Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: SSI
Immediate Use Steam Sterilization and the Effect on Surgical Site Infections in an Acute Care Facility
Casey Lewis, UPMC; Victoria Crall, UPMC; Graham Snyder, UPMC, University of Pittsburgh; Ashley Ayres, UPMC; Avisha Risnear, UPMC Presbyterian; Jason Miller, UPMC Presbyterian and Joanne Sherer, UPMC Presbyterian

Background: Immediate use steam sterilization (IUSS) shortens the time from sterilization to the aseptic transfer onto the surgical sterile field. Published data incompletely defines the extent to which IUSS increases risk of surgical site infection (SSI), compared to standard sterile reprocessing methods. We aimed to measure the association between IUSS use for surgical instrument reprocessing and SSI risk in a facility where IUSS use increased due to staffing constraints and case volumes. **Methods:** In this retrospective observational study at a tertiary care hospital with a diverse mix of surgery types, we used sterile reprocessing logs and SSI outcomes defined using National Health and Safety Network definitions to compare SSI rates among surgeries using surgical devices sterilized using IUSS compared to standard terminal sterilization methods. We calculated a risk ratio (RR) and 95% confidence interval (95%CI), including stratification by eleven high-volume service lines. **Results:** Among 23,919 surgical procedures, 416 (1.74%) developed SSIs. IUSS was used to sterilize instruments prior to 1,524 (6.37%) surgical procedures, and of these procedures 39 (2.56%) developed an SSI, compared to 1.68% of non-IUSS procedures (377 SSI in 22,395 procedures; risk ratio [RR] 1.52, 95% confidence interval [95%CI] 1.10-2.11). Two surgical services had statistically significant RRs for SSI development after IUSS: transplant surgery (RR 2.47, 95%CI 1.32-4.60] and plastic surgery (RR 3.64, 95%CI 1.13-11.74; Figure). **Conclusion:** IUSS is associated with a significant increase in SSIs, including among varied surgery types. IUSS utilization should be minimized.

Antimicrobial Stewardship & Healthcare Epidemiology 2024;4(Suppl. S1):s143
doi:10.1017/ash.2024.316

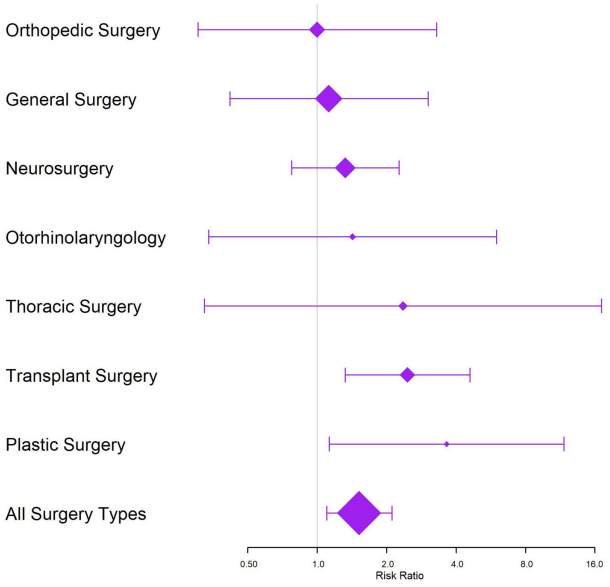

Figure: Odds of NHSN-defined surgical site infection among procedures with and without preceding immediate use steam sterilization of surgical devices, by surgery type.

Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: SSI
Microbiologic Evaluation of Colorectal Surgical Site Infections to Guide Surgical Prophylaxis Recommendations
Ardath Plauche, Memorial Hermann Health System; Clare Gentry, UT Health Science Center at Houston and Linda Yancey, Memorial Hermann Health System

Background: Use of a combination of parenteral and oral antimicrobial prophylaxis prior to colorectal surgery is recommended to reduce risk of surgical site infection (SSI). Parenteral antibiotic selection is complicated by the need to target organisms likely to cause infection at the surgery site, while mitigating risk of antimicrobial resistance caused by overuse of broad spectrum agents. This study aimed to evaluate microbiologic data from colorectal surgical site infections across an 11-hospital health system. Microbiologic data from SSI events were used to assess continued appropriateness of health system standard recommendations for parenteral antibiotic prophylaxis in colorectal surgery, consisting of either cefazolin with metronidazole or cefoxitin monotherapy. **Methods:** This multicenter, retrospective, observational study was conducted from January 1, 2019 to March 31, 2023, using data extracted from the National Healthcare Safety Network (NHSN). Microbiologic data from colorectal SSIs from 2019 to 2022 were evaluated for a descriptive review of pathogen and phenotype trends. SSI data excluded patients age < 18 years, those identified as infection present at time of surgery (PATOS), or outpatient procedures. **Results:** A total of 8059 colorectal procedures were evaluated. Most SSIs were polymicrobial, with at least one pathogen detected in 65% of cases. The most commonly identified organisms were E. coli (22.5%), Enterococcus spp. (19.7%), P. aeruginosa (6.5%), Streptococcus spp. (4.9%), and C. albicans (4.7%). Change over time in antimicrobial-resistant phenotypes from 2019 to 2022 was not statistically significant for extended-spectrum cephalosporin-resistant E. coli (p=0.335), extended-spectrum cephalosporin-resistant K. oxytoca/pneumoniae (p=0.189), multi-drug resistant P. aeruginosa (0.058), methicillin-resistant S. aureus (p=0.906), or among isolates with no identified antimicrobial-resistance phenotype (p=0.096). Among E. coli, change from 2019 to 2022 in cefazolin non-susceptible, ceftriaxone susceptible isolates was not statistically significant (p=0.177). No carbapenem-resistant Enterobacterales isolates were identified among non-PATOS cases. **Conclusions:** Data does not support a change to broader spectrum agents for colorectal surgery parenteral antimicrobial prophylaxis. Continued use of cefazolin with metronidazole or cefoxitin as IV antibiotic prophylaxis in colorectal surgery is recommended, with ongoing tracking of microbiologic trends and antimicrobial susceptibility.

Antimicrobial Stewardship & Healthcare Epidemiology 2024;4(Suppl. S1):s143
doi:10.1017/ash.2024.317

Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: SSI
Bundle Implementation to Prevent Surgical Site Infections - A Study of SRN Hospitals
Aurora Pop-Vicas, University of Wisconsin School of Medcine and Public Health; Michelle Zimbric, Infecitous Disease, Department of Medicine, School of Medicine and Public Health; Michelle Schmitz, UW Health - University Hospital; Gabrielle Hatas, University of Wisconsin Hospital and Clinics and Nasia Safdar, University of Wisconsin Hospital and Clinics

Background: Guidelines recommend bundles with multiple infection control elements to prevent surgical site infections (SSI). Although effective in multiple research studies, little is known about the implementation of such

Table 1. Implementation barriers to SSI Prevention Bundle reported by hospitals within SHEA Research Network*

Implementation barrier	Successfully mitigated	Persistent
Clinicians' low adherence to all bundle elements	41	35
Clinicians' lack of knowledge about bundle elements	35	24
Clinicians' skepticism regarding bundle effectiveness	31	31
Inadequate audit and feedback regarding bundle adherence	35	30
Patients' low adherence to bundle elements within their control	22	24
Patients' lack of knowledge about bundle elements within their control	19	12
Supplies and equipment needed not easily available	22	6
Clinical supervision insufficient to ensure bundle compliance	12	18
Inadequate executive leadership support for SSI prevention	22	16
Institutional culture generally resistant to change	20	37

*Numbers reported as percent of total N = 49 hospitals participating in the survey

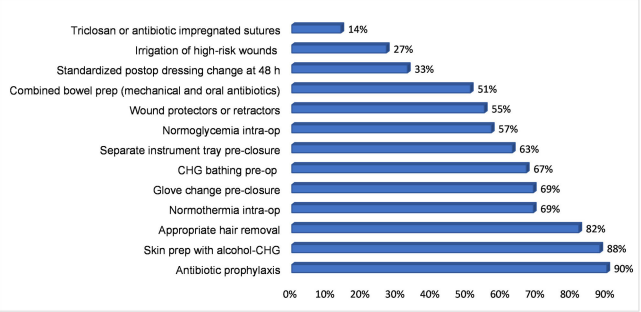

Figure 1. SSI Prevention Bundle Elements Implemented by Hospitals in SHEA Research Network

complex bundles in the real-world clinical setting. **Methods:** A survey was distributed to the SHEA Research Network (SRN) hospitals during November 2022 – December 2023, to assess processes related to the implementation of SSI prevention bundles in colorectal surgery. **Results:** Of the 93 US and international hospitals within SRN, 49 completed the survey (53% response rate). The mean volume of colorectal surgeries per year was 377 (median 400). Figure 1 shows the individual elements of SSI prevention bundle reported as consistently used in most surgeries. There were no significant differences between hospitals with high vs. low volume (cut-off 400 surgeries), except for wound protectors or retractors, more likely to be used in high-volume hospitals (P = 0.047). A formal process for auditing adherence was reported by 71% of respondents for antibiotic prophylaxis, and 51% for skin prep, with the remaining elements audited < 50% of the time. Feedback of audited adherence to surgeons occurred < 50% of the time for all bundle elements, except antibiotic prophylaxis (59%). Table 1 shows the most common barriers reported as either successfully mitigated or still persistent at the time of the survey. High-volume hospitals were more likely to report persistent clinicians' low bundle adherence (P = 0.016) and inadequate bundle adherence audit and feedback (P = 0.0016). **Conclusion:** Implementation of guideline-recommended colorectal SSI Prevention bundles remains highly variable. Further research aiming to develop strategies that optimize implementation and adherence is needed.

Antimicrobial Stewardship & Healthcare Epidemiology 2024;4(Suppl. S1):s143–s144
doi:10.1017/ash.2024.318

Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: SSI

Concordance with Preoperative Intravenous Antibiotics Guidelines and Risk of Surgical Site Infection (SSI)

Anupama Neelakanta, Carolinas HealthCare System; Lisa Davidson, Atrium Health; Kristin Fischer, Atrium Health; Shelley Kester, Atrium Health; Jennifer Onsrud, Atrium Health and Katie Passaretti, Atrium Health

Background: Administration of antimicrobial prophylaxis close to incision time is recommended as an essential practice to prevent surgical site infections (SSI). Despite guideline recommendations, adherence to preoperative intravenous antibiotic guidelines is variable. We aim to assess perioperative factors associated with guideline concordant (GC), guideline second line (GSL) and non-guideline concordant (NGC) antibiotic choice and timing and impact on odds of SSI. **Methods:** 3173 patients at 9 hospitals with National Health Safety Network (NHSN) procedure codes for colon surgery and abdominal hysterectomy between January 1, 2023, and

Table 1: Clinical Characteristics of Patients with Colon Surgery and Abdominal Hysterectomy Between January 1, 2023, and October 31, 2023

	Total Patients (n=3173)
Procedure	
Colon	877 (28%)
Hysterectomy	2296 (72%)
Patient Classification	
Emergency	24 (1%)
Inpatient	269 (8%)
Surgery Admit	743 (23%)
Surgery Outpatient	2137 (67%)
History of MRSA in Past Year	43 (1%)
Beta Lactam Allergy	589 (19%)
Antibiotic Choice	
GC	2982 (94%)
GSL	98 (3%)
NGC	93 (3%)
Antibiotic timing	
GC	2995 (94%)
NGC	178 (6%)
GC Combined Choice and Timing	2910 (92%)

Table 2: Characteristics of Colon and Abdominal Hysterectomy Patients with Guideline Concordant (GC), Guideline Second Line (GSL) and Non-Guideline Concordant (NGC) Antibiotic Choice

	NGC (n=93)	GSL (n=98)	GC (n=2982)	P value
Surgery				<0.001
Colon	51 (55%)	87 (89%)	739 (25%)	
Abdominal Hysterectomy	42 (45%)	11 (11%)	2243 (75%)	
Patient Classification				<0.001
Emergency	3 (3%)	5 (5%)	16 (1%)	
Inpatient	18 (19%)	72 (74%)	179 (6%)	
Surgery Admit	34 (37%)	14 (14%)	695 (23%)	
Surgery Outpatient	41 (41%)	7 (7%)	2092 (70%)	
Urgent/Emergent Case	21 (23%)	79 (81%)	196 (7%)	<0.001
Beta Lactam Allergy	53 (57%)	14 (14%)	522 (18%)	<0.001
MRSA History in Past Year	7 (8%)	3 (3%)	33 (1%)	<0.001
GC Antibiotic Timing	34 (37%)	50 (51%)	2911 (98%)	<0.001
SSI	2 (2%)	11 (11%)	65 (2%)	<0.001

Table 3: Risk of Surgical Site Infection

	Unadjusted OR SSI	95% CI	P value
Facility			0.8
Procedure			
Colon surgery	Reference	n/a	n/a
Hysterectomy	0.3	0.2-0.5	<0.001
Patient Class			< 0.001
Emergency	Reference	n/a	
Inpatient	0.6	0.2-2.2	
Surgery Admit	0.2	0.1-0.8	
Surgery Outpatient	0.1	0-0.4	
Urgent/Emergent	4.6	2.8-7.6	<0.001
Admission to ICU, Transfer from another facility and/or history of MRSA > 1 year prior	2.0	0.8-5.0	0.2
MRSA in past year	8.4	3.6-19.5	<0.001
Beta Lactam Allergy	10.5	0.6-1.9	0.9
Antibiotic choice			<0.001
GC	Reference		
GSL	5.7	2.9-11.1	
NGC	1.0	0.2-4.1	
GC Antibiotic Timing	0.5	0.2-1.1	0.08
Combined GC Antibiotic Choice and Timing	0.4	0.2-0.7	<0.001