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/documenting 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. SSIs 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 hips/Knees and fusion infection pre and post intervention

	TKR		THR		Fusion		Total	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
SSI Rate per 100 surgeries (# infections/surgeries performed)	1.36 (11/807)	0.82 (3/365)	1.53 (5/327)	1.17 (2/171)	1.61 (5/311)	0 (0/158)	1.45 (21/1445)	0.72 (5/694)
Standardized Infection Ratio	1.68	1.40	1.50	1.24	1.56	0	1.60	0.95
SSI Risk Ratio comparing post to pre (95% CI, p value)	0.60 (0.17-2.15, p=0.44)		0.76 (0.15-3.90, p=0.75)		0.18 (0.01-3.21, p=0.24)		0.50 (0.19-1.31, p=0.16)	

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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

Eunjung Lee, MD, PhD[1]; Mariya Kovryga Kornick, MD, MPH[2]; Lisa Wilhelm, RN, MSN[2]; Janice White, RN, MSN[2]; JeanMarie Bancher, RN, BSN, CNRN[2]; Shruti K. Gohil, MD, MPH[3]; Michelle Paff, MD[3]; Frank P. Hsu, MD, PhD[3]; Susan S. Huang, MD, MPH[3]; [1]Soonchunhyang University Seoul Hospital, Seoul, Seoul-t'ukpyolsi, Republic of Korea; [2]UCI Medical Center, Orange, California; [3]University of California, Irvine School of Medicine, Irvine, California

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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 inpatient post-operative craniotomy wounds 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 peroxide. 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)

Sisham Ingnam, MD[1]; Jennifer Flaherty, RN, MPH, CIC[2]; Mark Lustberg, MD, PhD[3]; Julie E. Mangino, MD[4]; Shandra R. Day, MD[2]; [1]Cheyenne Regional Medical Center, Cheyenne, Wyoming; [2]The Ohio State University Wexner Medical Center, Columbus, Ohio; [3]The Ohio State University College of Medicine, Columbus, Ohio; [4]The Ohio State University, Columbus, Ohio

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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, hematoma, 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.

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 63.1, and 40.1% were male. In both groups, the most common indications for surgery were osteoarthritis followed by osteonecrosis and malignancy. 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 factor. 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 Ratio	Confidence Interval	p-value
BMI	1.10	1.00 - 1.21	0.04
CKD	14.3	2.02 - 101.2	0.008
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 - 76.8	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

Michael Tichy, PharmD Candidate[1]; Jessica Seidelman, MD, MPH[2]; Sarah S. Lewis, MD[3]; Richard H. Drew, PharmD MS [3]; Richard H. Drew, PharmD MS [3]; Christina Sarubbi, PharmD[3]; [1]University of North Carolina at Chapel Hill, Chapel Hill, North Carolina; [2]Duke University, Durham, North Carolina; [3]Duke University Hospital, Durham, North Carolina

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Background. Continuous infusion cefazolin (CI) has been investigated as a means to optimize antibiotic exposure for prophylaxis against SSI, notably in patients undergoing cardiac procedures involving cardiac bypass (CPB). However, data are limited on its impact on late SSIs and adverse events. In 6/16, the Duke University Hospital (DUH) Antimicrobial Stewardship Team implemented a program to promote CI. We compared the incidence of culture-confirmed SSIs through postoperative day 90 (POD90) between patients receiving either intermittent infusion cefazolin (INT) or CI intraoperatively. We also compared the rate of acute kidney injury (AKI) between groups.

Methods. This retrospective quasi-experimental design included adult and pediatric patients undergoing cardiac surgery at DUH between March 2014 and August 2018 and receiving intraoperative cefazolin (alone or in combination with other antibiotics). Patients were categorized as CI (having received at least 1 intraoperative CI infusion) or INT. Culture-confirmed SSIs utilizing NHSN definitions were recorded and a relative risk (RR) determined. AKI was defined as a ≥0.3 mg/dL rise in serum creatinine within 2 days postoperatively.

Results. A total of 2,172 unique surgical procedures (from 2,143 unique patients) were included. Comparisons of groups are summarized in Table 1. Rates of SSIs were 1.1% and 1.6% in the CI and INT groups, respectively (RR [95% confidence interval] for CI 0.73, [0.35, 1.52]). AKI was reported in 12.9% and 17.4% of patients, respectively.

Conclusion. We were unable to detect a difference in late SSIs between intraoperative CI and INT cefazolin. Differences observed between AKI between groups requires further investigation, but likely impacted by confounders, including pre-existing renal dysfunction.

Table 1. Patient Demographics by Group

	Continuous Infusion (n=1,333)	Intermittent Infusion (n=839)
Male, n (%)	888 (66.6)	541 (64.5)
Age, median (IQ_{25}, IQ_{75})	65.4 (56, 72.1)	64.3(53.9, 71.4)
Charleson Score, median (IQ_{25}, IQ_{75})	5 (3,9)	7 (4,12)
Diabetes, n (%)	136 (10.2)	95 (11.3)
Wound Class D, n (%)	3 (0.2)	3 (0.4)
Baseline creatine ≥ 1.5mg/dL, n (%)	139 (10.5)	146 (17.6)
Intraoperative vancomycin use, n (%)	956 (71.2)	488 (58.2)

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1244. Evaluation of Intraoperative Topical Vancomycin and the Incidence of Acute Kidney Injury

Alison L. Blackman, PharmD[1]; Sabeen Ali, PharmD[1];
Xin Gao, MS, PharmD Candidate 2020[1];
Rosina Mesumbe, PharmD Candidate 2020[1];
Carly Cheng, PharmD Candidate 2020[1]; Hyunuk Seung, MS[1];
Mary Banoub, PharmD[2]; Kimberly C. Claeys, PharmD[1];
Emily Heil, PharmD, BCIDP[3]; [1]University of Maryland School of Pharmacy, Baltimore, Maryland; [2]University of Maryland Medical Center, Baltimore, Maryland; [3]University of Maryland School of Pharmacy; University of Maryland Medical Center, Baltimore, Maryland

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Background. The use of intraoperative topical vancomycin (VAN) is a strategy aimed to prevent surgical site infections (SSI). Although there is evidence to support its efficacy in SSI prevention following orthopedic spine surgeries, data describing its safety, specifically acute kidney injury (AKI) risk, is limited. The purpose of this study was to determine the AKI incidence associated with intraoperative topical VAN.

Methods. This is a retrospective cohort study reviewing patient encounters where intraoperative topical VAN was administered from February 2018 to July 2018. All adult patients (≥18 years) that received topical VAN in the form of powder, beads, rods, paste, cement spacers, or unspecified topical routes were included. Patient encounters were excluded for AKI or renal replacement therapy (RRT) at baseline, ≤ 2 serum creatinine values drawn after surgery, and/or if irrigation was the only topical formulation given. The primary outcome was the percentage of patients who developed AKI after intraoperative topical VAN administration. AKI was defined as an increase in serum creatinine (SCr) ≥50% from baseline, an increase in SCr >0.5 from baseline, or0 if RRT was initiated after topical VAN was given. Secondary outcomes included analysis of AKI risk factors and SSI incidence. AKI risk factors were analyzed using a multivariable logistic regression model.

Results. A total of 589 patient encounters met study criteria. VAN powder was the most common formulation (40.9%), followed by unspecified topical routes (30.7%) and beads (9.9%%). Nonspinal orthopedic surgeries were the most common procedure performed 46.7%. The incidence of AKI was 8.7%. In a multivariable logistic regression model, AKI was associated with concomitant systemic VAN (OR 3.39, [3.39–6.22]) and total topical VAN dose. Each doubling of the topical dose was associated with increased odds of developing AKI (OR = 1.42, [1.08–1.86]). The incidence of SSI was 5.3%.

Conclusion. AKI rates associated with intraoperative topical VAN are comparable to that of systemic VAN. Total topical vancomycin dose and concomitant systemic VAN was associated with an increased AKI risk. Additional analysis is warranted to compare these patients to a similar population that did not receive topical VAN.

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1245. Does Complexity of Infection Prevention Bundles Matter in Colorectal Surgery? A Systematic Review and Meta-Analysis

Aurora E. Pop-Vicas, MD, MPH[1]; Cybele Lara R. Abad, MD[2];
Fay Osman, MPH[1]; Kelsey Baubie, MS, MPH[1]; Nasia Safdar, MD, PhD[1]; [1]School of Medicine and Public Health, University of Wisconsin, Madison, Wisconsin; [2]University of the Philippines - Philippine General Hospital, Manila, National Capital Region, Philippines

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Background. Surgical site infection (SSI) prevention bundles in colorectal surgery are common. The optimal bundle composition and impact of increasingly complex and resource-intensive bundled interventions on SSI remain unclear.

Methods. (1) A systematic review and meta-analysis of randomized and observational trials with pre-post implementation data for colorectal SSI prevention bundles to study their effect on superficial, deep, and organ-space SSI. (2) A meta-regression to determine whether the bundle size (number of different bundle elements) affects SSI. (3) A correlation analysis to identify individual bundle elements with greatest SSI reduction. We used the METAN, METAEFF, and METAREG packages in STATA SE 15 for analysis.

Results. We included 38 studies in the systematic review, and 29 studies (49,589 patients) in the meta-analysis. Bundle composition was highly variable, ranging from 3 – 13 guideline-recommended elements per bundle. Meta-analyses showed bundles to be associated with relative risk reductions of 43% for any SSI (RR 0.57 [95% CI 0.48–0.67]; 44% for superficial SSI (RR 0.56 [95% CI 0.42–0.75]; 33% for deep SSI (RR 0.67 [95% CI 0.45–0.98], and 37% for organ/space SSI (RR 0.63 [95% CI 0.49 – 0.81]). On meta-regression, bundle size, especially ≥10 elements, was significantly associated with SSI reduction for any SSI ($P = 0.04$) and for superficial SSI ($P = 0.005$). Individual bundle elements correlated with strongest SSI reductions were mechanical bowel prep combined with oral antibiotics ($R = -0.68$, $P = 0.0028$) and pre-operative chlorhexidine showers ($R = -0.49$, $P = 0.04$) for organ/space SSI. Protocols including separate instrument trays and glove ± gown change prior to surgical wound closure ($R = -0.55$, $P = 0.009$), and standardized postoperative wound dressing change at 48 hours ($R = -30.59$, $P = 0.005$) correlated with highest superficial SSI reductions.

Conclusion. Complex colorectal bundles with ≥10 clinical guideline-recommended prevention elements are associated with higher reductions in any SSI and in superficial SSI. Further research should evaluate how complex SSI prevention colorectal bundles can be implemented and sustained with high fidelity in the clinical setting in a cost-effective manner.

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1246. Outcomes of Extended Spectrum β-Lactamases Producing Enterobacteriaceae Colonization among Patients Underwent Abdominal Surgery

Anucha Apisarnthanarak, MD[1]; Sumalee Condo[1];
Chatchai Mingmalairak, MD[2]; Prasit Mahawongkajit[1]; Jatupong Juntong[1];
Palin Limpavitayaporn, MD[1]; Ekkapak Sriussadaporn[1]; Assanee Tongyoo[1];
Linda Mundy, MD, PhD[3]; [1]Thammasat University Hospital, Pratumthani, Pathum Thani, Thailand; [2]Thammasat University Hosptial, Pathum Thani, Thailand; [3]Bryn Mawr, Pennsylvania, Pennsylvania

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Background. To evaluate the outcomes of surgical patients colonized with extended-spectrum β-lactamases (ESBL) producing enterobacteriaceae (EN).

Methods. A prospective cohort study was performed from February 1, 2016 to April 1, 2019. All patients who underwent abdominal surgical procedures were enrolled. Enrolled surgical patients were screened for ESBL EN colonization by rectal swab culture 1 day before and 5 days after surgery. Data collection included clinical characteristics, risk of SSIs, previous hospitalization, and type of surgical procedure, antibiotic prophylaxis and duration, ASA risk class, and 28-day postoperative outcomes, inclusive of SSIs and associated microbiological data.

Results. Among 360 prospectively enrolled patients, 204 (56%) were male; the abdominal surgical types included 234 (65%) clean-contaminated, 90 (25%) contaminated, and 36 (10%) dirty cases. Pre-op,129 patients (36%) had ESBL EN colonization. Surgical prophylaxis included second-generation cephalosporins ($N = 224$, 62%), third-generation cephalosporins ($N = 92$, 25%), and carbapenems ($N = 44$, 12%). Post-operative SSIs were identified in 51 patients (14.1%) [superficial SSIs ($N = 41$) and intra-abdominal SSIs ($N = 10$)] By multivariate analysis, ESBL EN colonization (aOR = 2.4; 95% CI = 1.19–19.91) and dirty abdominal wound classification (aOR = 3.6; 95% CI = 1.94–16.99) were independent risk factors for SSIs. Culture detection of SSI pathogens differed for superficial vs. intra-abdominal SSIs. Pathogens associated with superficial SSIs included *Staphylococcus aureus* (10/41;24%), *Streptococcus* spp. (5/41; 12%), *Pseudomonas aeruginosa* (6/41; 15%) and non-ESBL EN (16/41;39%). In contrast, all 10 cases of intra-abdominal SSIs were attributed to ESBL EN.

Conclusion. Enteric colonization with ESBL EN was an independent predictor of intra-abdominal SSIs due to ESBL EN, while superficial SSIs were associated with a variety of non-ESBL pathogens. Our study support the need for awareness of the SSI risks associated with ESBL EN. Additionally, the findings support current surgical prophylactic guideline for the use of non-carbapenem among ESBL EN colonizer undergoing abdominal surgery.

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