Reduction of Central Line Associated Bloodstream Infections through the Use of a Designated Unit-Based Infection Control Nurse
University of Maryland Medical Center - Surgical Intensive Care Unit

Program/Project Description.
The Surgical Intensive Care Unit (SICU) at the University of Maryland Medical Center (UMMC) is a 19-bed critical care unit in a tertiary care medical center that is designed to provide the highest level of care to patients in Maryland undergoing complex surgery or with other critical illnesses. The SICU had a high central line utilization rate and subsequently, a high central line-associated bloodstream infection (CLABSI) rate. Despite the implementation of best practices, such as the use of a central line insertion checklist, a central line cart, and maximal sterile barrier precautions, the SICU's CLABSI rate was still above the NHSN benchmark of 2.7 per 1000 central line days. In FY 2010, the target rate for CLABSI in the SICU was 2.3 per 1000 central line days; while the actual CLABSI rate for FY 2010 in the SICU was 5.5 per 1000 central line days. The target rate for FY 2011 has been set at 2.3 per 1000 central line days. To achieve the set target rate the SICU initiated an aggressive plan to reduce CLABSIs. This plan included a unit-based nurse to be designated as the Infection Control Nurse (ICN). The ICN is present on the unit 5 days per week to assist with insertion and removal of central lines, provide infection prevention education to staff, and conduct audits of infection control practices. These practices include compliance with hand hygiene and contact isolation precautions, as well as central line dressing surveillance. The SICU nurse manager appointed the ICN role to SICU bedside nurses who were leaders on the unit and passionate about reducing the SICU’s CLABSI rate. The goals of this process improvement project were to reduce the CLABSI rate and to change the culture of the SICU by empowering nurses to stop central line insertions when aseptic technique was breached and to stop any procedure if best practices for infection control were not followed.

Process.
The ICN expectations were established by the SICU leadership team including the SICU nurses, SICU nurse manager, director of nursing for medicine and surgery, and SICU attending physicians. With the guidance from the Department of Infection Control and Hospital Epidemiology, the SICU nurse manager chose a core group of SICU bedside nurses to implement the ICN role. The expectations were outlined and explained to each ICN and then they were trained by the infection control practitioners and SICU attendings on how to ensure aseptic technique during central line insertion. The ICNs were also trained on how to address the situation if aseptic technique was breached. As the weeks progressed, the ICN role was expanded to meet unit needs. Each week, the ICN reported off to the oncoming ICN by summarizing the weeks events and relaying any changes to the role that occurred over the previous week. After several weeks, the ICN became a stable role on the unit; both doctors and nurses would seek out the ICN for central line placements as well as for other infection control advice.

Solution.
In July 2010, a designated unit-based ICN was assigned to the SICU 5 days per week. This nurse was expected to be present at every central line insertion, ensure that blood cultures were obtained from peripheral veins (and not routinely drawn from central lines), conduct daily central line dressing surveillance, and ensure that all central lines from outside hospitals were removed and replaced within 24 hours of admission to the SICU. They were also responsible for upholding the SICU’s zero tolerance policy for breaches in hand hygiene practices and compliance with isolation precautions. They enforced the zero tolerance policy for ensuring that needleless access ports were scrubbed with friction for 15 seconds with 70% alcohol prior to use. The ICNs also were charged with educating SICU nurses on the best practices associated with CLABSI reduction and ensuring that the central line checklist was completed at every central line insertion. They provided daily education at the shift huddles and made sure that all SICU nurses watched the central line insertion tutorial video and completed the post assessment quiz.

Measurable Outcomes.
Since the implementation of the ICN role in the SICU there have been no CLABSIs in five months. The number of central line days decreased by 20% as compared to the same quarter a year ago (1292 central line days vs 1038 central line days, respectively). The unit-based ICNs in collaboration with others have significantly reduced the number of CLABSIs in the SICU, taught nurses to advocate for the removal of central lines, and empowered nurses to speak up if best practice is not being followed.
Sustainability.
The designated unit-based ICN is still being utilized in the SICU and there are plans to continue its use throughout the fiscal year. There are also plans at UMMC to create infection control nurse champions in other units throughout the hospital to further CLABSI reduction efforts due to the success the SICU has experienced in the reduction of CLABSI by using a unit-based ICN.

Role of Collaboration and Leadership.
Teamwork played a major role in the success of the ICN. The unit-based ICN collaborated daily with both the SICU doctors and nurses to coordinate daily line placements and discuss removal of central lines. They also worked individually with SICU nurses during central line dressing surveillance providing on-the-spot education if the central line dressing was soiled and needed to be changed. The ICNs worked with both the doctors and nurses during central line placement providing on-the-spot education to ensure that aseptic technique was followed. The ICNs have also worked closely with the infection control practitioners to help investigate potential CLABSI.

UMMC's senior leadership fully supported the SICU's CLABSI reduction efforts. Senior leadership financially supported the role as well as empowered the SICU nurses to continue in their CLABSI reduction efforts. To show their appreciation, the Medical Centers Chief Executive Officer, Chief Medical Officer, Chief Nursing Officer, as well as the Director of Medical and Surgical Nursing hosted a celebration for the SICU staff after 15 weeks without a CLABSI.

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UMMC SICU
Central-Line Related Blood Stream Infection (CLBSI)
July 2007 through October 2010

average 427 catheter days/month

Rate per 1000 CL Days

SICU Monthly Rate  SICU Annual Mean Rate  NHSN Mean Rate