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J. Matthias Walz
University of Massachusetts Medical School

Richard T. Ellison III
University of Massachusetts Medical School

Helen Flaherty
University of Massachusetts Medical School

See next page for additional authors

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Authors

Comments
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Effect of a Multidisciplinary Team Approach to Eradicate Central Line Associated Blood-Stream Infections (CLABSI)

J. Matthias Walz, Richard Ellison, Helen Flaherty, John McIwaine, Deborah Mack, Kathleen Whyte, Karen Landry, Stephen Baker and Stephen Heard for the CCOG Research Group* UMass Memorial Medical Center and University Medical School, Worcester, MA

Abstract # 583

Introduction: CLABSI remains a significant problem in the intensive care unit. Hypothesis: A multimodal approach for the insertion and care of central lines will prevent central line associated bloodstream infections (CLABSI). Methods: A Critical Care Operations Committee was formed to transition care in eight intensive care units (ICUs) on an academic medical center in 19924. One goal was to reduce CLABSI. Using evidence-based medicine, a clinical practice guideline was developed that incorporated the use of maximum barrier precautions, maximum sterile barrier precautions, chlorhexidine for catheter insertion, catheter hubs, and daily assessment. As part of the effort to reduce CLABSI, a recommendation to use ultrasound guidance when inserting a CVC in the internal jugular vein, was made. Out of the pool of multidisciplinary team members, 11 were selected to become members of the CLABSI steering committee. Committee meetings were held monthly with the hospital epidemiologist and缠CVC days were tracked. Rates of CLABSI were followed from 9/2004 through 7/2011. The Spearman correlation coefficient was used for statistical evaluation. A p<0.05 was considered significant: Results: CLABSI rates per 1000 catheter days declined dramatically from 2004 to 2017. Poisson regression was performed using Log-Poisson. Linear models were fit using the Mixed procedure (SAS).

Discussion

Similar to other published reports, the primary finding of our study is that a multimodal approach to the insertion and care of central venous catheters is highly effective in reducing infection rates of CLABSI. However, our study is different in several important ways from previous investigations. Other investigations included a single ICU that did not use antibiotic catheters7,8 or any ICU that did not use maximum barrier precautions,7 whereas from 2010 to 2011 it dropped significantly (p=0.0015). However, the number of PICCs did not significantly change in frequency over time (Figure 2). Table 3 shows the longest CLABSI-free time and APACHE III scores for individual units. Microbiology data are presented in Table 4. Microbiology data are presented in Table 4. Table 3 shows the longest CLABSI-free time and APACHE III scores for individual units. Microbiology data are presented in Table 4. Microbiology data are presented in Table 4.

References


Results

From 2004 to 2011 the rate of CLABSI declined by 5.86 to 0.6 infections per 1000 catheter days (p<0.0001). There was a significant consistent downward trend (0.4 fold decrease per year) (Figure 1) (p<0.0001) (1). The number of catheterizations differed significantly by type, with approximately eight times as many CVCs being performed than peripherally inserted central catheters (PICCs) (p<0.0001). From 2009 to 2010 catheter usage significantly increased (p<0.009), whereas from 2010 to 2011 it dropped significantly (p<0.0015). However, the number of PICCs did not significantly change in frequency over time (Figure 2). Table 3 shows the longest CLABSI-free time and APACHE III scores for individual units. Microbiology data are presented in Table 4. Microbiology data are presented in Table 4.

Methods

In 2004, a critical care operations committee (CCOC) was formed at UMass Memorial Medical Center to provide standardization for all our critically ill patients by developing clinical practice guidelines based on the best published medical evidence.e- This committee is multidisciplinary and includes physicians, nurses, medical and physical therapists, hospital administrators and patient representatives. One of the earliest developed subcommittees was a steering committee for the rate of CLABSI. Interventions (Table 1) that were incorporated into the initiative over time included an education program (that also emphasized hand hygiene), use of a dedicated catheter that has all of the necessary elements for the introduction of maximum barrier precautions, pre-procedural time out, use of a check list during catheter insertion, empowering the nurse to decide to stop the procedure if the steps in the checklist were not followed, incorporation of chlorhexidine solutions for skin preparation and chlorhexidine sponges for catheter dressing, tracking of high risk catheters (i.e. those inserted during emergent or in the femoral vein), treating a CVC as a critical event and holding a root cause analysis after each one to discuss the cause, use of the subclavian vein as the preferred site of catheter insertion, documentation of the catheter insertion with a standardized procedure note, and daily assessment as to the need of the central venous catheter.

Discussion

Central venous catheters are essential for the care of the critically ill patient. However, serious complications can occur with their use. One such complication is central line associated bloodstream infection (CLABSI). Although the attributable mortality and care of central lines is likely unaffected, the economic costs and morbidity can be substantial.

In 2000, the estimated number of CLABSI in intensive care units (ICU) in the United States per year was 80,000. Since that time, both behavioral and technological interventions have resulted in reduced CLABSI rates. For example, an estimated 25,000 fewer CLABSI occurred in 2009 in US ICUs than occurred in 2001a. Hand hygiene, education programsb and use of maximum barrier precautionsc, and check lists are some of the behavioral changes that have resulted in reductions in CLABSI. Technological advances include aqueous or alcoholic chlorhexidine solutions for skin preparation, chlorhexidine patches for catheter site care and anti-tie and antibiotic impregnated cathetersd. Although these aforementioned studies showed significant reductions in CLABSI, the rates remain relatively high. In this study we describe our approach toward reducing CLABSI rates in the intensive care units at UMass Memorial Medical Center, Worcester, MA.

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