

# Reducing Central Line Bloodstream Infections

## The Problem

Central line-associated bloodstream infections (CL-BSIs) result in increased mortality, prolong hospitalization by up to a week, and are highly preventable. In 2005 this was identified as an opportunity for breakthrough performance.

## Aim/Goal

To strive for elimination of CL-BSIs by improving compliance with insertion, care and maintenance of central lines.

## The Team

Since central lines are integral to the modern practice of critical care, forming the right Change Team was critical. In addition to hospital administration, infection control, specialty line nurses, and purchasing, this team included:

- Physicians from medical critical care, surgical critical care, anesthesia, emergency medicine, interventional radiology, and nephrology
- Nurses from critical care, emergency medicine, and interventional radiology
- Representatives of graduate medical education.

## The Interventions

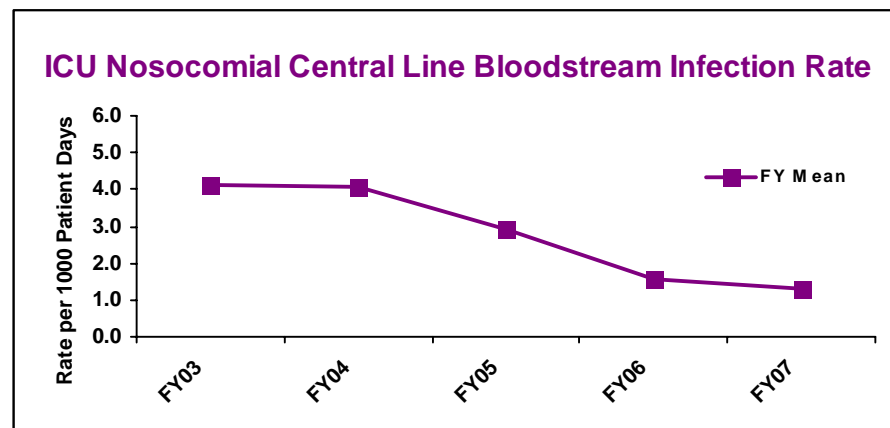
Chief components of the first phase of this initiative included:

- Standardization of insertion practices by a checklist-based procedure note that prompted clinicians to use full barrier precautions, chlorhexidine site preparation, preference for subclavian sites, standardization of line site care, daily assessment for line removal.
- A central line kit including all necessary personal protective equipment, barrier precautions, and the central line checklist was created to improve compliance with insertion practices.
- Specially trained nurses routinely rounded on all patients with central lines and directly observed line insertions to ensure proper practice.

- Implemented a protocol that required removal of all central lines placed in other institutions or placed at BIDMC without a fully completed checklist, since we could not ensure that those lines were inserted under optimal conditions.
- Approached all nosocomial central line-associated bloodstream infections as sentinel events, performed a multidisciplinary root cause analysis on each. In addition to using these analyses to learn how to improve global practices, departmental chairs discussed them directly with the attending physician responsible for the infected line's placement.

## The Results/Progress to Date.....

Since 2003 nosocomial central line-associated bloodstream infections in ICU patients per 1000 patient days fell from a mean of 4.14 to 1.30 in 2007.



## Lessons Learned

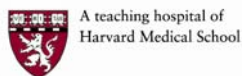
Support from administration and clinical leadership, including having the goal of CL-BSI reduction incorporated into the BIDMC annual operating plan gave the team the needed support for success.

## Next Steps/What Should Happen Next:

Continued attention by staff at all levels helped to sustain improvement efforts. New opportunities for improvement continue to be identified. A guideline for standard practice for rewiring central lines is under development by the team.



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