of tissue- and foreign body-associated pathogens. Amicidin-β demonstrates rapid (20 min) eradication of *P. aeruginosa* biofilms *in vitro*. It also causes multi-log reduction in CFU of MRSA and *P. aeruginosa* in the rodent closed wound model with a single application 15 min after microbial inoculation, assessed at 48h. Preliminary safety studies show a favorable profile for local application.

Conclusions:

Amicidins demonstrate rapid and potent killing of clinically relevant microorganisms with excellent tissue compatibility. These data support progress to a first-in-man clinical trial.

P09.
Combination Therapeutic Approach for Muscle Function Improvement in Injured Mice

Rohan Kulangara, ;Alvand Sehat, ;Navin Maredia, ;Christian Maxwell, ;Ming-Mei Liu, ;Kevin DeSpain, ;Steven Wolf, MD, ;Juquan Song, MD,

Background:

Loss of skeletal muscle from direct injury presents debilitating effects to an individual. Established treatment methods addressing muscle loss are limited in their ability to sufficiently reconstitute the functional capabilities of muscle. Novel regenerative medicine technologies include the application of Urinary Bladder Matrix (UBM) and mesenchymal stem cells (MSCs) to restore functional muscle tissue.

Hypothesis:

In our previous studies, we found that UBM increased muscle myoblast cell proliferation. Therefore, we examined whether co-treatment with MSCs would further augment regeneration as compared to individual treatments.

Methods:

Twenty C57BL/6 male adult mice received bilateral laceration injuries on the gastrocnemius muscle under anesthesia, and were randomly grouped to a designed treatment applied 14 days after injury. Treatment groups were 1) DMEM culture medium, 2) UBM only (150μg), 3) MSCs only (1 million mouse derived cells), and 4) UBM+MSCs. 4 additional mice served as a control baseline not receiving injury. Efficacy of treatment was analyzed through isometric muscle force testing as well as histomorphologic examination at 50 days after injury. Two-way ANOVA was applied for statistical analysis.

Results:

Isometric muscle force was measured, including twitch (Pt), tetanic (Po), and fatigue isometric functions with the muscle stretched to optimal length (Lo). Muscle twitch (Pt) significantly decreased in the DMEM group compared to the non-injured group at day 50 ($p < 0.05$). Furthermore, twitch significantly increased with UBM treatment, but not with MSC treatment. Regenerating myofiber nuclei were counted and myofiber cross sectional area was measured with histology. New myotubes were identified as having centrally located nuclei. Further, Ki-67 nuclear immunofluorescence staining was performed to demonstrate proliferating satellite cells. The myofiber cross sectional area and the number of Ki-67/DAPI overlapping stained nuclei significantly increased in the DMEM group compared to the non-injured group ($p < 0.05$). No differences were observed with other treatments in injured mice at day 50.

Conclusions:

We observed a significant improvement in muscle function with combination treatment and single UBM treatment applied 50 days after injury. The current animal model provides a tool to study muscle regeneration, and is feasible for clinical translation to address impairment in skeletal muscle function after burn injury.

P10.
In Vitro Activity of Imipenem-Relebactam (MK-7655) against gram-negative ESKAPE pathogens from Intra-abdominal Infections in the United States - SMART 2015-2016

Sibylle Lob, IHMA, Inc.;Sam Bouchillon, International Health Management Associates, Inc.;Katherine Young, MRL Merck & Co., Inc.;Mary Motyl, MRL Merck & Co., Inc.;Daniel Sahm, IHMA, Inc.

Background:

Relebactam (MK-7655, REL) is a β-lactamase inhibitor of class A and C β-lactamases that is in development in combination with imipenem (IMI). REL restores the *in vitro* activity of imipenem against *Enterobacteriaceae* and *Pseudomonas aeruginosa* (Pa). Gram-negative ESKAPE pathogens are known to 'escape' the effects of many currently marketed antimicrobial agents.

Hypothesis:

In this study we evaluated the *in vitro* activity of IMI/REL against gram-negative ESKAPE pathogens collected as part of the 2015-2016 SMART surveillance program in the United States.

Methods:

20 US hospitals collected up to 100 consecutive gram-negative pathogens from intra-abdominal infections. MICs were determined for 234 Pa, 396 *K. pneumoniae* (Kp), 223 *Enterobacter* spp. (Espp), and 10 *A. baumannii* (Ab)

using CLSI broth microdilution. CLSI IMI breakpoints were applied to IMI/REL. Proteeae were excluded due to intrinsic non-susceptibility to IMI. REL was tested at a fixed concentration of 4 µg/mL in combination with IMI.

Results:

The cumulative % of isolates at each MIC is shown in the table.

Organism	N	Drug	MIC (µg/mL)							
			≤0.5	1	2	4	8	16	32	>32
Pa	234	IMI	16.2	65.4	73.1	76.9	85.0	**97.4**	99.1	100
		IMI/REL	76.1	86.8	**96.6**	98.7	99.6			100
Pa, IMI-NS	63	IMI				14.3	44.4	**90.5**	96.8	100
		IMI/REL	15.9	50.8	87.3	**95.2**	98.4			100
Kp	396	IMI	**93.4**	96.5	96.7	98.0	98.7	99.0	100	
		IMI/REL	**96.2**	98.7	99.7	100				
Kp, IMI-NS	14	IMI			7.1	42.9	64.3	71.4	**100**	
		IMI/REL	57.1	64.3	**92.9**	100				
Espp	223	IMI	79.8	**96.4**	97.8	98.7	99.1	99.6	100	
		IMI/REL	**98.2**	100						
Espp, IMI-NS	8	IMI			37.5	62.5	75.0	87.5	**100**	
		IMI/REL	62.5	**100**						
Ab	10	IMI	30.0	50.0		60.0	70.0	80.0	**90.0**	100
		IMI/REL	50.0			60.0	70.0		**90.0**	100

Shaded area indicates susceptible by CLSI imipenem breakpoint; MIC_{90} bolded; NS, non-susceptible

Among 234 Pa isolates, 73.1% (171) were susceptible (S) to IMI; of the 63 non-susceptible (NS) isolates, 87.3% (55) were rendered S by the addition of REL, for a final 96.6% S. Among 396 Kp, 96.5% (382) were S to IMI; of the 14 NS isolates, 64.3% (9) were rendered S by the addition of REL, for a final 98.7% S. Among 223 Espp, 96.4% (215) were S to IMI; the 8 NS isolates were rendered S by the addition of REL, for a final 100% S. As expected, REL did not increase %S of Ab to IMI, as REL does not inhibit class D β-lactamases carried by Ab.

Conclusions:

Relebactam exhibited strong potential for restoring the *in vitro* activity of IMI against many gram-negative ESKAPE pathogens otherwise NS to carbapenems. Further development of this compound could provide a valuable therapeutic option for patients with antimicrobial-resistant gram-negative intra-abdominal infections.

P11.
CHRFAM7A Expression Implies a Uniquely Human Mechanism Gauging Tissue Injury Response

Theresa Chan, University of California San Diego;Emily Lurier, Drexel University;Kara Spiller, Drexel University;Brian Eliceiri, University of California San Diego;Andrew Baird, University of California San Diego;Todd Costantini, University of California San Diego

Background:

The alpha-7 nicotinic acetylcholine receptor (α7nAChR), encoded by the CHRNA7 gene, on macrophages is required for the anti-inflammatory activity of the vagus nerve. While vagal agonists have been widely successful in limiting the inflammatory response in animal models of injury, clinical studies in humans have been largely

disappointing. Interestingly, the human genome encodes a uniquely human gene called CHRFAM7A that is a negative regulator of α7nAchR signaling.

Hypothesis:

Having previously shown that the relative expression of CHRFAM7A compared to CHRNA7 in leukocytes is highly variable between individuals, we hypothesized that, if CHRFAM7A gauges inflammation, its relative expression should be dependant on the polarization state of macrophages.

Methods:

Blood was collected from buffy coats obtained from the New York Blood Center and leukocyte subpopulations were purified using sequential density gradient centrifugations. Cells were expanded with monocyte colony stimulating factor and tissue culture polystyrene to promote macrophage activation. Polarization into M1 (inflammatory) and M2 (anti-inflammatory) subgroups was induced by incubation with gamma interferon and lipopolysaccharide or interleukins 4, 13, and 10. Gene expression was quantified with real-time PCR in triplicate from five donors.

Results:

$CD14^+$ monocytes express CHRFAM7A while none was detected in lymphocytes. There was significant (10-30 fold) variability in CHRFAM7A expression in macrophages from healthy volunteers. Individual variability of CHRFAM7A relative to CHRNA7 was even more striking with approximately 400-800 fold differences between individual donors. This relative CHRFAM7A compared to CHRNA7 gene expression was also significantly decreased when donor macrophages were differentiated into the pro-inflammatory M1 phenotype. This change was not seen in the anti-inflammatory M2 phenotype.

Conclusions:

CHRFAM7A expression in human macrophages varies between individuals and potentially gauges the individual local inflammatory state of tissues. Because CHRFAM7A is an inhibitor of α7nAChR-mediated anti-inflammation, our findings are consistent with the hypothesis that CHRFAM7A can confer individual variability to the human inflammatory response and thus contributes to the uniquely human and unpredictable responsiveness to vagal agonists observed in clinical studies. As such, inhibition of CHRFAM7A expression may increase α7nAChR agonist anti-inflammatory activity.

P12.
Sepsis and the NLRP3 Inflammasome: Comparing Temporal Trajectories of Acute Phase Mediators in Adult Burn Patients

Mile Stanojcic, Sunnybrook Research Institute;Abdikarim Abdullahi, Sunnybrook Research Institute, Toronto, Canada;Marc Jeschke, Sunnybrook Research Institute

Background:

Sepsis in critically ill patients is a leading cause of morbidity and mortality with burn patients being particularly vulnerable. The hyperinflammatory response in burn and sepsis patients has been extensively supported in the past. Recently, our group has shown the NLRP3 inflammasome is upregulated in the adipose tissue of burned patients. Furthermore, using the major output of this acute phase response (IL-1β) we showed that it predicts patients susceptible to sepsis and collectively established it as a critical mediator.

Hypothesis:

We aimed to compare changes in NLRP3 inflammasome in white adipose tissue of non-sepsis and sepsis burned patients in order to determine if this crude measurement can differentiate these cohorts as an acute phase inducer of pathology.

Methods:

Healthy controls (n=10) and burn patients (n=34) were included in the present study with the later being stratified into non-sepsis and sepsis patients. White adipose tissue (WAT) from the site of injury was collected from the time of OR and inflammasome markers (NLRP3, IL-1β, Caspase-1 & IL-18) were measured using RT-PCR.

Results:

Here we show that during the early phase after burn(<12 days), both non-sepsis and sepsis patients had increased WAT gene expression of inflammasome relative to controls. Specifically, NLRP3, IL-1β, Caspase-1 and IL-18 were all between 2 to 15-fold increased. However, interestingly enough there were no significant differences between non-sepsis and sepsis patients. At later time points, sepsis patients had elevated expression relative to non-sepsis counterparts for NLRP3, IL-1β and IL-18 ($P<0.05$). When comparing the onset of sepsis in patients, early onset sepsis had greater IL-18 expression than healthy controls. Patients with late onset sepsis(≥12 days) had greater inflammasome expression for all measures relative to controls ($P<0.05$) and NLRP3, IL-1β and Caspase-1 ($P<0.05$), relative to early onset.

Conclusions:

Our findings indicate that NLRP3 inflammasome activity in non-sepsis and sepsis burn patients is upregulated after insult. However, differentiation between the groups does not become evident until later time points, suggesting a late hyperinflammatory responses in septic patients. Despite the upregulation after burn, gene expression from the site of injury was unable to distinguish sepsis patients acutely after injury. Collectively, the NLRP3 inflammasome may be an acute phase culprit whose prolonged activation may be driving local inflammation and predispose burn patients to negative outcomes

P13.
Identifying the source of hyperactivity in the hGR-S1(-349) human glucocorticoid receptor isoform

Tajia Green, Shriners Hospitals for Children Northern California;Stacey Leventhal, Shriners Hospitals for Children Northern California;Debora Lim, Shriners Hospitals for Children;Kiho Cho, Shriners Hospitals for Children;David Greenhalgh, Shriners Hospitals for Children

Background:

Glucocorticoids are one of the most commonly used therapeutics in the treatment of inflammatory conditions, including sepsis. It is widely known that there are variable patient responses to treatment with glucocorticoids. A likely cause for these differences may be naturally occurring variations in the glucocorticoid receptor (GR). The human GR (hGR) is known to have several alternative splicing patterns and alternative translation start sites, in addition to numerous single nucleotide polymorphisms. We previously reported finding a naturally occurring human variant, hGR-S1(-349A), while screening a volunteer population for polymorphisms. hGR-S1(-349A) is a splice variant retaining intron H between exons 8 and 9. It is also missing an adenosine at position 349, resulting in a frame shift and early termination which produces a 118 amino acid putative protein that has a truncated transactivation domain, and lacks the DNA and ligand binding domains. This isoform has no baseline activity; however, when treated with steroids, it is hyperactive in comparison to the NCBI reference hGR. Interestingly, when the novel 3' UTR created by the early termination is removed the activity is lost.

Hypothesis:

A search for the cause of this phenomenon has led us to believe that, as a result of the deletion, an alternative hGR isoform is being transcribed from one of the hGR-D alternative transcription initiation sites. Due to the alternate start site and retained intron H, this putative hGR isoform would contain a C-terminus end that is significantly different from the previously reported hGR-D isoforms. We believe that one of these isoforms may be responsible for the hyperactive response to steroid treatment observed in hGR-S1(-349A).

Methods:

To confirm the theory that one of these D-isoforms is responsible for the hyperactivity seen in hGR-S1(-349A), a series of constructs will be created for hGR-S1(-349A) beginning at the 316 (D1), 331 (D2), and 336 (D3)

translation start sites, then their activity will be tested in a luciferase assay.

Results:

Preliminary Western blot data has identified the expression of these novel hGR-D isoforms from the hGR-S1(-349A) construct.

Conclusions:

Information from these experiments will allow us to determine if alternative splicing, in combination with alternative translation, contributes to the tremendous variability observed in the response to steroids. Understanding these mechanisms may be important in developing personalized care regimens for patients with inflammatory conditions.

P14.
Growth, Colonization, and Species Type of Microbes Identified on Robots in the Operating Room Before and After Cleaning and Between Cases

Melanie Sandoval, University of Colorado Hospital;Theresa Gray, University of Colorado Hospital;Mary Mancuso, University of Colorado-Denver

Background:

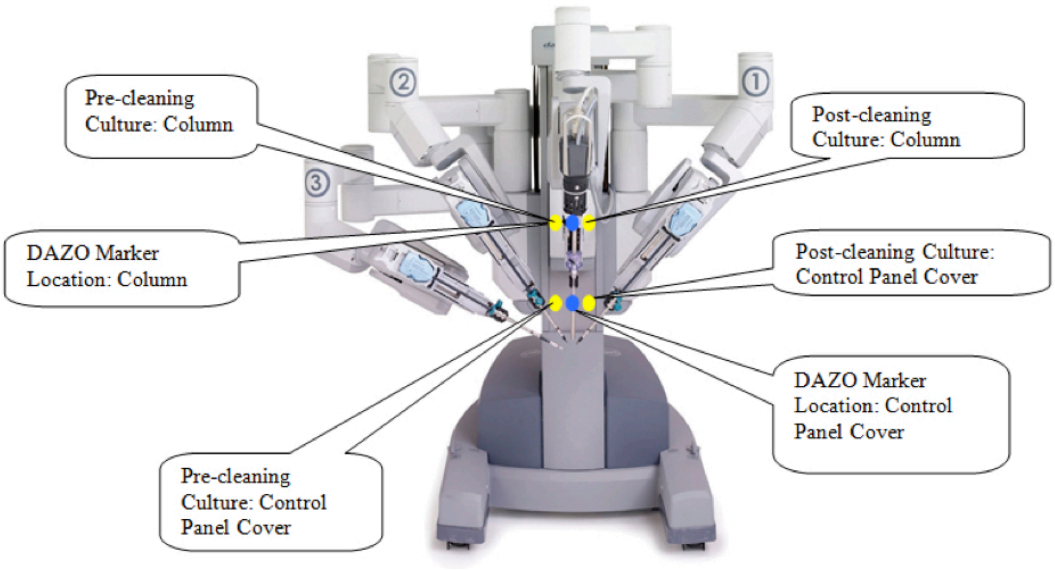
Decontamination of surgical instruments is a challenge to healthcare organizations. Successful decontamination and cleaning of crevices and surfaces of surgical instruments and equipment are affected by a number of factors including the porosity of the surface, the effectiveness of the cleaning solution, protocol adherence by staff responsible for cleaning the equipment, and an effective and efficient cleaning protocol. Recent studies have concluded that the complete removal of residual protein from robotic equipment is near impossible. However, there is limited evidence on the effectiveness of cleaning surgical robots when performed by nursing staff using cleaning protocols.

Hypothesis:

Bacterial colonization and growth will not be eradicated on a surgical robot after cleaning of the robot is performed.

Methods:

An investigative, pilot study was conducted to determine the efficacy of robotic cleaning. Data was collected over three months. The robot was marked with a water-based fluorescent marker before and between cases, and after cleaning. Surface cultures of the column and control panel were collected. Bacterial and/or fungal growth, colony count, and species subtyping was performed by an unaffiliated lab. The research team collected 15 sets of culture at the beginning and end of robotic cases. Photos of visual debris were also



collected.

Results:

The presence of bacteria and yeast was found at both case starts and endings. Colony counts ranged from 0-6 bacterial colonies. Yeast, staph aureus, e-coli, and pseudomonas aeruginosa accounted for most of the microbial growth (>50%). 33% of the robotic columns failed marking removal; 44% of the robotic control panels failed marking removal. Visual inspection of the robot revealed unknown fluids, pen-marking, and blood.

Conclusions:

Current cleaning protocols and solutions are ineffective in eradicating visible soil, fluorescent markings, and microbial organisms from robots. The implementation of effective environmental cleaning protocols and cleaning solutions, trained personnel, and sterile drapes may minimize the colonization of robotic equipment and minimize the risk of patient cross-contamination during surgery and surgical site infections.

P15.
Kill Kinetics and Re-Growth pattern of Escherichia coli following exposure of different concentrations of four Betalactam antibiotics

Hugo Bonatti, University of Maryland Shore Health;Franz Allerberger, AGES;Josef Guggenbichler,

Background:

Escherichia coli has developed increasing resistance rates against many antibiotics (AB). Exposure to concentrations below the minimal inhibitory concentration (MIC) of AB may be partially responsible for selection of resistant mutants.

Hypothesis:

E. coli may be capable to show growth after exposure to various betalactams even if significant changes in morphology are observed.

Methods:

E. coli ATCC 12 249 was incubated in Mueller-Hinton broth and exposed to various concentrations of four different ABs (ampicillin (AMP), piperacillin (PIP), cefotaxim (CTX) and imipenem/cilastatin (IMI)). Growth pattern was investigated using microcalorimetry and turbidimetry. Samples were taken at different time points after AB exposure

and 10microliter were plated on slides, covered in 0.1ml liquid agar and covered. Morphology of bacteria was assessed immediately and at various time points thereafter using a phase contrast microscope.

Results:

Without ABs, MCM showed various spikes reflecting consecutive utilization of nutritional compounds of broth with continuous increase in turbidity. When exposed to 1/10th, 1/4th and 50% of MIC, curves shifted to the right with preserved spikes. With increasing AB concentration, peaks on MCM decreased in size and shifted further to the right without exponential growth. At 10-100MICs, only minimal growth was observed followed by bacterial lysis. Microscopic examination at 1/10th MIC showed minimal changes in morphology. At f 1/4th to fourfold MIC, filament (AMP, PIP, CTX) and sphaeroplast (IMI) formation occurred. Maximum changes and bacterial lysis were observed after 60-180 minutes occurring earlier with increasing AB concentrations. At 10-100 MIC, rapid lysis of bacteria within 30-60 minutes without major morphologic changes was seen. During re-growth in agar, at concentrations below MICs and exposure <1 hour, bacterial lawn growth was seen. With increasing time of exposure to ABs and increasing concentrations, cluster growth of filaments and grotesque bacterial appearance with bulges (AMP, PIP, CTX) and giant cells (IMI) occurred. At high AB concentrations, even at exposure <30 minutes, only minimal growth was observed.

Conclusions:

Appropriate AB exposure seems crucial for bacterial killing, which may take several hours. Even with significant changes in bacterial morphology after exposure to betalactams, if AB concentrations drop, Gram negative rods bare the ability to repair damage caused by inhibition of Penicillin binding proteins and initiate exponential growth.

P16.
The Emergence of Bronchopulmonary Aspergillosis: A Commonality Exist Among Us.

Morgan Lane, Grand Strand Medical Center/University of South Carolina;Jason Sciarretta, Grand Strand Medical Center/University of South Carolina;Keely Muertos, Grand Strand Medical Center/University of South Carolina;John Davis, Grand Strand Medical Center/University of South Carolina

Background:

Aspergillus-related bronchopulmonary disease is dependent on the impairment of natural antifungal defense mechanisms. Airway colonization and host susceptibility lead to various clinical conditions despite a small fraction of *Aspergillus* species causing human disease.

Hypothesis:

We hypothesize that the risk for *Aspergillus*-related bronchopulmonary infection in our regional aging population is increasing regardless of historically known comorbid risk factors. We sought to identify *Aspergillus* species and further describe their associations within our community.

Methods:

A 6-year (2010-2016) retrospective analysis of all *Aspergillus*-related infections was performed. Any patient without bronchopulmonary isolates were excluded in this review. Subgroup analysis of *Aspergillus* species were compared for age, gender, comorbidities and other concomitant infections observed on culture isolates.

Results:

A total of 147 patients with *Aspergillus*-related infections were identified. Of these, 131 bronchopulmonary isolates of *Aspergillus* species were analyzed including: *A. fumigatus* (64%), *A. niger* (21%), *A. flavus* (9%), *A. terreus* (3%), and other species (3%). The mean age was 72.9 ± 12.1 years (range, 26-92). Bacterial coinfection was observed in 53% of specimens. *A. niger* infections likely involved males (p=0.031) while females with underlying lung disease were likely to have *A. flavus* (p=0.049). In general, *A. flavus* patients were significantly younger (< 64 years, p=0.003). On the other hand, older male patients with lung disease more likely had coinfections with *Mycobacterium* species (p=0.029). *A. terreus* associated with *Pseudomonas* spp. (p<0.001) and with unremarkable

radiograph (p=0.028). Traditional risk factors like emphysema and diabetes had no significance except for underlying neoplasm (p=0.003).

Conclusions:

Bronchopulmonary *Aspergillus* infections is considered a relatively rare infection, the monthly case average was over 20 cases. Our findings suggest that younger patients and patients with other pulmonary coinfections exist in the general population.

P17.
Investigation of a C. difficile Outbreak: Is the patient, the environment, antibiotic use or human factors the cause?

Sandra Swoboda, Johns Hopkins ;Lindsay Robertson, Johns Hopkins;Karen Earsing, Johns Hopkins;Pamela Lipsett, Johns Hopkins

Background:

C. difficile is an infectious disease commonly associated with antibiotic use, inadequate hospital environmental cleaning and poor infection control techniques. Infections and outbreaks are costly, up to 5 billion dollars a year in excess health care costs with a one year attributable mortality rate of 16%. During an outbreak investigation in our SICU, a multidisciplinary team convened to determine potential causes and plans to prevent further infections.

Hypothesis:

Patient population, environment, and antibiotic over-utilization contribute more to the incidence of *C. diff* than human factors.

Methods:

This was a retrospective administrative database review of all patients admitted to the SICU in 2015 and a prospective review of infection control (IC) policies and practices, including staff education, hand hygiene (HH) and environmental cleaning (EC). Data included demographics, admitting diagnosis, antibiotic use and *C.difficile* cultures.

Results:

1,030 patients were admitted to the SICU for a total of 4,365 patient days. The mean ICU length of stay (LOS) was 4.2 days [IQR:2,4] range 1-134) and hospital LOS of 15 days [IQR: 5,16] range 1-202. 14 cases of *C.diff.* (32 cases/10,000 patient-days) occurred during 2015: (Jan=1, May=4, June=1, July=2, Aug=1, Nov=2, Dec=1). Services with outbreaks included (Vascular 8.6%, Liver Transplant 33%, Trauma 11%, Pancreatitis 2%, GI 10% and spinal surgery 6% , p>.05). Overall, 910 patients received a mean of 1.4 antibiotics per day [IQR:1,2], range 0-8. *C. diff* patients did not receive statistically more antibiotics (p>0.65).

HH rates were below the hospital goal of 90% in April-June and Aug-Nov. Targeted initiatives for IC and EC were implemented and continued: (May-HH, staff ed, July-preemptive isolation in patients with diarrhea and July-Oxivir and UV disinfection).

Conclusions:

While we expected to find patient factors, service, LOS and antibiotic utilization as explanatory factors in our *C.diff* outbreak, our data suggest the most important aspects were human factors including HH, IC and environmental cleaning.

P18.
Hidradenitis Suppurativa: Patient Profile of Emergency Department Admissions Treated by The Acute Care and Emergency Surgery Service at a Tertiary Care Center in the Midwest

Ricardo Ramirez, Washington University School of Medicine;Christopher Horn, Washington University School of Medicine;Dajun Tian, Washington University School of Medicine;Jorge Zárate Rodriguez, Washington University School of Medicine;Wen Hui Tan, Washington University School of Medicine;John Kirby, Washington University School of Medicine;Obeid Ilahi, Washington University School of Medicine;Grant Bochicchio, Washington University School of Medicine

Background:

The prevalence of Hidradenitis Suppurativa (HS) is poorly characterized. Reports in the US range from 1-4%. The large variance in number of cases reported is largely attributable to nature of the disease, which can be an uncomfortable topic for some patients precluding early detection. Patients with HS are more likely to seek care in the emergency department (ED) than patients with other chronic skin conditions. HS flares presenting to the ED are more severe, often requiring admission with subsequent surgical intervention. The patient profile of cases requiring urgent surgical intervention has not been well described.

Hypothesis:

We sought to characterize the patient profile of those with HS requiring surgical intervention by our Acute Care and Emergency Surgery (ACES) service after ED presentation.

Methods:

The ACES Database is a prospectively maintained dataset of all hospital admissions to the ACES service at our academic tertiary care center. The database was queried for all patients with HS who required an ED admission from 2008-2015. Demographics and outcomes were analyzed using SAS v9.3 statistical software. ANOVA statistical test was applied to categorical variables with normal distribution, and Chi-squared test was applied for measurement of frequencies.

Results:

A total of 123 HS patients with 164 lesions requiring hospital admission from the ED were identified. Of the 164 lesions identified, 147 required urgent surgical intervention with 12 lesions requiring more than one trip to the operating room. 17 lesions did not undergo any type of surgical intervention. Patients had a mean age of 38.9 (±12.89), mean BMI of 34.7 (±10.2), 88% were African American, and 65% of patients were female. Nearly two thirds of patients had a positive history for tobacco use (57.7%), 21.9% of patients were diabetic, 4.9% had history of MI, and 4.1 % had a prior history of malignancy. 11 patients required an ICU stay with 1 patient requiring mechanical ventilation. When examining microbiological data, lesions were grouped into 3 anatomical locations: axilla, groin, and other. The most commonly reported microorganism isolates in all three anatomical locations were “Mixed microorganisms”, followed by *S. agalactiae*, and *S. aureus*.

Conclusions:

The results of our study serve to better characterize the patient population seen by our ACES service requiring urgent surgical intervention for HS. Further research is needed to better understand the impact of these factors on patient outcomes.

P19.
The Role of Ultrasound Guided Inguinal Lymph Node Biopsy in Studying Ongoing HIV Nodal Replication Despite Undetectable Viral Loads

Nora Christensen, University of Minnesota Medical School;Jeffrey Chipman, University of Minnesota Department of Surgery;Gregory Beilman, University of Minnesota ;Ann Thorkelson, University of Minnesota ;Lin Zhang, University of Minnesota;Alexander Khoruts, University of Minnesota ;Timothy Schacker, University of Minnesota

Background:

HIV has been shown to actively replicate in lymph nodes even in the setting of viral suppression by antiretrovirals. Additionally, it is this particular viral strain that is noted to recrudesce in the blood when HART is stopped. Therefore, obtaining lymph nodes from HIV-positive individuals is critical in order to study this phenomenon. Lymph node biopsy has shown to be safe, but can be challenging when lymph nodes are small.

Hypothesis:

We hypothesize that ultrasound guidance would increase the yield of lymph nodes when utilized by experienced surgeons.

Methods:

We retrospectively reviewed prospectively collected data on 91 patients from both the United States and Uganda who underwent one or more inguinal lymph node biopsies. We compared the success rate of ultrasound guided biopsies versus biopsies guided on palpation alone. A Fischer exact test was used for this comparison.

Amongst a smaller subgroup of patients (US patients only), we examined the success rate of ultrasound guided biopsy in patients with a BMI >25. A Fischer exact test was used. We also compared lymph node excision times between ultrasound guided biopsies versus palpation guided biopsies. A Wilcoxon rank sum test was used for analysis.

Results:

The success rate of lymph node biopsy was statistically significantly higher with the use of ultrasound (P=0.03871).

		Ultrasound used	
		No	Yes
Lymph node obtained	No	7	7
	Yes	28	92

Table 1: count table of lymph node obtained versus ultrasound used

Among a subgroup of patients whose BMI > 25, the odds ratio indicates that the biopsy success rate was higher with the use of ultrasound, however this difference was not statically significant (OR=2.260536; P=0.5303).

		Ultrasound used	
		No	Yes
Lymph node obtained	No	1	1
	Yes	13	30

Table 2: count table of lymph node obtained versus ultrasound used for patients with BMI >25

There is no significant difference in excision time between ultrasound guided biopsy and palpation guided biospsy alone (P =0.9621).

Conclusions:

Lymph node biopsy is extremely important in the study of HIV replication. Ultrasound guided biopsy is safe and effective.

P20.
Mortality from Necrotizing Pancreatitis in the Era of Endoscopic Drainage; An Analysis of 337 Cases

Kristin Colling, Department of Critical Care and Acute Care Surgery, University of Minnesota Medical Center;Guru

Trikudanathan, Department of Gastroenterology, University of Minnesota Medical Center;Jeff Chipman, Department of Critical Care and Acute Care Surgery, University of Minnesota Medical Center;Martin Freeman, Department of Gastroenterology, University of Minnesota Medical Center;Greg Beilman, Department of Critical Care and Acute Care Surgery, University of Minnesota Medical Center

Background:

Necrotizing pancreatitis (NP) is associated with high mortality. Infection of NP is a feared complication, often difficult to treat. Treatment options for NP and infected NP have been improved with the increased availability and versatility of endoscopic and interventional radiologic treatment options.

Hypothesis:

Infected NP patients will have different outcomes compared to patients without infection.

Methods:

We performed a retrospective review of all patients admited with NP to our quaternary referral center from 2010 until 2016. Age, sex,etioloy of NP, length of stay, substance use, organ failure at admission, all culture data, number and type of procedure performed for treatment of NP, and complications leading to death were collected. Student's t-test was used to analyze continuous variables and chi-square test for categorical variables. P values <0.05 were considered significant.

Results:

Of the 337 patients with NP, 35 (10%) died. The etiology of pancreatitis included alcohol (25%), post-procedure (19%), gallstones (11%), and malignancy (6%). Patient demographics are listed in table 1. Nineteen patients (54%) had infected NP. The majority of patients with infected NP had multiple organisms identified in cultures; the most common isolate being Enterococcus species (63%) half of which were vancomycin resistant, followed by *P. aeroginosus* (42%). Seventeen patients (49%) survived to initial discharge, only to later succumb to sepsis or organ failure.

	All Patients (n = 35)	**Infected NP (n = 19)**	**Non-Infected NP (n = 16)**	**P value**
Age (years)	60.8 (27-83)	61 (27-73)	60.6 (33-83)	NS
Sex (Male)	24 (69%)	14 (74%)	10 (63%)	NS
APACHE II Score on Admission (range)	17.3 (11-29)	19.2 (11-28)	15.25 (10-29)	P < 0.05
Length of Initial Hospital Stay (Days)	53 (6-318)	70.8 (9-318)	32.5 (6-106)	NS
Time from Admission to Death (days)	179 (6-754)	167 (17-754)	193 (6-581)	NS
Organ Failure On Admission?	24 (69%)	15 (79%)	9 (56%)	NS
Total Number of Procedures *Endoscopic* *IR* *Surgical*	5.5 (0-23) *2.9 (0-10)* *2.2 (0-13)* *0.3 (0-4)*	8.2 (1-23) *4.1 (0-10)* *3.6 (0-13)* *0.6 (0-4)*	2.2 (0-6) *1.6 (0-6)* *0.6 (0-3)* *0 (0-0)*	P < 0.05
Death Due to Sepsis	16 (46%)	15 (79%)	1 (6%)	P <0.05

Conclusions:

NP continues to have significant mortality, even with less invasive options for treatment. Infected NP patients presented with higher APACHE II scores (even though infection was not present on admission), had higher mortality due to sepsis, and underwent more procedures. Time to mortality varied greatly for all patients. Mortality risk persists even with survival to initial discharge.

P21.
Line Salvage in Children with Central Line Associated Bloodstream Infection Caused by Staphylococcus aureus.

Rachel Jones, Ann & Robert H Lurie Children's Hospital of Chicago;Caroline Reuter, Ann & Robert H Lurie Children's Hospital of Chicago;Elaine Morgan, Ann & Robert H Lurie Children's Hospital of Chicago;Larry Kociolek, Ann & Robert H Lurie Children's Hospital of Chicago;Timothy Lautz, Ann & Robert H Lurie Children's Hospital of Chicago

Background:

Staphylococcus aureus is known to generate a biofilm on foreign bodies, making clearance of Central Line-Associated Bloodstream Infections (CLABSI) more difficult and potentially increasing the risk of treatment failure. Infectious Disease Society of America guidelines therefore recommend removal of central venous catheters (CVC) in the setting of *S. aureus* CLABSI. Anecdotal evidence from our institution suggested, however, that CVC salvage following *S. aureus* CLABSI was often successful.

Hypothesis:

CVC salvage is possible in the majority of children with *S. aureus* CLABSI and is not associated with excess morbidity in cases of failed line salvage.

Methods:

A retrospective cohort study was performed of all children with *S. aureus* CLABSI at Lurie Children's Hospital of Chicago from 2012-2015. Patients with and without immediate CVC removal (≤2 days after first positive culture) were compared. The primary outcome was failed CVC salvage (removal after 3+ days).

Results:

Among 77 children who met criteria for *S. aureus* CLABSI, 48 (62.3%) were male, and the median age was 6.4 years. Immediate CVC removal was performed in 21 (27.3%) patients because of physician preference (n= 10), patient instability (n=5), concurrent malfunction or thrombosis (n=3), and exit site infection (n=3). Among the 56 (72.7%) patients in whom CVC salvage was attempted, 44 (78.6%) were successful and 12 (21.4%) required delayed CVC removal between days 3-30 because of patient instability (n=1), concurrent thrombosis (n=3), exit site infection (n=1), and persistent or recurrent bacteremia (n=7). Factors including malignancy, short gut syndrome, neutropenia, methicillin-resistant *S aureus*, and line type were not associated with increased risk of failed CVC salvage. No patients with a failed attempt at CVC salvage died or suffered from endocarditis or metastatic infection due to delayed CVC removal. New or recurrent *S. aureus* CLABSI occurred in 5 (8.9%) patients between 31 days and 6 months after CVC salvage, and 3 of those CVCs were salvaged a second time.

Conclusions:

CVC salvage was successful in the majority of children with CLABSI due to S. aureus. Failed attempts at line salvage were not associated with significant complications or attributable mortality as reported elsewhere. Our data suggest that a significant proportion of children with S. aureus CLABSI are candidates for CVC salvage. Additional research is needed to identify patient characteristics associated with complications related to attempted line salvage.

P22.
Incidence of Necrotizing Soft Tissue Infections Based on an Acute Care Patient Registry

Stephen Eaton, Washington University School of Medicine;John Kirby, Washington University School of Medicine;Grant Bochicchio, Washington University School of Medicine;John Mazuski, Washington University School of Medicine

Background:

Skin and soft tissue infections (SSTI) range widely in severity and remain difficult to study well with available data registries. More serious infections often require surgical treatment, with wide debridement frequently necessary for patients with necrotizing soft tissue infections (NSTI). Thus a significant portion of acute care surgery practices are patients presenting with SSTI, but these patients may be inaccurately characterized. Capturing and characterizing these patients in acute care surgery registries, although a formidable challenge, may provide a means of accurately identifying the most seriously-ill patients with SSTIs for further study, particularly those with NSTIs.

Hypothesis:

We hypothesized that current estimates of the incidence of NSTIs, many of which are based on hospital discharge data or isolation of specific microorganisms such as group A streptococci, underestimate the numbers of patients presenting with these infections.

Methods:

We developed and then retrospectively reviewed the Acute and Critical Care Surgery database from 2008 to 2013 at our urban, academic Level I trauma based adult hospital for all patients with SSTIs. Patients with SSTI's were broken down into subsets, including those with NSTI. We compared our tabulated patients to national predictions of NSTI by the region's surrounding census population.

Results:

This retrospective study was approved by our Institutional Review Board. During the six year study period from 2008 to 2013 the Acute Care Surgical Service admitted 8369 patients. Within these, 1395 patients with SSTI were identified, representing 17% of the inpatients directly cared for by ACS. 1022 underwent a surgical procedure including wide local debridement. The types of SSTI treated were quite heterogeneous, ranging from simple conditions such as cellulitis or abscesses, to severe life-threatening NSTI. 92 had NSTI, all of whom were treated surgically and this is a higher number than would predicted by previous estimates in the US.

Conclusions:

These data suggest that NSTI may be more common than generally reported. Previous data registries restricted to specific organisms or qualifying diagnostic criteria may have excluded patients that clinically had NSTI. These data reflect only one center and may underestimate rates of NSTI as cases may have been treated elsewhere. Coordinated use of Acute Care Surgery registries or other data registries from many different sites may help clarify to true scope of importance of NSTI's.

P23.
Obesity is Protective in Necrotizing Soft Tissue Infection

Manuel Castillo-Angeles, Brigham and Women's Hospital;Nathan Blecker, Brigham and Women's Hospital;Emily Keung, University of Texas MD Anderson Cancer Center;Rene Borscheid, Brigham and Women's Hospital;Stephanie Nitzschke, Brigham and Women's Hospital;Ali Salim, Brigham and Women's Hospital;Reza Askari, Brigham and Women's Hospital

Background:

There is a described obesity paradox in sepsis and some aspects of cardiovascular disease, where obesity exhibits a protective effect on patient mortality. Preliminary work by our group has shown this paradox in Necrotizing Soft Tissue Infection (NSTI) using a national administrative database. We sought to examine if this association is still prevalent using a clinical database.

Hypothesis:

We hypothesize that obesity is a protective factor in regards to mortality in NSTI.

Methods:

This is a single-center retrospective cohort study of NSTI patients admitted from 1995 to 2014. Body mass index (BMI) was used to categorize patients into non-obese (BMI < 30) and obese (BMI >= 30). Multivariate logistic regression was performed to assess the association between obesity and in-hospital mortality.

Results:

203 patients with complete data were included. Median age was 58.4 y (IQR 43 – 64.4). 53.2% were male. 89 (43.8%) patients were categorized as obese. Multivariate analysis showed that obese patients were less likely to die in hospital compared with non-obese patients (OR = 0.30, 95% Confidence Interval 0.10 – 0.90, p=0.03) (Table 1).

Conclusions:

Table 1. Multivariate analysis of clinicodemographics, treatment factors, and NSTI-associated In-Hospital Mortality.

Variable	Odds Ratio	95% Confidence Interval		P Value
Body Mass Index (BMI), kg/m², <30 vs. ≥30	**0.30**	**0.10**	**0.90**	**0.032**
Gender	1.39	0.52	3.71	0.511
Age	1.04	1.01	1.08	0.011
American Society of Anesthesiologists Physical Classification score	5.11	2.48	10.55	<0.001
Diabetes Mellitus	0.63	0.23	1.78	0.390
Coronary Artery Disease	1.71	0.54	5.43	0.360
Length of Stay	0.95	0.92	0.98	0.003
Purulent Drainage	0.36	0.11	1.23	0.104
Immune Status	1.23	0.44	3.48	0.694

In patients with the diagnosis of NSTI, obese patients (BMI>30) have lower in-hospital mortality when compared to non-obese patients. This obesity paradox should be further studied. One future direction is to determine if nutritional status plays a role in this paradox.

P24.
Predictive factors for abscess development after perforated pediatric appendicitis

Nathan Coopersmith, Alpert Medical School Brown University;Catherine Dickinson, Alpert Medical School Brown University;Francois Luks, Hasbro Children's Hospital and Alpert Medical School Brown University

Background:

A substantial proportion of children with appendicitis present with perforation. While this increases the risk for postoperative complications and readmission, it is not yet possible to predict who will develop an abdominal abscess.

Hypothesis:

We sought to identify specific risk factors for this complication, in an attempt to streamline postoperative care.

Methods:

We reviewed the records of all cases of perforated appendicitis over a 15-month period at a tertiary children's hospital. All patients who developed an abscess despite appropriate treatment (min. 7 d antibiotic therapy) were identified. Patients readmitted with an abscess after early discharge were excluded from analysis. Charts were reviewed for demographics, laboratory results, progression of oral intake, vital signs, diagnostic imaging, and operative details.

Results:

We identified 45 cases of perforated appendicitis. One patient was readmitted with a complication after incomplete antibiotic therapy. Eight of the remaining 44 patients (18.2%) developed an abscess during their initial admission. Their mean length of stay was longer than that of patients without an abscess (13.4 v. 6.9 d, $P<0.0001$); other parameters (gender, leukocytosis or diarrhea at presentation, maximum temperature on postoperative day (POD) 3, maximum heart rate on POD 3) were not statistically different. Of note, no patient who developed an abscess had a fever on POD 3. Diet progression was significantly different between the two groups: Only 1 of the 22 patients who were given a regular diet by POD 3 developed an abscess, compared with 7 of the 22 patients who were not yet eating a regular diet on POD 3. (Upon chart review, that one patient was ordered a regular diet on POD 3, but did not tolerate it.) The odds of developing an abscess if advanced to a regular diet by POD 3 was 0.102 (95% CI 0.0113-0.9187). Seven of the 8 patients with an abscess had persistent leukocytosis at day 5-7, compared with 3 of 31 patients without abscess. An ultrasound was obtained in these 3 patients, and proved normal.

Conclusions:

Tolerating a regular diet 3 days after appendectomy for perforated appendicitis significantly decreased the likelihood of a postoperative abscess. No other parameter was predictive of this complication. If confirmed in a larger, prospective study, this finding may help decrease the length of stay for low-risk patients, and identify abscesses in high-risk patients in a timely fashion (POD 7).

P25.
Trauma-induced fungal infections: factors influencing the emerging challenge in the intensive care unit.

Georgina Alizo Arruebarrena, Grand Strand Medical Center/University of South Carolina;Morgan Lane, Grand Strand Medical Center/University of South Carolina;Keely Muertos MPH, Grand Strand Medical Center/University of South Carolina;Jason Sciarretta, Grand Strand Medical Center/University of South Carolina;John Davis, Grand Strand Medical Center/University of South Carolina

Background:

Host-related risk factors augment the development of rare fungal infections.These infections remain difficult to diagnose and treat in the severely injured trauma patient. Furthermore, the potential to progress is fairly rapid, thus a high clinical index of suspicion in the trauma population is mandatory.

Hypothesis:

We sought to characterize the risk of invasive fungal infections in intensive care unit (ICU) post traumatic injury and hypothesize that severely injured trauma patients have influencing variables that increase the risk of developing invasive fungal infections and overall mortality in the ICU.

Methods:

Patients 18 years or older with trauma-related injuries admitted to the ICU during a 6-year period (January 2010 - December 2016) were retrospectively reviewed. Excluding all *Candida* species, any invasive fungal infection confirmed by histopathological examination was included in the study. Demographics, clinical data, length of stay (LOS), ventilator days and outcomes were reviewed. Subgroup analysis of host risk factors were completed

including preexisting conditions and hospital-related associated risk factors.

Results:

Twelve patients were identified with fungal infections including *Mucor* (n=2), *Absidia* (n=1), *Aspergillus* (n=8), and *Rhizopus* (n=1). Infections were limited to subcutaneous tissue (50%), pulmonary tract (42%) and sinuses (8%). Mean age was 40.3±13.3 years, with 83% male. Motor vehicle collisions (42%) presented as the most common mechanism of injury. Mean Injury Severity Score was 29 ±16 and a mean ICU LOS of 23.5 ±16.5 days. Mean days at fungal infection diagnosis was 20 days. Clinical trends included concomitant infections (83%), open fractures (50%), damage control laparotomy (42%), and splenectomy (25%). Additional factors included severe protein caloric malnutrition, rhabdomyolysis and the need for multiple transfusions. All pulmonary tract infections involved Aspergillus spp. Severe traumatic brain injury requiring craniectomy and in the presence of a fungal infection were more likely to expire (p=0.007). Overall mortality in this series was 25%.

Conclusions:

Invasive fungal infections following trauma remains a highly lethal disease. Clinical suspicion is warranted in severely injured patients with prolonged ICU stays and post injury complications.

P26.
Long-Term Results of a Screening and Immunosuppression Protocol for Polyoma BK Viremia After Renal Transplantation

David Conti, Albany Medical Center;Dan Schuster, Albany Medical center;Jonathan Eldor, Albany Medical Center;Grace Luetters, Albany Medical Center;Nik Chandolias, Albany Medical Center;Reynold Lopez-Soler, Albany Medical Center

Background:

With the development of potent immunosuppressive drugs in the mid 1990's BK nephropathy (BKN) emerged as a significant cause of graft dysfunction and loss after renal transplantation. There is currently no treatment consensus with regards to modulating immunosuppression for BK infection, and BK-targeted antiviral therapies are not yet available. Thus balancing the down modulation of immunosuppression to prevent viral induced nephropathy with the attendant risk of acute rejection remains paramount for long-term allograft survival.

Hypothesis:

Minimization of immunosuppression consisting of a decrease in mycophenolate mofetil (MMF) daily dosing will decrease the progression to BK-nephropathy with a low incidence of acute rejection.

Methods:

Between Jan. 1,2016 and Dec.31, 2012, 371 adult renal transplants were performed at our center. Immunosuppression consisted of Thymoglobulin induction followed by maintenance therapy with tacrolimus, MMF and either sirolimus (88%) or prednisone (12%). Serum PCR screening for BK virus was obtained monthly. BK viremia was detected in 66 (18%) recipients (Group A) while the remaining 305 recipients were never detected to have viremia (Group B). Down modulation of immunosuppression for Group A recipients occurred in a stepwise fashion and consisted of an immediate 50% reduction in MMF dosing followed by complete discontinuation if BK viremia did not clear within 3 months. All recipients were followed long-term for patient survival and graft function and survival.

Results:

Group A patient survival at 1, 3 and 5 years was 100%, 98.5% and 97% compared to 99.3%, 98.4% and 95.4% in Group B. Graft survival at the same intervals in Group A were 100%, 98.5% and 93.9% versus 99%, 97.7% and 92.5% in Group B recipients. Mean serum creatinine, mg/dl, levels at 1, 3 and 5 years in Group A patients were 1.6, 1.7 and 1.6 compared to 1.5, 1.5 and 1.6 in Group B recipients. Subsequent to MMF dose reduction/elimination.

only one Group A patient progressed to BKN (1.5%) and only two recipients sufferred from an episode of acute rejection (3%).

Conclusions:

This pre-emptive reduction in immunotherapy at the detection of BK viremia was associated with a low rate of progression to BKN and a low incidence of acute rejection. Furthermore, with our immunosuppressive regimen this reduction of immunotherapy was associated with comparable long-term patient and graft survival.

P27.
Locoregional Anesthesia is Associated with Reduced Infectious and Overall Complications in Open Inguinal Hernia Repair

Zachary Dietch, University of Virginia;Christopher Guidry, UVA Health System;Puja M. Shah, University of Virginia;Robert Sawyer, University of Virginia HSC

Background:

Open inguinal hernia repair (IHR) may be performed under general (GA) or locoregional (LR) anesthesia. A protective relationship between LR and morbidity following IHR has been described in limited series.

Hypothesis:

We hypothesized that IHR with LR is associated with fewer infectious complications versus GA.

Methods:

The ACS NSQIP Participant Use Files for 2011-2014 were queried to identify patients undergoing IHR. Descriptive comparisons were performed and multivariate regression was utilized with *a priori* selected variables to assess the relationship of anesthetic technique with a composite of 30-day postoperative infectious complications, after controlling for age, race, ethnicity, body mass index, ASA class, diabetes, hypertension, functional status, congestive heart failure, dyspnea, COPD, steroid use, tobacco use, renal failure, and the presence of bowel obstruction or gangrene. A secondary outcome was the relationship of anesthetic technique with a composite of overall complications.

Results:

We identified 62,074 patients, of which 48,825 underwent IHR under GA versus 13,249 with LR (78.7% vs. 21.3%). Overall, those undergoing IHR with GA were younger (59 vs. 66 years, $p<0.001$) with fewer comorbidities, including hypertension (38.2% vs. 44.0%, $p<0.001$), COPD (3.0% vs. 5.3%, $p<0.001$) and steroid use (1.7% vs. 2.5%, $p<0.001$) in comparison to LR patients. Obstruction or gangrene was more common in GA than LR patients (8.8% vs. 5.1%, $p<0.001$). Infectious complications occurred in 1.0% of GA and 0.82% of LR patients ($p=0.02$), including superficial surgical site infections (0.4% GA vs. 0.3% LR, $p=0.07$) and urinary tract infections (0.4% GA vs. 0.3% LR, $p=0.14$). Overall, a complication occurred in 2.2% of GA patients versus 2.0% of LR patients ($p=0.10$). On multivariate regression, however, LR was associated with decreased odds of infectious complications (**Table**) and the composite measure of overall complications (OR 0.77, 95% CI 0.67-0.89).

Variable	Odds Ratio	95% CI
Age	1.01	1-1.02
Body Mass Index	1.05	1.04-1.06
Male Sex	0.74	0.58-0.96
Locoregional Anesthesia	0.70	0.56-0.86
Tobacco Use	1.43	1.16-1.76
Dependent Functional Status	4.66	3.14-6.7
ASA Class 2	1.52	1.1-2.14
ASA Class 3	2.26	1.57-3.31
ASA Class 4	3.98	2.43-6.5
Bowel Obstruction	1.31	1.02-1.67

c-statistic - 0.69

Conclusions:

Open inguinal hernia repair is most commonly performed under GA and is associated with low morbidity. LR may be associated with a modest, but significant, reduction in complications, and surgeons may wish to consider IHR using LR for these reasons.

P28.
Impact of the Timing of Emergency Laparotomy in Penetrating Trauma Patients on the Incidence of Superficial, Deep, and Organ/Space Surgical Site Infections: A Propensity Matched Analysis

Nasim Ahmed, Jersey Shore University Medical Center;Patricia Greenberg, Hackensack Meridian Health

Background:

The purpose of the study was to evaluate the impact of the timing of an emergency laparotomy, for penetrating injury cases with systolic blood pressure (SBP) $\leq$ 90 mmHg , on the incidence of superficial, deep, and organ/space surgical site infections (SSI)

Hypothesis:

Emergency laparatomy in penetrating injury with SBP $\leq$ 90 mmHg within 1 hour will decrease incidence of wound infections

Methods:

Study data was obtained from the National Trauma Data Bank (2007-2010 edition). Only patients who sustained penetrating injuries, presented with an initial systolic blood pressure (SBP) ≤ 90 mmHg, and who underwent an exploratory laparotomy within 4 hours of hospital arrival were included in the analysis. Patients who underwent laparotomy within one hour (Group 1) were compared to those who underwent a laparotomy between 1-4 hours post-admission (Group 2). Patients' age, race, gender, SBP, heart rate, mechanism of injury, intent of injury, injury severity score (ISS), and Glasgow Coma Scale (GCS) were all included for consideration in the study. These measures as well as the SSI complications were compared across the two unmatched groups then propensity score matching analysis was performed using baseline characteristics.

Results:

A total of 2,345 patients qualified for the study and of those, 1,931 (82.35%) patients had their laparotomy within the first hour (Group 1) and 414 (17.65%) had their laparotomy between 1-4 hours (Group 2). There were significant differences between the two groups regarding the injury mechanism (gunshot wound [74.6% vs.63.5%, P<0.001]), SBP (Mean [SD]: 60.8 [31.5] vs.72 [23.5], P<0.001), ISS (21 [14.5] vs.18.2 [11.5], P<0.001) and GCS (10.3 [5.4] vs. 12.5 [4.4], P<0.001), respectively. After propensity score matching was performed, there was no longer a significance difference seen regarding mechanism (gunshot wound [69.1% vs. 63.5%], P=0.085), ISS (Mean [SD]: 18.2 [10.9] vs.18.2 [11.5], P=0.696) or GCS (12.4[4.5] vs. 12.5 [4.4], P=0.164); however, SBP (68.2 [25.3] vs. 72.1 [23.5], P=0.007) was still significantly different. Using the matched data, the overall incidences of superficial, deep, and organ/space surgical site infections were 1.7% vs 3.1% (P=1.0), 1.4% vs 0.2% (P=0.074) and 4.6% vs. 2.2% (P=0.211) between Groups 1 and 2, respectively.

Conclusions:

There were no significant differences seen between the groups regarding superficial, deep, and organ/space surgical site infections when compared to those who had a laparotomy between 1-4 hours post-admission.

P29.
Post Caesarean Section Surgical Site Infection Surveillance Using an Online Database and Mobile Phone Technology

Eliana Castillo, University of Calgary, Canada;Corrine McIsaac, Health Outcomes World Wide;Rosemary Kohr, Health Outcomes World Wide;Bhreagh MacDougall, Health Outcomes Worldwide;Douglas Wilson, University of Calgary, Canada

Background:

Obstetric surgical site infections are common and expensive to the health care system but remain under reported given shorter post-operative hospital stays and suboptimal post-discharge surveillance systems.

Hypothesis:

Demonstrate the feasibility of real-life use of a patient driven SSIs post-discharge surveillance system consisting of an online database and mobile phone technology (surgical mobile application*) among women undergoing caesarean section (CS) in a Canadian urban center.

Methods:

Prospective cohort of consecutive women delivering by CS at one urban Canadian hospital. Using the mobile application*, predetermined demographics, comorbidities, procedure characteristics and self-reported symptoms and signs of infection were collected and linked to patients' incision self-portraits (photos) on postpartum days 3, 7, 10 and 30.

Results:

N= 105 patients were enrolled over a 5-month period. Mean age was 31 years, 13% were diabetics and most were at low-risk of surgical complications. Forty-six percent of surgeries were emergency cesarean sections and 104/105 received antibiotic prophylaxis. Forty-three percent of patients (45/105) submitted at least one photo, and among those, one surgical site infection was detected by photo appearance and self-reported symptoms by postpartum day 10. The majority of patients whom uploaded photos did so multiple times and 43% of them submitted photos by day 30. Patients with either a diagnosis of diabetes or self-reported Asian ethnicity were less likely to submit photos.

Conclusions:

Post-discharge surveillance for CS-related surgical site infections using surgical mobile app* is feasible and patient-friendly. This application has implications for SSIS post-hospital discharge regarding rate of SSIS and predisposing factors in a larger sample of CS patients.

P30.
Quality of Reporting on Compliance with Evidence-Based Measures to Prevent Surgical Site Infections in the Morbidity and Mortality Review

Krislynn Mueck, University of Texas Health Science Center at Houston;Tien Ko, University of Texas Health Science Center at Houston;Mike Liang, University of Texas Health Science Center at Houston;Stefanos Millas, University of Texas Health Science Center at Houston;Lillian Kao, University of Texas Health Science Center at Houston

Background:

Morbidity and mortality (M&M) review is a mainstay of surgical quality improvement. However, it is unknown if reviews accurately identify modifiable risk factors.

Hypothesis:

We hypothesized that M&M review of surgical site infections (SSI) does not consistently assess compliance with evidence-based measures (EBMs) for prevention and that subjective assessment of deviations from standard practice and preventability are not correlated to compliance.

Methods:

All SSIs reported in M&M conference at a safety-net hospital 11/2013-10/2016 were reviewed. Surgical residents filled out standard forms listing the procedure, comorbidities, complication, and sequelae. One of 14 faculty identified deviation from standard practice(1=care appropriate,2=minor deviation,3=major deviation,4=inappropriate), assigned categories(delay in diagnosis/treatment, disease progression, technical/judgment error), and assessed preventability. EBMs in SSI bundles include chlorhexidine shower/prep, clippers for hair removal, normothermia, normoglycemia, and preoperative antibiotics. Chi square was performed to compare compliance with EBMs between cases scored as deviations and as preventable or potentially preventable.

Results:

Of 688 complications, 156(23%) were SSIs. Residents noted EBM compliance in 83(53%) cases, most commonly prophylactic antibiotics(n=43,28%), intraoperative normothermia(n=28,18%), preoperative glucose assessment(n=19,12%), and chlorhexidine shower/prep(n=4,3%). Deviation from standard practice was coded in 42 cases(27%) while only 1 report noted EBM non-compliance. The assignment of deviation was not associated with reporting of EBMs(p=0.86). There was no association between resident level and deviation(p=0.44) or reporting of EBMs(p=0.86). Faculty most commonly assigned categories of disease progression(n=66,42%), technical error(n=18,12%), or both(n=13,8%). Faculty rated 113(72%) SSIs potentially preventable or preventable and 18(12%) not preventable; 25(16%) had no rating. Even when a technical error was identified(12%), some SSIs were still classified as not preventable(3%).

Conclusions:

In this study, SSIs were most frequently attributed to disease progression rather than provider factors in M&M review. Assignment of deviations and preventability of SSIs was not associated with EBM compliance or with committal of errors. Interventions such as standard report forms tailored to specific complications may improve identification of modifiable risk factors and maximize the benefits of the M&M review process.

P31.
Wound Classification Accuracy: Do Residents Know How to Classify?

Jessica Goodwin, JPS Health Network;Pepper Womack, RN, ;Billy Moore, PhD, ;Jessica Phillips, MS, MPH, ;Therese Duane, JPS Health Network

Background:

It is unclear whether surgical residents understand how to classify operative cases which may impact how wound closure is handled in the operating room.

Hypothesis:

We hypothesized that surgical residents accurately define wound class (WC) compared to an attending NSQIP surgeon champion (SC).

Methods:

We evaluated our NSQIP database from 3/1/2015-8/31/2016 including cases in which a resident was present and WC was documented. Cases in which either the resident, circulator or surgical clinical rater disagreed on the WC were then reviewed by a blinded SC.

Results:

Residents were correct in 82.8% of the cases (Table 1) with PGY 5 having the lowest accuracy. Class 3 wounds were most often misclassified (34.5%). Chief residents (4&5) compared to juniors were significantly less accurate (79.6 % vs 90.6%, P=0.00, unadjusted; 86.5% vs. 92.4%, P= 0.00, adjusted for WC distribution). After adjustment for WC distribution, chief residents were 47% less likely to be accurate than junior residents. Chief resident inaccuracies appeared most frequently in true Class 2 and Class 3 wounds (Table 2); classification error for this group most often occurred by residents' up-classifying a true Class 2 wound to Class 3 and down-classifying true Class 3 wounds to Class 2.

Conclusions:

Although overall accuracy appears reasonable, it is concerning that wounds at higher risk of infection (contaminated), were least likely to be appropriately classified. More worrisome is that chief residents who are often making the decisions on wound closure were the least accurate in determining wound classification. This may have a deleterious impact on wound management suggesting a need for directed resident education on WC and further investigation to determine its impact on surgical site infection risk and patient outcomes.

P32.
Patient Compliance with Surgical Site Infection Protocol Increases with the Implementation of Strategies to Enhance Patient Engagement and Access to Care

Melanie Sandoval, University of Colorado-Denver;Craig Hogan, University of Colorado-Denver;Michael Dayton, University of Colorado-Denver;Hugo Xi, Becton Dickinson

Background:

Surgical site infections (SSIs) are the most prevalent healthcare associated infection (HAI). The estimated cost of one SSI to the U.S. Healthcare System is approximately $26,000. An SSI may result in decreased income, physical debilitation, depression, and increased caregiver burden. Standard practices, often referred to as "bundles" have been shown to decrease provider error and variance with best practices, improve patient satisfaction, and decrease the incidence and occurrence of SSIs. Review of SSI data at an academic association

revealed an increase in SSIs among total arthroplasty patients. SSI bundle compliance rates revealed decreased compliance with preoperative bathing.

Hypothesis:

Increasing patient access to care (chlorhexidine gluconate (CHG)) and increasing patient engagement with care (messaging reminder system) will increase patient compliance, satisfaction, and decrease infection rates among total arthroplasty patients.

Methods:

The standard evidence-based SSI protocol included: 1.) Instructions to use an “antimicrobial” solution for three consecutive days prior to surgery; 2.) Povidone-iodine nasal swab to decolonize nares of staph-related microorganisms applied by the nurse in preoperative bay; 3.) CHG wipes to the surgical site the day of surgery; 4.) Appropriate hair removal;5.) CHG skin preparation intraoperatively.

The enhanced evidenced-based SSI protocol included the addition of: *1.) chlorhexidine gluconate (CHG) provided to the patient during the clinic visit when scheduled for surgery with verbal and written material instructing the patient to wash the surgical area with CHG for three consecutive days prior to surgery; *2.) Messaging reminders (delivered via email, telephone call, or text message based on the patient’s preference) for three consecutive days prior to surgery reminding the patient to use the CHG to wash the surgical area.

Post-operative patient satisfaction and adverse events were measure using postoperative phonecalls. Compliance and infection reports were run monthly and shared with an interdisciplinary team.

Results:

SSI bundle compliance increased from 80% to 95%. Lack of compliance was often related to lack of nursing documentation rather than patient compliance. Frequency data revealed a decrease in infection rates by 25%.

Conclusions:

Strategies to increase patient engagement and access increases protocol compliance, which may decrease SSIs and increase patient satisfaction.

P33.
Safety and Tolerability of Laser Hair Depilation in Pilonidal Disease: A Pilot Study

Joseph Lopez, Nationwide Children's Hospital ;Jennifer Cooper, Nationwide Children's Hospital ;Beth Fischer, Nationwide Children's Hospital ;Dani Gonzalez, Nationwide Children's Hospital;Katherine Deans, Nationwide Children's Hospital ;Peter Minneci,

Background:

Pilonidal disease is a common surgical problem characterized by acute and chronic wounds and sinuses that can cause both short-term and long-term morbidity, disability, and impaired quality of life. Definitive treatment with surgical excision and reconstruction is also associated with significant morbidity, with reported wound complication rates as high as 30% and recurrence rates after excision of 9-11%. Laser hair depilation of the natal cleft has been reported to be protective for pilonidal disease recurrence. The purpose of this study is to assess the safety and tolerability of laser hair depilation in adolescents and young adults with pilonidal disease.

Hypothesis:

Laser hair depilation is well-tolerated and protective for pilonidal disease recurrence in this population.

Methods:

We performed a prospective single arm pilot trial of laser hair depilation to the natal cleft in patients with pilonidal disease. Each patient received a scheduled outpatient laser depilation treatment every 4 weeks and a total of 5 treatments. An 810 nm wavelength laser (for Fitzpatrick skin types I-IV) and Nd:YAG laser (for Fitzpatrick skin types V-VI) were used. Initial follow up was performed to assess the tolerability of each laser treatment; pain scores were recorded immediately after treatment and every 6 hours for the first 24 hours after each treatment. The primary endpoint was the tolerability and safety of the laser depilation treatments, defined as pain scores consistently <4 and no occurrence of deep second degree burns during the 24-hour post-treatment period.

Results:

We have enrolled 13 patients. Eleven patients have completed three laser depilation treatment sessions thus far with 100% tolerability and no second degree burns. No patients were unable to complete a treatment session due to discomfort. All 13 patients remain recurrence-free at 8 months after the initiation of treatment. This group of patients will complete 5 treatment sessions and will be followed for 1 year after the final treatment session to assess for disease recurrence. Significantly diminished hair growth is noted in these patients after 3 treatments.

Conclusions:

Laser hair depilation is both safe and well tolerated in in adolescents and young adults with pilonidal disease and may represent a promising therapy to decrease disease recurrence.

P34.
Early Prediction and Influence of Secondary Bloodstream Infections in Patients with Complicated Intra-abdominal Infections.

Jinjian Huang, Jinling Hospital, Southeast University;Jianan Ren, Nanjing General Hospital of Nanjing

Background:

The bloodstream infections after primary infections were proved to be a negative factor for prognosis. Through secreting toxin to bloodstream, bacteria could attack the host again, exacerbating the patients' illness. It was reported patients in a state of immunosuppression were susceptible to bacterial dissemination.

Hypothesis:

Severity of primary infections and inadequate treatment might be considered as risk facters of secondary bloodstream infections (SBSIs).

Methods:

187 patients in 2014 and 2015 with cIAIs were included in our retrospective study, except for those dignosed with catheter-related bloodstream infections. Patients with SBSIs were compared with those without SBSIs. Multivariate logistic regression was applied to identify factors independently associated with SBSIs and a predictive score was built.

Results:

Four factors (Figure 1) at admission were independently associated with SBSIs including alanine aminotransferase (ALT)≥66U/L, (odds ratio (OR): 2.3, 95% confidence interval (CI): 1.1-4.9, P<0.034, 2 point); insensitivity of initial

antibiotics (IIA), (OR: 2.9, 95% CI: 1.4-6.2, P=0.006, 3 points); Sepsis-related Organ Failure Assessment (SOFA) score≥2, (OR: 3.3, 95% CI: 1.5-7.2, P=0.003, 3 points); generalized peritonitis , (OR: 3.6, 95% CI: 1.7-7.4, P=0.001, 4 points). The area under the curve (AUC) (95% CI) of receiver operating characteristic curves (ROC) was 0.81 (0.74-0.87). In order to predict the SBSIs, A score ≥5 was regarded as the critical value in the combined test, with a sensitivity of 0.78 and a specificity of 0.73. Futhermore, the SBSI was linked with higher mortality (Figure 2).

Parameters	OR	95% CI	P value	Points
ALT≥66U/L	2.3	1.1-4.9	0.034	2
IIA	2.9	1.4-6.2	0.006	3
SOFA score≥2	3.3	1.5-7.2	0.003	3
Generalized peritonitis	3.6	1.7-7.4	0.001	4

A

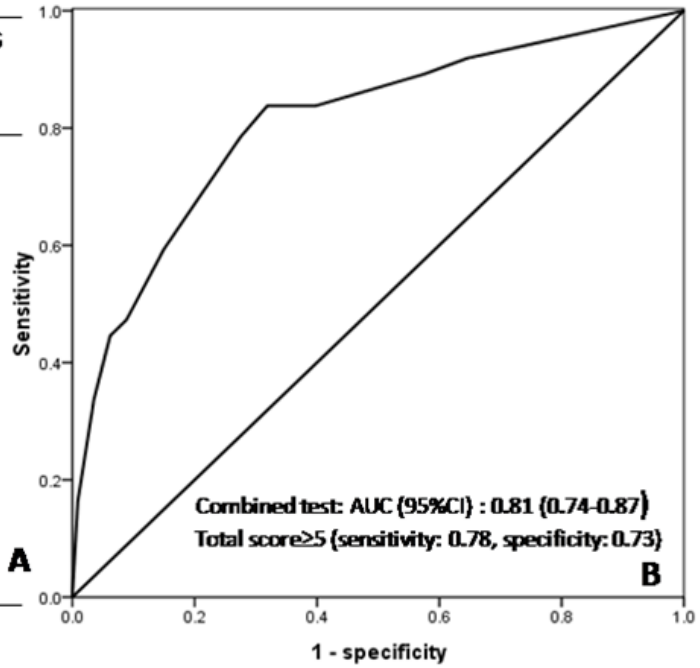


Figure 1: (A) Multivariate analysis of factors independently associated with bloodstream infections secondary to complicated intra-abdominal infections. (B) Receiver operating characteristic (ROC) curves of the combined test. ALT, alanine aminotransferase (normal, 13-66U/L). IIA, insensitivity of initial antibiotics. SOFA, Sepsis-related Organ Failure Assessment. OR, odds ratio. CI, confidence interval. Combined test, Generalized peritonitis + IIA + ALT≥66U/L + SOFA score≥2.

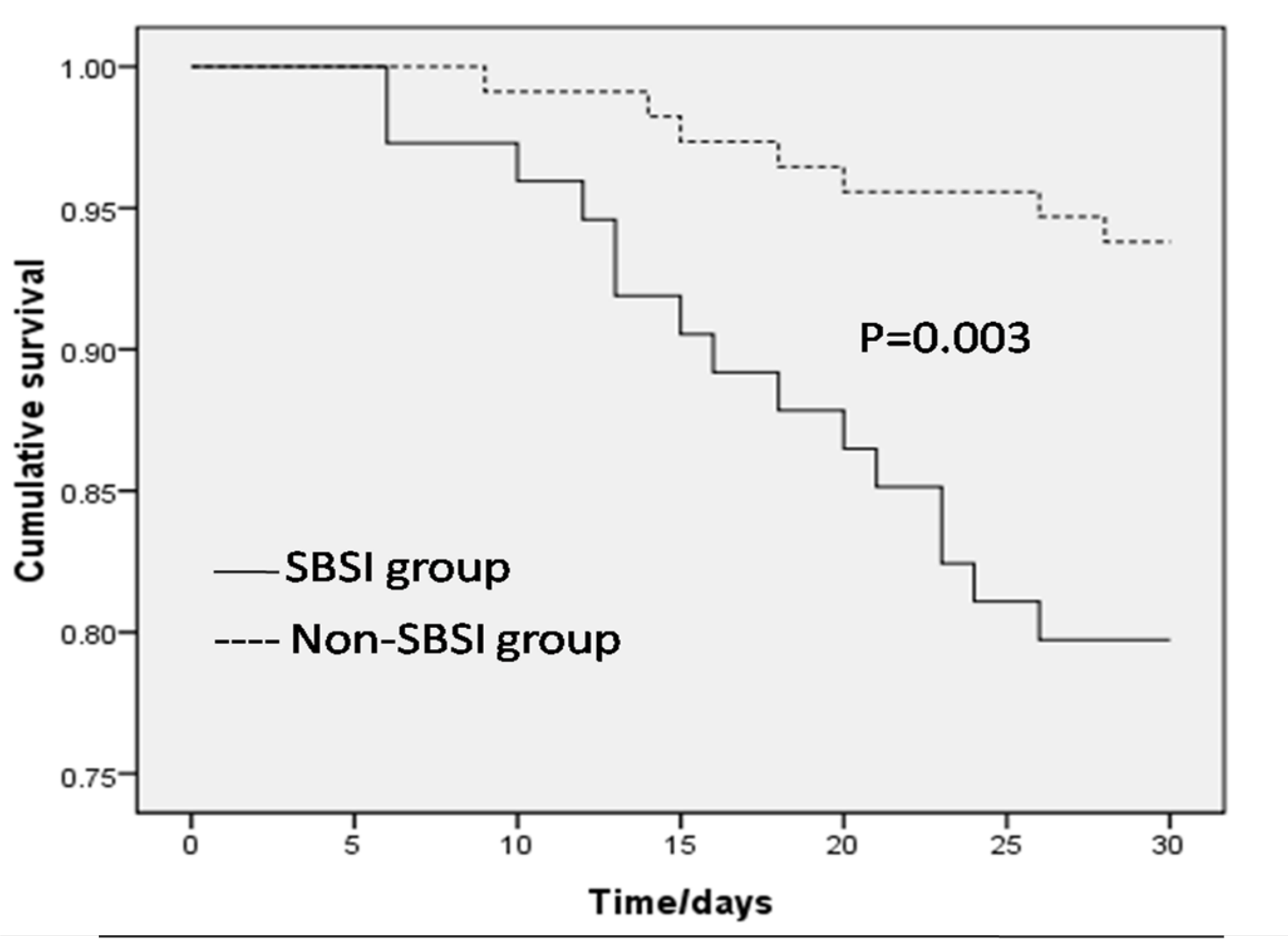


Figure 2. Cumulative survival of the SBSI group and the non-sBSI group. SBSI, secondary bloodstream infection.

Conclusions:

Bloodstream Infection secondary to complicated intra-abdominal infection largely represents deteriorated condition of patients. Our new scoring method depended on patients' condition on admission may have a potential advantage on the early prediction and recognition in clinical practice.

P35.
Three port cholecystectomy for acute cholecystitis: safe and feasible?

Hugo Bonatti, University of Maryland Shore Health

Background:

The majority of surgeons use four ports for laparoscopic cholecystectomy (LC). We recently presented a three port technique with access from the left upper quadrant (LUQ) using a modified dome down technique. Initially the

technique was used in easy cases but subsequently it was also expanded to more difficult cases including patients presenting with acute and acute on chronic cholecystitis.

Hypothesis:

Three port laparoscopic cholecystectomy may be feasible in patinets with acute cholecystitis.

Methods:

A total of 127 LCs performed from 6/2013 - 9/2016 were analyzed. There were 56 cases of acute or acute on chronic cholecystitis and they were subject to this analysis. Trocars are placed in the LUQ (5mm), umbilicus (5 or 10-12mm), and between the two (5mm). After the gallbladder (GB) serosa is incised on both sides, the fundus is shelled out and then the GB is dissected out in a dome down technique. In a subset of patients first step was creation of a window behind the gallbladder, which is then widened towards fundus and infundibulum. Ultimately, cystic artery and duct are dissected out of the tissue below the GB infundibulum obtaining the critical view and they are secured with clips or endoloop.

Results:

Median age of 30 women and 26 men was 60.4 (range 16.5-84.1) years. LC was done for acute cholecystitis (n=18) and acute on chronic cholecystitis (n=38). Conversion rate for the 127 cases was zero. In 56 cases (91%), the procedure could be completed with three instruments, in five cases an additional instrument was inserted – four of them during the first 6 study months A Keith needle was used for GB suspension in three patients, in 22 cases a Blake drain was inserted. Six patients had an ERCP for common bile duct clearance prior to LC and three had a combined LC with ERCP. In twelve cases the Teleflex minigrasper replaced one port. In 21 cases additional procedures were done including lysis of adhesions, liver biopsy, small bowel resection, fundoplication, hernia repair and ERCP. In eleven cases Indocyanine green was used for non invasive cholangiography. Median operative time was 1hour 46 minutes (range 45-200 minutes). There were no vascular or bile duct injuries in this series. 25% of cases were done as outpatient procedures, 42% of patients required 23hours observation and 34% were hospitalized.

Conclusions:

Three instrument modified or classic dome down technique with trocar placement in LUQ is feasible and safe in acute cholecystitis.

P36.
Safety, Satisfaction, and Efficacy of Resistive Polymer versus Forced Air Warming in Total Joint Surgery

Melanie Sandoval, University of Colorado-Denver, School of Medicine;Michael Dayton, University of Colorado-Denver, School of Medicine;Craig Hogan,

Background:

Forced-air warming is used as a mechanism to prevent hypothermia and adverse outcomes, including: surgical site infection, morbid cardiac events, blood loss and transfusion requirements, increased length of hospital stay, adrenergic activation, thermal discomfort, and, decreased drug metabolism. Alternative healthcare technologies are available to maintain normothermia in patients undergoing surgery. Patient safety in healthcare includes the use of devices and technology that minimize adverse events to patients. The safety, efficacy, and userability of technology are key elements to consider. The present study compares the capabilities of patient warming between two different devices that use different mechanisms of warming: forced-air warming and non-air warming.

Hypothesis:

There is no difference in warming capabilities between-forced air warming and non-air warming

Methods:

120 patients undergoing total hip or total knee arthroplasty received patient warming via a forced warming device or non-air warming fabric conductive material. The project was part of a quality improvement initiative to identify optimal devices for patient warming associated with the least risk to the patient and the greatest user satisfaction. Descriptive, frequency, and correlational data analyses were performed.

Results:

Forced-air warming and non-air warming achieved similar results in maintaining the core temperature of patients undergoing total knee or hip arthroplasty. No adverse events were reported in either group. Operating room staff observed that the non-air warming device was less noisy and appreciated the disposable covers that could be changed after each surgical case. 90% of orthopedic surgeons preferred less heat generation from the non-air warming device. 86% of users felt that the non-air warming device was easy to use. Overall satisfaction with the product is as follows: Great 51.5%; good 46.5%; and, fair 2%. 95% of the users would recommend using non-air warming devices for orthopedic cases.

Conclusions:

These findings demonstrate that patient warming is equally achieved using forced-air and non-forced air warming devices among total knee and hip arthroplasty patients. The potential for air-flow disruption is present with the forced-air warming device and does not exist with the non-forced air device. The disruption of laminar air flow may be associated with surgical site infections. The disposable covers used to protect the device and patient has potential implications for surgical site infection.

P37.
Airborne bacteria in the operating room can be reduced by HEPA/Ultraviolet air recirculation system (HUAIRS)

David Kirshman, Aerobiotix, Inc., West Carrollton, Ohio;Soumitra Eachempati, Weill Cornell Medical College

Background:

Surgical site infections (SSI) are a major cause of morbidity and mortality in US hospitals. Environmental issues such as airborne bacteria in operating rooms may contribute to SSI but this effect has not been well studied. Nonetheless, in Europe but not the US, regulations exist to limit the airborne bacterial levels in the operating theater. A newly available HUAIRS utilizes C-band ultraviolet light focused on a reaction chamber filled with a multitude of clear cylindrical silicate quartz crystals to decrease bacteria from the air. In the first part of a multi-part study, we sought to determine whether airborne bacterial levels can be reduced by a HUAIRS.

Hypothesis:

We hypothesized that the HUAIRS could decrease the meaured quantity of airborne bacteria from a functioning surgical theater.

Methods:

A newly commercialized HUAIRS (Aerobiotix, Inc., Dayton, OH) was evaluated in its ability to reduce airborne bacteria in a plastic surgery operating room at an outpatient surgery center. An air sampling impactor and agar media plates were placed in multiple locations in the operating room and used to measure the number of colony forming units (CFU) per cubic meter of bacteria in the air before and after the utilization of the HUAIRS. Stats: paired t-test.

Results:

The samples of airborne CFU/m^3 were measured during surgical procedures over a seven hour sampling period. 12 samples were taken for each of control and HUAIRS periods. The results are as shown below.

Sample	1	2	3	4	5	6	7	8	9	10	11	12	**MEAN**
Control	63	34	10	22	27	15	16	8	22	14	33	22	**23.8**
HUAIRS	11	13	4	14	7	8	11	17	8	11	8	21	**11.1**

Values are expressed in CFU/m^3

For the cultured samples obtained, there was a 67.7% ($p<0.05$) reduction in CFU count in twelve paired samples.

Conclusions:

The HUAIRS device significantly decreases the level of airborne bacteria present in the operating room in preliminary study. Further studies will demonstrate whether this actual reduction will translate into a decrease in SSI rate in surgical patients. Environmental concerns may prove to be an important aspect of the overall strategy in reducing SSIs in the future.

P38.
Surgical Skin Preparation of the Open Abdomen, a Descriptive Study

Marcoandrea Giorgi, Brown University;Alicia Alterio, Brown University;Charles Adams, Jr., Brown Medical School/R.I. Hospital

Background:

Damage control approaches in trauma increase the number of take-back surgeries for patients with open abdomens. There is little or no data describing how the skin and viscera should be prepared for these operations. Surgeons use different techniques for sterile preparation based on personal experience, but there is a lack of data in the literature regarding the contribution of different sterile preparation techniques on post-operative abdominal complications for these procedures. We undertook a review in an attempt to define the optimal strategy for skin preparation for patients with an open abdomen

Hypothesis:

Betadine is inferior to other types of sterile preparation in take-back open abdomen surgeries

Methods:

A retrospective chart review of a single level 1 trauma center was performed. All trauma patients who underwent exploratory laparotomy, whose abdomens were left open using temporary abdominal closure devices then taken back to the operating room for re-exploration from 2007 through 2015 were included. We analyzed the technique and materials used to perform the sterile preparation of the surgical site. Complications were defined as anastomotic leak, entero-cutaneous fistula, intra-abdominal infection, or fascial dehiscence. Skin prep was broken down into chlorhexidine (CHG-alcohol) on skin only, chlorhexidine cleanser (CHG) on skin and viscera, povidone-iodine (P-I) on skin only or P-I on skin and viscera

Results:

97 patients (76 males, 21 female) had take-back surgeries (69 blunt, 28 penetrating mechanisms). Mean age was 39.9. Skin preparation was CHG on 23 patients (skin and viscera), CHG-alcohol (skin) on 22 patients, P-I on 36 patients (skin), and P-I for other 16 (skin and viscera). Complications rate was 16.5%, 6 leaks (6.18%), 4 intra-abdominal infections (4.12%), 4 fascial dehiscences (4.12%), 3 entero-cutaneous fistulas (ECF) (3.1%). In the CHG group there were 3 complications (13%, 2 leaks, 1 ECF); in the CHG-alcohol group there were 3 complications (13.6%, 2 fascial dehiscences, 1 ECF); in the P-I group there were 6 complications (16.6%, 3 leaks, 2 intra-abdominal infections, 1 ECF); in the P-I on bowel group there were 4 complications (25%, 1 fascial dehiscence, 2 intra-abdominal infections, 1 leak)

Conclusions:

Many patient factors play an important role in determining outcomes for open abdomens. In our study P-I was associated with a slight higher chance of complications. Additional prospective randomized studies will be needed to validate our findings

P39.
Chlorhexidine Gluconate Solution and Patient Reminders Decrease Infections and Minimize Costs among Total Arthroplasty Patients

Melanie Sandoval, University of Colorado-Denver, School of Medicine, Department of Orthopedic Surgery;Hugo Xi,

Background:

Surgical site infections (SSIs) account for 33% of total health care acquired infection costs. The incidence rate of SSIs is 1.98/100 patient procedures; with an average cost of $20, 785.00; and, an average length of stay of 11.2 days. Public awareness of SSIs has increased and multiple agencies receive and report SSIs, including the National Health Safety Network (NHSN), state (health department), and Centers for Medicaid and Medicare (CMS). Standardized practices, often referred to as bundles, focused on the prevention of SSIs by minimizing variance with best practice, are used by healthcare organizations to improve quality and contain costs. To increase compliance with preoperative showering, a component of an SSI bundle, at a large, academic hospital, a clinical trial was conducted to increase compliance, decrease infections, and minimize costs.

Hypothesis:

Chlorhexidine gluconate (CHG) and patient reminders to bathe with CHG via phone, text, or email increases patient compliance, decreases infections, and minimizes costs.

Methods:

A convenience sample of patients undergoing scheduled total hip or total knee arthroplasty received the standard of care: Instructions on preoperative bathing and a list of over the counter antimicrobial soaps, or enhanced care: CHG solution provided at the preoperative clinic visit and a messaging reminder via text, email, or a phone call, based on the patient's preference. Patients in the control group (standard of care) and patients in the study group were followed for 90 days postoperatively for the development of a surgical site infection. Surgical infection rates and SSI bundle compliance with preoperative bathing were compared. Financial comparison was conducted.

Results:

Patients in the control group averaged 84% SSI bundle compliance compared to 100% compliance in the study group. Zero infections occurred in study patients who had undergone total knee or total hip arthroplasty. The total hip patients in the control group experienced 2 infections (1.57/100 rate) and total knee experienced 2 infections (1.31/100 rate). The estimated cost savings, based on the direct cost of a knee ($14, 579) and hip ($14,347) at the academic center that the study was conducted at and the average cost of an infection was $140,992.00 over a three month period.

Conclusions:

A system combining an effective produce, such as CHG solution, coupled with patient reminders increases bundle compliance, decreases infection rates, and minimizes costs.

P40.
Trauma/Critical Care Surgeons are More Likely to See and Treat Perirectal Infections in the Operating Room

Husayn Ladhani, MetroHealth Medical Center, Cleveland, OH;Brenda Zosa, MetroHealth Medical Center, Cleveland, OH;Emily Verbus, Case Western Reserve University, School of Medicine, Cleveland, OH;Peter Lawson, MetroHealth Medical Center, Cleveland, OH;Jeffrey Claridge, MetroHealth Medical Center, Cleveland, OH

Background:

Perirectal infections are a common problem seen by the Acute Care Surgery (ACS) service that is covered by surgeons from various training backgrounds, such as trauma/critical care (TCCS), general and colorectal surgeons (GCS). We sought to compare treatment patterns and outcomes for patients with perirectal disease when managed by surgeons from different training backgrounds.

Hypothesis:

Treatment patterns and outcomes for patients presenting with perirectal infections will differ by time of consultation and type of surgeon providing care.

Methods:

Adult patients seen by the ACS service from 02/2014 to 05/2016 for various perirectal infections were included. Demographics, hospital stay, cost, and recurrence data was obtained from hospital administrative data and electronic medical records. Treatment patterns and outcomes were compared by time of consultation and type of staffing surgeon.

Results:

A total of 129 patients were evaluated for perirectal infections. Mean age was 43 years and 81% were male. Majority of the patients evaluated had an abscess and only 7 patients had a NSTI. Most (64%) of the consultations occurred on weeknights and weekends. TCCS saw 47% of consults, whereas GCS saw 53%. Almost half (49%) required bedside drainage, and 34% had an operation. Majority (84%) of the patients received antibiotics with mean duration of 7 days. 22 patients were seen within 30 days for persistent complaints, of which 16 required a procedure. When compared by time of consultation (weekdays vs. weeknights and weekends), patients were more likely to be evaluated in person by attending surgeon on weekdays ($p<0.01$), otherwise results were not statistically different.

When compared by type of surgeon (after excluding colorectal surgeons), TCCS were more likely to evaluate the patient in person ($p<0.01$) and also more likely to treat them operatively ($p<0.05$). There was no difference in time to OR, overall LOS, and antibiotic days (see Table).

	Trauma/Critical care (n = 61)	General surgery (n = 36)	p
Mean age	42.0 ± 1.8 yrs	43.8 ± 2.1 yrs	0.721
Male	49 (80%)	27 (75%)	0.613
Diagnosis			0.708
Abscess	57 (93%)	33 (92%)	
NSTI	4 (7%)	3 (8%)	
Time of consult			0.132
Weekdays (Mon-Fri 7am-5pm)	27 (44%)	10 (28%)	
Weeknights and weekends	34 (56%)	26 (72%)	
Physically seen by staffing surgeon	46 (75%)	10 (28%)	**<0.001**
Bedside procedure	29 (48%)	21 (58%)	0.400
Operating room	25 (41%)	7 (19%)	**0.044**
Median time to OR	5.3 (3.4, 7.1) hrs	3.9 (2.9, 5.9) hrs	0.494
Discharge home from ED	27 (44%)	21 (58%)	0.211
Median LOS	23.6 (6.4, 47.8) hrs	10.7 (5.3, 47.9) hrs	0.321
Received antibiotics	52 (85%)	30 (83%)	0.780
Mean antibiotic days	6.4 ± 0.5	7.4 ± 0.7	0.291
Persistent complaints	9 (15%)	6 (17%)	0.780
Procedure for persistent complaints	6 (10%)	4 (11%)	1.000

Conclusions:

When consulted to evaluate perirectal infections, trauma/critical care surgeons are more likely to physically see the patient and treat them in the operating room, as compared to general surgeons, without any significant difference in outcomes.

P41.
Simple as checking the box? Reducing catheter-associated urinary tract infections in a neurotrauma ICU

Scott Fligor, Virginia Tech Carilion School of Medicine;Anthony Baffoe-Bonnie, Carilion Clinic;Katie Love, Carilion Clinic;Kelli Loftus, Carilion Clinic;Eric Bradburn, Lancaster General Health

Background:

Catheter-associated urinary tract infections (CAUTIs) are associated with sepsis and increased mortality in trauma patients.

Hypothesis:

Implementation of a daily checklist during rounds in a neurotrauma ICU will decrease catheter utilization and CAUTI incidence.

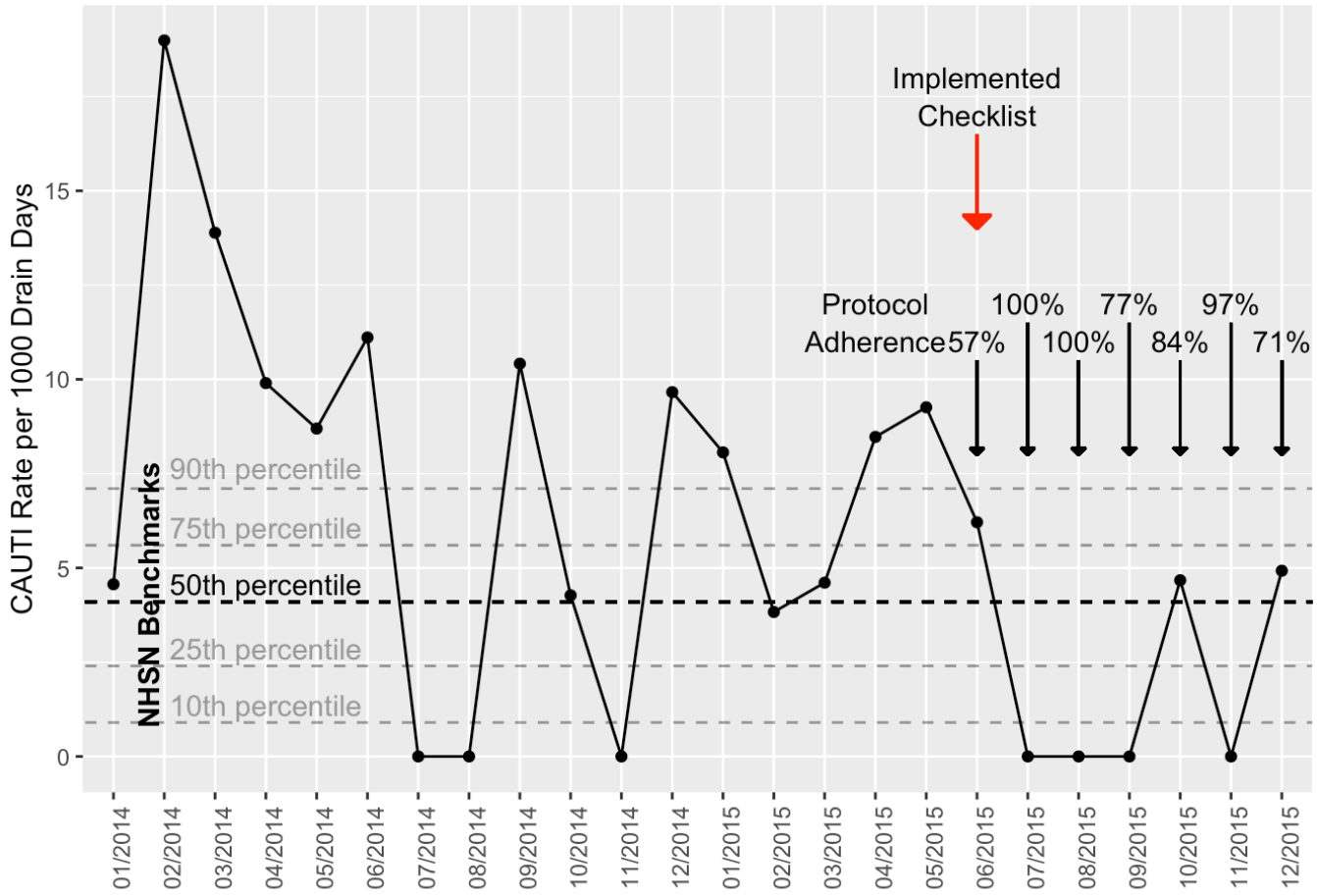
Methods:

We retrospectively reviewed CAUTIs in a neurotrauma ICU at a Level 1 trauma center from January 2014 through December 2015. A paper checklist containing eight yes/no questions was introduced in June 2015 to determine whether patients with indwelling catheters met criteria for a trial-without-catheter. The form was completed daily by the attending physician during rounds. Protocol adherence was evaluated by tracking daily checklist completion on each patient. CAUTI incidence and catheter utilization rates were determined before and after checklist incorporation. Data from the National Healthcare Safety Network (NHSN) was used for benchmarking. Rate ratios

were calculated and p<0.05 was considered significant.

Results:

Following implementation of the checklist the CAUTI rate was significantly reduced from 7.19 to 2.28 CAUTIs per 1000 urinary-catheter days, with a rate ratio of 0.33 (95% CI: 0.08-0.94, p=0.037). When compared to the NHSN benchmarks, the CAUTI rate at our institution fell from above the 90th percentile to below the 25th percentile among similar units. Utilization of catheters also significantly decreased from 0.68 to 0.59 urinary catheter days per patient days, with a rate ratio of 0.87 (95% CI: 0.82-0.93, p < 0.001).



Conclusions:

Implementation of a daily rounding checklist reduces catheter utilization and CAUTIs. Further research should examine the efficacy of similar checklists for other nosocomial infections as well as investigate the utility of incorporating checklists into electronic health records.

P42.
A Comparison of Self-Reported Conflict of Interest in the Surgical Infections Literature to the Centers of Medicare and Medicaid Services Open Payments Database

Deepa Cherla, University of Texas Health Science Center at Houston;Oscar Olavarria, University of Texas Health Science Center at Houston;Cristina Viso, University of Texas Health Science Center at Houston;Julie Holihan, University of Texas Health Science Center at Houston;Lillian Kao, University of Texas Health Science Center at Houston;Tien Ko, University of Texas Health Science Center at Houston;Mike Liang, University of Texas Health Science Center at Houston

Background:

Financial relationships are pervasive between healthcare providers and healthcare companies. In order to maintain transparency, investigators are expected to self-disclose their conflicts-of-interest (COI). In 2010, the passage of the Physician Payments Sunshine Act led the Centers of Medicare and Medicaid Services (CMS) to establish an Open Payments Database (OPD) of COI reported by industry.

Hypothesis:

We hypothesize there is discordance between industry-reported and physician self-reported COI among publications pertaining to infections in surgical specialties.

Methods:

A previously developed database of 400 manuscripts in four surgical specialties (cardiac, orthopedics, otolaryngology, and ventral hernia), 1986 authors, and the COI (self- and industry-reported) was searched for articles pertaining to surgical infections. COI were defined as payments received as honoraria, consulting fees, compensation for serving as faculty or as a speaker at a venue, research funding payments, or having ownerships/partnerships in companies. COI disclosed on the published manuscripts were compared to the financial relationships reported on the OPD.

Results:

A total of 40 studies were identified with 338 participating authors. Of the 40 manuscripts, 5(12.5%) had complete concordance of self- and industry-reported COI, 20(50.0%) had differences between self- and industry-reported COI, and 15(37.5%) had no COI. Of the 338 authors, 98(28.9%) met the definition for COI. When comparing COI disclosed by authors and the COI disclosed in the OPD, 40 (11.8%) authors had at least 1 COI but did not declare any, and 34 (10.1%) declared a COI not listed in the OPD. The overall discordance rate was 21.9% (Table).

Table 1: Disclosure Status by Author in the Infectious Disease Literature (n=480)

		Industry Disclosure (OPD)	
		Yes	**No**
Self-Disclosure	**Yes**	Full Disclosure 19 (4.0%)	Incomplete Industry Disclosure 45 (9.4%)
	No	Incomplete Self-Disclosure 43 (9.0%)	No COI 373 (77.7%)

Conclusions:

Among the medical literature pertaining to surgical infections, there is substantial discordance between self-reported COI compared to those in the CMS OPD. Further studies are needed to determine the reasons for and impact of these differences, as COI may influence the validity of the design, conduct and results of a study.

P43.
Options for Source Control in Patients with Leak after Laparoscopic Sleeve Gastrectomy

Dena Arumugam, Winthrop University Hospital;Owen Pyke, Winthrop University Hospital;Alexander Barkan,

Winthrop University Hospital;Keneth Hall, Winthrop University Hospital;Patricia Cherasard, Winthrop University Hospital;Stavros Stavropoulos, Winthrop University Hospital;Rani Modayil, Winthrop University Hospital;Collin Brathwaite, Winthrop Surgical Associates, P.C.

Background:

Laparoscopic sleeve gastrectomy (LSG) is the most common bariatric surgery performed in the U.S. Postoperative leak is rare, but the risk of sepsis, organ failure and death is significant if inadequately treated. While source control in septic patients entails washout, drainage, and debridement, endoscopic procedures are crucial adjuncts to treat LSG leaks.

Hypothesis:

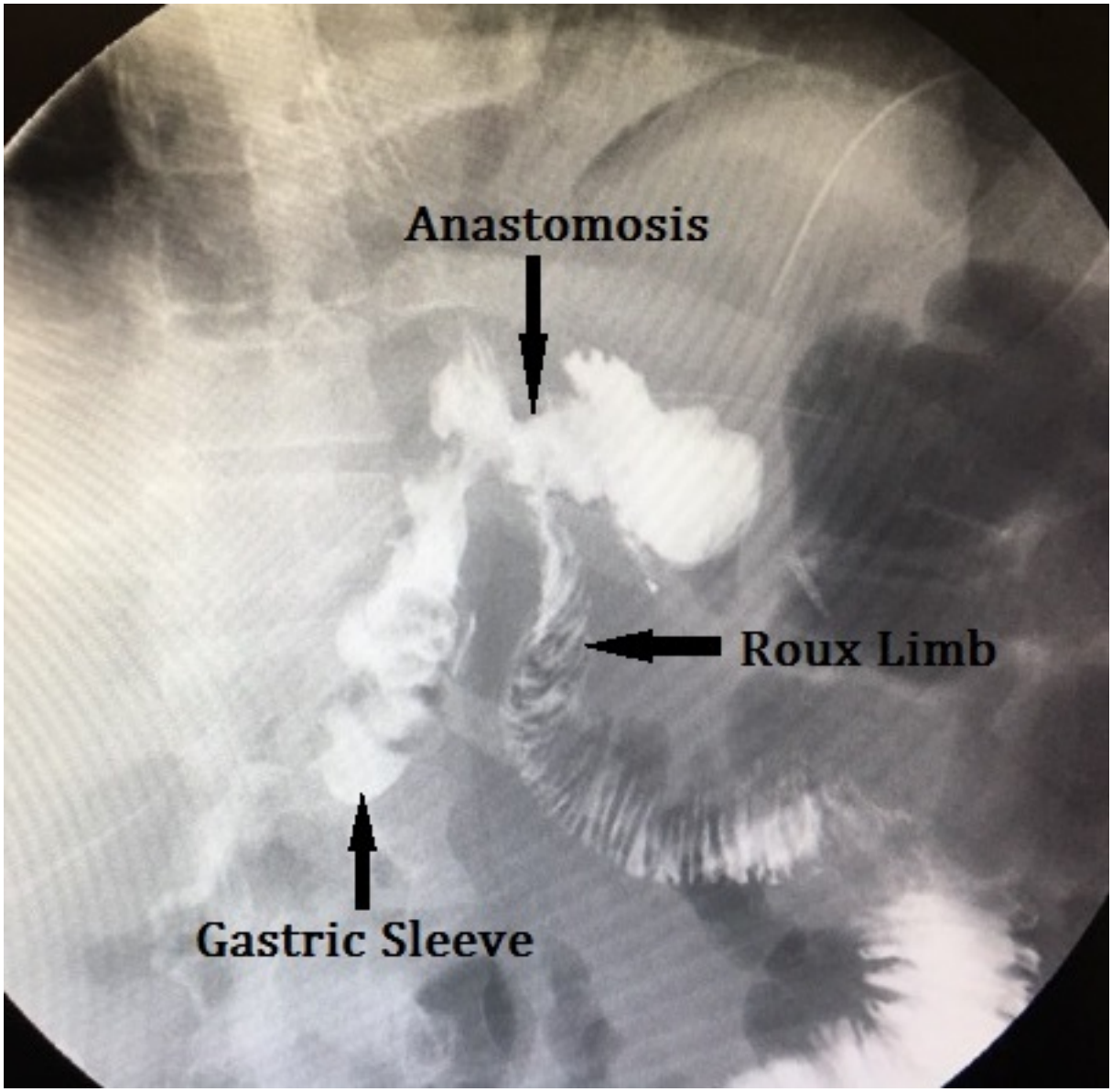
Minimally invasive options exist to control leak after LSG.

Methods:

We retrospectively reviewed a prospectively collected database of patients treated at our Metabolic and Bariatric Surgery Center of Excellence with leak after LSG (2004-2016). Demographics, time to leak, treatment modalities and outcomes were analyzed.

Results:

Sixteen patients (mean age 38.3 years) had leak after LSG; 6 underwent LSG elsewhere. Ten patients (63%) were female and 4 (25%) had BMI greater than 50 at LSG. Leak occurred 5 days to 7 months after LSG. Three patients had gastro-pleural fistulae; 1 also had a gastro-bronchial fistula. Endoscopic stent (ES) placement was initial therapy in 14 (88%) patients, most of whom (71%) had multimodality therapy with endoscopic clip, suture, and/or fibrin glue. One (6%) patient had percutaneous drainage of intra-abdominal abscess alone and 1 (6%) had endoscopic clipping of leak site alone. Average ES therapy was 6.8 weeks. ES was effective in 10 (71%) of 14 patients. Three of these also had laparoscopic washout and closure of the leak site. One patient did not tolerate ES and underwent ES removal and endoscopic clipping and glue. One patient had roux-en-y gastro-jejunostomy with roux limb anastomosis to the leak site and one had gastric resection with roux-en-y esophago-jejunostomy; both had ES removal. All revisions were minimally invasive (2 laparoscopic, 1 robotic). Demographics, leak type, and endoscopic clip or glue did not predict ES success. Most patients (93%) needed parenteral nutrition; 1 received jejunal tube feeds. All leaks healed as confirmed by endoscopy or radiology. There was 1 mortality in a patient whose leak resolved after extended ES therapy.



Conclusions:

Many options exist for source control of leak after LSG. Roux limb anastomosis to the leak site can be beneficial in those who fail standard ES therapy.

P44.
Is Rapid Source Control Laparotomy Efficacious? A cohort analysis

James Vogler, Grand Strand Medical Center;Laura Bagwell, University of South Carolina Medical School;Leslie Hart, PhD, Grand Strand Medical Center;Jason Sciarretta, Grand Strand Medical Center - University of South Carolina;John M Davis, Grand Strand Medical Center - University of South Carolina;Sharon Holmes, Grand Strand Medical Center

Background:

Damage control laparotomy for patients with severe traumatic abdominal injuries where an abbreviated initial procedure is used, has provided increased survival rates to critically ill patients. Typical indications include massive

liver trauma and massive blunt retroperitoneal injury. Sepsis has recently become an indication, with patients benefiting from the contamination control provided by a **rapid source control laparotomy** (RSCL). However,the range of patients who may benefit from RSCL has not been fully delineated. RSCL requires prolonged ventilatory support which potentially can increase ventilatory associated pneumonia (VAP) but may reduce the morbidity of recurrent intraabdominal infections by timely repair of the underlying condition.

Hypothesis:

RSCL for intraabdominal perforations is an effective means for safely reducing morbidity and mortality in critically ill patients as compared to the standard approach of closing the abdominal wall after surgery.

Methods:

The ICD 10 codes from patients having RSCL at our institution were identified and used to identify patients from the National Surgical Quality Improvement Project (NSQIP) 2015 database. RSCL (n=222) patients were compared to standard closed abdomen management (n=2677) and were analyzed for length of stay, postoperative pneumonia and mortality. Confounding variables (age, gender, wound classification, ASA classification, wound classification, operative time sepsis and risk factors) were included in the analysis.

Results:

Mortality was significantly higher (31% versus 11%, $p<0.0007$) in the RSCL group compared to those patients treated in the traditional manner. Age, sepsis, the number of comorbid risk factors, wound and ASA classification and were also associated with a higher mortality rate ($p<0.0001$). After adjusting for the number of risk factors, ASA classification, age, and sepsis status, RSCL was significantly associated with mortality (CI 2.09, 1.51-2.92, $p<0.00001$). Length of stay, 16.70 versus 12.16 days, was significantly longer in the RSCL than the closed group, respectively ($p<0.0001$).

Conclusions:

This cohort analysis indicates that RSCL is not beneficial in the codes selected. As with most large database studies, details in specific patient management cannot be queried. Unanswered for example is whether this population include patients who would benefit from RSCL. Additionally, there may be selection bias not otherwise controlled for. More study needs to be done to more make an informed judgement as to the value of RSCL.

P45.
Improving safety in laparoscopic sigmoid colectomy for perforated diverticulitis: use of lighted ureteral stents and indocyanine green to determine colonic perfusion

Hugo Bonatti, University of Maryland Shore Health;Scarlet Hao, University of Maryland School of Medicine, Baltimore, MD

Background:

Injury to the ureter and anastomotic leak due to poor perfusion of the colonic conduit are most feared complications in surgery for left colonic, sigmoid, rectal pathologies especially in patients with inflammatory disease. Ureteral stents have been used in previous series with conflicting reported data but lighted stents may be a better tool. Testing perfusion of the tip of the colonic conduit may be able to tailor exact placement of the anvil for the stapled anastomosis.

Hypothesis:

Lighted ureter stents and indocyanine green (ICG) perfusion testing of the conduit may be helpful tools in laparoscopic colon resection.

Methods:

All patients from a single rural hospital who had colonic resection and had a lighted ureteral stent (figure 1) placed cystoscopically prior to the procedure and/or had perfusion of the conduit tested using ICG (3ml bolus injection and excitement with laser light using the Stryker or Novadaq system) during a two years period were included in this study. The stent was removed immediately after the procedure, a Foley catheter remained in place for 24-48 hours per protocol.

Results:

A total of 17 patients including 10 men and 7 women with a median age of 62.4 (range 28.0 - 88.5) had a lighted ureteral stent placed in the left ureter. All attempts were successful and placement took average less than 30 minutes. Fifteen patients had a laparoscopic sigmoid colectomy/low anterior resection and two had a laparoscopic Hartman reversal. In all cases the lighted stent was well visualized allowing safe dissection of tissue far away from the critical structure and in no case an injury to the ureter or bladder occurred. Macrohematuria was observed in the majority of patients but no patient suffered ureter injury or kidney injury. ICG testing of the conduit was available for seven cases (figure 2) and helped placing the anvil in a well perfused area in all cases.

Conclusions:

Lighted ureteal stents were found extremely useful in laparoscopic colon surgery with risk of ureter injury. This is not only a matter of patient safety but also allows much faster dissection of tissue and potentially shortens the surgical procedure. Testing of perfusion of the conduit is helpful in determining perfusion of the conduit. Lighted ureter stents and ICG testing of the colon conduit may be particularly useful for laparoscopic sigmoid collection for diverticulitis in the rural setting.

P46.
The status and prognostic significance of serum electrolytes in the patients with intestinal fistula

Guanwei Li, ;Jianan Ren, Nanjing General Hospital of Nanjing;Gefei Wang, Department of Surgery, Jinling Hospital, Medical School of Nanjing University;Guosheng Gu, Department of Surgery, Jinling Hospital, Medical School of Nanjing University

Background:

Intestinal fistula is always a clinical dilema. Besides the complicated intra-abdominal infection, this disease also causes electrolyte imbalance, necessitating correction to maintain homeostasis and promote rehabilitation. Little data regarding serum electrolytes have been reported in the intestinal fistula.

Hypothesis:

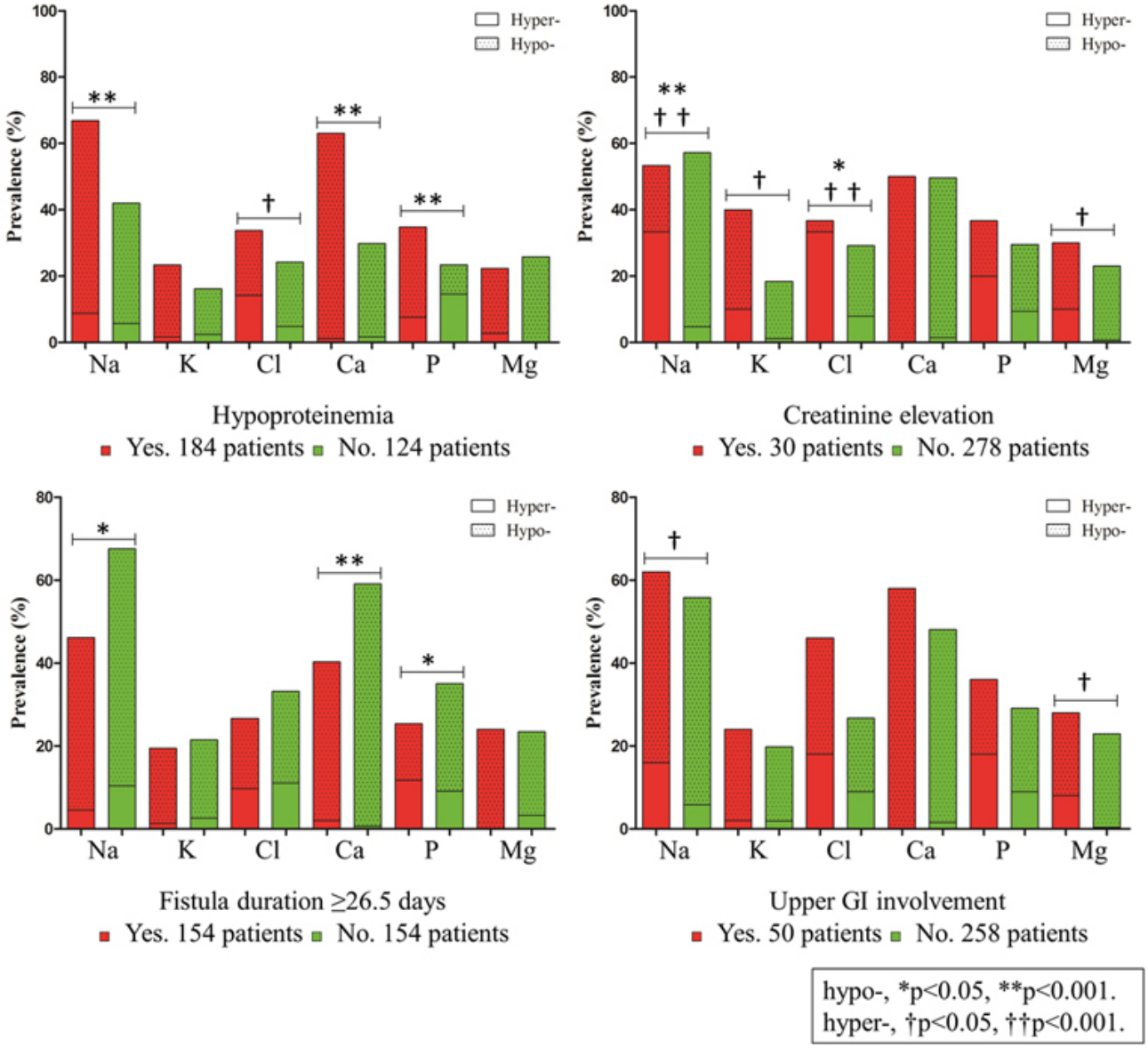
We aimed to investigate the status of serum electrolytes at admission in the intestinal fistula patients and explore the possible relationship with the prognosis.

Methods:

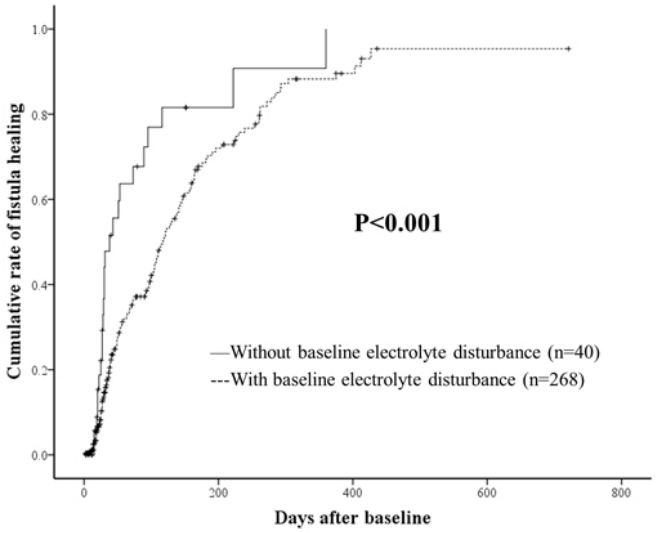
We retrospectively enrolled consecutive patients discharged from our center between 2015.1 to 2015.11. The data when the patients were first admitted and the outcomes, were analyzed.

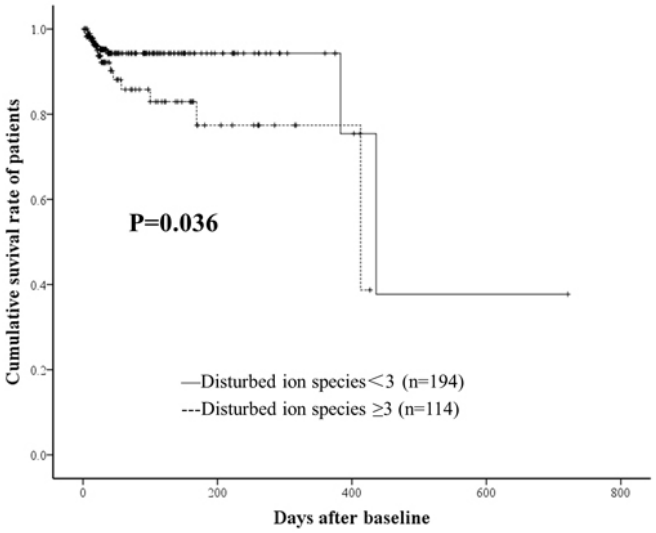
Results:

308 patients were included consisting of 217 males and 91 females. The most common primary diseases were tumor (26.6%) and trauma (16.9%). The prevalence of hypernatremia, hyponatremia, hyperkalemia, hypokalemia, hyperchloremia, hypochloremia, hypercalcemia, hypocalcemia, hyperphosphatemia, hypophosphatemia, hypermagnesemia and hypomagnesemia at admission was 7.5%, 49.4%, 1.9%, 18.5%, 10.4%, 19.5%, 1.3%, 48.4%, 10.4%, 19.8%, 1.6% and 22.1%, respectively.



As for the subgroup analysis (Figure 1), patients with hypoproteinemia had higher risk of presenting hyponatremia, hyperchloremia, hypocalcemia and hypophosphatemia. Creatinine elevation was more commonly associated with hyper-electrolyte disturbances. Long-standing fistulas may have compensatory effects therefore the rates of hypo-electrolyte disturbances were lower.





The patients without baseline electrolyte disturbance recovered more quickly, whereas those with severe disturbances had higher mortality (Figure 2).

Conclusions:

Electrolyte imbalances, especially hypo-electrolyte disturbances, were frequently seen in intestinal fistula patients, and related with the outcomes. More researches are needed to clarify the effects of intervention.

P47.
Evaluation of the Timing of Emergency Laparotomy on the Incidence of Pneumonia and Systemic Sepsis in Penetrating Trauma Patients

Nasim Ahmed, Jersey Shore University Medical Center;Patricia Greenberg, Hackensack Meridian Health

Background:

The purpose of the study was to evaluate the impact of the timing of an emergency laparotomy, for penetrating injury cases with systolic blood pressure (SBP) $\leq$ 90 mmHg on the incidence of pneumonia and systemic sepsis

Hypothesis:

Hypotensive patient who undergoes emergency laparatomy within an hour compare to between 1 nad 4 hours following penetrating trauma has lower incidence of pneumonia and sepsis

Methods:

Study data was obtained from the National Trauma Data Bank (2007-2010 edition). Only patients who sustained penetrating injuries, presented with an initial systolic blood pressure (SBP) ≤ 90 mmHg, and who underwent an exploratory laparotomy within 4 hours of hospital arrival were included in the analysis. Patients who underwent laparotomy within one hour (Group 1) were compared to those who underwent a laparotomy between 1-4 hours post-admission (Group 2). Patients' age, race (white versus non-white), gender, systolic blood pressure, heart rate, mechanism of injury, intent of injury, injury severity score (ISS), and Glasgow Coma Scale (GCS) were all included for consideration in the study. These measures as well as the complications were compared across the two unmatched groups and then propensity score matching analysis was performed using baseline characteristics.

Results:

A total of 2,345 patients qualified for the study and of those, 1,931 (82.35%) patients had their laparotomy within the first hour (Group 1) and 414 (17.65%) had their laparotomy between 1-4 hours (Group 2). There were significant differences between the two groups regarding the injury mechanism (gunshot wound [74.6% vs.63.5%, P<0.001]), SBP (Mean [SD]: 60.8 [31.5] vs.72 [23.5], P<0.001), ISS (21 [14.5] vs.18.2 [11.5], P<0.001) and GCS (10.3 [5.4] vs. 12.5 [4.4], P<0.001), respectively. After propensity score matching was performed, there was no longer a significance difference seen regarding mechanism (gunshot wound [69.1% vs. 63.5%], P=0.085), ISS (Mean [SD]: 18.2 [10.9] vs.18.2 [11.5], P=0.696) or GCS (12.4[4.5] vs. 12.5 [4.4], P=0.164); however, SBP (68.2 [25.3] vs. 72.1 [23.5], P=0.007) was still significantly different. Using the matched data, the overall incidence of pneumonia was 9.4% vs. 8.9 % (P=0.775), and systemic sepsis was 6.0% vs. 4.3% (P=0.458) between Groups 1 and 2, respectively.

Conclusions:

There were no significant differences seen between the groups regarding pneumonia or systemic sepsis when compared to those who had a laparotomy between 1-4 hours post-admission.

P48.
Propofol Use is Associated with Increased Risk of PNA in Patients with Chest Trauma

Krista Haines, University of Wisconsin ;David Rivenbark, University of Nevada, Las Vegas;Suresh Agarwal, University of Wisconsin Hospital and Clinics

Background:

Ventilator Associated Pneumonia (VAP) occurs in 28% of patients increasing morbidity and cost. Literature has shown immunosuppressive properties of propofol causing impaired innate immune response. Despite the movement to use analgesia prior to sedatives since 2012, sedatives continue to be front line and long term therapy in the surgical ICU. Prior to this intervention, the propofol rate was 39.8 average infusion hours per patient at a mean rate of 27.2mcg/kg/hr. After this initiative, rates declined in the first year to 33.3 hours with 26.8 mcg/kg/hr, but have increased yearly to 35.7 hours at a rate of 28 mcg/kg/hr most recently.

Hypothesis:

We hypothesize that long term propofol use leads to increased risk of VAP in trauma patients.

Methods:

This retrospective study was designed to review current interventions for all patients entering the surgical ICU requiring ventilation who were diagnosed with VAP and its relation to propofol.

Results:

From 7/2015 to 9/2016, 854 patients were admitted to the trauma and surgical ICU. 547 patients required mechanical ventilation with mean total vent days of 3.2±4 — lower than a predicted vent day calculation of 5±2. Mean APACHE score was 84± 1, ICU LOS was 5±4. 6 patients had at least one diagnosis of VAP during their hospitalization. All patients were trauma patients; 5 had rib fractures and 1 had a sternal fracture. 83% had an initial admission to the ICU and one was upgraded from intermediate care status. All 6 patients received long term propofol infusions. Mean age of VAP patients was 40±14, 100% were male. 100% of these patients were trauma patients, 50% fall and 20% MVC. Admission ISS was 37±10, APACHE was 66±19 (p<0.034). Total LOS was significantly higher at 22±15, actual ventilator days 11±8, and ICU days 11±8. Only one patient was able to be discharged home; 83% to a rehab or SNF. Data are mean±STDEV.

Conclusions:

Although the data reviewed were for all acute care surgical and trauma critical care patients, all patients who developed VAP during the study period were trauma patients with rib or sternal fractures. Despite current evidence that propofol causes immunosuppression and the push to give analgesia as primary mode of therapy, 100% of this group received first line propofol. Furthermore, despite high APACHE scores in our entire population, the group that developed VAP had significantly lower scores. These data warrant further randomized studies to investigate the effect of propofol on VAP rates.

P49.
Traumatic Injury is Associated with a 3-fold Increase in the Frequency of the Diagnosis of Ventilator Associated Pneumonia (VAP)

Christopher Horn, Saint Louis University School of Medicine;Dajun Tian, Washington University School of Medicine;Grant Bochicchio, Washington University School of Medicine;Isaiah Turnbull, Washington University School of Medicine

Background:

Up to 40% of intubated trauma patients will develop pneumonia. This is significantly higher than the rates of pneumonia observed in non-trauma populations and suggests that trauma is associated with an increased risk of pulmonary infection. To specifically measure this effect, we determined the rates and clinical consequences of pneumonia and VAP in a matched cohort injured and uninjured patients using the National Inpatient Sample.

Hypothesis:

We hypothesized that after controlling for demographics and clinical metrics, injured patients would have increased incidence of pneumonia.

Methods:

The 2012 National Inpatient Sample was queried for injured patients and these patients case-matched with uninjured controls for age, length of stay (LOS), and number of comorbidities and operating room procedures. We measured the rate of pneumonia and related outcomes. Injury was defined by ICD-9 800.00-959.9; pneumonia as Clinical Classification Software Code 122 and Ventilator Associated Pneumonia (VAP) as ICD-9 997.31. Frequencies were compared by χ^2 and continuous variables by the Student's T-test using SPSS.

Results:

447722 injured patients were identified; 389413 were matched to an uninjured control. After matching, the average age was 63 years, 51% of patients were female and the average number of comorbidities was 5. Overall mortality was 2.8% for uninjured patients and 3.0% for injured patients. Pneumonia was less frequent in the injured vs. uninjured patients (6.9% vs. 9.5%, $p<0.05$) but was associated with higher mortality (9.5% vs 8.2%, $p<0.05$). The rate of VAP was 3-fold higher in injured vs. uninjured patients (0.20% vs. 0.06%, $p<0.05$), but was associated with a significantly lower risk of death (13% vs. 24%, $p<0.05$). In the injured vs. uninjured patients, pneumonia was associated with a significantly higher LOS (8.2 vs. 12.0 days, $p<0.05$).

Conclusions:

Traumatic injury is associated with a 3-fold increase in the diagnosis of VAP. However, the mortality of VAP in injured patients is half that of uninjured controls. Together, the increased incidence and decreased mortality suggests that in trauma patients VAP may be being overdiagnosed in patients without a clinically significant infection. Given that nosocomial infection and specifically VAP have been put forth as benchmarks for patient safety, the over-diagnosis of VAP in injured patients may significantly impact quality metrics and remuneration for organizations caring for trauma patients.

P50.
Raging Hormones: Inflammatory Differences in Young and Geriatric Trauma Patients

Puja Shah, University of Virginia;Addison May, Vanderbilt University Medical Center;Christopher Guidry, UVA Health System;Nathan Elwood, University of Virginia;Zachary Dietch, ;Robert Sawyer, University of Virginia HSC

Background:

The impact of age and hormone inflammatory profiles on outcomes is unclear.

Hypothesis:

We hypothesize geriatric trauma patients express lower levels of anti-inflammatory molecules than the young, which may lead to differences in rates of post-admission death.

Methods:

A prospective, multi-institutional cohort of 911 critically ill trauma patients between October 2001 and May 2006 was analyzed retrospectively. Patients were stratified into young (18-40) or geriatric (≥65) categories. Serum inflammatory markers were collected for each patient within 48 hours of admission. Demographic and clinical data were examined using univariate techniques and *a priori* covariates were selected for multivariable logistic regression. Primary outcomes of interest included association of gender and age group to inflammatory markers along with all-cause mortality.

Results:

Geriatric males had significantly higher estradiol and testosterone than young males, whereas DHEA-S was significantly elevated in young men. A similar hormone profile is seen in young versus elderly females (Table I). The geriatric cohort had a higher overall mortality rate (24% versus 7%, $p<0.0001$). While there were no differences in gender related mortality within each age group, geriatric males and females had elevated mortality compared to younger patients ($p<0.0001$ and $p=0.0002$, respectively). Elevated estradiol and testosterone were associated with mortality ($p<0.0001$, $p=0.008$, respectively) while elevated DHEA was protective ($p=0.003$). Cytokines IL1-2, 4-6, 8,10, 12, GM-CSF, TNF and IFN did not correlate with mortality. Geriatric age group ($p<0.0001$), male gender ($p=0.05$) and testosterone ($p=0.04$) remain independently associated with mortality in a multivariable model (c-statistic 0.82).

Conclusions:

Elderly patients typically express decreased levels of sex hormones, however these results surprisingly demonstrate elevated estradiol and testosterone in a geriatric trauma cohort. Age-related variations in trauma sex hormone inflammatory responses may influence geriatric trauma mortality. Peripheral conversion of DHEA-S to sex steroids may provide an inflammatory modulation target to improve trauma-related geriatric death rates.

Table I. Inflammatory sex hormones in males and females stratified by age group. Hormone units expressed in pg/ml.

Males			
Inflammatory Marker†	Young (n=520)	Geriatric (n=144)	p-Value
Estradiol	16.3 (9.9-40.2)	32.8 (11.8-65.3)	<0.0001*
Testosterone	35.0 (22.0-63.0)	44.0 (26.0-76.0)	0.04
DHEA-S	121.0 (67.0-192.0)	36.0 (18.0-62.0)	<0.0001
Females			
Inflammatory Marker†	Young (n=162)	Geriatric n=85)	p-Value
Estradiol	21.4 (9.9-58.9)	48.3 (13.8-74.0)	0.02*
Testosterone	28.5 (15.0-44.0)	35.0 (2.0-60.0)	0.02
DHEA-S	84.4 (39.0-168.0)	27.4 (15.0-58.8)	<0.0001

†represented as medians and interquartile ranges (parentheses) *significance at p<0.05

.

P51.
Evaluating the Effects of Blood Alcohol Concentration on the Rate of Systemic Sepsis Complications in Burn Patients

Nasim Ahmed, Jersey Shore University Medical Center;Patricia Greenberg, Hackensack Meridian Health

Background:

The purpose of this study was to evaluate the incidence of systemic sepsis in burn patients who tested positive for alcohol at the time of hospital arrival versus those who tested negative.

Hypothesis:

Burn patient who tested postive for alcohol on arrival to the hospital has higher incidence of systemic sepsis

Methods:

Retrospective data from patients who sustained burns (based on injury mechanism) and also underwent blood alcohol testing was pulled from the National Trauma Data Bank (2007-2010 edition) for inclusion in the study. Any blood alcohol concentration (BAC) identified above the legal limit (≥0.08 g/dL) was considered “positive” for alcohol, and if no alcohol was identified through testing, the patient was considered “negative” for alcohol. Patient demographics including age (≥ 14 years old), race (white vs. nonwhite), gender, systolic blood pressure, heart rate, intent of injury, injury severity score (ISS), and Glasgow Coma Scale (GCS) were also collected as part of the study. The two groups were compared using Chi-Square, Fisher Exact, and Wilcoxon Rank Sum tests. Logistic regression analysis was additionally performed to help control for any possible confounders. Propensity score matching was also performed to help balance the two groups using baseline characteristics.

Results:

A total of 3,809 patients qualified for this study, and of those, 675 (17.7%) had a positive test result for BAC above the legal limit (≥ 0.08 g/dL) and 3,134 (82.3%) had a negative test result for BAC. There were statistically significant demographic differences found between the two groups; therefore, propensity score matching was performed using age, gender, and race to better balance the two patient groups. The resulting mean standardized differences were less than 10% between the groups after matching, indicating that the matching procedure was successful. No statistically significant difference was found when comparing the incidence of systemic sepsis between the matched alcohol positive vs. alcohol negative patients (11.1% vs. 8.0%, P=1.0). However, alcohol positive patients had a significantly longer median length of hospital stay (6 days vs. 5 days, P=0.040) and rate of death (10.4% vs 6.1%, P=0.006).

Conclusions:

Patients who tested positive for alcohol following a traumatic burn injury did not show any significant difference in the incidence of systemic sepsis complications when compared to matched patients who tested negative for alcohol.

P52.
Examining the Incidence of Pneumonia in Burn Victims with Positive Blood Alcohol Concentration

Nasim Ahmed, Jersey Shore University Medical Center;Patricia Greenberg, Hackensack Meridian Health

Background:

The purpose of this study was to evaluate the incidence of pneumonia in burn patients who tested positive for alcohol at the time of hospital arrival versus those who tested negative.

Hypothesis:

incidence of pneumonia will increase following burn in patients who tested positive for alcohol above the legal limit at the time of hospital arrival.

Methods:

Retrospective data from patients who sustained burns (based on injury mechanism) and also underwent blood alcohol testing was pulled from the National Trauma Data Bank (2007-2010 edition) for inclusion in the study. Any blood alcohol concentration (BAC) identified above the legal limit (≥0.08 g/dL) was considered “positive” for alcohol, and if no alcohol was identified through testing, the patient was considered “negative” for alcohol. Patient demographics including age (≥ 14 years old), race (white vs. nonwhite), gender, systolic blood pressure, heart rate, intent of injury, injury severity score (ISS), and Glasgow Coma Scale (GCS) were also collected as part of the study. The two groups were compared using Chi-Square, Fisher Exact, and Wilcoxon Rank Sum tests. Logistic regression analysis was additionally performed to help control for any possible confounders. Propensity score matching was also performed to help balance the two groups using baseline characteristics.

Results:

A total of 3,809 patients qualified for this study, and of those, 675 (17.7%) had a positive test result for BAC above the legal limit (≥ 0.08 g/dL) and 3,134 (82.3%) had a negative test result for BAC. There were statistically significant demographic differences found between the two groups; therefore, propensity score matching was performed using age, gender, and race to better balance the two patient groups. The resulting mean standardized differences were less than 10% between the groups after matching, indicating that the matching procedure was successful. No statistically significant difference was found when comparing the incidence of pneumonia between the matched alcohol positive vs. alcohol negative patients (21.6% vs. 14.5%, P=0.677). However, alcohol positive patients had a significantly longer median length of hospital stay (6 days vs. 5 days, P=0.040) and rate of death (10.4% vs 6.1%, P=0.006).

Conclusions:

Patients who tested positive for alcohol following a traumatic burn injury did not show any significant difference in the incidence of pneumonia complications when compared to matched patients who tested negative for alcohol.