

Reduction of ICU CLABSI Rates by Integrating Stethoscope Hygiene Innovation and Dressing Standardization into a Prevention Bundle

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Purpose/Rationale

ICU CLABSI rates increased significantly between 2021 and 2022. After evaluation of the literature and current practice, we created a prevention bundle that incorporated a CHG-impregnated dressing and changed our stethoscope hygiene practices due to their known risk of microorganism transmission and proximity to the catheter.

Synthesis of Evidence

Evidence was lacking on the infection control benefit of disposable stethoscopes to reduce microorganism transmission; however, we did identify 3 studies supporting the use of a touch-free diaphragm barrier system to create a non-touch process while maintaining auditory clarity of the stethoscope. In addition, we found 3 studies to reinforce the use of a CHG-impregnated dressing to prevent central line infections.

Practice Change

We implemented a CLABSI prevention bundle in an 18-bed high acuity ICU from March 2022 to current date. The bundle included daily nursing and infection prevention rounds, daily line checks, alerts for ordered blood cultures, prompt central line downgrades, and education of all staff. We began standardization of CHG-impregnated dressings for all central lines and standardized all insertion and dressing change kits. We installed automated aseptic stethoscope barrier dispensers in each room and decreased the use of disposable stethoscopes.



Figure 1: Touch-free diaphragm barrier system for stethoscope hygiene.



Figure 2: Standardized, CHG-impregnated dressing.

Implementation Strategies

Standardization of CHG dressings and kits across all dialysis and central lines was implemented, along with staff education on aseptic technique and ongoing rounding. Additional strategies included placing the stethoscope barrier system in patient rooms near the hand hygiene station for maximum use. Instruction placards were placed above each system as reminders. Surveys were deployed to collect clinician feedback and refine the implementation processes. ICU champions were appointed to ensure continued adoption of all bundle elements.

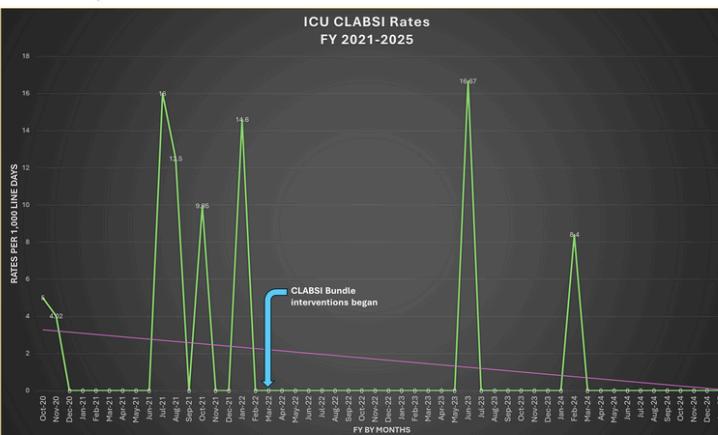


Figure 3: ICU CLABSI rates per 1,000 line days from FY 2021 to FY 2024, demonstrating a declining trend following the implementation of CLABSI bundle interventions in March 2022 (indicated by the blue arrow). The overall decrease (indicated by the purple trendline) highlights the impact of the bundled implementation strategies.

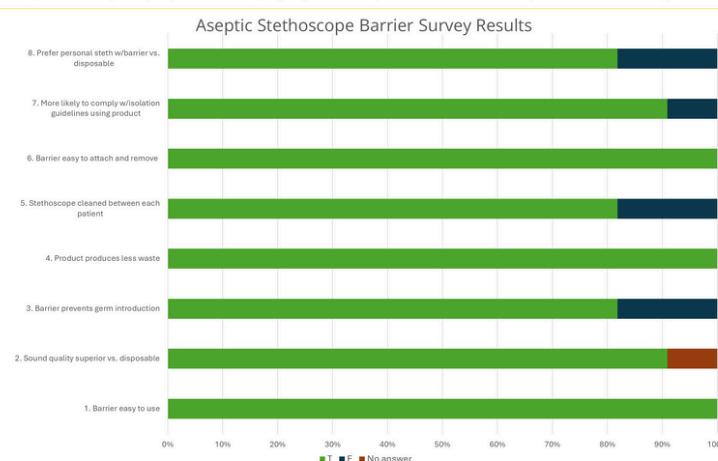


Figure 4: Survey results on aseptic stethoscope barriers highlighting clinician preferences and perceptions across various metrics including ease of use, sound quality, prevention of germ introduction, and compliance with isolation guidelines. The results demonstrate strong overall satisfaction for the barrier's utility and effectiveness.

Evaluation

The post-implementation group had a significant reduction in CLABSI rates, from an average of 3.88 to 0.93 infections per 1,000 line days. The CHG-impregnated dressing eliminated the problem of staff not addressing compromised dialysis dressings. As all central lines were now changed using the same kit and dressing, compliance was 100%. Clinician survey responses regarding stethoscope hygiene innovation reported implemented systems were easy to use, and the majority believed the new hygiene method was superior to disposable stethoscopes.

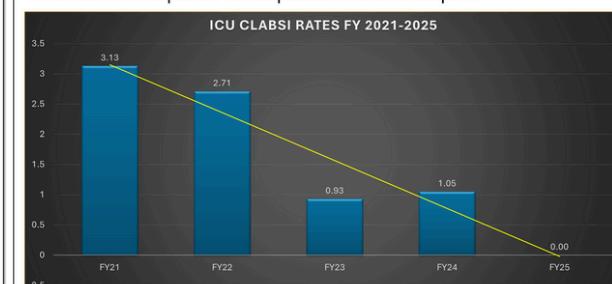


Figure 5: ICU CLABSI rates from FY 2021 to FY 2025, showing a significant and consistent decline over the years. The implementation of a CLABSI bundle is reflected in the downward trend, with rates reaching 0.00 in FY 2025.

Implications for Practice

- A CLABSI bundle that included an aseptic stethoscope hygiene barrier and a standardized dressing and kit was effective in decreasing infection rates.
- The implementation of the stethoscope hygiene barrier will allow us to comply with the new CDC stethoscope hygiene standards.
- The removal of the disposable stethoscopes resulted in clinician satisfaction.
- Next steps involve expanding the system's use hospital wide.

References

- Kalra S, Amin A, Albert N, et al. Stethoscope hygiene: A call to action. Recommendations to update the CDC guidelines. *Infect Control Hosp Epidemiol*. 2021;42(6):740-742. doi:10.1017/ice.2021.115
- Peacock WF, Kalra S, Vasudevan RS, Torriani F. Aseptic Stethoscope Barriers Prevent *C difficile* Transmission In Vitro. *Mayo Clin Proc Innov Qual Outcomes*. 2021;5(1):103-108. Published 2021 Jan 13. doi:10.1016/j.mayocpiqo.2020.10.002
- Vasudevan R, Shin JH, Chopik J, et al. Aseptic Barriers Allow a Clean Contact for Contaminated Stethoscope Diaphragms. *Mayo Clin Proc Innov Qual Outcomes*. 2020;4(1):21-30. Published 2020 Feb 5. doi:10.1016/j.mayocpiqo.2019.10.010
- Duyu M, Karakaya Z, Yazici P, et al. Comparison of chlorhexidine impregnated dressing and standard dressing for the prevention of central-line associated blood stream infection and colonization in critically ill pediatric patients: A randomized controlled trial. *Pediatr Int*. 2022;64(1):e15011. doi:10.1111/ped.15011
- Buetti N, Rucky S, Schwebel C, et al. Chlorhexidine-impregnated sponge versus chlorhexidine gel dressing for short-term intravascular catheters: which one is better? *Crit Care*. 2020;24(1):458. Published 2020 Jul 23. doi:10.1186/s13054-020-03174-0
- Buetti N, Tabaha A, Timsit JF, Zingg W. What is new in catheter use and catheter infection prevention in the ICU. *Curr Opin Crit Care*. 2020;26(5):459-465. doi:10.1097/MCC.0000000000000754