

The Military Health System's

PARTNERSHIP FOR PATIENTS CAMPAIGN

SAFE CARE SAVES LIVES



Implementation Guide for Central Line Associated Blood Stream Infection

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1. Introduction

This implementation guide was created to support the Partnership for Patients, a national initiative sponsored by the Department of Health and Human Services to reduce harm in health care facilities. Military Health System leadership has pledged its support to the P4P, and has made a commitment to specific, identified aims. Improving the quality and safety of health care in all Department of Defense facilities will only be possible with universal support at every level in the MHS.

This guide is one of 10 harm-specific guides designed to assist you as you implement identified evidence-based practices to improve patient care. Common to all guides are resources that support efforts to educate the health care team by providing MHS-selected EBPs and quality improvement strategies.

In addition, implementation strategies and tools relevant to all harm categories are included in a guide titled “Practical Applications for Process Improvement and Change Management.” This guide supports efforts to equip the health care team with rapid-cycle process improvement methods and engage the health care team through the use of change management strategies.

2. Central Line Associated Blood Stream Infection Prevention Evidence-Based Practices

2.1 Background Information

According to the [Centers for Disease Control and Prevention](https://www.cdc.gov), a blood stream infection is “central line associated if a central line or umbilical catheter was in place at the time of, or within 48 hours before, onset of the event. There is no minimum period of time that the central line must be in place in order for the blood stream infection to be considered central line associated.”



CLABSI Burden of Illness

- CLABSI is one of the most deadly hospital acquired infections with a mortality rate between 12 and 25 percent.
- An estimated 41,000 CLABSIs occur in U.S. hospitals each year.
- Most infections now occur in hemodialysis patients, estimated at 37,000 a year.
- About 1 in 20 patients acquire a central line infection each year while receiving medical care.
- Between 14,000 and 28,000 deaths are related to an acquired CLABSI.

Sources:

1. CDC Vital Signs March 4, 2011, MMWR / March 1, 2011 / Vol. 60
2. Mermel LA. Prevention of intravascular catheter-related infections. Ann Intern Med. 2000;132(5):391-402.
3. MMWR 2011 Mar 4; 60 (8):243-8. CDC Vital signs: central line-associated blood stream infections - United States, 2001, 2008, and 2009.

2.2 Risk Factors

Drs. Alex Kallen and Priti Patel of the CDC's Division of Healthcare Quality Promotion cite the following modifiable risk factors related to CLABSI¹:

- Emergent insertion of central line
- Inexperience of the clinician performing the insertion
- Insertion into femoral vein
- Use of multiple lumen catheters
- Leaving the catheter in longer than needed
- Submaximal barrier precautions – not following all aspects of barrier precautions

2.3 Evidence-Based Practice Guidelines

To reduce the prevalence of CLABSI, the CDC and professional organizations such as the Society of Healthcare Epidemiologists of America and the Infectious Disease Society of America have developed evidence-based guidelines for the prevention of catheter-related infections.

¹ Kallen, A, Patel, P. "Central Line-Associated Bloodstream Infections (CLABSI) in Non-Intensive Care Unit (non-ICU) Settings Toolkit", Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, 2009.





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Evidenced-Based Practice Guidelines for CLABSI Prevention

- Education and training of staff
 - Educate staff on the bundle
 - Periodically assess knowledge and competency of staff to implement the bundle
- Selection of catheters and sites
 - Use an upper extremity site when possible
 - In pediatrics, upper, lower extremities or scalp may be used
 - Avoid use of the femoral vein except for pediatric and hemodialysis patients
- Hand hygiene and aseptic technique
 - Perform hand hygiene before and after inserting, replacing, accessing, repairing, or dressing a catheter
- Skin preparation
 - Prepare skin with chlorhexidine 2% in 70% isopropyl alcohol before catheter insertion or dressing changes and allow to dry prior to insertion of line (~2 minutes)
- Catheter site dressing regimens
 - Sterile gauze or sterile semi-permeable dressing for site
 - Minimize contamination risk by cleaning access port with an antiseptic

Sources:

1. IHI, *How to Guide: Preventing Central Line Associated Bloodstream Infections*, 2012.
2. CDC *Guidelines for the Prevention of Intravascular Related Infections*, 2011.
3. HHS.gov. *National Action Plan to Prevent Healthcare-Associated Infections: Roadmap to Elimination, END-AGE Renal Disease Facilities*. <http://www.hhs.gov/ash/initiatives/hai/actionplan/> Accessed 7/10/12.

In an effort to prevent infection, care management bundles have been created. **A care bundle is a set of evidence-based interventions** that, when used together, significantly improve patient outcomes.

The MHS has selected the Institute for Healthcare Improvement Central Line Bundle for implementation at Military Treatment Facilities:

1. Practice proper hand hygiene
2. Use maximum barrier precautions (cover patient head to toe in sterile drape)
3. Cleanse the patient's skin with chlorhexidine (all non-allergic patients and patients greater than 2 months of age), allowing skin to dry prior to insertion of catheter (~ 2 min)
4. Select the optimal vein in which to insert the line – avoid use of femoral line except for pediatric and dialysis patients
5. Daily review of the line for prompt removal when appropriate





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Further guidance has been provided by IHI regarding proven interventions for preventing CLABSI, in the 5 Million Lives Campaign, [How-To Guide: Prevent Central Line-Associated Bloodstream Infection](#).

2.4 MHS CLABSI Prevention Performance Measures

MTFs are expected and encouraged to report facility-wide CLABSI data as required by The Joint Commission's [National Patient Safety Goal 07.04.01](#). The MHS has selected the following process and outcomes measures to track performance:

Goals and Measures	Data Source	Metric
<ul style="list-style-type: none">• Observation / Checklist for bundle compliance	Essentris	Process Measure
<ul style="list-style-type: none">• Central Line Associated Blood Stream Infections Rate per 1000 central line days:<ul style="list-style-type: none">○ $([\text{Number of CLABSI}] / [\text{Number of central line days}]) \times 1000$○ Calculate separately for different types of ICUs, specialty care areas, and other locations in the facility	CDC/NHSN	Outcome Measure



3. References

5 Million Lives Campaign, Getting Started Kit: Prevent Central Line Infections How-to Guide. Cambridge, MA; 2008.

CDC. (2012). *CDC National Healthcare System Network (NHSN) Device-associated Module: CLABSI*.

CDC. (2012). *Morbidity and Mortality Weekly Report*. March 4, 2011. "Vital signs; central line - associated blood stream infections - US, 2001, 2008, 2009".

CDC (2011). Guidelines for the Prevention of Intravascular Catheter-Related Infections, Health Care Infection Control Practices Advisory Committee.

HHS.gov. National Action Plan to Prevent Healthcare-Associated Infections: Roadmap to Elimination, End-Stage Renal Disease Facilities. <http://www.hhs.gov/ash/initiatives/hai/actionplan/> Accessed 7/10/12.

Institute for Healthcare Improvement. (2012). How-to Guide: Prevent Central Line Associated Bloodstream Infections. Cambridge, MA.
<http://www.ihc.org/knowledge/Pages/Tools/HowtoGuidePreventCentralLineAssociatedBloodstreamInfection.aspx> Accessed 7/10/12.

Kallen, A, Patel, P. "Central Line-Associated Bloodstream Infections (CLABSI) in Non-Intensive Care Unit (non-ICU) Settings Toolkit", Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, 2009.

Mermel LA, Farr BM, Sherertz RJ, Raad II, O'Grady N, Harris JS et al. Guidelines for the management of intravascular catheter-related infections. *Infection Control Hospital O'Grady NP, Alexander M, Dellinger P, et al. 2002 Guidelines for the prevention of intravascular catheter-related infections. Infection Control and Hospital Epidemiology. 2002; 23(12):759-769.*



4. Appendix

4.1 Attachment A: Central Line Bundle – Compliance Form

Central Line Bundle – Compliance

Objective: To provide documentation of compliance with implementation of the Central Line Bundle.

Instructions: Assess bundle compliance on patients receiving a central line.

Central Line Bundle Compliance Checklist	Yes	No	Identified Barriers/ Plans to Overcome Barriers
1. Practice proper hand hygiene.			
2. Use maximum barrier precautions (cover patient head to toe in sterile drape).			
3. Cleanse the patient's skin with chlorhexidine 2% in 70% isopropyl alcohol (all non-allergic patients and patients >2 months of age).			
4. Allow skin cleanser to dry prior to insertion (~2 min).			
5. Select optimal vein (avoid femoral vein except for pediatric and dialysis patients).			
6. Review of continued need for the line on a daily basis.			