

# Central Line–Associated Bloodstream Infection: Not Just an Intensive Care Unit Problem

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Central line–associated bloodstream infection (CLABSI) is an ongoing issue in health care, causing increased mortality and billions of dollars in healthcare costs. The majority of research and implementation has been done in the intensive care unit (ICU) setting. Although thousands of non-ICU patients are known to have CLABSI, adequate research has not been conducted in this population. This article explores the current literature on CLABSI and recommends additional research to focus on the non-ICU population and setting.

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Healthcare-associated infections can cause substantial harm or even death. Central line-associated bloodstream infections (CLABSIs) are frequent healthcare-related infections that have a high mortality rate of 12%–25% (Centers for Disease Control and Prevention [CDC], 2011). Those infections are preventable problems. Since 2001, a vast reduction of CLABSIs has occurred in intensive care unit (ICU) patients (CDC, 2011). Many hospitals nationwide have had excellent success in implementing programs to reduce or eradicate ICU CLABSI rates, saving billions of dollars and thousands of lives (CDC, 2011). From 2001–2009, the number of CLABSIs in U.S. ICUs dropped substantially from 49,000 to 18,000 (CDC, 2011). That dramatic decrease is attributed to large-scale projects that have focused on implementing best practices to reduce CLABSI in ICUs. Some of the strategies implemented in those projects included adhering to guidelines for best insertion practices, implementation of care bundles, education programs for staff, and an improved culture of safety (CDC, 2011).

Despite the successful reduction of CLABSI rates in ICUs, thousands of patients outside of the ICU continue to contract those infections. The CDC (2011) estimated that 37,000 outpatient hemodialysis recipients and 23,000 hospitalized patients in non-ICUs developed CLABSIs in 2008 and 2009, respectively, representing a potential 60,000 lives at risk and billions in extra healthcare costs. The purpose of this article is to explore the current literature on CLABSI and show that research is needed urgently for non-ICU patients.

## Literature Review

A literature review was conducted to identify current research studies involving CLABSI. In 2002, guidelines on preventing CLABSI (CDC, 2002) led to multiple research studies looking at CLABSI rates in ICUs. A pioneer study included all adult ICU patients in Michigan (Pronovost et al., 2006). The ICUs implemented five evidence-based procedures recommended by the CDC that have been found to significantly reduce

CLABSIs: “hand washing, using full-barrier precautions during the insertion of central venous catheters, cleaning the skin with chlorhexidine, avoiding the femoral site if possible, and removing unnecessary catheters” (Pronovost et al., 2006, p. 2726). Central line removal was discussed daily at rounds, a cart was created with all the supplies needed for central lines, a checklist was created to ensure adherence to policy, and CLABSI rates were provided at monthly and quarterly meetings. The result was a significant decrease in the number of CLABSIs; in the first three months after the changes were initiated, “the median rate of infection decreased from 2.7 per 1,000 catheter-days at baseline to 0” (Pronovost et al., 2006, p. 2729). Lasting benefits of the changes also were seen with a 66% decline in CLABSIs 18 months postintervention (Pronovost et al., 2006). The study showed that change in practice can have a significant impact on CLABSI rates in ICUs.

A study that included all 23 ICUs in Rhode Island provided education for clinicians and again incorporated the five evidence-based behaviors recommended by the CDC for reducing CLABSI (DePalo et al., 2010). The intervention resulted in lower CLABSI rates in January 2006 and a further decline to zero CLABSIs reported by any of the ICUs in June 2008 (DePalo et al., 2010).

Similarly, other studies have examined the remaining CLABSIs present in an ICU after implementation of a central line bundle that included education of the nurses and physicians, using carts with all supplies for central line insertions, using a checklist during insertion, stopping procedures if any guidelines have been violated, and doing a daily