

ABSTRACT

Background/Objectives: Pediatric patients in the Cardiac Intensive Care Unit (CICU) are at significant risk for catheter related-blood stream infections (CR-BSI) due to multiple central lines including arterial, venous, and transthoracic intra-cardiac. Historical CR-BSI rates in CICU are highly variable with a mean of 7.3 in 2005 and a peak of 18.2 January 2006 (all rates per 1000 line days). During this peak, the BSI Bundles were implemented per Centers for Disease Control (CDC) and Child Health Corporation of America (CHCA) guidelines. Initial reductions in rates ranging from 2.4 to 5.4 were not sustained despite compliance with the bundles and rates spiked to 15. We have estimated that central lines in our CICU are entered approximately 13,000 times per month for blood sampling and medication administration (an average of 26 times per patient, per day). Minimizing this particular risk of infection is crucial to the overall reduction of CR-BSI in this patient population. Because the standard of care for skin asepsis is chlorhexidine due to the increased capacity for residual affect up to 48 hours, it was hypothesized that there would also be a residual affect on tubing hubs; thus minimizing the risk of CR-BSI from accessing lines when used instead of alcohol and result in decreased rates. **Methods:** All patients, ages 0-21 years old, admitted to the 17 bed pediatric CICU from 8/1/06-11/30/06 were included (n=295). Their bedside carts were randomly stocked with wipes containing alcohol or 3.15% chlorhexidine/70% isopropyl alcohol (CHG), utilized for disinfection prior to accessing all lines for blood sampling, medication administration or line flushing. The standards of care for all patients related to central line care were maintained utilizing CHG for skin asepsis during line insertions and CHG containing sponge dressings were maintained per Centers for Disease Control (CDC) and BSI bundle recommendations. CDC guidelines were utilized to diagnose CR-BSI, the primary endpoint. Fisher's 2-tailed analysis was done to determine statistical significance. **Results:** During the 4 month trial period, a total of 9 CR-BSIs were diagnosed in the 295 total patients. The 170 CHG patients had 2 infections versus the alcohol group with 7 infections in 125 patients, p value 0.04. See chart for data comparison. **Conclusions:** Wipes containing CHG were superior to alcohol in their prevention of CR-BSI when used as a disinfectant prior to accessing central lines in this group of high risk pediatric patients. This addition to the BSI bundles was directly correlated to the significant decline in our CICU CR-BSI rate and improved quality of care to the children we serve.

Minimizing the Risk of Catheter Related Blood Stream Infections From Multiple Line Accesses in a Pediatric Cardiac Intensive Care Unit

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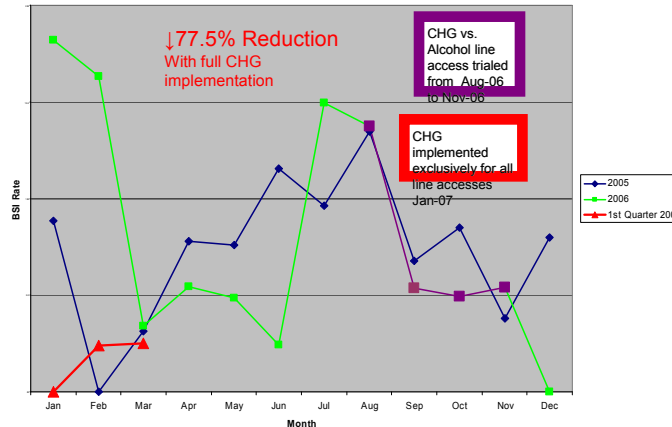
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INTRODUCTION

- Patient Population
 - Neonates to 20 year olds in a 17 bed CICU
 - High acuity patient population
 - High central line utilization
 - >90% of patients with central lines (often multiple)
 - >11,000 total central/arterial lines used per year
 - Frequent line accesses
 - Blood draws, medication administration, flushes
 - Estimated access totals 13,000 times per month
 - Average of 26 times per patient, per day
- Historically high/variable BSI rates (see graph)
- BSI Bundles instituted without sustained goal attainment
- Chlorhexidine vs. Alcohol Trial
 - Purpose: to determine best practice and potential ability of CHG to reduce the risk of CR-BSI (Catheter Related-Blood Stream Infections) from frequent line accesses**

CICU CR-BSI RATES



Surgical Patient Population
 25% Neonates (<30days old)
 35% Infants (>30 days to 1 year)



CONCLUSIONS

- Chlorhexidine in the form of 3.15%/70% isopropyl alcohol was superior to alcohol as a disinfectant prior to accessing lines
 - CR-BSI rate reduction by 77.5%
 - Sustained low rates since full implementation with complete removal of alcohol wipes from patient bedside carts.
 - There have been no reactions, burns, or skin irritation associated with CHG use in our neonatal and pediatric patient populations
- BSI bundle implementation alone did not sustain reduced CR-BSI rates
- CHG for line access disinfection should be considered a valuable addition in implementing comprehensive BSI Bundle programs

METHODS

- All patients admitted to the CICU for 4 months (8/06-11/06) were included in the trial
 - no exclusions
 - Neonates were included without restricting the use of CHG to hubs
- Random assignment of CHG or Alcohol to bedside cart, utilized for duration of CICU stay
 - Carts stocked with wipes containing alcohol or CHG (3.15% chlorhexidine/70% isopropyl alcohol)
 - Assigned product used for all line accesses
- BSI Bundles maintained on all patients
 - Including CHG for line insertions and maintenance

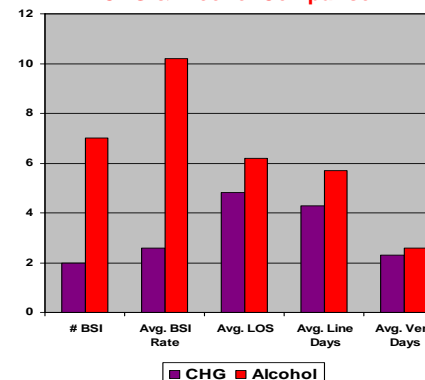
RESULTS

Comparison of CHG & Alcohol Groups

- Total Patients Enrolled
 - CHG 170
 - Alcohol 125

	CH G	Alcoho I	P Value
# infections	2	7	0.04
BSI Rate	2.6	10.2	0.02
Avg. LOS	4.3	4.8	0.54
Avg. Line Days	4.3	5.7	0.34
Avg. Vent Days	2.3	2.6	0.65

CHG & Alcohol Comparison



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