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**Adverse Catheter-related Bloodstream Infection Rates Associated with a Change in Needlefree Connectors and a Subsequent Return to Baseline Values when Reversed: *An Argument for Change is not Always Good.***

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## **INTRODUCTION**

University Medical Center is a 355 bed Acute Care Teaching Hospital located at the Arizona Health Sciences Center, adjacent to The University of Arizona in Tucson, Arizona. AHSC includes the colleges of Medicine, Nursing, Pharmacy and Public Health as well as the physicians from University Physicians Healthcare. UMC serves the southern Arizona community and was ranked in the 2008 US News and World Report amongst America's top 50 best Hospitals for a variety of specialties.

## **BACKGROUND**

During the past three years, the Society for Hospital Epidemiologists of America (SHEA), and the Association for Practitioners in Infection Control (APIC) have presented an issue about the temporal relationship between a rise in Catheter-related Bloodstream Infections (CRBSIs) and a change in their needleless connection device. The healthcare facilities involved then switched back to their original devices and observed their CRBSI return to baseline before the conversion. Many articles have been published in medical journals regarding the issue, and communication with several of the authors directly to gain more knowledge of their experience was done. Healthcare facilities felt this observation significant enough to inform the Food and Drug Administration from which a safety alert was issued regarding the product.

At UMC we have experienced the same challenge. We switched to the SmartSite® (Cardinal Health) NeedleFree Connector in 2003, and since then, our CRBSI rates had continued to rise above threshold. The attributable cost of a hospital acquired bloodstream infection costs anywhere from \$34,508.00 - \$56,000.00 per incident. In 2006 and 2007 our rates remained above the National Nosocomial Surveillance System (NNIS) thresholds for targeted populations.

Upon investigation, staff members shared with us that they were diligently disinfecting the connectors; the practice known as "scrub the hub". However, a study that was published in the Infection Control and Hospital Epidemiology Journal also claimed that despite intense education and adherence to infection control practices, there was no improvement in bloodstream infection rates. The article prompted us to aggressively seek administrative support in order to

switch back to our original device, the CLAVE® Needlefree Connector (ICU Medical, Inc.). This motion was unanimously approved at the Infection Prevention Committee meeting of July 25, 2007. Based on a review of the literature, FDA alerts, conference presentations, round table discussions, and unnecessary risk to our patients, we decided that to further delay the conversion back to CLAVE was clinically unacceptable.

## **IMPLEMENTATION**

UMC started implementation of the CLAVE Connector in September 2007. We worked very closely with the ICU Medical Product Specialist Team to bring the product in to our facility and to educate staff. The Team was at UMC on a number of occasions, over several weeks, and worked to educate staff, days, nights and weekends. They not only dealt with education but were also available and here almost immediately when any issues arose concerning tubing, tube sets pumps, end-user issues, etc. Official surveillance of CRBSI was scheduled to begin in October of 2007.

## **RESULTS**

Almost immediately UMC observed a remarkable decrease in CRBSI following the implementation of CLAVE. We observed a 42% drop in our CRBSIs between 4th quarter 2007 and 1st quarter 2008, and another 47% decrease between 1st and 2nd quarter 2008. The more recent drop was attributed to the Bone Marrow Transplant Unit which originally declined the CLAVE implementation. The BMT unit protocol was previously to do all intravenous infusions hub to hub. Following the rest of the UMC's success with CLAVE, they were also convinced and made the conversion to CLAVE in early 2008.

## **CONCLUSIONS**

UMC currently use the CLAVE for most of the hospital and the MicroCLAVE® in our BMT Hematology Oncology unit, Home Infusion, Home Health, and Outpatient Cancer Clinics. We are not only pleased with the drastic improvement in our CRBSI rate following the implementation of CLAVE, but for outstanding support that was given from the ICU Medical Team. UMC is happy to recommend the CLAVE and ICU Medical, Inc. to other healthcare organizations encountering challenges in their infection prevention campaigns.



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