





Overview

Project was conducted at University of Texas Southwestern Medical Center – University Hospital Zale Lipshy in Dallas, Texas, in a 20-bed Surgical Intensive Care Unit with a majority focus on a Neurosurgery/Neurology patient population. Our goal was to reduce the rate of CLABSI to 0. Team Members include:

- SICU Clinical Manager
- **SICU Medical Director**
- **SICU Educator**
- SICU Nurses
- Infection Control Practitioner
- **Director of Neuro Science Services**

Background

Hospital-wide and unit-specific HAI rates are monitored on monthly basis at UTSWMC. For CLABSI, the Infection Control Practitioner determines the number of infections and reports data to unit managers and educators. Each quarter the SICU is provided with graphs that show it's CLABSI rates as compared to the 50th and 90th percentile benchmarks for other ICU's according to the NHSN. Recent CLABSI rates up to 2008 indicated the SICU was measuring well above the 50th percentile. The following quality tools were utilized to reduce these rates:

- PDCA methodology was used to address problem.
- During 2008 a Failure Mode and Effects Analysis (FMEA) team was created to analyze current practice and bring up to current standards.
- Implementation of an insertion checklist resulted from the FMEA, but outcomes did not improve sufficiently.
- Brainstorming activities conducted to analyze institutional practices with IV tubing and dressing changes.
- Review of the literature was conducted and the central line care module subsequently revised. This also contributed to many of the interventions being implemented in 2010.
- The presence of CLABSI were determined by the guidelines established by the CDC's National Healthcare Safety Network (NHSN).
- Rates were reported as the number of infections observed per 1,000 central line days.

Reduction of Central Line-Associated Bloodstream

Interventions

A number of initiatives were implemented to achieve the stated goal: January of 2010: Formal "kick-off" meeting in the SICU led by the Clinical Manager, ICU Educator, and Clinical Coordinators of the Unit. The VP of Performance Improvement & Clinical Education attended and spoke to underscore gravity of initiative to frontline staff. New hygiene protocol implemented—all SICU patients bathed daily with chlorhexidine-infused wipes. New color-coded central line hubs used, yellow hubs were placed on Tuesdays and green hubs on Fridays, to increase accountability with bi-weekly change policy. **Procedure cart created for use with central line placement procedures.** ICU staff reported issues with insertion practices in OR—Collaborative meeting conducted between SICU Manager, OR Director, Chief Anesthesiologist, and SICU/OR Educators to ensure OR was using same best practice standards as SICU with regards to line insertion and care. SICU Clinical Manager met with SICU Medical Director monthly to ensure line necessity was being reviewed during daily rounds.

All staff empowered with ability to halt procedure if best practice standards were not being followed. This was supported by ICU Medical Director and Chief Medical Officer. Review of compliance with central line insertion/maintenance bundle conducted each shift (12 hours) by SICU charge nurse and compliance rates posted in the Unit/discussed at staff meetings Importance of CLABSI prevention measures constantly given a high profile in Unit discussions, emails, and staff meetings.

Results

The SICU went nearly 2 years without observing a CLABSI.

Figure 1 exhibits progress in incidence reduction since 1st Quarter of 2007. The number of CLABSI is shown for each quarter since beginning of 2007. In July of 2008 the central line checklist was implemented. The rates showed sustained decline after an initial spike in 4th Quarter, 2008. The IV hubs were changed to lessen "dead space" in Q3 2009. In Q1 of 2010 the SICU kicked off official initiative and implemented daily chlorhexidine baths, color-coded IV hubs, central line procedure cart, and per-shift bundle compliance audits.

SICU went from July of 2009 through June of 2011 without incidence of CLABSI.

Infection Rates in the SICU

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According to CDC, attributable cost of acquiring a CLABSI in hospital settings ranges from \$5700 to \$23,000. During 12 months between August of 2008 and July of 2009, the SICU recorded total of 9 CLABSI over 3,493 central line days (2.6 infections per 1,000 days with a central line). In the year prior the rate was 2.2 (8 CLABSI in 3,618 central line days). *Figure 2* shows cost avoidance associated with reduction in CLABSI over time.



----- Number



FIGURE 1: CLABSI INCIDENCE FROM 1Q07-2Q11

Revenue Enhancement/Cost Avoidance

Conclusions and Next Steps

The results highlight fact that inappropriate insertion technique and line care can be potential sources of infection. In addition, increased steps in eliminating potentially harmful flora on skin of ICU patients during daily hygiene can help eliminate risk for infection. A combination of heightened awareness with increased accountability, empowerment of frontline staff, and opportunity for feedback provides important downward pressure on CLABSI rates in ICU settings.

Steps taken in this project have contributed to current progress in UTSWMC's organizational goal of reducing CLABSI rates. This initiative has already been modeled in other intensive care units inside the hospital, and, as progress is monitored, will be rolled out to other areas within the institution that care for patients with central lines.