**Organization:** University of Maryland Medical Center, Surgical Intensive Care Unit

**Solution Title:** Reduction of Central Line Associated Bloodstream Infections through the Use of a Designated Unit-Based Infection Control Nurse

**Program/Project Description, including Goals:** The Surgical Intensive Care Unit (SICU) is a 19-bed unit in a large, urban, 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. Despite use of best practices, the SICU had high central line high central line-associated bloodstream infection (CLABSI) rate, which was above the National Healthcare Safety Network (NHSN) benchmark of 2.7 per 1000 central line days. Thus, we initiated an aggressive plan that included a designated unit-based Infection Control Nurse (ICN). Present on the unit 3 to 5 days per week, the ICN assists with insertion and removal of central lines, provides infection prevention education to staff, and audits infection control practices. Audited practices include compliance with hand hygiene and contact isolation precautions and surveillance of central line dressings. The ICN is appointed by the nurse manager, who chooses SICU bedside nurse leaders who are passionate about reducing the CLABSI rate. The overall goal of this process improvement project is to change culture around central line management and empower nurses to stop central line insertions when aseptic technique is breached and stop any procedure where best practices for infection control are not followed.

**Process:** Expectations for the ICN role were established by the SICU nurse manager, nurses and physicians along with the Director of Medical/Surgical Nursing and several infection control practitioners. With guidance from the Department of Infection Control and Hospital Epidemiology, the SICU nurse manager chose a core group of bedside nurses to implement the ICN role. Role expectations were explained to each ICN, followed by training provided by infection control practitioners and SICU attendings on how to ensure aseptic technique during central line insertion. The ICNs also were trained on how to best address situations when aseptic technique was breached. Over time, the ICN role expanded to become an expert resource for staff. Both doctors and nurses began to seek out the ICN for central line and other infection control advice.

**Solution:** A designated unit-based ICN is assigned to the SICU 3-5 days per week. The ICN is expected to be present at every central line insertion, ensure that blood cultures are 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 are removed and replaced within 24 hours of admission to the unit. The ICN is also responsible for upholding a zero tolerance policy for breaches in hand hygiene, isolation precautions, and scrubbing of needleless access ports with 70% alcohol and friction for 15 seconds prior to use. The ICN is charged with educating the nurses on the best practices associated with CLABSI reduction and ensuring that central line checklists are completed with every central line insertion. The ICN attends daily multidisciplinary rounds, provides daily education at shift huddles and assures that all SICU nurses watch a central line insertion tutorial video and complete a post assessment quiz.

**Measurable Outcomes:** Since implementation of the ICN role in July 2010, the SICU CLABSI rate has decreased substantially. The rate dropped 80% from 5.5 infections per 1000 central line days in 2010 to 1.1 per 1000 central line days in 2011. And, the decrease has been sustained with rates of 1.8
and 0.5 per 1000 central line days in 2012 and 2013, respectively. Also during this time, all nurses have become more active in advocating for removal of central lines, and speaking up when best practices are not being followed.

**Sustainability:** The SICU sustained the 80% reduction in CLABSI that was achieved in 2011 through present. The combined rate for 2011-2013 is 1.1 per 1000 central line days, which is below the NSHN benchmark of 1.4 per 1000 central line days. Further, the unit has currently had over 39 consecutive weeks without a CLABSI (January 30, 2013 – present November 8, 2013). A culture change appears to have occurred.

**Role of Collaboration and Leadership:** Teamwork played a major role in reducing the SICU CLABSI rate. The unit-based ICN collaborated daily with both the doctors and nurses to coordinate daily line placements, discuss removal of central lines, and provide on-the-spot education. They worked individually with SICU nurses during central line dressing surveillance to educate about appropriate dressing change practices. The ICNs worked closely with the infection control practitioners to help investigate potential CLABSIs. Our senior leadership financially supported the ICN role to reduce CLABSI and was key to empowering SICU nurses to intervene when breeches in best practices were observed.

**Innovation:** The ICN role is an innovative approach to CLABSI reduction that utilizes a unit-based nurse to focus on CLABSI prevention and infection control practices that also include CAUTI and VAP. The SICU realized a significant reduction in CLABSI, CAUTI and VAP after the ICN role was implemented.

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