



NOVA SCOTIA

Health and Wellness

Protocol for Central Line-Associated Bloodstream Infection (CLABSI) Surveillance in Intensive Care Units in Nova Scotia

Patient Safety Act

Revised March 2025

The following protocol is an appendix to the Patient Safety Reporting Regulations for the *Patient Safety Act* and pertains to reporting of central line-associated blood stream infection rates in intensive care units. This protocol will provide a standardized process for the collection of rates of central line-associated blood stream infection and subsequent process for reporting to the public and to the Department of Health & Wellness.

DISCLAIMER: Changes may occur to this protocol over time. Users must refer to the online version of this document located on the DHW website ([Public Reporting on Patient Safety - Government of Nova Scotia, Canada](#)) to ensure version accuracy.

Background

The *Act to Improve Patient Safety and Health Systems Accountability (Patient Safety Act)* requires that the Nova Scotia Health Authority (NSHA) and IWK Health Centre publicly report patient safety indicators in accordance with protocols established by the regulations. Beginning on April 1, 2015, central line-associated bloodstream infection (CLABSI) rates within intensive care units (ICUs) have been included as a patient safety indicator under the Act.

Why are incidence rates being publicly reported?

Public reporting using standardized definitions and methods ensures that all hospitals track, count, and report infections consistently. The purpose of publicly reporting CLABSI is to reinforce system-wide accountability and transparency while supporting efforts to reduce infection rates.

This surveillance protocol helps determine the rate of healthcare-associated CLABSI in ICUs. By measuring, monitoring, and reporting these infections, hospitals can strengthen existing infection prevention and control measures while continuing to improve patient safety. Additionally, hospitals with similar demographics and challenges can share prevention strategies, fostering collaboration and continuous improvement.

Data Collection Methodology

A) Case Definitions

1. Bloodstream Infection (BSI):

The BSI is NOT related to an infection at another site (not a secondary BSI according to National Healthcare Safety Network (NHSN) definitions), and it meets one of the following criteria.

Criterion 1:

Recognized pathogen¹ cultured from at least one blood culture, unrelated to infection at another site.

OR

Criterion 2:

At least one of the following:

- fever (>38°C core)
- chills
- hypotension
- If aged < 1 yr: fever (>38°C core), hypothermia (<36°C core), apnea, or bradycardia

AND

Common skin contaminant² cultured from 2 or more blood cultures drawn on separate occasions, or at different sites, unrelated to infection at another site.

Notes:

¹ Recognized pathogen does not include microorganisms considered common skin contaminants. A few of the recognized pathogens are *Staphylococcus aureus*, *Enterococcus* spp., *Escherichia coli*, *Pseudomonas* spp., *Klebsiella* spp., and *Candida* spp.

² Common skin contaminants can include Diphtheroids (*Corynebacterium* spp. not *C. diphtheria*), *Bacillus* spp (not *B. anthracis*), *Propionibacterium* spp., coagulase-negative staphylococci, (including *S. epidermidis*) viridans group streptococci, *Aerococcus* spp., *Micrococcus* spp and *Rhodococcus* spp

Criterion elements must be met within a seven-day time period which includes three days before and three days after the collection date of the first positive blood culture

Different sites may include peripheral veins, CVCs, or separate lumens of a multilumen catheter. Different times include 2 blood cultures collected on the same or consecutive calendar days via separate venipunctures or catheter entries. The collection date of the first positive blood culture is the date used to identify the date of positive culture. Two positive blood culture bottles filled at the same venipuncture or catheter entry constitute only one positive blood culture

2. Central line associated BSI (CLABSI):

A CLABSI must meet one of the following criteria:

Criterion 1:

A laboratory-confirmed bloodstream infection where a central line catheter (CL) or umbilical catheter (UC) was in place for more than 2 calendar days on the date of the positive blood culture, with day of device placement being Day 1.

OR

Criterion 2:

A laboratory-confirmed bloodstream infection where CL or UC was in place more than 2 calendar days and then removed on the day or one day before positive blood culture drawn.

Notes:

If admitted or transferred into a facility with a CL/UC in place (e.g., tunneled or implanted central line), day of first access is considered Day 1.

Access is defined as line placement, infusion or withdrawal through the line

3. ICU-related CLABSI:

A CLABSI is related to an ICU if it meets one of the following criteria:

Criterion 1:

CLABSI onset after 2 days of ICU stay.

OR

Criterion 2:

If the patient is discharged or transferred out of the ICU, the CLABSI would be attributable to the ICU if it occurred on the day of transfer or the next calendar day after transferring out.

Note:

If the patient is transferred into the ICU with the CL and the blood culture was positive on the day of transfer or the next calendar day, then the CLABSI would be attributed to the unit where the line was inserted.

Exclusion criteria:

Infection was already present upon admission to ICU.

4. Relapse vs. new infection

Same microorganism (as best as can be determined by the data available – e.g., species, antibiotic sensitivity, etc.) isolated from a subsequent blood culture:

- If *less* than or equal to 10 days from a negative culture **OR** *less* than or equal to 10 days from completion of appropriate antibiotic therapy, consider as a relapse and DO NOT REPORT.
- If greater than 10 days from a negative culture (if culture was done) **AND** greater than 10

days from completion of appropriate antibiotic therapy, REPORT as a NEW infection.

B) Population Under Surveillance

The population under surveillance consists of patients admitted to ICUs in Nova Scotia acute care hospitals. ICU is defined as a nursing care area in an acute care hospital that provides intensive observation, diagnostic and supportive care to critically ill patients including, but not limited to, invasive intravascular hemodynamic monitoring, endotracheal intubation and mechanical ventilation.

Exclusions:

Bone marrow transplant units and units that provide step-down care, intermediate care or telemetry only are excluded (CDC, 2012).

C) Numerator Data

The numerator is the number of CLABSIs which meet the case definition provided.

D) Denominator Data

The denominator is the total number of central line days in the ICU during the reporting period. An ICU's number of central line days on a given day is equal to the total number of patients in the specified ICUs with one or more central line. Only one central line day per patient is counted, even if the patient has more than one central line at the same time.

Note:

Central lines that are removed and reinserted: If, after central line removal, the patient is without a central line for at least one full calendar day then the central line day count will start anew. If instead, a new central line is inserted before a full calendar day without a central line has passed, the central line day count will continue.

E) Calculating the CLABSI Rate

The CLABSI rate is calculated by dividing the number of new cases of CLABSI observed in the ICU by the number of central line days per quarterly reporting period. Rates are expressed as cases per 1000 line days.

The CLABSI rate is calculated as follows:

$$\text{CLABSI rate} = \frac{\text{Number of CLABSIs}}{\text{Number of central line days}} \times 1000$$

Process for Public Reporting

Reporting process to the DHW

1. The number of CLABSI cases, central line days and CLABSI rates will be calculated as described through this protocol.
2. The number of CLABSI cases, central line days and CLABSI rates will be sent to DHW on an ICU level using the data collection tool *Central Line-Associated Bloodstream Infection Surveillance Reporting Form*.
3. CLABSI rates will be reported on a quarterly basis. The data will be securely transferred to

DHW on or before the last business day prior to the quarterly deadlines below:

Quarter 1 (April 1-June 30): August 15

Quarter 2 (July 1-September 30): November 15

Quarter 3 (October 1-December 31): February 15

Quarter 4 (January 1-March 31): May 15

4. Facilities will post their CLABSI rates on their public websites either independently or by providing a link to the DHW webpage displaying publicly reported indicators under the *Patient Safety Act*. http://novascotia.ca/dhw/qps/public_reporting.asp
5. Facilities may choose their own methods to display CLABSI rates (e.g. charts, graphs).
6. Additional CLABSI rates may also be reported by the facility. This may include patient care areas outside of the ICU as determined by the infection prevention and control program. However, the DHW will only require CLABSI rates associated with the ICU.
7. CLABSI rates will be accompanied by a standard narrative that will allow the public to interpret the rates. This narrative will be developed in collaboration with the NSHA and IWK Health Centre subject matter experts and the DHW to ensure consistent messaging.

How will DHW present the data?

The DHW will post the CLABSI rates in the following manner:

- 1) For the NSHA: CLABSI rates will be reported by zone. In the Eastern Zone, the CLABSI rates for the NICU and adult ICUs will remain separate.
- 2) For the IWK Health Centre: Pediatric ICU and NICU rates will be reported separately.
- 3) Provincial Rate: Two provincial rates of CLABSI will be reported.
 - a) A provincial rate will be determined by aggregating the CLABSI data for all ICUs in the province (with the exception of the NICUs).
 - b) A provincial NICU rate will be determined by aggregating the data from the NICUs.

How should the data be interpreted?

Rates of CLABSI can be used as a tool for hospitals to monitor their overall efforts to prevent healthcare-associated infection. The public reporting of CLABSI rates in Nova Scotia is not intended to serve as a measure for hospitals to compare themselves against other organizations, or for the public to use as a measure of where to seek care, or the quality of care at different hospitals. Rather, public reporting of health care quality over time are intended to be important tools to ensure transparency and accountability to Nova Scotians. Rates can vary from hospital to hospital, month to month.

References:

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