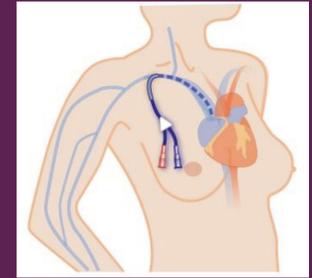


# The Effects of Chlorhexidine Bathing on Reducing Central Line Associated Blood Stream Infections

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## BACKGROUND

- The CDC estimates that 80,000 CLABSIs develop each year in ICU environments, but this estimate climbs to 250,000 CLABSIs per year when entire hospitals are included in the assessment (CDC, 2011)
- CLABSIs have been found to be the second most deadly type of hospital acquired infection
- According to the Joint Commission, the yearly cost of CLABSIs nationally is greater than \$1,000,000,000 and estimated costs per individual patient diagnosed with a CLABSI can exceed \$16,000
- Development of a CLABSI can result in an extended length of hospital stay of up to three weeks, driving up the financial cost of treatment considerably
- These consistently high rates of CLABSIs, despite the adoption of standard prevention techniques by most hospitals, are an indication of the need for more effective interventions

## PICO QUESTION

In adult patients with a central venous access device, does the use of daily chlorhexidine bathing versus use of standard soap and water bathing decrease the incidence of central line infections?



## LITERATURE SEARCH

- A systemic search of published literature was performed in the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and PubMed databases
- The following keywords/phrases were searched: chlorhexidine bathing, central line infection, effects of daily chlorhexidine bathing on central line infection, chlorhexidine bathing AND central line infections, chlorhexidine bathing central, and CLABSI prevention
- 13 articles were reviewed and 8 were included for systematic review
- There was no restraint on the date of publication but only articles printed in English were reviewed
- The John Hopkins Nursing Evidence Based Practice Appraisal was utilized to determine strength of evidence of each study

## LITERATURE REVIEW

### Karki and Cheng (2012)

- Systematic review
- Published in the Journal of Hospital Infection
- Included twenty studies
- Level one strength of evidence
- Five of these studies exhibited improvement in the CLABSI rate, but three studies examined presented no benefit of chlorhexidine bathing in lowering the rate of CLABSIs
- Combined analysis of accessible studies revealed greater than 50% reduction in the rate of CLABSIs with the use of chlorhexidine bathing instead of bathing with soap and water or non-medicated washcloths

### Popovich, Hota, Hayes, Weinstein & Hayden (2010)

- Quasi experimental study
- Performed in a surgical intensive care unit (SICU) at the Rush University Medical Center.
- Level two strength of evidence
- There was no significant difference in the rate of CLABSIs when chlorhexidine was utilized. ( $p=0.57$ )
- There was half the amount of contamination during the blood culture collection process when chlorhexidine was used ( $p=0.003$ )
- Limitation: Significant decrease in average monthly admissions between the soap and water and chlorhexidine periods
- Did not produce results like comparable studies performed in medical intensive care units, quite possibly due to the large wounds many patients have in the SICU, which often times are the primary source of infection, and often are not cultured resulting in misidentified CLABSIs.

### Climo, Yokoe, Warren, Perl, Bolon, Herwaldt, & Wong (2013)

- A randomized controlled study.
- Performed in nine intensive care and bone marrow transplantation units in six hospitals which included a total of 7727 patients between August 2007 and February 2009.
- Level one strength of evidence
- The rate of hospital acquired bloodstream infections was 28 % lower with chlorhexidine-impregnated washcloths ( $p=0.007$ )
- When chlorhexidine wipes were utilized, there was a 90% reduction in the rate of fungal bloodstream infections.

### Dixon & Carver (2010)

- Observational cohort study
- Performed in a nine bed SICU, which involved all patients who were admitted or transferred to the unit
- A level three strength of evidence study
- The sample size was adequate with more than 6000 central line days being studied
- 144 patients were included in the initial three months of the study resulting in a decrease in CLABSI rates from 12.07 CLABSIs per 1000 central line days to 3.17 CLABSIs per 1000 line days. This was an astonishing 73.7% rate reduction ( $p=.0358$ )
- Pre intervention and post intervention CLABSI rates were then reviewed, and a 76% reduction in CLABSIs was noted

### Lopez (2011)

- Quasi-experimental study
- Conducted in a medical-surgical intensive care unit (ICU) at a regional medical center
- Level two strength of evidence study
- Rates of CLABSI infection were reduced by 96% from a pre intervention rate of 5.7/1000 device days to a post intervention rate of 0.2/1000 device days ( $p<.001$ )
- The compliance rate with using the chlorhexidine baths throughout the study was 97%.

### Munoz-Price, Hota, Stemer, & Weinstein (2009)

- Quasi-experimental study
- A study performed at a 70 bed LTACH in Chicago, IL was in process from February of 2006 to February of 2008
- The level of strength of this study is two
- Review of the results showed a 99% reduction of CLABSI rates during the period of time when chlorhexidine bathing was utilized ( $p=.02$ )

## CONCLUSIONS

- CLABSIs are a prevalent and costly issue in the healthcare industry today. CLABSIs are a preventable type of infection, and evidence based interventions should be utilized in the effort to reduce them
- Existing evidence supports the use of daily chlorhexidine bathing as an effective intervention in the prevention of CLABSIs in adult patients with a central venous access device in comparison with traditional soap and water bathing
- Further study on the effectiveness of chlorhexidine bathing is warranted, specifically randomized controlled studies in order to strengthen the evidence in favor of this intervention, and promote the incorporation of this intervention into the plan of care in facilities across the country

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