1237. Review of Implant Surgical Site Infections and Staphylococcus aureus Screening Compliance for 2018 at a Large Healthcare System
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Background. Surgical site infections (SSIs) following hip arthroplasty (THA), knee arthroplasty (TKA) and spinal fusions result in substantial morbidity, mortality and increased costs. We recommended preoperative Staphylococcus aureus (SA) screening and decolonization; however, there are numerous logistical challenges with implementing this process. We reviewed compliance with SA screening and decolonization practices and relation to THA, TKA, and fusion SSI performance.

Methods. Preoperative SA screening programs and associated data were reviewed for THA, TKA and fusion procedures between September and December 2018 across 9 hospitals in a large healthcare system. Compliance with preoperative SA screening was counted if SA nares culture or polymerase chain reaction (PCR) was completed at any point in the 28 days prior to surgery. This SA screening compliance was compared with year 2018 SSI rates per 100 procedures and National Healthcare Safety Network (NHSN) all SSI Standardized Infection Ratio (SIR). All 2018 SSIs were reviewed to determine whether infection was due to SA and for compliance with preoperative SA surveillance.

Results. Over all preoperative SA screening compliance for September through December 2018 was 49% (32%, 54% and 62% for THA, TKA and TKA respectively). Only 9% (25/285) of all SSI and 30% (7/23) of SA SSIs had preoperative SA screening completed. (Table 1). While overall preoperative SA screening compliance was poor, day of surgery SA screening with immediate decolonization using nasal iodine was 75% compared with 58% and 44% for those screened at preoperative medical visit or by surgeon order.

Conclusion. One-third of our implant surgeries were complicated by SSIs due to SA. Overall compliance with preoperative SA screening was poor however SSI rates trended down with higher preoperative SA screening compliance. Better optimization of preoperative SA screening programs or further data on impact of day of surgery screening and immediate decolonization are needed.

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1238. Alcohol-Based Nasal Antiseptic as Part of a Bundle to Reduce the Incidence of Contact Precautions and Surgical Site Infections
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Background. A 145-bed hospital embarked on a 12-month project to reduce contact precautions (CP) for colonized methicillin-resistant Staphylococcus aureus (MRSA) patients, and to reduce surgical site infections (SSI) for orthopedic patients. Prior to the project all high-risk patients were screened using nasal polymerase chain reaction (PCR) test for MRSA, and if positive, placed on CP. Orthopedic surgical patients were also screened for MRSA, and if positive, received preoperative chlorhexidine (CHG) bath and nasal mupirocin.

Methods. Starting in January 2017, all high-risk patients received twice-daily alcohol-based nasal antiseptic and a daily chlorhexidine (CHG) bath, in place of targeted screening and CP. In addition, an SSI prevention bundle was instituted, comprised of alcohol-based nasal antiseptic in place of mupirocin, retraining perioperative staff on skin preparation, and UV-C disinfection added to manual cleaning in the operating room. Preoperative CHG bathing was already in place and was continued. During this period, there was a total of 868 orthopedic surgery patients. Patients who remained in the hospital post-operatively received twice-daily nasal antiseptic and daily CHG bathing.

Results. There was a reduction in the incidence of CP from 16% to 10% per day, while maintaining a rate of zero MRSA bacteremia. Reduction of gloves, gowns and nasal PCR tests, resulted in an estimated total cost reduction of $200,000. Additionally, there was a statistically significant reduction in total hip SSI from a 2016 baseline of 1.15 infections per 100 procedures to 0.017 infections per 100 procedures (98% reduction, P = 0.014), and the rate of zero SSI in total knee replacement patients was maintained.

Conclusion. Universal decolonization in place of targeted screening and CP for colonized MRSA patients, reduced costs without increasing MRSA bacteremia. Replacement of mupirocin with a nasal alcohol-based antiseptic, as one component of an SSI prevention bundle, resulted in a marked reduction in SSI after total hip procedures.

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1239. Efficacy of Preoperative Chlorhexidine Gluconate and Mupirocin in the Prevention of Orthopedic Surgical Site Infections
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Background. Surgical site infections (SSIs) affect 1–5% of patients undergoing surgical procedures in the United States each year and have a mortality rate of up to 75%. We sought to assess the efficacy of a bundled preoperative decolonization treatment protocol to prevent SSIs in hip, knee, or spine procedures.

Methods. A retrospective chart review was conducted for 2224 adult patients undergoing spine, knee, or hip procedures performed at the JL Pettis Memorial VA Medical Center, from October 1, 2010 to December 31, 2018. NHSN/CDC criteria were utilized. The study included spine surgeries with or without new hardware, but only hip and knee surgeries with new hardware. Procedures with an infection present at the time of surgery (RATOS) were excluded. A pre-operative mecillinam-resistant Staphylococcus aureus (MRSA) nares screen was performed. Patients treated were given mupirocin (MPN) to apply to their nares and 4% chlorhexidine gluconate (CHG) to wash all skin prior to the procedure. Patients undergoing emergent procedures received CHG without MPN. The intention to treat model and chi-square test were utilized. The primary endpoint were the infection rates in both the untreated and treated groups. Secondary endpoints included the MRSA screening result, SSI class, causative organism(s), and the surgical site.

Results. A total of 2,112 procedures were included in the study. Thirty-three (1.56%) procedures met NHSN/CDC criteria for SSI. Of the 1,754 (83.0%) procedures given decolonization treatment with MPN and/or CHG, 22 (1.25%) developed an SSI. Of the 358 procedures not receiving treatment, 11 (3.07%) developed an SSI.

Conclusion. Patients given decolonization treatment had a lower infection rate compared with those who were not treated (1.25% vs. 3.07%, P = 0.0115). Even though the decrease in infection rates were most significant for hip procedures, the overall trend favored the use of a preoperative decolonization treatment protocol for all of the orthopedic procedures studied (Table 1). Current barriers include patient compliance and colonization use of decolonization agents, which may affect the actual efficacy of decolonization treatment. A possible confounder was the known increased risk of SSIs in emergent procedures.

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1240. Evaluation of Preoperative Staphylococcus aureus (SA) Decolonization with Nasal Iodine for Hips/Knees and Fusion Surgeries
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Background. Preoperative decolonization for patients with known nasal carriage of Staphylococcus aureus is recommended in some surgical site infection (SSI) guidelines, however, meaningful implementation is often challenging with poor compliance. We evaluated utilization of nasal iodine with S. aureus polymerase chain reaction (PCR) screening on the day of surgery as an alternative approach.

Methods. For all total hip replacements (THR), total knee replacements (TKR) and fusion patients in a 250-bed community hospital, we implemented day of surgery S. aureus PCR for all patients who had not been screened in the 2 weeks prior in August 2018. Those known to have S. aureus colonization in the 2 weeks prior to surgery as well as those who had no screen in the 2 weeks prior were treated with nasal iodine and received a chlorhexidine (CHG) bath in the preoperative

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area. Postoperatively any patient found to have (methicillin-resistant S. aureus) MRSA from preoperative screen or who had a history of MRSA in the past year were automatically decolonized with 5 days of intranasal mupirocin and CHG baths in addition. Compliance with S. aureus screening in preoperative area, results of screens and rates of THR, TKR and fusion SSI per National Health Safety Network (NHSN) definitions were monitored throughout the study period. SSI standardized infection ratios (SIR) during the study were compared with data 1 year prior to intervention date.

Results. Between August 2018 and January 2019, 694 THR, TKR and fusion surgeries were performed. Preoperative nursing compliance with completing the SA screen was 79.2% and percent compliance with administering/documented nasal iodine was 77.8%. Of those screened 21.7% (126/578) were found to have SA. Only 15% (n = 19) of SA positive PCRs were positive for MRSA. SSS decreased in intervention period compared with preintervention (August 2017–July 2018) as shown in Table 1.

Conclusion. Preoperative nasal iodine has been effective and helped reduce our infection SIR to below 1. These results could be confounded by the presence of other initiatives but looks promising and large-scale studies would be helpful to make these results generalizable.

Table 1: Rates of hip/knee and fusion infection pre and post intervention

|                | THR          | THR          | Fusion       | Total         |
|----------------|--------------|--------------|--------------|---------------|
| Post           | Pre          | Post         | Pre          | Post          | Post         |
| SSI Rate per 100 surgeries (%) | 1.36 (1/0.77) | 0.82 (1/1.16) | 1.53 (5/3.57) | 1.17 (1/1.71) | 1.61 (5/3.11) | 0 (0.158) | 1.45 (2/1.45) | 0.72 (6/0.94) |

Baseline

Intervention

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1241. Marked Improvement in Post-Operative Craniotomy Wound Care Using 2% Chlorhexidine (CHG) Cloths for Blood Clots Removal and Hair Cleaning in a Photo-Documentation Survey

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Background. Post-operative wound care can be an important strategy to prevent surgical site infection (SSI) following craniotomy. Insufficient wound care, blood clots, and oily hair near the incision can increase SSI risk.

Methods. We conducted a pre-post prospective cohort evaluation of a quality improvement intervention to address post-operative craniotomy wound care at an academic hospital. A post-op wound care protocol was jointly developed by neurosurgical wound care nurses, clinicians, and infection preventionists. The protocol began on postoperative day 1, and included use of soft ties to keep adjacent hair away from the incision, use of 2% CHG cloths to clean skin and hair within 2 inches of the incision as well as the proximal 6 inches of any surgical drain, and use of 2% CHG cloths to remove blood clots. Selection of 2% CHG cloths for blood clot removal was made following comparison to several concentrations of povidone. A twice-weekly photo-survey of all inpatients undergoing craniotomy was undertaken during the baseline period (October–December 2018) and intervention period (March–April 2019), with feedback to wound care nurses occurring during the intervention period only. The proportion of redness, extensive blood clots (≥50% incision), and oily hair near the incision were compared between the baseline period and the intervention period using Fisher’s exact tests.

Results. A total of 156 photo assessments were performed in 71 patients (101 assessments in 45 patients in the baseline period, and 55 photo assessments in 26 patients in the intervention period). Demographics, body mass index, emergent status, and prior craniotomy were similar across the baseline and intervention periods. The intervention was associated with significant reductions in redness (27.7% vs. 11%, P = 0.015), blood clots (33.7% vs. 10.9%, P = 0.002), and oily hair near the incision (76.7% vs. 28.6%, P = 0.001) (Figure 1).

Conclusion. The care of post-operative craniotomy wounds and adjacent hair was significantly improved through a standardized protocol to remove blood clots and ensure clean skin and hair adjacent to the incision during the post-operative inpatient stay. Photo documentation and feedback to wound care nurses helped ensure protocol adherence.

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1242. Evaluation of Risk Factors for Development of Total Hip Arthroplasty (THA) Surgical Site Infections (SSI)

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Background. THA is one of the most commonly performed surgeries for pathologic diseases of the hip. Multiple risk factors have been identified for SSI including: female gender, previous joint surgery, hemotoma, joint dislocation, intraarticular glucocorticoid injection, rheumatoid arthritis, uncontrolled diabetes, anemia, malnutrition, and an immunosuppressed state. The objective of our study is to evaluate obesity (body mass index (BMI) >30) as an independent risk factor for THA SSI and identify other risk factors for SSI.

Methods. A retrospective case–control (1:3) matched observation study was conducted from January 1, 2014–June 30, 2016. Patients with a THA SSI were identified using NHSN definitions and 3 controls were matched for sex and month of surgery for each SSI case. Patient information was extracted through chart review including BMI, revision surgery, chronic kidney disease (CKD), diabetes mellitus (DM), anemia, malnutrition, smoking, surgery duration, steroid use, pre-operative chlorhexidine (CHG) bathing and nasal povidone–iodine (PI) compliance. Multivariate analysis using a conditional logistic regression model was performed. The multivariate analysis identified five independent risk factors for SSI (see Table 1).

Results. Among 906 THA, 29 patients developed an SSI with 87 matched patients over the 2.5 years. The mean age in the SSI group was 61.0 years, and 37.9% were male. Mean age in the control group was 62.3, and 40.1% were male. In both groups, the most common indications for surgery were osteoarthritis followed by osteonecrosis and malalignment. Results of multivariate analysis identified five independent risk factors for SSI (see Table 1).

Conclusion. Obesity (BMI >30) was identified as an independent risk factor for THA SSI as well as CKD, steroid use and revision arthroplasty. While these risk factors are not easily modifiable, noncompliance with pre-operative CHG bathing and PI administration were also identified as significant SSI risk factors. These findings emphasize the importance of evaluating patients for SSI risk factors including obesity and improving compliance with all pre-operative SSI reduction measures.

Table 1: Odds ratios and 95% confidence intervals

| Risk Factor | Odds Ratio | 95% CI       | p-value |
|-------------|------------|--------------|---------|
| BMI >30     | 1.30       | 1.00 - 1.61  | 0.04    |
| CKD         | 3.94       | 2.01 - 7.82  | 0.001   |
| Steroid use | 19.8       | 2.32 - 168.7 | 0.006   |
| No CHG or PI| 0.22       | 0.07 - 0.72  | 0.01    |
| Revision    | 8.75       | 1.00 - 76.9  | 0.05    |

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1243. Continuous vs. Intermittent Intraoperative Infusion of Cefazolin on Surgical Site Infections (SSIs) and Acute Kidney Injury in Patients Undergoing Cardiac Procedures

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