Surgical Site Infection Reduction, Beyond the Standard Bundle

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Introduction

Fairview Ridges Hospital experienced an increase in surgical site infections (SSIs) in 2025 with the Standardized Infection Ratio (SIR) exceeding 1.5 for inpatient procedures and 2 for outpatient procedures. Increases were specifically noted in hysterectomy and orthopedic procedures. Throughout 2025 compliance with the Fairview surgical site infection reduction bundle remained high. Bundle elements include preoperative shower with Chlorhexidine, appropriate hair removal, preoperative site preparation of the planned surgical area, nasal decolonization, glucose control, OR skin preparation, antibiotic prophylaxis, and maintaining normothermia.

Methods

- A workgroup consisting of Operating Room (OR) leadership, Pre- and Post-Operative Care leadership, Practice and Education (P&E) Professional Practice Nurses, and Infection Prevention (IP) was formed to review high SSI rates and opportunities for SSI reduction.
- During audits conducted by P&E and IP along with workgroup SSI reviews areas of risk such as excess dust in ORs, inappropriate antibiotic timing, inadequate hand hygiene within the OR space, insufficient skin preparation, and frequent OR door openings were identified.
- Vendor representatives provided observations and feedback for skin preparation and OR turnover.
- Ridges created additive, not alternative, actions for SSI reduction outside of the standard bundle based on audits, vendor observations, and SSI reviews.
- Ridges ORs implemented additional hand hygiene audits, site preparation and skin antisepsis education, a core supply cart cleaning schedule, OR cleaning and room turnover education, limiting OR traffic, and additional pre-op antibiotic education.

Results

- Improvements were seen in 2026 in all additive actions for SSI reduction.
- Hand Hygiene audits increased in both volume of audits and compliance. Only 19 audits were performed in January 2026 with 85% compliance compared to 65 audits in June 2026 with 99% compliance within the OR.
- Site preparation and skin antisepsis is a competency for OR staff in 2026 with audits noting improved compliance.
- Core supply cart cleaning on a monthly schedule with monthly validation.
- OR cleaning and room turnover added to OR staff competency.
- The correct antibiotic is given YTD with 90% compliance prior to surgery.
- 3 month OR door opening trial with one orthopedic surgeon demonstrated a drop in total door openings from high twenties to an average of 5 openings per case. Limiting door openings moved from a successful trial to all orthopedic rooms in July 2026.

	SSI Count	SIR
Inpatient 2025	18	1.66
Inpatient 2026 (YTD)	10	1.5
Outpatient 2025	9	2.45
Outpatient 2026 (YTD)	0	0

Conclusion

- Creating additive actions for SSI reduction along with the standard SSI reduction bundle has demonstrated an effective tool for SSI reduction.
- No outpatient SSIs have been reported in 2026.
- Inpatient SIR remains above 1, indicating additional opportunities for SSI reduction.
- OR audits continue to assess for compliance with additive actions and identify opportunities for SSI reduction.

Acknowledgements

We want to thank all Ridges OR and Pre- and Post-Operative staff for their dedication to surgical site infection prevention to successfully reduce SSIs.

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Fairview

Increasing Use of Alternatives to Indwelling Urethral Catheters in the Emergency Department

Tami Dahlquist, MS CIC, Jane Hinderscheid, RN BSN CIC

ABSTRACT

Catheter Associated Urinary Tract Infections (CAUTIs) are a significant patient safety concern. In 2024, 15% of UMMC CAUTIs occurred in patients whose Indwelling urethral catheter(IUC) was placed in the ED. A gap analysis conducted in the UMMC East Bank ED identified limited use of alternatives to IUCs.

A multidisciplinary team implemented a quality initiative to increase use of alternatives to indwelling urethral catheterization. Interventions included supply inventory and optimization, roving cart education, audits with feedback and provider engagement. Outcome measures included the straight catheterization-to-IUC ratio and external device-to-IUC ratio monitored from January 1 through September 30, 2025.

Following implementation, straight catheterization-to-IUC ratio increased from 0.64 to 1.14 representing a 78% improvement. The external device-to-IUC ratio increased from 0.9 to 1.17, representing a 33% improvement.

A coordinated approach incorporating education, supply availability, audit and feedback, and provider engagement increased the use of alternatives to IUC in the ED. These findings support urinary device stewardship and reduce unnecessary IUC use.

CONTACT

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OBJECTIVE

- Increase availability and understanding of alternative devices in an Emergency Department.
- Increase the ratio of straight catheters – to IUCs by 50%
- Increase the ratio of external devices to IUC by 30%

METHODS

- Gap analysis conducted by Infection Prevention and an ED Provider on 2/4/2025.
- Multidisciplinary team composed of ED front line staff, manager, director, supply chain inventory specialist, providers, advanced practice nurse educators and infection prevention.
- Created an A3 project Implementation plan to address actionable gaps.
- Pre-intervention (2024) and post intervention data analysis(January 1- September 30, 2025).

Figure 1. Gap Analysis

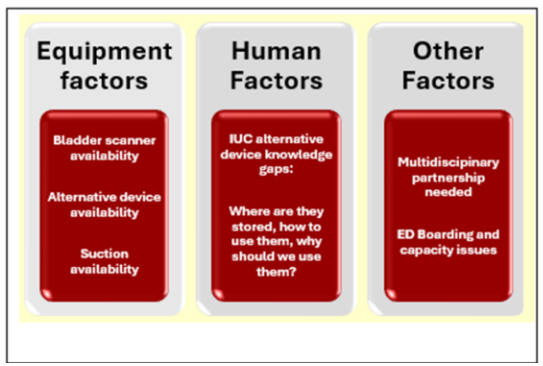


Figure 2. Strategies to Address gaps

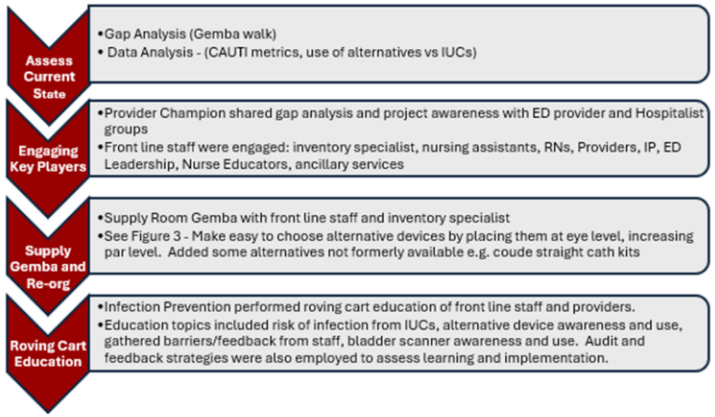


Figure 3. Supply Optimization: Before(left) and After (right)



Figure 4. Analysis of Interventions

	Pre-intervention	Post-Intervention	% Change
Ratio of straight catheterization-to-IUC	0.64	1.14	78% improvement
Ratio of external device-to-IUC	0.90	1.17	33% improvement

SUMMARY

Following implementation of a gap analysis (Figure 1), and strategies to address gaps (Figure 2 and 3), straight catheterization –to-IUC ratio increased from 0.64 to 1.14, representing a 78% improvement(Figure 4). The external device-to-IUC ratio increased from 0.9 to 1.17, representing a 33% improvement. A multidisciplinary multi-faceted approach – including education, improved product availability, audit and feedback, and provider engagement – resulted in increased use of alternatives to IUCs in the ED.

REFERENCES

1. Gould, CV et al, Guideline for Prevention of Catheter-Associated Urinary Tract Infections, 2009. https://www.cdc.gov/infection-control/hcp/cauti/index.html
2. Greene, L. et al. Alternatives to the Indwelling Urinary Catheter. CAUTI 103 – Centers for Disease Control and Prevention, 2011
3. Lo E, Nicolle L, Coffin S, et al. Strategies to prevent catheter-associated urinary tract infections in acute care hospitals: 2014 update. Infect Control Hosp Epidemiol. 2014; 35(5):464-7
4. Meddings J, Saint S. Disrupting the life cycle of the urinary catheter. Clin Infect Dis. 2011;52(11):1291-3
5. Moore K, Atrubin K, Murphy C Quality initiative to provide alternative external catheters to reduce utilization of indwelling catheters and infection rates. American Journal of Infection Control, 52, S71-S72 https://doi.org/10.1016/j.ajic.2024.04.137

Defending Surgical Patients With One Step PVP-I

Jamie Clemmons, BSN RN & Connie Clark, BSN RN CIC
UNC Health Nash



What is PVP-I

- PVP-I is a Povidone-Iodine antiseptic product specifically designed to be used in the nose.
- PVP-I provides a broad-spectrum antiseptic that has been proven effective in reducing both Methicillin-resistant Staphylococcus aureus (MRSA) and Staphylococcus aureus (S. aureus) .
- According to the CDC, Povidone-iodine can be used as an effective alternative to the five (5) day mupirocin application for nasal decolonization.
- PVP-I can assist with the prevention of surgical site infections in high risk patient populations.

Triggers for the Project

- Protecting patients against hospital acquired infections, such as MRSA and S. aureus, is a principal patient care safety initiative.
- Consistent application of mupirocin nasal decolonization for the required five (5) days prior to surgery has not occurred.
- Non-compliance has been linked to the time consuming and unrealistic expectations of the mupirocin application process.
- Providers have been unable to consistently validate the five (5) day application process for patient-administered mupirocin which significantly affects efforts to accurately measure Surgical Site Infections.
- Inconsistent documentation of patient-administered nasal decolonization in the electronic medical record.

Defending Surgical Patients With One Step PVP-I

Easy and Efficient

Just Snap, Swab, and Document



CDC guidelines recommend nasal decolonization as a core strategy to prevent surgical site infections

UNC Health Nash chose to utilize the broad-spectrum antiseptic Povidone-Iodine (PVP-I) rather than an antibiotic, such as mupirocin, to support our antimicrobial stewardship program.

UNC Health Nash implemented Povidone-Iodine (PVP-I) nasal swab sticks as a means to proactively defend our surgical patients against infections related to S. aureus and MRSA colonization.

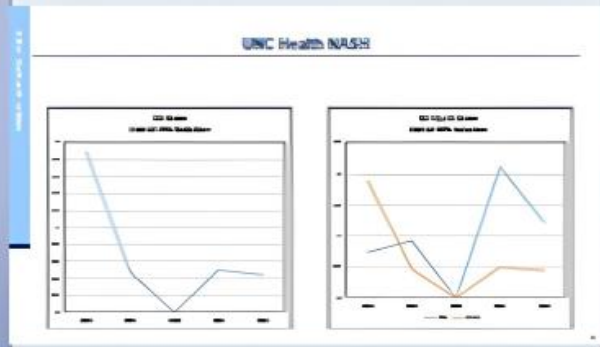
Due to the results of using Povidone-Iodine (PVP-I) on high risk orthopedic surgical patients, PVP-I has been incorporated into UNC Health Nash's standard protocol for all surgical patients. (excluding pediatric and cataract cases)

Studies have found that 90% of healthcare providers surveyed preferred PVP-I products because of the quick application process and the increased level of comfort reported by patients of PVP-I nasal decolonization product versus mupirocin.

Each povidone-iodine soaked swab stick is applied for fifteen (15) seconds for a total application time of sixty (60) seconds.

Measurable Outcomes

- Following the implementation of PVP-I in February 2019, UNC Health Nash immediately began to see results.
- UNC Health Nash has realized a 74% reduction in Surgical Site Infections in Total Knee Replacement procedures alone.



- UNC Health Nash has also recognized a 49% reduction in Surgical Site Infections for both Total Knee Replacement and Total Hip Replacements.
- Increased patient and staff satisfaction scores.

REFERENCES

AORN. (2021). Recommends Nasal Decolonization for SSI Prevention, Off Today Magazine. Industry Insights, News and Notes. https://ortoday.com/aorn-recommends-nasal-decolonization-with-pvp-i

Centers for Disease Control and Prevention. (2019). *Strategies to Prevent Hospital-onset Staphylococcus aureus Bloodstream Infections in Acute Care Facilities.* https://www.cdc.gov/hai/prevent/staph-prevention-strategies.html

Hospital-wide, All Vascular Access Devices Survey Program Decreases Central Line-Associated Blood Stream Infections

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Allina Health
ABBOTT NORTHWESTERN HOSPITAL

MAGNET RECOGNIZED
AMERICAN NURSES CREDENTIALING CENTER

HOSPITAL DESCRIPTION

Abbott Northwestern Hospital (ANW) is a Magnet-recognized tertiary care hospital in Minneapolis, MN. It is one of 11 hospitals in the Allina Health system.

- 640 operational beds, typical daily census ~580
- Infection Prevention (IP) team = 6
- Encompasses 6 communities: Critical Care, Med/Surg, Telemetry, Neuro/Ortho/Spine/Inpatient Rehab, Mental Health, and Mom-Baby.
- One on-campus ED and one off-site ED at ANW West Health



BACKGROUND

- 2024 was the hospital's third consecutive year with elevated CLABSI rate despite focus on bundled central line maintenance practices.
- Presence of other vascular access devices increases risk of CLABSI.
- Regardless of source, BSI/CLABSI are often detrimental or fatal for hospitalized patients.
- While a CLABSI clinical action team (CAT) focused on bundle compliance for central lines, the hospital had never conducted a house-wide assessment of all vascular access devices (VADs).

KEY PROJECT PARTICIPANTS

Abbott Northwestern Hospital's VAD Survey RN Team





METHODS

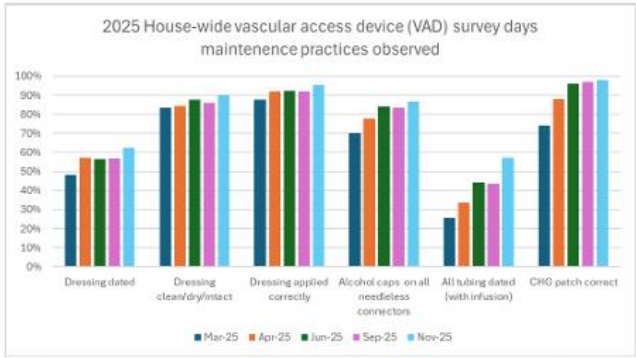
- As a tactic to address the risk for CLABSI introduced by all VADs, nursing leadership supported execution of five house-wide VAD survey days in 2025.
- During each survey day, all VADs present in admitted patients were assessed by trained Registered Nurse (RN) observers
- RN observers spanned all 23 inpatient units with the highest VAD placement volume, focusing on Critical Care (3 units), Med/Surg (11 units), Telemetry (5 units), and Neuro/Ortho/Spine/Inpatient Rehab (4 units) communities.
- During assessments, 20 RN observers
  - Noted compliance with maintenance practices observed with each VAD
  - Removed peripheral IVs (PIVs) that were symptomatic or no longer needed
  - Provided hands-on coaching to their peers
- At the conclusion of each event the RN observers shared a summary of their findings with their own unit.
- House-wide level data and specific community-level data were shared with care team members via other communication channels.

2025 Vascular Acces Device Survey Days Device Volumes	
Peripheral IVs	2396
Central/arterial/mid-lines	510
Total VADs	**2906**

2025 Vascular Acces Device Survey Days PIVs assessed for removal	
Peripheral IVs assessed	1866
Peripheral IVs removed	168
%Peripheral IVs removed	**9%**

RESULTS

- 2,900 VADs were assessed over the course of five events
- Incremental, then sustained improvements were noted in bundle maintenance practices for all VADs as the events progressed through the year
  - 9% of all PIVs observed were removed
  - Reduced and sustained prevalence of femoral central lines in the intensive care units from 17% to 2%.
- Concurrently, our 2025 CLABSI rate was 0.69 compared to 1.01 in 2024, a reduction of 30%.





APPLICATION TO PRACTICE

- The VAD survey day events have contributed to the hospital's reduced CLABSI rates by improving and sustaining the practices that prevent infection.
- Additionally, the RN observers became champions on their units who continue to positively influence their peers.

No conflict of interest, financial or otherwise to disclose.

Antimicrobial Susceptibility Variation Among Emerging WHO Listed *Candida* Pathogens

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ECOLAB®

BACKGROUND

Invasive fungal diseases (IFDs) are severe infections caused by fungi that can spread throughout the body, particularly in individuals with weakened immune systems. These infections are increasingly challenging, especially those that are resistant to antifungal treatments. IFDs represent an emerging global threat, highlighting the urgent need for increased attention and research.

In 2022, the World Health Organization (WHO) released the WHO Fungal Priority Pathogen List (WHO-FPPL), ranking 19 fungal pathogens as critical, high or medium based on multicriteria decision analysis (MCDA) approach using 10 criteria:

- Mortality
- Transmissibility
- Diagnostic Availability
- Antifungal Resistance
- Treatability
- Preventability
- Morbidity
- Public Health Impact
- Emerging Threat
- Economic Impact

While *Candida albicans* and *Candida auris* are well-known and included on the list, it also features four other species of concern (*C. glabrata, C. tropicalis, C. parapsilosis, C. krusei*) that are not typically listed on disinfectant master labels.

This study aims to evaluate the antimicrobial susceptibility differences between *Candida* species from commonly used healthcare disinfectant products.

MATERIALS AND METHODOLOGY

The "Quantitative Method for Evaluating the Efficacy of Antimicrobial Products against *Candida auris* on Hard, Non-Porous Surfaces" method as described in the U.S. EPA protocol MB-35 was followed for the efficacy test parameters described below:

Test Organism Preparation

Six different species of *Candida* were chosen based on their inclusion in the 2022 WHO Fungal Priority Pathogen List.

Broth cultures were prepared in Sabouraud Dextrose Broth (SAB) and incubated at 30°C for 24-8 hours.

On day of test each culture was centrifuged and the pellet resuspended in an appropriate volume of Phosphate Buffered Saline.

Carrier Inoculation

Cleaned and sterilized 1 cm in diameter, 304 brushed stainless-steel coupons were use used as the representative hard, non-porous surface.

Test Culture was combined with a 3-part organic soil comprised of bovine serum albumin, yeast extract and mucin

A 10 µL aliquot of organism + soil was inoculated onto the center of the carriers. Carriers were allowed to dry in a vacuum desiccator for 45 minutes.

Test Substance Efficacy Testing

All products were Ready-to-Use. If product was a wipe, liquid was collected by plunging wipe through sterile syringe.

Dried carriers were treated with 50 µL of test substance and allowed to expose. One product was tested per day against each Candida species.

Each product was tested at ~75% of the manufacturer defined exposure time to stress the product and try to elucidate any differences between the active ingredients.

Carrier Processing & Recovery

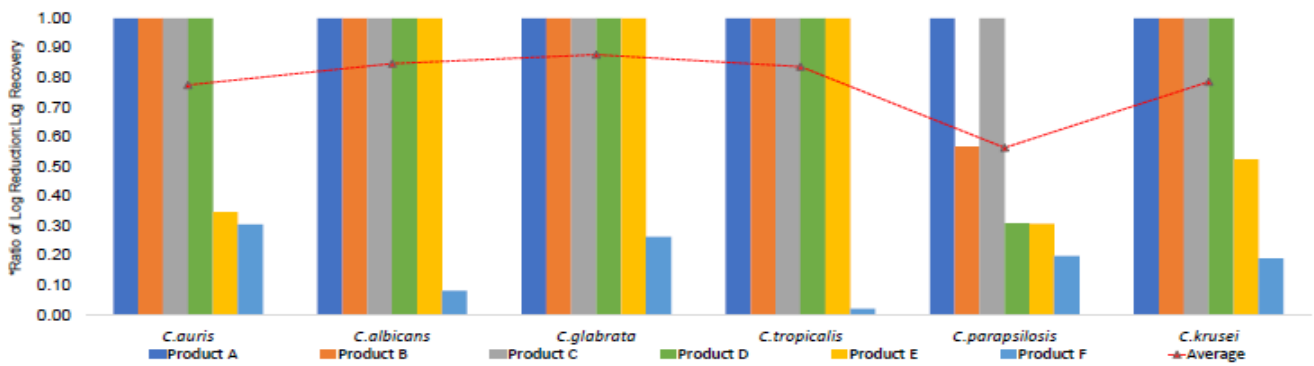
After exposure, 10 mL of an appropriate neutralizing broth medium was added to each treated carrier. Carriers were then vortex mixed for 30 seconds to remove and resuspend any surviving organisms.

Recovered organism were filter plated onto SAB agar plates and incubated at 30°C for 3 days.

Surviving organism were counted and Log_{10} Reductions were determined by comparing recovery of Treated carriers to Untreated carriers.

RESULTS

Graph 1: Summary of Antimicrobial Susceptibility of *Candida* Species to Various Common Healthcare Disinfectants



**Ratio of 1.00 is equivalent to complete kill of organism with product. Ratio of 0.00 is equivalent to no reduction seen.*

Product ID		A	B	C	D	E	F
**C.auris label claim?		Yes	Yes	Yes	No	Yes	No
Application Type		Liquid	Wipe	Liquid	Liquid	Wipe	Liquid
Contact Time	Label	3 minutes	5 minutes	3 minutes	5 minutes	1:15 minutes	10 minutes
	As Tested (~75%)	2:15 minutes	3:45 minutes	2:15 minutes	3:45 minutes	0:55 minutes	7:30 minutes

**Claim may not be registered with same strain of organism used in testing.

WHO PRIORITY LEVEL

CRITICAL
Candida auris
Candida albicans

HIGH
Candida glabrata
Candida tropicalis
Candida parapsilosis

MEDIUM
Candida krusei

CONCLUSION

While *Candida auris* remains a primary concern in healthcare settings, these findings highlight the continued need for ongoing fungal surveillance, research of emerging fungi, and the potential impact on environmental hygiene practices.

Only two Products (A & C) were effective against ALL *Candida* strains. One Product demonstrated no effectiveness (F), which was not unexpected due to lack of label claim.

Candida parapsilosis was the most difficult species to kill for most of the tested products.

This study helps demonstrate the variability in antimicrobial susceptibility between these emerging fungal pathogens and common healthcare disinfectants.

REFERENCES

1. WHO Fungal Priority Pathogens List to Guide Research, Development and Public Health Action, 2022.
2. EPA MLB SOP-35: Quantitative Method for Evaluating the Efficacy of Antimicrobial Products against *Candida auris* on Hard, Non-Porous Surfaces.
3. ASTM E2197-17: Standard Quantitative Disk Carrier Test Method for Determining Bactericidal, Virucidal, Fungicidal, Mycobactericidal and Sporicidal Activities of Chemicals

The Scoop with Poop: Highlighting the importance of fecal incontinence care as an intervention to prevent CLABSI

Hannah Shibeshi, DNP, APRN, AGCNS-BC, CCRN; Daniel Cates, MPH, CIC;
Cindy Schuveiller, MS APRN, CCNS, CCRN, CWCN; Dan McNamara, RN, BSN, CHSE

PURPOSE

The purpose of the simulation experience was to test a hypothesis that frequent incontinent episodes can be a source of contamination of PICC lines that increase incidence of CLABSI associated with enteric organisms.

BACKGROUND

Bundle elements for Central line-associated blood stream infection (CLABSI) prevention, such as those from the collaborative Society for Healthcare Epidemiology of America (SHEA), include disinfection techniques to prevent contamination of hubs and catheters. The bundle does not address fecal incontinence hygiene care as a method to reduce the contamination of vascular access devices. In 2023, the hospital observed a 159% relative increase in CLABSI infections caused by Enterococcus and other enteric organisms compared with 2022. Due to the close proximity of PICCs and tubing to incontinence cares, the CLABSI team created a simulation experience to identify opportunities with hygiene cares.

METHODS

A multidisciplinary team, including two clinical nurse specialists, an infection preventionist, and a simulation education specialist designed a simulation exercise highlighting risks of fecal contamination around central lines. The simulation used a mannequin covered with UV-fluorescent simulated fecal material and had a PICC and peripheral IV tubing in place. Clinical nurse specialists performed incontinence care on the mannequin while the infection preventionist examined potential contamination sites, including skin folds, wipes packaging, linens, and IV tubing hubs. Photographs were taken to document areas where contamination occurred.

Enteric causal organisms used for CLABSI classification and analysis were Bacteroides sp., Clostridiums sp., Prevotella sp., Escherichia sp., Klebsiella sp., Enterobacter sp., Citrobacter sp., proteus sp., or Enterococci sp. CLABSI with both enteric and non-enteric organisms, n=3, were reviewed by an infectious disease physician and assigned a category based on clinical assessment.

The proportion of enteric CLABSI 2023 vs 2024, were analyzed via Fisher's exact test for hypothesis testing. To measure magnitude of the association, odds ratios were calculated using a 2x2 table and the delta method.

DISCOVERY INTERVENTION: SIMULATION EVENT

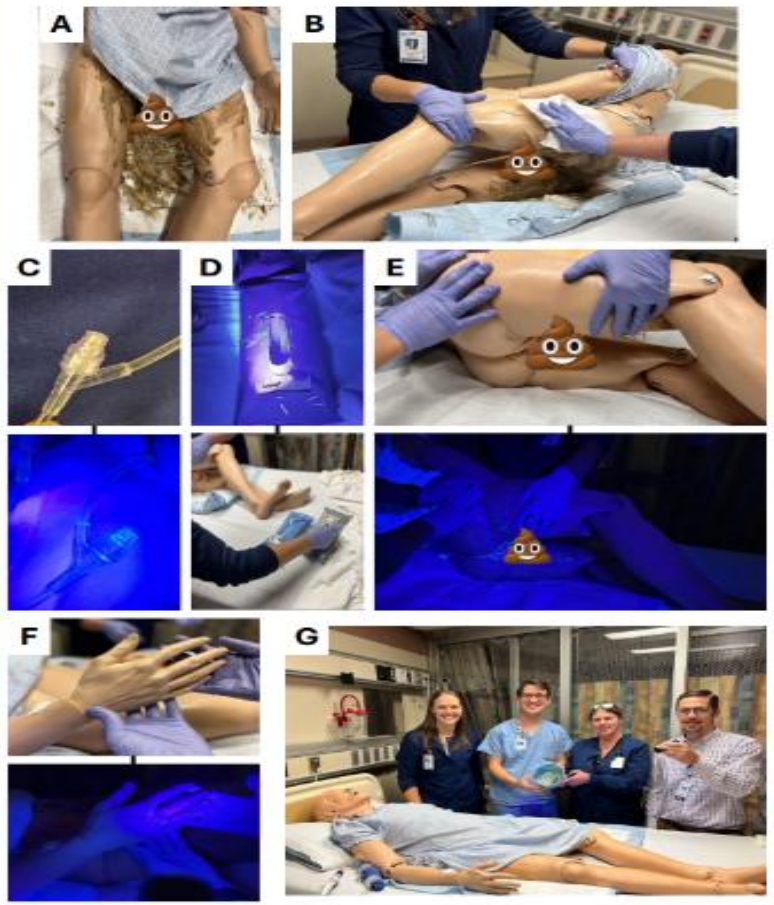


Figure 1 | Project Photographs
(A) Simulation setup: Homemade Vaseline-based "poop" with GloGerm™ was added to the mannequin to simulate a restless patient with loose stools. (B) Incontinence cares were provided. Note how easy it is to touch the patient's PICC during a turn. (C-F) Ultraviolet light was used to search for residual remnants of "feces" following basic incontinence cares on - (C) Y-site tubing ports, (D) bathing wipes, (E) perineum, and (F) mannequin hands. (G) - Back row from left to right: Hannah Shibeshi, Dan Cates, Cindy Schuveiller, Dan McNamara. In bed: Sim Mannequin

RESULTS

Compared to 2023, interventions resulted in a statistically significant 69% relative reduction, p=0.0461, in enteric organism CLABSI in 2024, (OR, 0.14; CI: 0.02 – 0.86). Pictures and opportunities were shared with nursing shared governance councils and the nursing leadership committee. Strategies to prevent infection using proper hygiene care identified include:

- Daily antimicrobial bathing
- Curos caps on all unused lumen and tubing hubs
- Encourage or assist patient in performing hand hygiene after incontinence cares
- Disinfect high-touch surfaces
- Discard extra wipes used for incontinence cares

Table 1 | CLABSI Characteristics – Attributing Org. and Line Type

CLABSI Characteristics	2022	2023	2024	2025
Total Cases, n	12	17	10	12
CLABSI Organism				
Enterococcus sp., no. (%)	2 (17)	8 (47)	2 (20)	3 (25)
Enteric Org., no. (%)	4 (33)	11 (64)	2 (20)	4 (33)
Line Type				
PICC, no. (%)	4 (33)	8 (47)	7 (70)	5 (42)
CVC[1], no. (%)	6 (50)	2 (12)	3 (30)	3 (25)
Dialysis, no. (%)	2 (17)	5 (29)	0(0)	4 (33)
Port, no. (%)	0 (0)	2 (12)	0 (0)	0 (0)
PICC & Enteric Org., no. (%)	1 (8)	7 (41)	1 (10)	1 (8)

[1]Non-Dialysis CVCs

LESSONS LEARNED

To sustain an improvement, changes were made to multi-disciplinary unit-based CLABSI Root Cause Analysis case reviews, such as (1) include documentation of the number of incontinent stool episodes for CLABSIs related to enteric organisms, and (2) provide unit leaders with opportunities for improvement related to hygiene practice with incontinence when relevant. This simulation event highlighted the benefit of using a realistic environment to test the hypothesis that frequent fecal incontinence episodes can lead to an increased risk in contamination of a PICC catheter.

REFERENCES

Association for Professionals in Infection Control and Epidemiology (APIC). (2025). Preventing catheter-associated bloodstream infections (CABSI) in adults. *APIC*. https://apic.org/wp-content/uploads/2025/06/2025-CABSI-Implementation-Guide-002.pdf

Buetti, N., Marschall, J., Drees, M., Fakih, M. G., Hadaway, L., Maragakis, L. L., Monsees, E., Novosad, S., O'Grady, N. P., Rupp, M. E., Wolf, J., Yokoe, D., & Mermel, L. A. (2022). Strategies to prevent central line-associated bloodstream infections in acute-care hospitals: 2022 update. *Infection Control & Hospital Epidemiology*. 43(5). 553-569. DOI: 10.1017/ice.2022.87

Eyes Wide Shut: When Sterilization Indicators Go Unchecked

Jennifer Davidson Feliu MSA, BN, RN, CIC, CRCST, Amy Hays MPH, RN, PHN, CIC, Meghan Larson MPH, MLS, CIC, Connor Liberman MPH, CIC

Background

On June 17, 2024, a large suburban ambulatory OB/GYN clinic identified a reprocessing breach involving instruments that were not sterilized prior to patient use.

While gathering instruments from central supply to restock exam rooms, staff noticed that instruments had been washed, packaged, and mistakenly placed back into circulation prior to being sterilized. In addition, clinic staff found wrappers with unprocessed indicators in exam room trash, signaling that some of the unsterilized instruments were used for patient care.

A breach of instrument reprocessing is an Infection Prevention concern that can lead to negative impacts on patients. There is risk of transmission of bloodborne pathogens if medical instruments are not properly cleaned and sterilized, and patients may lose trust in healthcare systems if their safety is put at risk. Healthcare systems are also at risk of financial liability and reputational damage.

Methods

At the time the breach was identified, clinic staff went through all clinic instrumentation to ensure that all unsterilized instruments were removed. The event was identified as a Category B breach according to the Centers for Disease Control and Prevention (CDC) Approach to an Infection Control Breach with Potential Risk of Bloodborne Pathogen Transmission.

Stakeholders were pulled together to discuss the breach and create a response plan. The group included Infection Prevention, Clinic Leadership, the Obstetrics Medical Director, Patient Safety, Laboratory leadership, Risk Management, Infectious Disease, Communications, Billing and Finance, the Minnesota Department of Health (MDH) and the CDC.

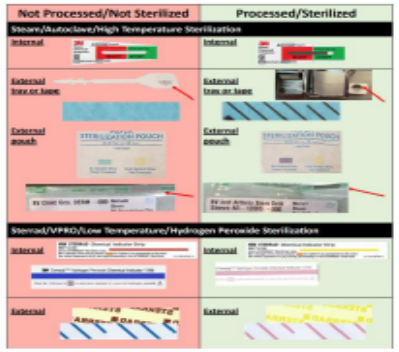
The comprehensive response plan included:

- Identification of potentially exposed patients based on appointment date and whether instruments were used
- Multimodal patient notification via phone, mail, electronic messaging, and in-person
- Centralized patient support line with standardized scripting
- Development of a lab testing protocol aligned with public health recommendations
- Provision of testing at no cost to patients
- Root cause analysis
- Staff re-education on instrument reprocessing and indicator verification



> IT'S NOT MY JOB.
>
> I DON'T HAVE TO DO IT EVERY TIME.
>
> THAT'S SPD'S RESPONSIBILITY.
>
> I DON'T KNOW HOW TO CHECK INDICATORS.
>
> IF THE INSTRUMENT IS IN THE EXAM ROOM, THE INDICATORS HAVE BEEN CHECKED ALREADY.

Internal and External Indicator Guide



Results

62 potentially exposed patients were identified, notified, and offered testing. Testing participation included:

- 6-week testing: 28 patients (45.2%)
- 4-month testing: 12 patients (19.3%)
- 6-month testing: 4 patients of 11 eligible (36.4%)

No cases of transmission related to the breach were identified.

The reprocessing breach investigation resulted in both testing expenses and significant staff time. The total cost of follow-up testing was approximately $5,564. In addition, Infection Prevention team labor associated with the investigation, including meetings, coordination efforts, documentation, data review, and follow-up actions, totaled approximately $3,125.00[1]. This total does not include time and resources contributed by leadership, other stakeholders, and organizational resources. Collectively, the breach response cost an estimated $8689.00 in testing and labor costs.

Interviews with clinic staff revealed variation in attitudes and inconsistent practices of checking sterilization indicators prior to instrument use.

All clinic staff, including clinicians, were re-educated on the importance of inspecting instruments and indicator results prior to use, as well as the proper process for performing these checks.

Conclusion

Exposure investigations are a costly process for healthcare systems. Preventing these events is important to maintain patient trust and preserve financial and labor resources. This investigation highlighted the need for ongoing staff education and building a culture of a shared accountability in ensuring instrument sterility and patient safety.

This exposure investigation was successful due to the strong collaboration with clinic leadership and sterile processing partners. This event strengthened stakeholder relationships and created new communication channels that will support future work.

Challenges during the investigation included clinician resistance to checking indicators, difficult patient conversations, and potential patient litigation.

Moving forward, strengthening standardization of reprocessing workflows and accountability measures is essential to prevent recurrence and maintain high-quality care and patient safety.

1.Indeed, *Infection preventionist salary in Minnesota*, 2026, indeed.com

Back to Basics: A Systemwide CLABSI Improvement Campaign

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3. Communications Team, M Health Fairview, MN

ABSTRACT

Background: Central line-associated bloodstream infections (CLABSIs) remain a significant healthcare-associated infection and patient safety concern. To reinforce evidence-based prevention practices, our health system launched a "Back to Basics" campaign aimed at improving CLABSI prevention bundle compliance while fostering a culture in which staff felt empowered to speak up when bundle elements were not consistently followed.

Methods: A systemwide quality improvement campaign was implemented over four months. Each month emphasized a key CLABSI prevention bundle theme. The multidisciplinary CLABSI Committee distributed weekly educational emails featuring a focused prevention topic, supporting resources, and practical reminders for frontline staff. Key messages were reinforced through weekly features in the organization's *90 Second News* communication. Leadership engagement and unit-level dissemination supported campaign implementation across the health system.

Results: Communication metrics demonstrated strong staff engagement throughout the campaign. Following implementation, the system CLABSI rate decreased from 0.75 to 0.42, while CLABSI prevention bundle compliance increased from 66.21% to 68.15%. Qualitative feedback from staff was positive, with participants reporting increased awareness of prevention practices and greater discussion of CLABSI prevention at the unit level. Leadership visibility and reinforcement were identified as key contributors to campaign success.

Conclusions: A focused, systemwide educational campaign was associated with improved CLABSI prevention bundle compliance and a reduction in CLABSI rates. Consistent messaging, leadership engagement, and reinforcement of foundational infection prevention practices can strengthen a culture of safety and support sustained improvements in CLABSI prevention across a healthcare system.

Search

OBJECTIVE

- Reinforce foundational CLABSI prevention practices
- Improve bundle compliance
- Promote a culture of safety where all staff feel empowered to speak up when CLABSI bundle elements are not followed

BACKGROUND

Preventing central line-associated bloodstream infections (CLABSIs) requires consistent adherence to a multifaceted, evidence-based prevention bundle. Sustaining staff awareness of all bundle elements and maintaining reliable compliance across care settings remains an ongoing challenge. A systemwide "Back to Basics" campaign was developed to reinforce foundational CLABSI prevention practices, improve bundle compliance, and promote a culture of safety in which all staff feel empowered to speak up when prevention practices are not followed.

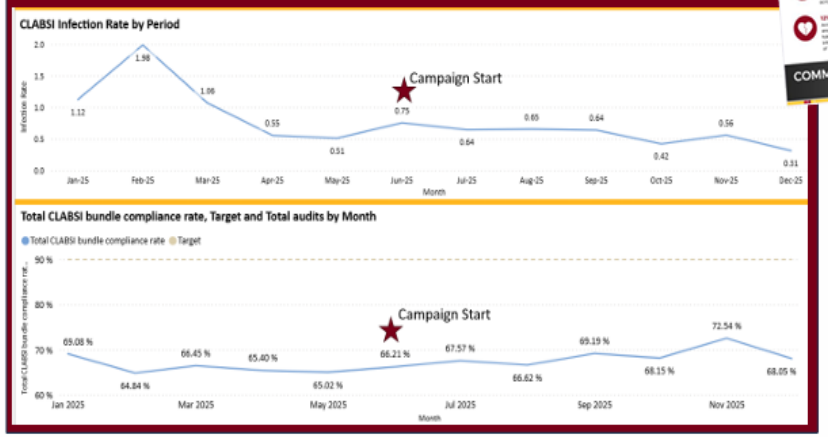
METHODS

The *Back to Basics* campaign used a microlearning approach to reinforce CLABSI prevention practices. Engaging, visually appealing educational materials—including quick-read content and brief videos—were designed to be completed in less than three minutes. A different CLABSI prevention element was highlighted each week to provide focused reinforcement. Campaign materials were distributed through systemwide email cascades and weekly *90 Second News* articles. Nursing and operational leaders reinforced key messages, promoted frontline engagement, and encouraged discussion of CLABSI prevention practices at the unit level.

RESULTS

Staff engagement remained high throughout the campaign based on communication metrics. The health system CLABSI rate decreased 44%, from 0.75 to 0.42 when the campaign completed, while CLABSI prevention bundle compliance increased 1.94 percentage points, from 66.21% to 68.15%. Staff reported increased awareness of CLABSI prevention practices and more frequent discussions regarding bundle adherence.

↓ 44% CLABSI rate (0.75 → 0.42)
↑ 1.94 percentage points in bundle compliance (66.21% → 68.15%)





SUMMARY

- A systemwide *Back to Basics* campaign reinforced CLABSI prevention practices through microlearning education, focused attention on specific bundle elements, and engaging staff communications.
- Following campaign implementation, the system CLABSI rate decreased while overall bundle compliance increased.
- Leadership engagement and consistent communication promoted frontline participation, increased awareness, and strengthened a culture of safety around CLABSI prevention.
- Campaign inspired additional quality initiatives with similar formatting.

REFERENCES

- Barnes, S., et al. (2015). Guide to preventing central line-associated bloodstream infections (L. Goss, Ed.). Association for Professionals in Infection Control and Epidemiology, Inc.
- Centers for Disease Control. (2011). Checklist for prevention of central line associated blood stream infections. https://www.cdc.gov/hai/pdfs/bsi/checklist-for-CLABSI.pdf
- Children's Hospitals Solutions for Patient Safety. (2019). SPS prevention bundles. https://www.solutionsforpatientsafety.org/wp-content/uploads/SPS-Prevention-Bundles.pdf
- Minnesota Hospital Association. (2019). Central line-associated bloodstream infection (CLABSI) road map. https://www.mnhospitals.org/Portals/0/Documents/patientsafety/CLABSI/CLABSI%20Road%20Map.pdf
- O'Grady, N. P., et al., (2017). Guidelines for the prevention of intravascular catheter-related infections, 2011. Centers for Disease Control. https://www.cdc.gov/infectioncontrol/pdf/guidelines/bsi-guidelines-H.pdf

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Using Six Sigma to Improve Central Line Maintenance and Reduce CLABSI Risk

Kelsey Wick, MPH, CIC, CSSGB; Sacha Kelly APRN, CNS, AOCNS; Megan Wagner MSN, RN, PHN; McKenna Godfrey BSN, RN

Introduction

St. John's experienced an increase in central line associated bloodstream infections (CLABSI) in early 2025. In response, Infection Prevention (IP) and Advanced Practice Nurses (APRN) conducted central line maintenance audits to identify gaps in practice and implement targeted improvements. The Six Sigma methodology was used to identify barriers to adherence and optimize central line maintenance practices.



Methods

Design

- Six Sigma methodology was used to guide this quality improvement project.
- The DMAIC framework and tollgates were used to assess and monitor progress.

Setting and Population

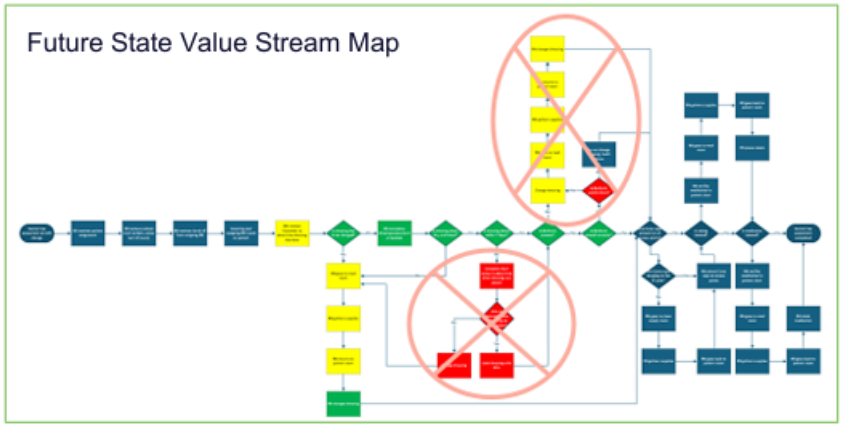
- Included all patients with an accessed central line on the medical surgical oncology unit.
- Excluded other inpatient units, outpatient clinics, labor and delivery, and postpartum units.

Data Collection

- A standardized central line maintenance tool was used to collect data, which were entered into REDCap.
- Audits were conducted by IP, APRN, unit leaders, and trained staff beginning in January 2025.
- Quarter 1 (Q1) served as the baseline period, and Quarter 4 (Q4) represented the post-intervention period.

Data Analysis

- Data were analyzed using Minitab Statistical Software, version 22.



Process Metrics	Q1 % compliance	Q4 % compliance	p-value
Dressing C/D/I	67% (n=39)	93% (n=224)	< 0.001
CHG sponge	79% (n=39)	96% (n=220)	= 0.001
Balancing Measures	**Q1 % compliance**	**Q4 % compliance**	**p-value**
Overall compliance	36% (n=39)	71% (n=229)	< 0.001
IV tubing current	83% (n=29)	99% (n=187)	< 0.001
Tubing and medication bag dated	72% (n=29)	98% (n=187)	< 0.001
Curos caps	69% (n=39)	99% (n=229)	< 0.001
CHG bath	86% (n=37)	91% (n=220)	= 0.376

Results

- Process improvement efforts focused on two central line maintenance bundle elements: (1) dressing clean, dry, and intact and (2) antimicrobial sponge present and placed correctly. The remaining maintenance bundle elements were monitored as balancing measures.
- Following implementation of improvement interventions the med/surg oncology unit reported no additional CLABSIs during the remainder of 2025.
- Hospital-wide, zero CLABSIs were reported during Q4 2025.

2025 Hospital CLABSI Count	
Q1	4
Q2	0
Q3	2
Q4	0

Conclusion

- Six Sigma methodology enabled the team to identify and prioritize central line maintenance practices with the greatest potential to improve patient safety.
- A priority matrix identified key barriers, including antimicrobial sponge placement and inconsistent stocking of central line supplies across all units.
- Findings informed targeted process improvements and led to a proposal for a 5S initiative on all med/surg and ICU clean supply rooms to standardize organization and improve access to central line supplies.
- Targeted interventions informed by Six Sigma methodology were associated with improved central line maintenance practices and prevention of additional CLABSIs on the focus unit in 2025.

Acknowledgements

Thank you to all the staff on P2 for their participation in this project! Thank you to my Green Belt Coach, David Pelletier, for all your support!

Barrier Builders: Boosting PPE Use in Isolation Rooms

Jennifer Gieser BSN, RN, PHN, Infection Prevention, Sanford Bemidji

Background/Significance

Proper use of personal protective equipment (PPE) is essential to prevent the spread of infectious organisms and protect both patients and staff in isolation rooms. In 2024, Sanford Bemidji Medical Center noted a significant decline in PPE adherence across inpatient units, with a yearly compliance rate of 42%. This low compliance increases the risk of exposure to pathogens such as C. difficile, MRSA, and other transmissible infections.
This project focuses on increasing proper PPE use for all isolation patients by addressing barriers such as workflow challenges, signage clarity, and staff knowledge. Improving PPE compliance will strengthen isolation practices, enhance patient and staff safety, and support overall infection prevention efforts.

Metrics

Outcome Metric: Monitor hospital acquired infection rate to achieve goal of zero hospital acquired infections.

Process Metric: Increase inpatient PPE use with goal of 95% or greater compliance .

Objective

To Improve PPE compliance for all isolation patients by increasing PPE use from 42% to 95% or above though clear signage, streamlined workflows, and focused staff education. Strengthening PPE practices will help reduce transmission and enhance overall patient and staff safety.

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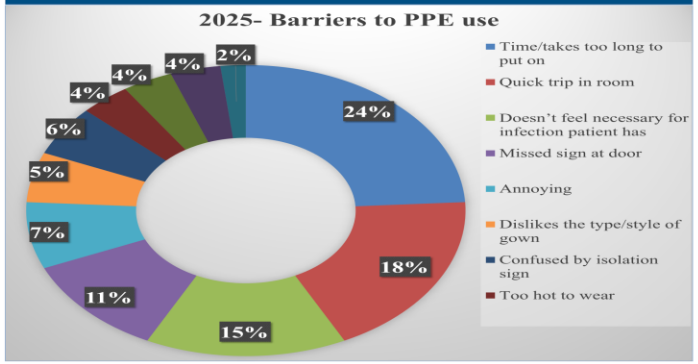
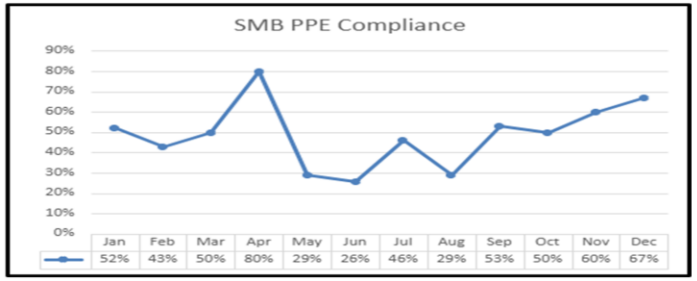
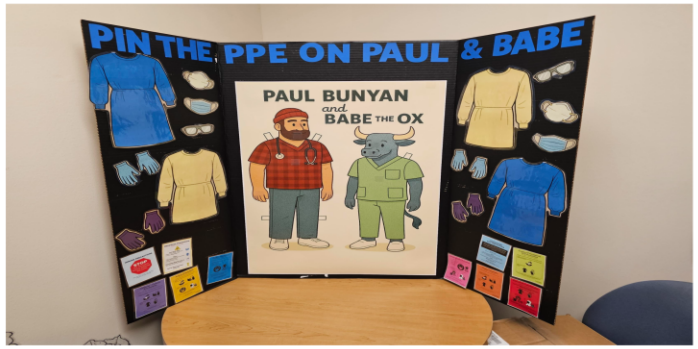
Analysis







Actions Taken

- Rounded with front line staff to identify PPE barriers and workflow gaps.
- Rounded with patients to understand their isolation/PPE awareness.
- Conducted rounding in isolation rooms to observe real time challenges.
- Reviewed provider isolation order workflows and met with providers to streamline process.
- Evaluated door caddy options to improve PPE accessibility at room entry.
- Investigated new PPE options and conducted a Halyard isolation gown trial.
- Developed adult learner PPE action plan and education to guide interventions across units.
- Meet with leaders for rounding, just-in-time education with staff, Review findings at Quality council.

Next Steps

- Continue to aim for 95% or greater in PPE compliance by end of 2026.
- Leader reinforce PPE reliability though routine rounding, real-time coaching and modeling correct PPE use.
- Strengthen real –time feedback by sharing monthly PPE compliance dashboards with units.
- Establish escalation pathway for addressing gaps in use, workflow issues and supply concerns.
- Celebrate success and sustain momentum.

Open Up And Say **PNEUMONIA**

The impact of oral cares on Non-Ventilator Hospital Acquired Pneumonia

Jennifer Gieser, BSN, RN Infection Prevention, Taycee Butts, BSN, RN Manager Critical Care Sanford Bemidji Medical Center

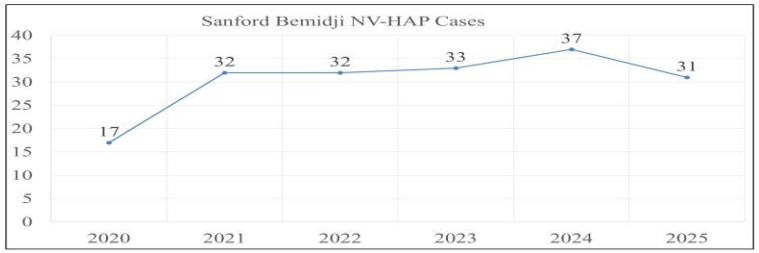
Background/Significance

Research demonstrates that providing hospitalized patients oral care at least twice daily significantly reduces the incidence of hospital-acquired infections, including Non-Ventilator Hospital-Acquired Pneumonia (NV-HAP). Sanford Bemidji experienced a 118% increase in NV HAP cases from 2020 to 2024, prompting an in-depth review of contributing factors. An audit of oral care practices among patients who developed NV-HAP, as well as patients with elevated sepsis scores, revealed gaps in both the completion and documentation of oral care.

This project aims to improve the reliability and consistency of oral care through increased completion rates, enhanced documentation practices, standardization of tools, and alignment of workflows across departments and staff roles. This initiative directly supports Sanford Bemidji's infection prevention strategy to reduce NV HAP across the organization.

Objective

To reduce NV-HAP at Sanford Bemidji by increasing reliability of twice daily oral cares on ICU and CCU units though standardized tools, increased education, aligned workflows, and improved documentation. Oral care completion rates and NV-HAP trends on ICU/CCU will be compared to MSO units, which serve as a non-interventional control. The goal is to demonstrate measurable improvement in oral care practices and associated reductions on NV-HAP within 12 months.



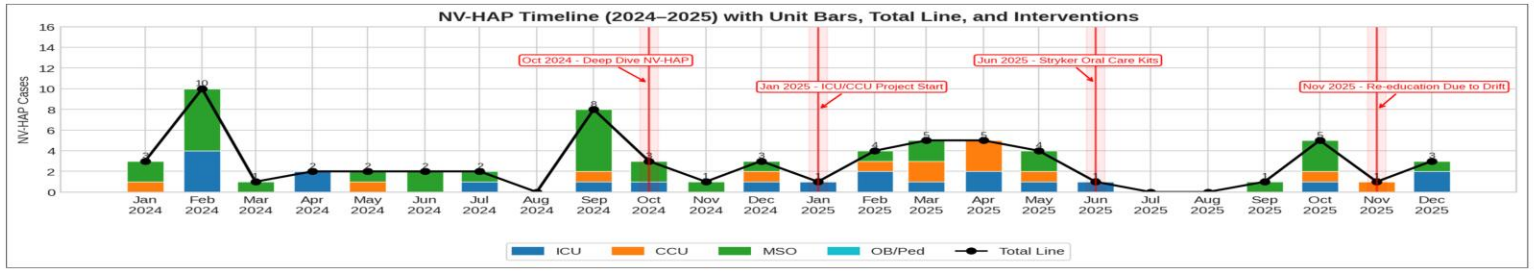


Metrics

Outcome metric:
- Monitor NV-HAP rate with a goal of zero.

Process metric:
- Increase patient oral cares with goal of 50% or greater compliance on patients with NV-HAP

Analysis & Actions



Next Steps

Continue to aim for reduction of NV-HAP by 25% in 2026

- Received approval of Stryker oral care kits for use on ICU,CCU and MSO units in Dec 2025.
- Education with MSO units for go-live
- Quarterly rounding with Stryker rep for continued support and education on drift.
- Auditing NV-HAP cases for oral care compliance
- Bring learnings and actions items to Quality council and Infection Prevention Committee.

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Multidisciplinary Team Reduced Surgical Site Infections via Targeted Interventions

APIC26 JUNE 15-17 NASHVILLE

Poster: QAPI 187

Allina Health

Jessica Nerby, MPH, CLS, CIC, Katie Lorenzen, RN, BSN, ONC, Jennifer Pierce-Querna, MPH, CIC, Emily Orlaska, MPH, Krista Gens, PharmD, BCPS, BCIDP, DPLA, Robert Quickel, MD, MBA, Frank Rhame, MD, FIDSA

Background

- Surgical site infections (SSIs) are associated with substantial healthcare costs and contribute to increased patient morbidity and mortality.[1,2]
- Several studies have noted that up to 60% of SSIs are preventable if evidence-based practices are implemented.[3,4]
- The Centers for Disease Control and Prevention (2017) and SHEA/IDSA/APIC (2022 Update) have published Guidelines and Recommendations for the prevention of SSI.[5,6]
- Recommendations include preoperative bathing or showering prior to surgery, evidence-based antimicrobial prophylaxis (selection, timing, redosing), maintenance of perioperative normothermia and glycemic control for all patients, data transparency and education for frontline staff and providers.
- In 2024, Allina Health SSI rates exceeded national benchmarks prompting executive leaders to empower a multidisciplinary team to lead SSI reduction efforts.

Methods

- Infection Prevention and quality leaders reviewed evidence-based best practices, compared them with current practices and identified priority targets for focused interventions.
- A multidisciplinary advisory group was formed to assess barriers to SSI best-practice adherence (Figure 1) and identify improvement opportunities. Membership included all surgical specialties, surgical leadership, anesthesia, infection prevention, and quality.
- The advisory group prioritized: antibiotic timing and selection for colon and abdominal hysterectomy cases, CHG bathing, surgical services staff education, and data transparency as key focus areas for 2025.
- Progress was managed through an A3 project plan with monthly executive oversight and prompt barrier resolution.

Results

Targeted Interventions

- Implemented monthly review of SSI prevention process measures with feedback to surgeons and anesthesia for missed antibiotic timing or selection and an Epic dashboard was updated to display surgeon-specific compliance with key process measures and associated SSI rates. (Figure 2)
- Deployed role-specific SSI prevention education and updated Epic tools (dashboards, reminders, documentation workflows) to support guideline-concordant care and real-time feedback.
- Standardized and reinforced preoperative CHG bathing and surgical antibiotic prophylaxis practices through guideline updates, education, and Epic integration.

Outcomes

Improved Process Measures:

- Antibiotic timing and selection for colorectal and hysterectomy procedures improved from 2024 to 2025. (Figure 3)
- Perioperative CHG bathing compliance increased from **82%** to **88%** across all surgical types. (Figure 4)

Improved clinical outcomes:

- Deep and organ-space **SSI rates decreased** from 2024 to 2025 in **7 of 8** surgical categories surveilled, with **6 of 8** meeting or falling below 2024 CDC national benchmark rates (Figure 5).

Figure 1: Surgical Site Infection Prevention Bundle



Figure 2: Surgeon Scorecard

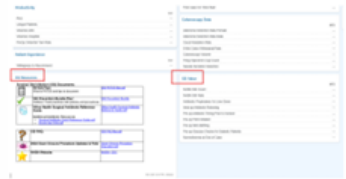


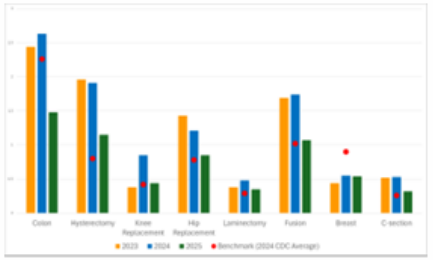
Figure 3: Colon and Abdominal Hysterectomy Antibiotic Selection and Timing Compliance



Figure 4: Preoperative CHG Bathing Compliance



Figure 5: Surgical Site Infection Rates 2023-2025



Conclusion

- Improvement was observed in targeted SSI prevention process measures, accompanied by a reduction in surgical site infection rates.
- Effective SSI prevention required sustained engagement across multiple disciplines and strong executive leadership to support improvement work prioritization and barrier removal.
- Increased surgeon and surgical services staff awareness and attention to all elements of the SSI prevention bundle likely contributed to reduced infection rates.
- Measured process improvements alone may not fully explain the observed decrease in SSIs.

Disclosures

Authors have nothing to disclose

References

1. Zimlichman E. Henderson D, Tamir O, *et al.* Healthcare-associated infections: a meta-analysis of costs and financial impact on the US healthcare system. *JAMA Intern Med* 2013;173:2039-2046
2. Kirkland KB, Briggs JP, Trivette SL, Wilkinson WE, Sexton DJ. The impact of surgical site infection in the 1190s: attributable mortality, excess length of hospitalization, and extra costs. *Infect Control Hosp Epidemiol* 1999;20:725-730
3. Meeks DW, Lally KP, Carrick MM, *et al.* Compliance with guidelines to prevent surgical site infections: as simple as 1-2-3? *Am J Surg* 2011;201:76-83
4. Umscheid CA, Mitchell MD, Doshi JA, Agarwal R, Williams K, Brennan PJ. Estimating the proportion of healthcare-associated infections that are reasonably preventable and the related mortality and costs. *Infect Control Hosp Epidemiol* 2011;32:101-114
5. Berrios-Torres SI, Umscheid CA, Bratzler DW, et al. Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017. *JAMA Surg* 2017;152:784-79
6. Calderwood MS, Anderson DJ, Bratzler DW, et al. Strategies to prevent surgical site infections in acute-care hospitals: 2022 Update. *Infect Control Hosp Epidemiol* 2023;44:695-720

Who Cleans What? Clarifying Cleaning Responsibilities to Improve Patient Safety and Regulatory Compliance Across a Multi-Hospital System

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Background:

- **The Problem:** Unclear cleaning roles create gaps in hospital equipment and environmental disinfection.
- **The Risks:** Higher regulatory citations, lower patient satisfaction, and increased risk for infection transmission.

Objective:

- Clearly define cleaning responsibilities and, as able, standardize practices across a multi-hospital system.

Methods:

- Formed a multidisciplinary team: Infection Prevention, Nursing, Environmental Services (EVS), and Facilities.
- Reviewed all inpatient room equipment and surfaces across all facilities.
- Documented exactly which discipline cleans each item upon inpatient discharge or transfer.

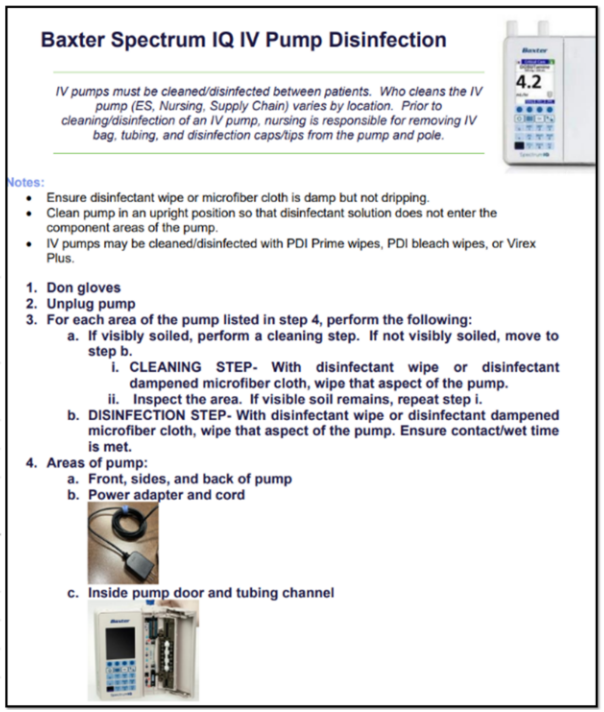
Results:

- Found significant variation between facilities regarding who disinfects medical equipment (e.g., IV pumps, capnography machines, feeding pumps).
- Role confusion: Nursing held responsibility in some locations, while EVS held it in others.
- Identified system-wide knowledge gaps regarding manufacturers' instructions for device disinfection.

Conclusion:

Documenting roles improved staff clarity, accountability, and regulatory readiness across the system.

Birthplace, NICU, Peds, Triage, Nursery Room Discharge Cleaning Roles & Responsibilities								
KEY: ES=Environmental Services, NUR=Nursing, SC= supply chain, FAC= Facilities, RT= Respiratory Therapy	NOTES	UMMC	Southdale	Ridges	St Johns	Woodwind	Lakes	Northland
Airflow christmas tree		ES	ES	Nursing discards	ES	ES	ES	ES
Bair huggers		NUR	NUR	NUR	NUR	NUR	NUR	NUR
Barcode Scanners		ES	ES	ES	ES	ES	ES	ES
Bassinet		ES	ES	ES	ES	ES	ES	ES
Bathroom (including toliet, shower, grab bars, shower head, vanity sink)		ES	ES	ES	ES	ES	ES	ES
bed air pumps		ES	ES	NUR & SC	N/A	N/A	N/A	N/A
bed extention pads		ES	ES	NUR	N/A	N/A	ES	N/A
Bili/TCB Check		NUR	NUR	NUR	NUR	NUR	NUR	NUR
Biohazard containers		ES	ES	ES	ES	ES	ES	NUR



Baxter Spectrum IQ IV Pump Disinfection

IV pumps must be cleaned/disinfected between patients. Who cleans the IV pump (ES, Nursing, Supply Chain) varies by location. Prior to cleaning/disinfection of an IV pump, nursing is responsible for removing IV bag, tubing, and disinfection caps/tips from the pump and pole.

Notes:

- Ensure disinfectant wipe or microfiber cloth is damp but not dripping.
- Clean pump in an upright position so that disinfectant solution does not enter the component areas of the pump.
- IV pumps may be cleaned/disinfected with PDI Prime wipes, PDI bleach wipes, or Virex Plus.

1. Don gloves
2. Unplug pump
3. For each area of the pump listed in step 4, perform the following:
   a. If visibly soiled, perform a cleaning step. If not visibly soiled, move to step b.
      i. CLEANING STEP- With disinfectant wipe or disinfectant dampened microfiber cloth, wipe that aspect of the pump.
      ii. Inspect the area. If visible soil remains, repeat step i.
   b. DISINFECTION STEP- With disinfectant wipe or disinfectant dampened microfiber cloth, wipe that aspect of the pump. Ensure contact/wet time is met.
4. Areas of pump:
   a. Front, sides, and back of pump
   b. Power adapter and cord
   c. Inside pump door and tubing channel

Investigation of a *Corynebacterium amycolatum* Sternal Surgical Site Infection Cluster in Cardiac Surgery

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ABSTRACT

BACKGROUND

We describe an investigation of a cluster of eight *Corynebacterium amycolatum* sternal surgical site infections (SSIs) that occurred among cardiac surgery patients from February to October 2025. Although *C. amycolatum* is a member of the skin microbiota, clinically significant infections caused by this organism may occur in cardiac surgery patients.

METHODS

The investigation included retrospective reviews of SSIs, clinical cultures and medical records, surgical observations, and operating room (OR) assessment. Line lists of surgical case criteria and infection prevention practices were created to assess common factors among cases (e.g., staffing, instrumentation, equipment, skin preparation and antisepsis, nasal decolonization, antibiotic protocols, and closure). Whole genome sequencing of isolates was performed and analyzed using PhyloPHoeNIx for single-nucleotide polymorphism (SNP)-based phylogenetic analysis.

RESULTS

Phylogenetic analysis indicated isolates from five of eight case patients who had cardiac surgeries occurring over a six-week period from February to April 2025 were genetically related (≤7 SNPs across the genome), suggesting a common source of infection. These five isolates were ceftriaxone, meropenem, and penicillin resistant. The other three case patient isolates were unrelated (>3181 to >15,000 SNPs); two were ceftriaxone, meropenem and penicillin resistant (one also doxycycline intermediate resistant), and the third penicillin resistant. Use of sternal tape for closure was identified as a recent practice change. Four of five genetically related cases involved the same surgeons and suture tape for sternal closure (wire for all other cases). Sternal tape was discontinued with three cases occurring afterwards. Seven patients completed chlorhexidine gluconate bathing and nasal *Staphylococcus aureus* decolonization. All patients received the same skin preparation and antiseptic. Antibiotic prophylaxis was appropriate. No trends were identified in instrument or equipment use. Broad infection control measures were implemented, including surgical clipper replacement, OR cleaning and ultraviolet (UV) light disinfection, headlamp cleaning, and environmental repairs. Leadership was engaged through frequent meetings and audits. Infection control practices such as minimizing OR traffic, double gloving, glove changes, and strict adherence to hand hygiene and attire were reinforced. Two of eight cases occurred after these recommendations were completed but were not genetically related to the primary cluster.

CONCLUSIONS

We describe a cluster of invasive *C. amycolatum* sternotomy SSIs. Only two genetically unrelated cases of *C. amycolatum* occurred following infection control investigation and interventions, underscoring the effectiveness of a comprehensive, multidisciplinary approach. This organism has rarely been reported as a cause of SSIs and may be an emerging pathogen.

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INTRODUCTION

- Eight *Corynebacterium amycolatum* sternotomy surgical site infections (SSIs) occurred among cardiac surgery patients from February to October 2025
- *C. amycolatum* is a Gram-positive, non-spore forming, facultative aerobic bacillus normally found on skin[1]
- To our knowledge, an SSI cluster due to *C. amycolatum* has not been previously reported.

METHODS

Confirm	• Surgeon notification: March 16th, 2025 • Medical chart line list and SSI rate review • Whole genome sequencing (PhyloPHoeNIx)
Case Definition & Case Finding	• Retrospective review of SSIs and cultures • Prospective monitoring • Additional whole genome sequencing
Hypothesis	• Literature search • Surgeon and staff interviews
Evaluation	• Surgery observations • Audits (e.g., instrument/equipment processing, supply storage, facilities)
Implement improvements	• Infection control recommendations (iterative)
Communicate	• Surgeon(s), Chair • Surgical Services leadership • Other stakeholders

Surgical Line List Criteria

Pre-Op Prep:
- CHG bathing
- Nasal decolonization
- Hair removal
- Skin antisepsis
- Draping

Procedure Factors:
- Timing
- Duration
- Antibiotic dosing
- Location
- Procedure type
- Patient temperature

Intra-Op Factors:
- Staffing
- Equipment
- Instrumentation, Implants
- Closure process: sutures, irrigation, dressings, wound vac

Patient Risk Factors:
- ASA scores
- Blood glucose
- Immunosuppression
- Age

Outcome Variables:
- Organism(s)
- SSI determination
- Infection depth
- Specimen type
- Antibiotic resistance profiles
- Return to OR

Post-Op:
- Admitting location
- Wound care
- Additional procedures

RESULTS

PHYLOGENETIC ANALYSIS

- Five of eight cardiac surgery patients over a six-week period from February to April 2025 were genetically related (≤7 SNP difference across the genome), suggesting a common source of infection
- Three case patient isolates were unrelated (>3181 to >15,000 SNP differences)

FIGURE 1 Phylogenetic Tree (Cluster Cases in Orange Box)

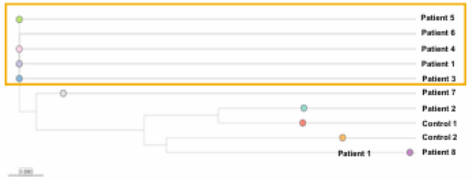


FIGURE 2 Pairwise Single-Nucleotide Polymorphism (SNP) Differences

	Patient 2	Patient 6	Patient 1	Control 1	Patient 3	Control 2	Patient 5	Patient 4	Patient 7	Patient 8
Patient 2	0	13694	13694	9701	13694	15071	13694	13695	13883	16950
Patient 6	13694	0	5	13658	5	14312	7	6	3182	15834
Patient 1	13694	5	0	13658	0	14311	6	1	3181	15834
Control 1	9701	13658	13658	0	13658	15250	13660	13659	14011	16622
Patient 3	13694	5	0	13658	0	14311	6	1	3181	15834
Control 2	15071	14312	14311	15250	14311	0	14311	14312	15031	17026
Patient 5	13694	7	6	13660	6	14311	0	7	3183	15836
Patient 4	13695	6	1	13659	1	14312	7	0	3182	15835
Patient 7	13883	3182	3181	14011	3181	15031	3183	3182	0	16106
Patient 8	16950	15834	15834	16622	15834	17026	15836	15835	16106	0

TABLE 1: Antibiotic Susceptibility Profiles (Cluster Cases in Orange)

Patient	Ceftriaxone	Meropenem	Penicillin	Doxycycline	Vancomycin
1	R	R	R	S	S
2	R	R	R	NA	S
3	R	R	R	NA	S
4	R	R	R	S	S
5	R	R	R	NA	S
6	R	R	R	NA	S
7	R	R	R	I	S
8	S	S	I	S	S

R = Resistant, I = Intermediate, S = Susceptible, NA = Not available

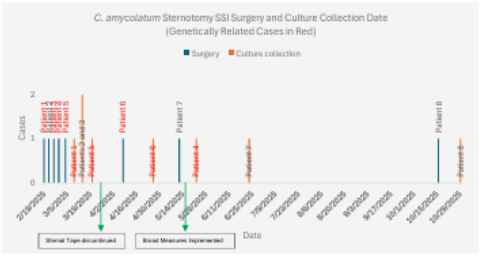
INFECTION CONTROL INVESTIGATION

- Four of five genetically related cases used sternal tape vs. wire for closure and the same surgeon team; sternal tape use, a recent practice change, was discontinued
  - One genetically related case occurred after sternal tape discontinuation
- No other consistent factors identified that would indicate a common source of infection
  - Broad infection control measures applied

TABLE 2: Sternotomy SSI Cluster Factors (Cluster Cases in Orange)

Patient	Surgery Date	Closure Type	Surgeon Team	Days from 1st Case	Culture Date	Days from Surgery to Culture
1	2/19/2025	Tape	A	0	3/9/2025	18
2	2/22/2025	Tape	B	3	3/14/2025	20
3	2/25/2025	Tape	A	6	3/14/2025	17
4	2/28/2025	Tape	A	9	5/22/2025	83
5	3/4/2025	Tape	A	13	3/20/2025	16
Surgeon Notified Infection Control on 3/16/2025 after first three cases						
Sternal tape discontinued 3/25/2025						
6	4/8/2025	Wire	C	48	4/26/2025	18
OR Deep Cleaning and Broad Recommendations 5/9/2025 to 5/16/2025						
7	5/12/2025	Wire	D	82	6/23/2025	42
8	10/16/2025	Wire	E	239	10/29/2025	13

FIGURE 3 *C. amycolatum* Sternotomy SSI Timeline



OR Deep Cleaning: Decluttered and cleaned all surfaces, UV light disinfection, headlamp replacement and cleaning program, and facility repairs

Reinforced Best Practices: Minimize OR traffic, double sterile gloving, frequent sterile glove changes, and strict adherence to hand hygiene and attire

Broad Infection Control Measures

Nasal Decolonization: Recommended change from five-day mupirocin to one-dose povidone iodine

Surgical Clippers: Recommended clipper base replacement and storage covers

CONCLUSIONS

- We describe a cluster of invasive *C. amycolatum* sternotomy SSIs
- *C. amycolatum* isolates are highly drug resistant
- Only two cases of *C. amycolatum* occurred following infection control investigation and interventions, and were genetically unrelated to the prior cases, underscoring the effectiveness of a comprehensive, multidisciplinary approach
- This organism has rarely been reported as a cause of SSIs and may be an emerging pathogen

REFERENCES

1. Mitchell BI, Markantonis JE. 2025. An underestimated pathogen: Corynebacterium species. J Clin Microbiol63:e01552-24. https://doi.org/10.1128/jcm.01552-24

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Hennepin County Public Health

Long-Term Care Infection Prevention (LTC IP) Program
- Dave Johnson
- Jen Malewicki
- Linn Warnke

Health Evaluation and Assessment Team (HEAT)
- Nick Fortmeyer
- Katlyn Rohrer

Convened by
Hennepin County Public Health
LTC IP Program

Promoting Local Engagement in Antibiotic Stewardship Efforts (PLEASE): Innovate and Collaborate with Long-Term Care and Public Health Partners

AIM STATEMENT **Advocate for clinical guideline-concordant diagnostic and prescribing behaviors in long-term care facilities (LTCF) via an educational intervention using Qualtrics XM software as a project management and implementation tool.**

PLAN

Problem/Situation:

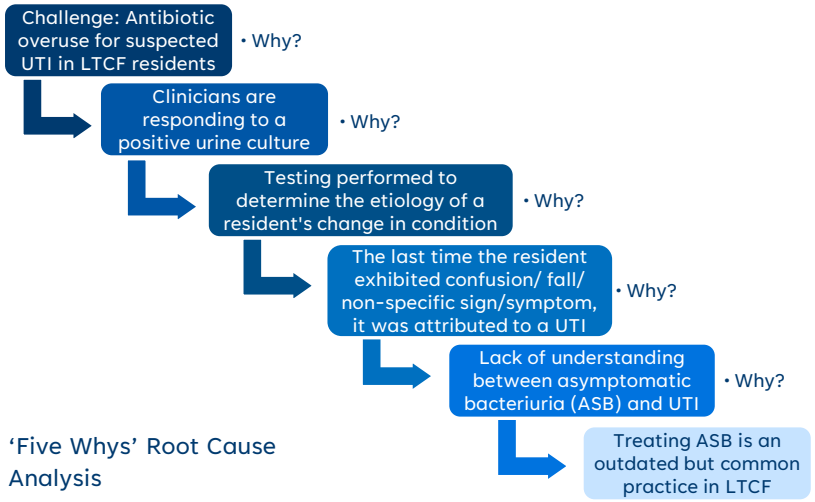
MN Department of Health's (MDH) 2023 *Antibiotic Use and Stewardship in MN* report described results from a 2022 survey of MN skilled nursing facilities' antibiotic stewardship practices and barriers.

70% Largest barrier, identified by 70% of respondents: **pressure from residents and family** members to prescribe antibiotics even when they're not necessary.

43% 43% of respondents perceived a **lack of awareness and commitment from health care providers** (HCP).

The Long-Term Care (LTC) IP Coalition of Hennepin County partnered with Hennepin County Public Health's (HCPH) Health Evaluation and Assessment Team (HEAT) to respond to MDH's guidance.

- Focused on suspected urinary tract infections (UTI)
- Brainstormed root causes for the MDH-identified challenges
- Conducted a needs assessment of LTC IPs and other infection prevention and control (IPC) leaders to guide project development



'Five Whys' Root Cause Analysis

DO

Key Action Steps:

Eight-part webinar series development featuring four subject matter experts:
- Dr. Sarah Kabbani (Centers for Disease Control and Prevention (CDC))
- Mr. Steven J. Schweon (Independent IPC Consultant)
- Dr. Galina Shteyman (MDH)
- Dr. Christopher Crnich (University of Wisconsin)



HEAT designed a novel platform using **Qualtrics XM**, where users could register, attend live and on-demand webinars, access presentation slides, complete evaluation forms and download continuing education using a single link.

Objectives: Upon series completion, ≥50% participants will:
1. Indicate plans to monitor urine culture (UC) and antibiotic use (AU) trends & implement improvement processes via quality committee.
2. Indicate plans to review policies for opportunities to incorporate best practices.
3. Perceive increased confidence communicating with residents/ families about managing a resident's change in condition.

ACT

Lessons Learned:

Qualtrics XM can support many public health program activities.

Seek thought partnership from colleagues with diverse skill sets!

High Consequence Infectious Disease (HCID) Preparedness

Elaine Stevens MSN, RN, CIC Rebecca Hesse MPH, RN, CIC and
Renee Flores Sanders MSN, RN, CNML

Allina Health
All together better.

Problem Statement

In 2024, Allina faced challenges meeting Joint Commission's directive to re-establish High-Consequence Infectious Disease (HCID) preparedness for emerging infectious threats. Variability in ongoing education created knowledge gaps and reduced staff familiarity with previous preparedness efforts.



Plan

- Implement a system-wide Infectious Disease All-Hazards Response Plan, supported by individual site-specific plans.
- Produce education and training plans addressing regulatory requirements, site and system interventions, individual job roles and reference documents.
- Partner with unit leadership to develop and implement training plans.

Do:

- Frontline application of training plans identified challenges with real-time decision making, application of references, initiation of PPE and procedural gaps.
- In response, Infection Prevention partnered with frontline healthcare workers, engaged in monthly workgroups and problem-solved with the Minnesota Department of Health.

Study/Results

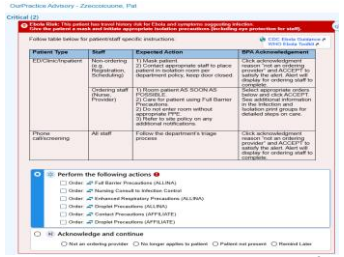
- After action analysis of HCID cases and scenario-based drills identified key areas for improvement.
- Real life scenarios presented new challenges in both how the patient presented and when symptoms and criteria were identified.
- System HCID workgroup provided a structured, organized forum for problem-solving and teamwork.
- Decisions made by HCID workgroup were taken back to sites to identify how to incorporate into their site-specific plans.

Act

- Key elements of a successful HCID Plan include frontline engagement, multidisciplinary collaboration, active and ongoing problem-solving, and scenario-based drills
- Modifications to HCID plans included a decision-making algorithm, OPA prompts within the EMR, VHF Screening questions, and an additional level of PPE.
- Recommend recurrent training/drills to maintain competency with process and critical thinking.







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