Session: P-42. HAI: Surgical Site Infections

Background. Beta-lactam allergies (BLA) are common, but the prevalence and impact on solid organ transplant (SOT) recipients is largely unknown. We assessed the prevalence of BLA labels in SOT recipients at the time of transplant and evaluated their influence on surgical site infection (SSI) prophylaxis and SSI incidence.

Methods. All patients undergoing first heart, kidney, liver SOT at our institution were retrospectively reviewed (1/1/2015-12/31/2019). Antibiotic allergies, surgical antibiotic prophylaxis, and SSIs were abstracted from the electronic medical record. Reported BLA reactions were classified as potentially IgE-mediated, delayed, or non-allergic based on documentation. SSIs were reported according to NHSN definitions, and the incidence of SSI was compared between patients with and without reported BLA. SSI prophylaxis regimens were compared to institutional guidelines. Basic descriptive statistics were performed.

Results. Out of a total cohort of 751 patients (122 heart, 435 kidney, 209 liver, 4 multi-organ), 129 (17%) reported at least one BLA, with 104 (15%) with reactions to penicillins, 26 (3%) to cephalosporins, and 1 (0.1%) to carbapenems. Commonly reported reactions were rash (38%), hives (25%), and "other" (21%); 28% of documented reactions were not documented or classified as non-allergic. SSI developed in 7 (6.1%) of heart, 10 (2.5%) of kidney, and 16 (9.4%) of liver transplant recipients. Excluding 44 patients already on antibiotics for treatment of systemic infection, guideline concordant beta-lactam antibiotic surgical prophylaxis was administered to 6 (5.2%) of BLA group vs 490 (85.8%) in the non-BLA group (p< 0.01); among the BLA group who did not receive a beta-lactam, 96 (83%) received a regimen concordant with institutional guidelines for penicillin allergy and 14 (12%) received guideline non-adherent regimens. Patients reporting BLA did not have a higher incidence of SSIs compared to those without BLA: 6 (4.8%) vs 27 (4.5%) respectively, p=0.86.

Conclusion. BLA prevalence in our SOT population was similar to previously reported rates, but many reported reactions were not allergic in nature. Pre-transplant allergy evaluation for patients with reported BLA may improve SSI antibiotic prophylaxis compliance.

Disclosures. **All Authors**: No reported disclosures

885. Feasibility of Observing Traffic Patterns (FOOT Patter) in Veterans Health Administration Operating Rooms

Tola Ewers, MS, PhD[1]; Babak Aryanfar, MD[2]; Marvin J. Bittner, MD[3]; Erin C. Balkenende, MPH[4]; Suzanne F. Bradley, MD[5]; Madisen Brown, MS Medical Anthropology and Cross Cultural Studies[6]; Matthew B. Goetz, MD[7]; Kalpana Gupta, MD, MPH[8]; Christopher J. Hostler, MD, MPH[9]; Eli N. Perencevich, MD MS[10]; Judith Strymish, MD[11]; Gisel Urdaneta, MD[12]; Christopher J. Crnich, MD, PhD[13]; [1]University of Wisconsin-Madison School of Medicine and Public Health, Madison, WI; [2]VA Greater Los Angeles, Los Angeles, California; [3]Creighton University School of Medicine and VA Nebraska-Western Iowa Health Care System, Omaha, Nebraska; [4]Iowa City VA Health Care System and University of Iowa, Iowa City, IA; [5]Univerisity of Michigan Medical School, Ann Arbor, Michigan; [6]Department of Veterans Affairs, Jamaica Plain, Massachusetts; [7]VA Greater Los Angeles Healthcare System and David Geffen School of Medicine at UCLA, VA-CDC Practice-Based Research Network, Los Angeles, California; [8]VA Boston Healthcare System and Boston Universiy School of Medicine, West Roxbury, MA; [9]Durham VA/Duke, Durham, North Carolina [10]University of Iowa, Iowa city, Iowa; [11]VA Boston Healthcare System, West Roxbury, MA; [12]Miami VA Healthcare System, Miami, Florida; [13]University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin

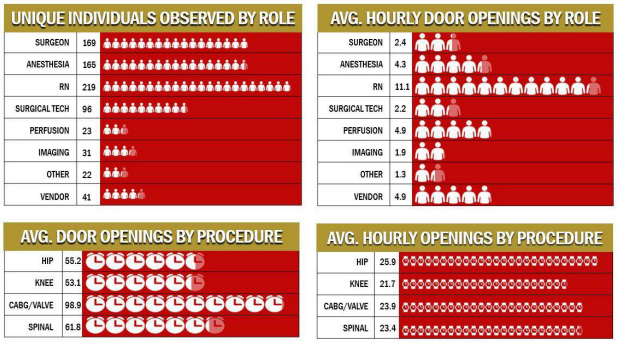
Session: P-42. HAI: Surgical Site Infections

Background. Surgical site infections (SSIs) complicate nearly 6% of surgeries performed in Veterans Health Administration (VA) hospitals and occur despite adoption of practices known to reduce them. SSIs are associated with prolonged hospitalization and an increased risk of readmission, reoperation and mortality. Operating room (OR) door openings may increase SSI through disruption of desired OR air flow patterns and increased wound microbe counts. Our study objectives were to: 1) develop a methodological approach for collecting data on entry/exit traffic patterns in VA ORs and 2) characterize patterns across different surgery types.

Methods. Trained researchers from 10 VA-Centers for Disease Control and Prevention (CDC) Practice-based Research Network sites observed staff entering and exiting VA ORs. Staff were categorized and identified by role. Exits/entries were recorded on a standardized tracking sheet. Surgery type and observation duration from incision to closure were noted. Mean hourly door openings across procedure and role types were compared via a one-way ANOVA using Stata ver. 15.0.

Results. We observed 56 surgeries on 55 patients (Fig. 1). During 9,801 observation minutes, 766 staff opened doors 3,882 times. Door openings by role differed significantly ($p < 0.001$) with nurses, perfusionists, anesthesia and vendors having the highest mean door-opening rate. Coronary artery bypass grafts (CABGs) accounted for most door openings and significantly greater surgical duration than other procedures (p=0.012). Time-adjusted OR door opening rate was similar across procedure types at ~22-26 hourly openings (p=0.186).

Figure 1. FOOT Patter results



Conclusion. The hourly rate of door openings varied notably by staff role. Our data show that measurement of OR movements is feasible although gaining access and approval to observe, achieving ideal observer positioning in complex floor plans, and potential misidentification of entering/exiting staff are challenges of direct methods. Scaling this study up may require automated processes. Studies exploring influences of traffic patterns on OR air quality metrics and impact on risk of SSI, identifying rationale and necessity for door openings and effective strategies for reducing unneeded door openings are needed.

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886. Impact of Type of Surgical Management on the Incidence of Recurrent Surgical Site Infections Following Hip and Knee replacements in Calgary, Alberta

Swati Chavda, MD[1]; Jenine Leal, PhD[1]; Shannon Puloski, MD[1]; Elissa Rennert May, MD[1]; [1]University of Calgary, Calgary, Alberta, Canada

Session: P-42. HAI: Surgical Site Infections

Background. Recurrent surgical site infections (SSIs) are associated with decreased quality of life for patients and increased economic burden to healthcare systems. Positive cultures at reimplantation and patient co-morbidities have been shown to increase the risk of recurrent SSI in hip and knee surgical site infections. Two-stage exchange has been considered for the most appropriate surgical management for these SSI's, however, it is unclear whether the type of revision arthroplasty and pathogen of the first SSI impacts recurrence rates.

Methods. A retrospective review of prospectively collected data on all complex SSIs following primary hip and knee arthroplasties between April 1 2012 and March 31, 2019, in Calgary, Alberta was performed. Patients were followed for two years post-index arthroplasty to determine initial management of first complex SSI (Debridement, antibiotics and implant retention (DAIR) vs DAIR+liner exchange vs one-stage vs two-stage), rate of recurrent complex SSI, and microbiological data for first and subsequent SSI's.

Results. Of the 142 complex SSIs, 95 (66.9%) were managed with DAIR and liner exchange, 25 (17.6%) were managed with DAIR, 13 (9.1%) with one-stage and 8 (5.6%) with two-stage procedures. The recurrence rate was 19/95 (20%) for DAIR and liner, 8/25 (32%) for DAIR alone, 2/13 (15%) with one stage, and 3/8 (37.5%) with two-stage. There was no significant difference in recurrence rates of complex SSI when stratified by surgical management. Of the pathogens, *Staphylococcus aureus* (*S.aureus*) (including methicillin-resistant *S. aureus* (MRSA)) accounted for 35.2% of total first SSI and 50% of recurrences. A significantly higher proportion of S.aureus infections (including MRSA) ended up with a recurrent infection compared to all other pathogens (p=0.045). Of the 32 recurrences, 28.1% were due to the same pathogen as the initial SSI.

Conclusion. S.aureus was the most common pathogen causing initial and recurrent SSIs. This reinforces that *S.aureus* complex SSIs would likely benefit from early recognition and aggressive treatment. Recurrence of SSI was not impacted by type of revision arthroplasty. This study is limited by a small sample size. These findings contribute to the paucity of literature in this area and suggest a need for expansion to larger populations.

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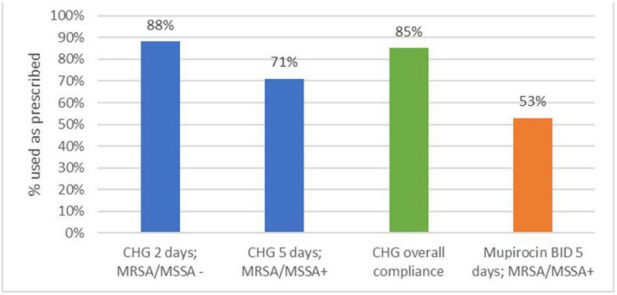
887. Implementation of a Surgical Site Infection (SSI) Prevention Bundle: Patient Compliance and Experience

Stacey Hockett-Sherlock, MAA[1]; Daniel Suh, MS MPH[2]; Eli N. Perencevich, MD MS[1]; Heather Schacht Reisinger, PhD[1]; Judy Streit, MD[1]; Gosia Clore, MPH[1]; Madeline Ohl, n/a[1]; Loreen Herwaldt, MD[1]; Marin L. Schweizer, PhD[3]; [1]University of Iowa, Iowa City, Iowa; [2]Iowa City VA Health Care System, Iowa City, Iowa; [3]University of Iowa Carver College of Medicine, Iowa city, IA

Session: P-42. HAI: Surgical Site Infections

Background. An evidence-based preoperative bundle including chlorhexidine gluconate (CHG) bathing, screening for *S. aureus* nasal carriage and decolonizing carriers with mupirocin was the standard of care for patients having total joint arthroplasty (TJA) at a VA medical center. We aimed to assess patient compliance with mupirocin and CHG, and characterize patient perceptions of barriers and facilitators to compliance.

Compliance with CHG Bathing & Mupirocin By Methicillin-resistant S. aureus (MRSA) or Methicillin-susceptible S. aureus (MSSA) Colonization Status



Methods. The bundle for *S. aureus* colonized patients having TJA included nasal mupirocin ointment twice daily and daily CHG bathing for 5 days before surgery. The bundle for non-carriers included CHG bathing the day before and the morning of surgery. From 7/2018-10/2019, inpatients completed a 31-item survey following their TJA.

Results. 73 patients completed the survey (~29% of the TJA population). 17 patients (23%) carried *S. aureus* & 56 patients (77%) were non-carriers. Patients reported high compliance with home use of CHG for the full number of days directed (88% when prescribed for 2 days; 71% when prescribed for 5 days; overall 85% used as prescribed; Figure). 7 (10%) patients reported CHG side effects, including burning or itchy/dry skin. 99% of patients reported willingness to use the CHG before a future surgery. Compliance with home use of mupirocin was lower (53% used as prescribed). Reported side effects included stinging, itching or dryness (N=2, 12%), unpleasant taste (N=2, 12%) & runny or stuffy nose (N=3, 18%). 100% of patients reported willingness to use mupirocin before a future surgery. Barriers to patient compliance with the bundle included forgetfulness and difficulty bathing daily. Facilitators to patient compliance included high facility compliance with *S. aureus* screening (100% patients reported), patient education regarding CHG and mupirocin use (95% patients recalled), and access to prescribed medications (100% patients received). Most patients (93%) reported no financial burden for mupirocin and 95% of patients reported no financial burden for CHG.

Conclusion. Patients reported high willingness to use the prevention bundle, yet mupirocin compliance was sub-optimal. Replacing patient-applied home mupirocin with nurse-applied day-of-surgery decolonization should be assessed in order to facilitate increased compliance.

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888. Improving outcomes with revised preoperative universal decolonization protocol

Silvia I. Gnass, CIC, FAPIC[1]; [1]MSc, Infection Prevention and Control Specialist, Riverside, California

Session: P-42. HAI: Surgical Site Infections

Background. In order to improve outcomes, including reduced surgical infection rate and costs, a revised universal preoperative decolonization protocol was implemented on a trial basis.

Methods. In a 12 month before and after study at a public teaching hospital in southern California, an alcohol based nasal antiseptic was introduced in place of nasal povidone iodine (PVI) for all surgical patients pre-operatively, paired with chlorhexidine (CHG) bathing which was already in place. All surgical procedures were included, the most common being cholecystectomy, cesarean section and hip fracture. The alcohol nasal antiseptic was selected to replace the PVI nasal antiseptic based on efficacy, staff preference and cost. At the same time, surgical team members began self-application of the alcohol nasal antiseptic each day prior to surgical procedures. This was not mandatory and compliance was not tracked, though informal feedback and observation revealed most surgical team members were applying the nasal antiseptic prior to cases daily.

Results. In comparison to the 6 month baseline period where there were 27 SSI in 1188 procedures, during the 6 month study period there were 10 SSI in 1253 procedures, representing a 63% reduction (p=.0162) for all types of procedures. We have observed a reduction of 17 SSIs in 2019, compared to the previous year, during the 6 months period. That means a saving of $589,420 during the same period.

Conclusion. Preoperative universal decolonization with alcohol based nasal antiseptic in place of nasal PVI, paired with CHG bathing, was effective in reducing SSI rate and associated costs. Further study is needed to measure and assess the impact of surgical team member nasal decolonization on patient infection risk and rate.

Disclosures. **All Authors**: No reported disclosures

889. Improving patient compliance with preoperative universal decolonization to reduce surgical infection rate and costs

Kimberly Candray, CIC[1]; [1]Northwest Healthcare, Tucson, Arizona

Session: P-42. HAI: Surgical Site Infections

Background. In order to address spine patient non-compliance with preoperative nasal decolonization, a trial was undertaken to replace nasal povidone iodine (PVI) with alcohol based nasal antiseptic paired with chlorhexidine (CHG) bathing for all spine fusion and laminectomy patients for a period of three months.

Methods. In addition to preoperative CHG bathing already in place, an alcohol based nasal antiseptic was applied to the nose of all spine surgery fusion and laminectomy patients within one hour of surgery instead of the PVI nasal antiseptic that had been in use previously.

Results. After switching the alcohol based nasal antiseptic, there was a reduction in surgical site infections (SSI) of 64% from 0.58 to 0.21/100 spine fusion procedures and a reduction in SSI of 100% from 0.46 to 0.00/100 laminectomy procedures. This represents an estimated cost avoidance of $127K associated with infections prevented. There was also a $37K cost savings resulting from switching from nasal PVI to alcohol based nasal antiseptic, with patients reporting greater satisfaction.

Conclusion. Universal preoperative decolonization for spine fusion and laminectomy patients using an alcohol based nasal antiseptic and CHG bathing resulted in reduced infection rates and associated costs, reduced nasal antiseptic cost and improved patient satisfaction.

Disclosures. **All Authors**: No reported disclosures

890. Incidence and Microbiology of Surgical Site Infection (SSI) after Breast Surgery

Farah Tanveer, MD[1]; Dima Youssef, MD[2]; Mamta Youssef, MD[1]; Susanna Szpunar, PhD[2]; Michelle Flood, MSN[2]; [1]Ascension St. John Hospital, Grosse Pointe Woods, Michigan; [2]Ascension St John Hospital, Grosse Pointe Woods, Michigan

Session: P-42. HAI: Surgical Site Infections

Background. Surgical site infection (SSI) after breast surgery is much more common than expected after a clean surgical procedure. Although breast SSIs are primarily Gram-positive; recent literature shows an increase in Gram-negative infections. We assessed the risk factors and microbiology of SSI following breast surgery at our institution.

Methods. We conducted a historical cohort study of all (³ 18 y) females who had surgery from 1/1/2014-3/31/2019 and subsequent SSI within 90 days of the procedure. Two controls, matched for surgery type, were selected per case. Data were collected on demographic and clinical characteristics, surgery type, microbiology and antibiotics. Data were analyzed using the χ^2 test, Student's t-test and multivariable logistic regression with a forward likelihood ratio algorithm.

Results. After excluding patients with limited data, we reviewed 284 charts: 95 of 132 cases and 189 controls. The 90-day incidence of SSI was 3.5 % (132/3755). Cases were younger than controls: 53.9 ± 12.4 years vs. 58.3± 13.7 years, respectively, p=0.02. Controls had more comorbidities: 1.8 ± 1.3 vs. 1.4 ± 0.7,respectively, p=0.001. Tissue expanders were placed in 65 (70%) cases versus 11 (5.8%) controls (p < 0.0001). After controlling for age, BMI, comorbidities and post-operative antibiotics, only tissue expanders were associated with infection (OR=35.1, p< 0.0001, 95% CI: 16.6, 74.0).

Microbiological data were available for 84 cases. Gram-positive organisms accounted for 45 (53.6%) infections and Gram-negative organisms accounted for 39 (46.4%) infections. Over 72% of African Americans (p= 0.014), 76.5% of patients with diabetes (p=0.005) and 57.1 % with tissue expanders (p= 0.02) had Gram-negative infections. The table shows the multivariable predictors of Gram-negative infection. Tissue expander removal was required in 61.5% of patients with Gram-negative infections compared to 39% with Gram-positive infections.

Predictors of Gram-negative SSI after breast surgery

Predictor	Odds Ratio	p-value	95% Confidence interval
Diabetes Mellitus	7.34	0.004	1.90, 28.3
Postoperative Antibiotics	5.35	0.001	1.93, 14.86

Conclusion. Patients with tissue expanders had a higher incidence of SSI after breast surgery; removal was often required in Gram-negative infections. Diabetes and post-operative antibiotics were significant predictors of Gram-negative infection. Knowledge of local epidemiology is a key factor in deciding empiric therapy for SSI.

Disclosures. **All Authors**: No reported disclosures

891. Is Post-discharge Surveillance of Surgical Patients Really Worth It? Results Observed in Three Years of a Multicenter Study

Rafaela Tonholli Pinho, n/a[1]; Luciana Coelho Tanure, n/a[1]; Joice Ribeiro Lopes, n/a[1]; Bárbara Caldeira Pires, n/a[1]; Flávio Henrique Batista de Souza, n/a[2]; Braulio Roberto Gonçalves Marinho Couto, n/a[2]; Carlos Ernesto Ferreira Starling, n/a[3]; Estevão Urbano. Silva, MD[4]; Thais MICHELI, n/a[4]; Míriam GUIMARAES, n/a[4]; Renato C. Couto, n/a[5]; Marina ARAÚJO, n/a[5]; Sheila FRANCISCO, n/a[5]; Neila EVANGELISTA, n/a[5]; Glauco Messias, n/a[5]; Leonardo Santos, n/a[6]; Jussara Pessoa, n/a[6]; [1]Centro Universitário de Belo Horizonte - UniBH, Belo Horizonte, Minas Gerais, Brazil; [2]Centro Universitário de Belo Horizonte, Belo Horizonte, Minas Gerais, Brazil; [3]Lifecenter Hospital, Belo Horizonte,