Relationship between MRSA HAC and HCAHPS question

Response to HCAHPS Question 8: "During this hospital stay, how often were your room and bathroom kept clean?"	n	Mean	SD	Skewness Statistic	Spearman rho correlation	p-value
Always	1725	67.47	6.19	-0.316	-0.141	<0.001*
Usually	1725	20.66	2.88	-0.037	0.066	0.006*
Never	1725	11.87	4.18	0.830	0.175	<0.001*

*p <0.05

Relationship between CDI HAC and HCAHPS question

Response to HCAHPS Question 8: "During this hospital stay, how often were your room and bathroom kept clean?"	n	Mean	SD	Skewness Statistic	Spearman rho correlation	p-value
Always	2707	69.05	6.72	-0.203	-0.023	0.237
Usually	2707	19.85	3.38	-0.203	0.061	0.001*
Never	2707	11.11	4.39	.803	-0.012	0.527

*p <0.05

HAC score. However, this research was done prior to the COVID-19 pandemic. This study looked to examine if the pandemic changed the relationship between patient perception of cleanliness and HAC score performance. **Method:** A retrospective correlational study was performed to examine if the relationship between patient perception of cleanliness and the incidence of Clostridioides difficile (CDI) and Methicillin-Resistant Staphylococcus aureus (MRSA) HAIs, as defined by the facility's HAC score, were affected by the COVID-19 pandemic. Multiple Center for Medicare and Medicaid Services (CMS) datasets were utilized for the study. There were approximately 2700 acute care facilities that reported data on the HCAHPS perception of cleanliness question and either a MRSA or CDI HAC score for the period of January 1, 2021, to December 31st, 2021. Basic descriptive statistics and Spearman's rho correlation analyses were performed to examine the potential associations between the two scores. **Result:** For MRSA, the study found that as the percentage of patients who reported that their room was "always" clean increased, the hospital's HAC score decreased (r= -0.141, p = < 0.001). Additionally, as the percentage of patients who reported their room was "never" clean increased, the hospital's HAC score increased (r= 0.175, p = <0.001) For C. difficile, the analysis also revealed that as the percentage of patients who reported their room was "always" clean increased, there was not a significant change in the hospital's HAC score (r= -0.023, p = 0.237). There was also not a significant change in the HAC score when the percentage of patients who reported their room as "never" clean increased (r= -0.012, p = 0.527).
Conclusion: The study found that for MRSA, a hospital's performance on the HCAHPS performance on patient perception of cleanliness is related to their performance on their HAC score. This did not hold true when looking at C. difficile infections, which is in contrast to the prior evidence. Further research is needed to determine if there are specific factors that may have influenced this change.
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Reducing Blood Culture Contamination in Adult Patients with Cancer Presenting to the Emergency Department

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Background: Infection is one of the most common complications of cancer and cancer treatment. Most patients admitted for fever or infection come through the Emergency Department (ED), which is a primary site for blood culture collection. Contamination of blood cultures complicates the diagnoses, compromises quality of care, leads to unnecessary antibiotic exposure and increases financial burdens. It may also lead to unnecessary removal of central venous access devices or delay of critical therapy or procedures. At our institution, the contamination rate of blood cultures drawn in the ED was over twice that of the remainder of the hospital (2.8 versus 0.8), prompting this quality improvement project. Unlike on hospital floors, nurses, instead of phlebotomists, draw most blood cultures due to the urgency of managing suspected sepsis. Our aim was to decrease the ED contamination rate by 20 percent after the first PDSA cycle, and ultimately bring it on par with the remainder of the hospital. **Methods:** First, we compared ED contamination rates versus other hospital inpatient floors and outpatient centers over a three-month period. We then evaluated the contamination rates of ED nurses versus ED phlebotomists and peripheral versus central line blood draws. Process mapping and fishbone analysis helped identify practices contributing to higher contamination rates. Key drivers of these practices were diagrammed, and potential interventions were ranked on a prioritization matrix. **Results:** We identified use of alcohol rather than chlorhexidine swabs for peripheral disinfection and inconsistent techniques of blood draw by nurses as critical contributors to increased contamination rates in the ED. Our intervention was creating premade blood culture kits promoting the use of chlorhexidine swabs through availability and easy access in the fast-paced ED environment. Ten cubic centimeter (cc) syringes in the kits encouraged withdrawal of adequate blood samples in compliance with the 7-10 cc guideline. Designated nursing team leaders checked off ED nurses at the bedside, implementing education and adherence in using the blood culture collection kits. The average number of blood cultures in the emergency department was 1,400. A reduction in blood culture contamination from 2.46 percent to 1.89 percent was seen after two months. **Conclusions:** A guideline-driven, standardized blood culture collection process followed by ED nurses is vital to reducing blood culture contamination. Chlorhexidine is necessary to maintain the lowest contamination rates. Readily available premade blood culture kits improve compliance with materials and techniques associated with best practices.

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Case-Control Study Design to Identify Attributable Risk Factors for Rare Yet Trending Healthcare-Associated Infections

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Introduction: There are a number of tools available to healthcare epidemiologists for identification and investigation of healthcare-associated infections. For example, root cause analysis (RCA) is an evidence-based strategy for identifying process failures that resulted in infection. However, RCA is most valuable on a case-by-case basis. It is not an efficient tool for investigating numerous events that trend over time. Healthcare epidemiologists must use different strategies that are both efficient and powerful. A case-control study is a valuable option to investigate rare but recurrent infection events. The objective of this study was to demonstrate the utility of a case-control study design to detect attributable risk factors of cesarean section surgical site infections (SSI). **Methods:** We conducted a case-control study at a Level III childbirth center with data timeframe of January 1, 2021 to May 31, 2023. The project was approved by the institutions' Quality Improvement Review Board prior to implementation. Cases were identified using the National Healthcare Safety Network (NHSN) SSI event criteria and included all levels of SSI. Controls were selected from the NHSN surgical denominator and were matched randomly without replacement by age at a 1:4 ratio. Variables were identified in collaboration with stakeholders based on known risk factors for SSI and abstracted manually. Analyses

were conducted in Stata/MP version 17.0, and we performed multivariable conditional logistic regression with an alpha of 0.05 as threshold for statistical significance. The model was built according to a priori hypotheses and results from bivariate analysis of individual risk factors. **Results:** There were 32 SSI among 1709 cesarean deliveries, and all cases successfully matched with 4 controls for an analytic sample of 128. Bivariate analyses identified 7 relevant variables for inclusion in the multivariable model which narrowed down significant risk factors to 3: operative time (in minutes), post-operative chlorhexidine gluconate (CHG) bathing, and number of people in the operating room. Assessment of fit indices suggested an excellent fit with pseudo R-square of 0.526. **Conclusions:** This study demonstrated the utility of a case-control study design to identify attributable risk factors for relatively rare but significantly trending infection events. Not only is the design more efficient (e.g., time needed to abstract 50 data points for each patient), but it also employs statistical analyses that are often lacking in case-by-case investigations or RCA. It also has the power to narrow down risk factors for focused prevention efforts to get "the most bang for the buck."

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Automated Discontinuation of Isolation Precautions with the Use of Electronic Health Record Tools

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Background: At a comprehensive cancer center, hundreds of patients are screened daily for infections requiring the implementation of isolation precautions. Discontinuation of precautions is determined by negative testing, resolution of infection, or other criteria. Determining appropriate discontinuation of isolation precautions is labor intensive for Infection Preventionists (IPs). An unintended consequence of manual discontinuation is that numerous patients remain on isolation indefinitely. This was amplified during the COVID-19 pandemic when thousands of patients were placed on isolation precautions. Using electronic health record (EHR) tools, opportunities for process improvements were developed. Our goal was to establish an automated method to resolve isolation precautions. We aimed to decrease the number of manually resolved precautions by 25% each fiscal year (FY), compared to our baseline of activity in FY 2019 (FY19). Our secondary aim was to automate adding and resolving precautions when testing is initiated for suspected transmissible conditions (rule-out testing features).

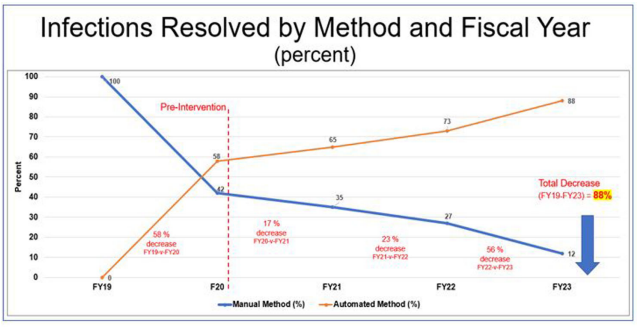

Figure 1

Line graph comparing rates of manual removal (blue line) versus automated EHR removal (orange line) of isolation restrictions over a five-year study period. Following the implementation of automated tools in FY20, there was a significant reduction in the time dedicated by IPs to removing isolation banners with 88% of all isolation statuses being removed automatically by EHR tools.

Methods: Infection Control (IC) collaborated with EHR analysts to build tools to automate a process for appropriate isolation discontinuation. We reviewed our internal data in conjunction with evidence-based guidelines and started with acute, short-term infections that do not require repeat testing or cultures. Expiration dates were established for these infections to resolve automatically after meeting criteria. A secondary review determined that additional infections could be added safely to this process. The secondary aim of establishing rule-out testing was implemented for respiratory viral panels (including SARS-COV-2) and C. difficile testing. When testing was ordered for these conditions, a suspect-infection status and alert for precautions were automatically added to patients' EHR banners. If the assay resulted negative, the suspect-infection status was automatically removed from their chart. **Results:** Our baseline of active infections in FY19 was approximately 2,700 cases. From FY19 through FY23, 123,115 infections were added to our patients, and 128,422 infections were resolved. In the first year of implementation, there was a 58% decrease in the number of manually resolved cases. From the initiation of our project through the end of FY23, manual discontinuation of precautions has decreased by 88%. **Conclusions:** We successfully implemented a process improvement project to appropriately remove patients from isolation precautions automatically using EHR tools, which resulted in reduced labor on our IPs and patient time spent on isolation restrictions. Additional benefits from this process improvement extend to decreasing unnecessary costs to the patient and the organization, better stewardship of supply/resources, and improving patient satisfaction.

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Utilizing Technology to Fill the Ambulatory Care Communicable Disease Practice Gap

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Background: Infection Prevention (IP) practices in ambulatory care are often reactive and many communicable diseases in the community often do not fall onto IP's radar until the patient becomes ill enough to seek inpatient services. The gap between ambulatory and inpatient care can lead to increased transmission and illness severity. Early identification has substantial impacts on timely implementation of IP mitigation strategies, appropriate handoff upon entry into other care settings, and timely reporting to public health organizations. Current IP processes underutilize electronic health record (EHR) capabilities by relying upon lab driven notifications. This project sought to redesign the IP's workflows, advancing the health system beyond the acute care setting and into the ambulatory care setting by adding the power of diagnosis codes to close a practice gap. **Method:** Infection Prevention and Information Technology collaborated to build silent best practice advisories (BPAs) in the EHR that utilized

Build Summary with Summary of Results		
	Pre Intervention	Post Intervention
Lab Orderables	Varicella PCR, Varicella IgM	Varicella PCR, Varicella IgM
Diagnosis Codes Utilized	None	B01, B01.0, B01.1, B01.11, B01.12, B01.2, B01.8, B01.81, B01.89, B01.9
Varicella zoster Cases Captured	3% 36 with Varicella diagnosis 1 case captured by physician call	80% 40 with Varicella diagnosis 32 captured by BPA
HCW Exposure Work Ups Completed	4% 28 cases eligible for exposure 1 case reported for exposure	70% 30 cases eligible for exposure 21 cases reported for exposure
Post BPA Logic Correction: Varicella zoster Cases Captured	N/A	100% 24 with Varicella diagnosis 24 captured by BPA
Post BPA Logic Correction: HCW Exposure Work Ups Completed	N/A	100% 16 cases eligible for exposure 16 cases reported for exposure