Does Skin and Nasal Decolonization Reduce Catheter-associated Urinary Tract Infections?

April Little BSN, RN, MLS, CIC

United Regional Healthcare System

BACKGROUND

Patients with indwelling urinary catheters are at an increased risk for catheter-associated urinary tract infections (CAUTIs).

According to the Centers for Disease Control's 2021 National and State Healthcare-Associated Infections Progress Report, there was an overall 5% increase in catheter-associated urinary tract infections observed in acute care hospitals between 2020 and 2021, with a 9% increase observed in intensive care units[2].

Upward trending in CAUTI rates in our facility began in 2021, consistent with national patterns. Decolonization strategies reduce the microbial bioburden on the skin and potentially decrease the occurrence of infection.

This study investigates whether implementing a skin and nasal decolonization bundle helps reduce CAUTIs in an acute care hospital.

OBJECTIVES

- Review existing data and research surrounding chlorhexidine and alcohol-based nasal decolonization to reduce hospital-acquired infections (HAIs).
- Describe a process to create a decolonization bundle utilizing chlorhexidine baths and alcohol-based nasal disinfectants to reduce catheter-associated urinary tract infections (CAUTIs).
- Define two ways to improve compliance in implementing a decolonization bundle to reduce catheter-associated infections (CAUTIs).

LITERATURE

Literature shows that implementing a decolonization bundle that includes alcohol-based nasal decolonization combined with chlorhexidine bathing reduces hospital-acquired infections, including surgical site infections and methicillin-resistant *Staphylococcal aureus* (MRSA) bacteremia[1,3,4]. There is limited research on utilizing decolonization bundles to reduce CAUTIs.

METHODS

- In February 2022, a multidisciplinary team implemented a decolonization regimen for patients admitted with an indwelling urinary catheter as a quality initiative to reduce CAUTIs.
- Patients with an indwelling urinary catheter received chlorhexidine gluconate (CHG) bathing once daily and nasal decolonization with an alcohol-based antiseptic twice daily.
- All CAUTI outcomes were tracked, and pre-and-post-implementation comparisons were reviewed to evaluate intervention effectiveness.
- Baseline (January 2019- January 2022) infection rates were calculated, and cumulative standardized infection ratios (SIRs) were obtained from the National Healthcare and Safety Network (NHSN) and compared to post-implementation data (February 2022 – October 2023) utilizing an NHSN statistics tool.

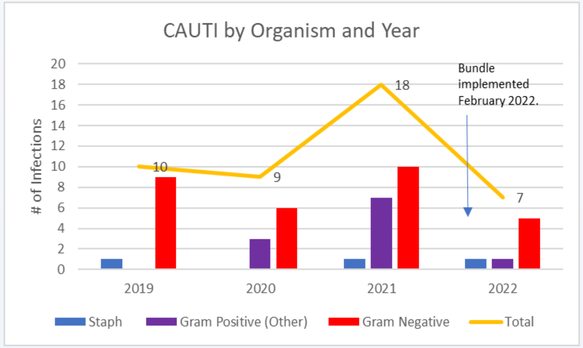
IMPLEMENTATION

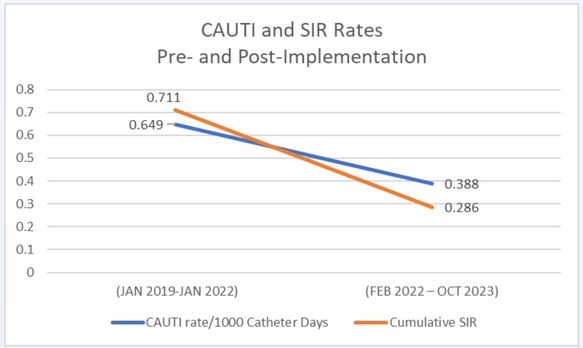
- Patients who met the criteria were placed on the decolonization bundle.
- Patient criteria were integrated into the electronic health record (EHR), which generated alerts if appropriate orders for nasal antiseptic and CHG baths were not ordered for the patient.
- Alcohol-based antiseptic was incorporated into the EHR to track utilization and improve compliance.
- Education regarding appropriate application was provided to nursing staff in all inpatient units.
- A formal policy was written and approved by the infection prevention committee and made available through the organization's policy manual.

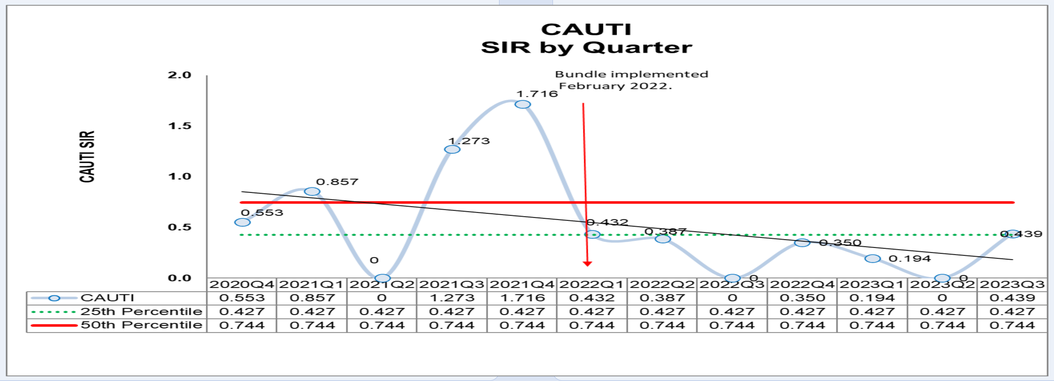
RESULTS

Following the implementation of a skin and nasal decolonization bundle:

- CAUTI rates decreased from 0.649 to 0.388 (per 1000 catheter days), a 40.2% reduction.
- The cumulative SIR decreased from 0.711 to 0.286.
- The NHSN SIR comparison tool showed a statistically significant reduction in CAUTI with a p-value of 0.0068 (95% confidence interval [0.19, 0.789]).
- There was an overall decrease in pathogens cultured in urine.







CONCLUSIONS

Findings from this study demonstrate a 40.2% decrease in CAUTI rates and a statistically significant decrease in CAUTI SIR after implementing a CHG bathing and alcohol-based nasal decolonization bundle.

CHALLENGES

Challenges observed throughout the process included:

- Lack of adherence to daily CHG baths.
- Inadequate or incomplete application of CHG baths.
- Lack of documentation for CHG baths.
- Patient volume and acuity due to COVID-19 patient surges.

IMPLICATIONS FOR PRACTICE

- Include both bundle components are incorporated into the electronic health record (HER) to improve compliance and ensure tracking.
- Provide education and visual aids for all bundle components.

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CONTACT INFORMATION

April Little, BSN, RN, MLS, CIC
Director of Infection Prevention
Medical City Fort Worth
april.little@medicalcityhealth.com