

# Using Evidence-Based Practice to Reduce Central Line Infections

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Central venous catheters (CVCs) are used commonly in a variety of inpatient and outpatient healthcare settings. Catheter-related bloodstream infections (CRBSIs) contribute to 2,400–20,000 deaths per year, with an estimated cost of \$296 million to \$2.30 billion (Hu, Veenstra, Lipsky, & Saint, 2004). CRBSIs can be reduced dramatically with maximal barrier precautions, chlorhexidine gluconate skin preparatory agents, and strict hand hygiene.

In December 2004, the Institute for Healthcare Improvement launched the 100,000 Lives Campaign, a national initiative with a goal of saving 100,000 lives among hospitalized patients through improvements in the safety and effectiveness of health care (Institute for Healthcare Improvement, 2006). Reducing CRBSIs was one of the six targets, all of which employ evidence-based practices to give patients the best care possible. Practitioners have found that implementing a series of linked interventions, also called a bundle, is an efficient and effective mechanism to transform healthcare practices. Although some of the practices to reduce CRBSIs have been well documented in the literature, compliance to the evidence-based practices has not been consistent. The 100,000 Lives Campaign jump-started interest in reducing lives lost because of preventable deaths, including those caused by preventable CRBSIs (Berwick, Calkins, McCannon, & Hackbarth, 2006).

The National Healthcare Safety Network has defined a central line as a catheter whose tip terminates in a great vessel, such as the aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal

jugular veins, subclavian veins, external iliac veins, and common femoral veins (Centers for Disease Control and Prevention, 2006).

CVCs benefit patients with cancer by facilitating blood draws and reducing painful peripheral blood draws, which is important for patients with cancer who have thrombocytopenia as a side effect of their treatment. However, CVCs are not risk free. Each time the system is accessed, the risk of bacterial contamination increases. The concomitant chronic illnesses and immune disturbance of patients with cancer enhance the risk of infection. Patients with cancer are at increased risk for CRBSIs (Anatoliotaki et al., 2004). Complications from CRBSIs impact healthcare costs as well as patient morbidity and mortality. Oncology professionals must be knowledgeable about the care of central lines as well as simple interventions that reduce the risk of acquiring infections. In short-term, noncuffed catheters, the skin insertion site is the

major source of colonization (Ferretti et al., 2002). See Figure 1 for other sources of CVC infections.

In 2003, nine healthcare systems in the Greater Cincinnati area participated in a two-year project to reduce hospital-acquired infections, including CRBSIs. The project, which won the Joint Commission on Accreditation of Healthcare Organizations Ernest A. Codman collaborative award, was made possible through a matching federal grant awarded to investigators at the Department of Veterans Affairs Getting at Patient Safety Center located at the Cincinnati Veterans Affairs Medical Center and through the work of the Greater Cincinnati Health Council. The central line “bundle” elements that the project focused on were

- Hand hygiene with soap and water or alcohol antiseptic hand sanitizer
- Use of chlorhexidine as a patient skin preparation prior to line insertion
- Full-body drape covering patients from head to toe

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