BACKGROUND

In October 2008 the Center for Medicare and Medicaid Services discontinued reimbursement for costs associated with Central Line-Associated Bloodstream Infections (CLABSIs); thus hospitals are implementing interventions, such as the Institute for Hospital Improvement (IHI) central line care bundle, to reduce these preventable complications. In addition, the Joint Commission’s 2008 National Patient Safety Goal MPG.07.04.01 mandates the implementation of evidence-based practices to prevent central line-associated bloodstream infections. These developments have resulted in a shift in hospital strategies to not just lowering CLABSI rates but setting goals to achieve a zero CLABSI rate.

METHOD

To determine if an antimicrobial needleless connector can assist in further decreasing an already low adult ICU PICC CLABSI rate, an antimicrobial version of a clear, swabable positive displacement needleless connector was trialed. Several types of antimicrobial catheters are available, including antibiotic coated or impregnated and silver coated or impregnated catheters. There is conflicting published evidence of the safety and efficacy of these antimicrobial catheters in reducing CLABSI rates.1 One concern is the potential of developing resistant strains of pathogens with antibiotic impregnated catheters.2 Silver is a safe antimicrobial agent with no toxic effect on humans, and pathogens are not known to develop resistance to the antimicrobial effects of silver.3 Next silver coated or impregnated catheters utilize silver ion technology. Silver ions are released from the antimicrobial device in the presence of moisture. The silver ions attack multiple targets within the microbes and prevent the pathogens from growing into harmful populations. A study comparing the efficacy of a standard polyurethane catheter with a silver impregnated catheter concluded that the silver impregnated catheter lead to a marked reduction of bloodstream infections.4 Antimicrobial catheters represent a significant additional cost over non-impregnated catheters. Recently needleless connectors utilizing similar antimicrobial technology have become commercially available. Antimicrobial needleless connectors represent a significantly less costly alternative to antimicrobial catheters, however there is little published evidence as to their effectiveness in reducing microbial contamination and CLABSI rates.5

RESULTS

This study was conducted as a prospective time series surveillance. A three hundred seventy-seven bed county medical center facility implemented several interventions over a three year period to lower CLABSI rates. These interventions included: Implementation of a dedicated PICC Team which has now grown to 4 RN and 1 LSN. Implementation and reinforcement of strict adherence to the Institute for Hospital Improvement (IHI) Central Line Bundle (CLB) Use of ultrasonic to place central lines PICC Team required to perform central line dressing changes Use of a chlorhexidine impregnated disk to protect the insertion site Use of a swabable, clear, positive displacement needleless connector to assist with reducing microbial regrowth and encourage clinicians to practice proper swabbing and flushing technique

CONCLUSIONS

The results of this small study suggest an antimicrobial, positive displacement needleless connector can assist in reducing CLABSI rates. This is in line with several other studies which have concluded that the silver impregnated catheter lead to a marked reduction of bloodstream infections.4 Antimicrobial needleless connectors may be a less costly alternative to antimicrobial catheters. These interventions resulted in a reduction of the Adult ICU PICC CLABSI rate to an average of .29% between January and July 2009. Analysis indicated the few CLABSIs that did not utilize the antimicrobial device, the total CLABSI rate experienced in Q1 2009 was 0.28%. The pre-intervention CLABSI rate was 0.29%. This represents a 90% decrease in the CLABSI rate.

REFERENCES

3. The Joint Commission's 2008 National Patient Safety Goals MPG.07.04.01

ACKNOWLEDGMENT

The author would like to acknowledge Sylvia I. Gnass, Infection Preventionist, for her assistance in data verification and analysis. Andre Schotte is or has been a clinical consultant/researcher for Bard, Inc., Medrad and Genzyme. This clinician and the facility at which this study was completed do not endorse or promote any product or device.