

Central Line-Associated Bloodstream Infection (CLABSI)

Agent: Bacteria, virus, or fungus

Mode of transmission: A CLABSI is a central line-associated bloodstream infection. A central line is a flexible tube that is inserted near the patient's heart or into one of the large veins or arteries that can be used to give fluids or medications or measure the amount of fluid in the body. Because a central line is located in a blood vessel, any introduction of an infectious agent during central line insertion, maintenance, or removal may lead to a bloodstream infection.

Signs/symptoms: A positive blood culture and fever, chills, low blood pressure, and/or redness or tenderness at the central line insertion site. For patients less than one year of age, symptoms may also include fever, hypothermia, apnea (suspension of breathing), and/or bradycardia (slow heart rate).

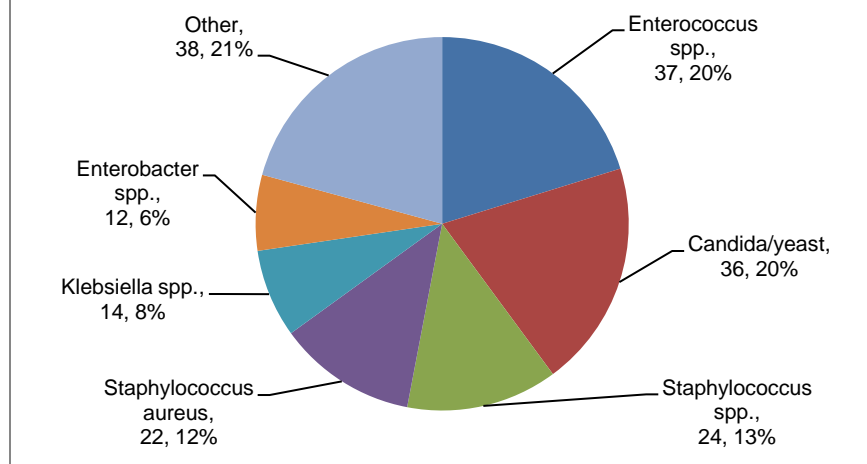
Prevention: To prevent CLABSIs, healthcare providers should follow CDC infection prevention guidelines, including removal of unnecessary central lines and compliance with recommended practices for hand hygiene, central line insertion, and central line maintenance.

Other important information: Hospitals are required to provide information on CLABSIs occurring in adult intensive care units to the Virginia Department of Health (VDH) via the Centers for Disease Control and Prevention's online surveillance system, the National Healthcare Safety Network (NHSN). Hospitals have reported these data since July 2008. In 2013, 78 hospitals reported CLABSI data to VDH. Reports of hospital-specific CLABSI data are available from the VDH Healthcare-Associated Infections Program upon request.

In 2013, 183 central line-associated bloodstream infections occurred among 187,156 central line days in Virginia hospital adult intensive care units (ICUs), yielding a standardized infection ratio (SIR) of 0.52. When compared with the U.S. reference value of 1, the SIR value of 0.52 can be interpreted as indicating that 48% fewer CLABSIs were observed in Virginia adult ICUs than were predicted based on the experience of adult ICUs in United States hospitals during the baseline period (2006-2008). The 2013 SIR is similar to the SIR of 0.49 observed in 2012. Similar to past years, approximately one in three persons with CLABSI died (32%, 59 fatalities), and the infection was noted as contributing to the death in 10 (17%) of the fatalities.

The mean age of persons with CLABSI in 2013 was 60 years (range: 17-99) and 55% occurred in males. The largest proportion of CLABSIs occurred in medical/surgical intensive care units (26%), followed by medical intensive care

Figure 7. Proportion of Central Line-Associated Bloodstream Infections by Primary Pathogen Identified, Virginia, 2013



units (20%), cardiothoracic intensive care units (17%), and cardiac and surgical intensive care units (10% each). Several pathogens can be present in a CLABSI, but of greatest interest is the primary pathogen, the one noted to be most responsible for causing the infection. In 2013, six primary pathogens were responsible for 79% of CLABSIs and included *Enterococcus* species, *Candida*/yeast, *Staphylococcus* species (excluding *S. aureus*), *Staphylococcus aureus*, *Klebsiella* species, and *Enterobacter* species (Figure 7). Other primary pathogens that caused multiple CLABSIs included bacteria such as *E. coli* (6 cases), *Serratia* species (5 cases), *Bacteroides* species, *Pseudomonas* species, and *Streptococcus* species (4 cases each), *Stenotrophomonas* species (3 cases), and *Pantoea* species and *Proteus* species (2 cases each).

In 2013, 32% of *S. aureus* CLABSIs were methicillin-resistant (MRSA) and 54% of the *Enterococcus* species CLABSIs were vancomycin-resistant (VRE); these numbers were slight declines from the 39% of methicillin-resistant *S. aureus* CLABSIs and 61% vancomycin-resistant *Enterococcus* CLABSIs from 2012. Of the 11 CLABSIs with a primary pathogen of *Klebsiella pneumoniae*, 18% (2 cases) were carbapenem-resistant. A total of eight carbapenem-resistant *K. pneumoniae* CLABSIs and zero carbapenem-resistant *E. coli* CLABSIs have been reported to VDH through NHSN since CLABSI reporting began in July 2008.