



AHRQ Safety Program for Intensive Care Units: Preventing CLABSI and CAUTI

Making It Work Tip Sheet Chlorhexidine Bathing and Perineal Cleaning

This “Making It Work” tip sheet provides additional information to help intensive care unit (ICU) team leaders implement effective strategies and achieve goals to reduce central line-associated bloodstream infections (CLABSI) and catheter-associated urinary tract infections (CAUTI) and improve safety culture at the unit level.

Issues

Bathing the entire body with chlorhexidine, also known as chlorhexidine gluconate (CHG), reduces the bioburden on the patient’s skin and thereby reduces the risk of central venous catheter (CVC) site infection and CLABSI. Although the evidence is strong to perform a daily 2% CHG bath, there is significant variation in the practice. While side effects are minimal, skin rashes have been documented. There is minimal research showing resistance to CHG, but it remains important to monitor.

Practice variations for CHG bathing:

- Methods of delivery that result in different concentrations of CHG on the skin, impacting its effectiveness
- Inconsistencies in performing the procedure due to lack of staff knowledge, beliefs/perceptions around CHG bathing, and patient response

Most of the published guidelines for perineal cleansing recommend the use of soap and water for cleansing. However, there is opposing literature about the impact of hospital tap water on hospital-acquired infections that indicates patient bath basins are a source of bacteria. Additionally, bacteria exist in pipes and faucets and can be transmitted via water. ICU teams have an opportunity to significantly reduce patients’ chances of developing a CLABSI or CAUTI through standardization based on the latest evidence for daily bathing and perineal care.

Practice variations for perineal care:

- Performing the procedure
- Solutions used for cleaning any objects or physical area
- Frequency of cleansing (bathing the body)



Suggested Strategies

CHG bathing and Sustainability

- To reduce variation in practice, consider:
 - Introducing an evidenced-based bathing protocol with pictures;
 - The largest study to date on universal decolonization included CHG bathing, which demonstrated a significant reduction in CLABSIs for various pathogens. The [protocol is available on the AHRQ website](#).
 - Standardizing material to perform the bath; and
 - Reducing the number of steps in the process, if possible. Make it easy for the staff to do the right thing.
- Ensure that all products used on the skin are compatible with CHG. If creams and lotions are not compatible, they can inactivate the beneficial impact of CHG.
- Consider renaming CHG bathing to “CHG treatment” or “infection prevention bath” to raise the significance of the therapy to the staff and the patient.
- Provide education for the staff on the science of CHG bathing and the impact on CLABSI reduction.
- Create scripted education that nursing assistants and nurses can use to share the importance of CHG bathing with patients and how it may feel different from the bath they take at home.
- Develop a process for a patient not feeling comfortable with the CHG treatment. Consider moving up the chain of command from nursing assistant, to registered nurse, to charge nurse and clinical nurse specialist/nurse manager to address this.
- Ensure leadership support for staff adherence to the evidence-based products and processes.
- Incorporate other strategies for assessing and improving compliance of CHG bathing:
 - Tracking product use per number of patients per day in the ICU
 - Examining electronic documentation of CHG bathing
 - Including discussion of CHG bathing in daily huddle
 - Periodically assessing CHG bath procedure with staff and retrain as necessary
 - Incorporating status of the CHG bath in the structured handoff as is done with other therapies/treatments

Suggested Strategies

Perineal Care

- Standardize the timing and the procedure for perineal care.
 - The strategy of once-a-day perineal care with bathing and after each incontinence episode was part of the bathing protocol for the cluster randomized multicenter methicillin-resistant staphylococcus aureus reduction study by Huang and colleagues. To date, that is the only study in which standardized timing and method of perineal cleansing demonstrated a reduction in *Candida* and CAUTI infections in males.

- Reduce process variation around the care intervention by choosing a product that safely cleanses the area in a quick, efficient manner allowing the staff to clean from front to back.
 - Bacteria exist in some hospital water supplies, and hospital staff can transmit bacteria both into and via water. Consider not using tap water in the cleaning process, but rather use packaged bath cloths.
- Daily bathing includes perineal care. CHG bathing is recommended in the ICUs to reduce CLABSI, but there were concerns regarding the safety and efficacy of using CHG to clean the perineal area. The Huang and colleagues studies showed the safety and some effectiveness of using CHG to clean the perineal area.
- It is important to remember to change gloves between cleaning an incontinence episode and then performing perineal care.
- Create a standardized process around fecal incontinence management since *E. coli* is one of the organisms associated with many CAUTI infections.
- If using an all-in-one fecal incontinence cleansing cloth with dimethicone, also known as a three-in-one incontinence cloth, do not use it to clean the perineal area in patients with an indwelling catheter. This may increase the risk of a CAUTI.

Conversation Starters

Use SBAR (Situation-Background-Assessment-Recommendation or Request) to raise awareness of the CHG bathing issue to the team. A sample script could be:

Situation: Our ICU has worked diligently to reduce our CLABSI rates, but over the last several months we have seen an increase in our CLABSI rates. The concern is that the maintenance care processes may not be hardwired into practice.

Background: The five additional CLABSIs we have seen after sustaining zero for 9 months have resulted in an ICU length of stay from an average of 3.5 days for our usual patients with a central line to up to 10 days. The mortality rate for this group of five patients was 44 percent compared with the predicted mortality of 20 percent. I know we have very sick patients in our unit, but we have been successful at preventing these infections in the past.

Assessment: Since we were previously successful at maintaining the CLABSI rate, we looked at several evidence-based maintenance care practices to prevent infection to see if they drifted from previous levels of compliance. We examined dressing securement and found that our new dressing and adhesive have resulted in successfully maintaining secure dressings, with 95 percent adherence to protocol. You all are doing such a wonderful job with those practices.

One of the areas of concern is adherence to daily CHG bathing. We examined the documentation of a daily CHG bath and found it to be 70 percent. Evaluation of the amount of product used based on the daily patient census found that the documentation rates were accurate. We interviewed some staff and patients and discovered staff concerns that the patient didn't seem like they were getting cleaned effectively and that patients' skin felt sticky after the bath. Many of the staff said they were told to use CHG for bathing patients now to reduce infection but were not provided with the evidence.

Recommendation: We would love to get a group of you together to work on the various issues around CHG bathing. Based on what we found, it seems like creating a better education plan for the staff is needed. We can consider creating a script for patient education as well as a process for not accepting the bathing. What other areas around this issue of CHG bathing need to be addressed?

Summary

It is important to utilize the evidence when implementing and sustaining CHG bathing for CLABSI reduction. Standardization of the bathing process and perineal care are critical to reducing process variation. Educating about the science around these fundamental care practices and auditing the practices are essential for sustained adoption.

References

1. Cassir N, Papazian L, Fournier P-E, et al. Insights into bacterial colonization of intensive care patients' skin: the effect of chlorhexidine daily bathing. *European Journal of Clinical Microbiology & Infectious Diseases*. 2015;34(5):999-1004. PMID: 25604707.
2. Climo MW, Yokoe DS, Warren DK, et al. Effect of daily chlorhexidine bathing on hospital-acquired infection. *New England Journal of Medicine*. 2013;368(6):533-42. PMID: 23388005.
3. Greene LR. CAUTI prevention and urinary catheter maintenance. *American Nurse*. April 2020;15(4). <https://www.myamericannurse.com/cauti-prevention-and-urinary-catheter-maintenance/>.
4. Huang SS, Septimus E, Hayden MK, et al. Effect of body surface decolonization on bacteriuria and candiduria in intensive care units: an analysis of a cluster-randomized trial. *Lancet Infect Dis*. 2016 Jan;16(1):70-9. PMID: 26631833.
5. Huang SS, Septimus E, Kleinman K, et al. Targeted versus universal decolonization to prevent ICU infection. *New England Journal of Medicine*. 2013;368(24):2255-65. PMID: 23718152.
6. Lo E, Nicolle LE, Coffin SE, et al. Strategies to prevent catheter-associated urinary tract infections in acute care hospitals: 2014 update. *Infect Control Hosp Epidemiol*. 2014;35(5):464-79. PMID: 25376068.
7. Mueller CJ, Castango WJ. Standardizing urinary catheter care and maintenance in the intensive care unit. *American J of Infect Control*. 2018;46(6):s14.
8. Musuuzi J, Purfuerst A, Knobloch MJ, et al. Chlorhexidine Bathing Treatments: A Toolkit to Guide Implementation. Veterans Health Administration (VHA) National Center for Patient Safety, Patient Safety Center of Inquiry and the University of Wisconsin (UW) – Madison Department of Medicine and the UW Health Innovation Program. Madison, WI; 2018. <http://www.hipxchange.org/CHGBathing>.
9. Popovich KJ, Lyles R, Hayes R, et al. Relationship between chlorhexidine gluconate skin concentration and microbial density on the skin of critically ill patients bathed daily with chlorhexidine gluconate. *Infect Control Hosp Epidemiol*. 2012;33(9):889-96. PMID: 22869262.
10. Reagan KA, Chan DM, Vanhoozer G, et al. You get back what you give: Decreased hospital infections with improvement in CHG bathing, a mathematical modeling and cost analysis. *Amer J of Infect Control*. 2019;47:1471-3. PMID: 31400883.

11. Rhee Y, Palmer L, Okamoto K, et al. Differential effects of chlorhexidine skin cleansing methods on residual chlorhexidine skin concentrations and bacterial recovery. *Infection Control & Hospital Epidemiology*. 2018;39(4):405-11. PMID: 29493475.
12. Agency for Healthcare Research and Quality. Universal ICU Decolonization Protocol Overview. <https://www.ahrq.gov/hai/universal-icu-decolonization/universal-icu-overvw.html>. Accessed November 29, 2021.
13. Weber DS, Rutala NA, Miller MD, et al. Role of hospital surfaces in the transmission of emerging health care-associated pathogens: Norovirus, Clostridium difficile, and Acinetobacter species. *Am J Infect Control*. 2010;38(5 suppl 1):S25-S33. PMID: 20569853.

AHRQ Pub. No. 17(22)-0019
April 2022