Central Line-associated Bloodstream Infections (CLABSI) in ICUs and select wards

NQF#: 0139

Developer: Centers for Disease Control and Prevention (CDC)

Data Source: Leapfrog Hospital Survey; CMS

Description: Standardized Infection Ratio (SIR) of healthcare-associated, central line-associated bloodstream infections (CLABSI) among patients in intensive care units (ICUs), neonatal ICUs (NICUs), and medical, surgical, and medical/surgical wards.

Rationale: An estimated 248,000 bloodstream infections occur in U.S. hospitals each year and a large portion of these are associated with the presence of a central vascular catheter. Bloodstream infections are usually serious infections typically causing a prolongation of hospital stay and increased cost and risk of mortality. CLABSIs are largely preventable through proper management of the central line using the CDC's *Guidelines for the Prevention of Intravascular Catheter-Related Infections.*

Evidence for Rationale:
- Klevens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007; 212:160-66.
- Centers for Disease Control and Prevention (CDC). Vital Signs: Central Line-Associated Blood Stream Infections—United States, 2001, 2008, and 2009. Morbidity and Mortality Weekly Report (MMWR) 2001 Mar; 60(8):243-48.
- Centers for Disease Control and Prevention (CDC). Guidelines Library. 2017. https://www.cdc.gov/infectioncontrol/guidelines/index.html

Numerator: Total number of observed healthcare-associated CLABSI among patients in select ICUs, NICUs, and medical, surgical, and medical/surgical wards.

Denominator: Total number of expected CLABSIs, which is calculated using a negative binomial regression model generated from nationally aggregated 2015 data and the facility's number of central line days, location within the hospital, medical school affiliation, bed size, facility type, and birthweight (for NICU locations only).

Impact: An estimated 30,100 central line-associated bloodstream infections occur in intensive care units and wards of U.S. acute care facilities each year. Furthermore, CLABSIs are important and deadly infections, with a reported mortality rate of 12%-25%.

Evidence of High Impact:
- CDC National and State Healthcare-Associated Infections Progress Report, published March 2014, available at www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf
- Centers for Disease Control and Prevention (CDC). Vital Signs: Central Line-Associated Blood Stream Infections—United States, 2001, 2008, and 2009. Morbidity and Mortality Weekly Report (MMWR) 2011 Mar; 60(8):243-48.

Opportunity: Although the CDC has reported declines in the number of CLABSIs between 2008 and 2013, opportunity for improvement still exists based on the coefficient of variation for the measure.

Citations for Opportunity:
- CDC National and State Healthcare-Associated Infections Progress Report, published March 2014, available at www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf

Evidence:
- Evidence ratings vary from Class A-I to B-II.
    - Class I: Evidence from 1 or more properly randomized, controlled trial.
    - Class II: Evidence from 1 or more well-designed clinical trial without randomization, from cohort or case-controlled analytic studies, from multiple time-series studies, or from dramatic results of uncontrollable experiments.
    - Class III: Evidence from opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees.
    - Class A: Good evidence to support a recommendation for use.
    - Class B: Moderate evidence to support a recommendation for use.
    - Class C: Poor evidence to support a recommendation.

Citations for Evidence:
- Marschall J, Mermel LA, Classen D, et al. Strategies to prevent central line-associated bloodstream infections in acute care hospitals. Infect Control Hosp Epidemiol 2008 Oct; 29 Suppl 1:S22-30.
- O'Grady NP, Alexander BS, Burns LA, et al. Guidelines for the prevention of intravascular catheter-related

infections. Clin Infect Dis 2011 May; 52(9):162-93.