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

Patient Safety Act

Final May 2015

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 Health System Quality branch at 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 IPCNS website (http://ipc.gov.ns.ca/) 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) will be included as a patient safety indicator under the Act.

Acute care facilities with ICUs will 1) post on their websites, on a quarterly bases, the incidence rates for CLASBI in their ICUs and 2) complete a reporting form (Appendix A) with their ICU-associated CLABSI rates. This form will be e-mailed to the Department of Health and Wellness (DHW) each quarter. The DHW will report CLABSI rates publicly at a zone level, for the IWK Health Centre, as well as an overall provincial rate.

Why are incidence rates being publicly reported?

Surveillance using common definitions and methods ensures that healthcare facilities are tracking, counting and reporting infections in the same way. The literature indicates that CLABSIs are a preventable cause of healthcare-associated infection. The literature also suggests that feedback of surveillance data to caregivers and healthcare facilities results in a reduction in CLABSI rates by allowing individual centres to examine and improve, as needed, their measures to prevent CLABSIs.

The purpose of reporting CLABSI on publicly available websites is to ensure and confirm a system-wide commitment to public accountability and transparency. An important objective is to reduce the rates of CLABSI in ICUs.

Data Collection Methodology

A) Case Definition

1. Bloodstream Infection (BSI):

Criterion 1:

Recognized pathogen[1] cultured from at least one blood culture, unrelated to infection at another site.

OR

Criterion 2:

a. At least one of the following:
   - fever (>38°C core)

[1] The term "recognized pathogen" does not include microorganisms considered common skin containments. A few of the recognized pathogens are *Staphylococcus aureus*, *Enterococcus* spp., *Escherichia coli*, *Pseudomonas* spp., *Klebsiella* spp., and *Candida* spp.

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

AND

b. Common skin contaminant[2] cultured from ≥2 blood cultures drawn on separate occasions and positive cultures are unrelated to infection at another site.

2. Central line (CL)-associated BSI:

A laboratory-confirmed bloodstream infection where a central line[3] or umbilical catheter (UC) was in place for >2 calendar days on the date of the positive blood culture, with day of device placement being Day 1[4].

AND

A central line or UC was in place on the date of the positive blood culture or the day before. If a central line or UC was in place for >2 calendar days and then removed, the BSI criteria must be fully met on the day of discontinuation or the next day. If the patient is admitted or transferred into the ICU with a central line in place and that is the patient's only central line, day of first access[5] is considered Day 1.

3. ICU-related:

CLABSI onset during ICU stay or within 2 calendar days of leaving ICU.

Exclusions:

a. Infection already present on admission to ICU
b. BSI in neonate < 48 hours old, unless epidemiologic evidence indicates acquisition in the neonatal ICU (e.g., procedure-associated; known endemic neonatal ICU strain)

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[2] Common skin contaminants can include *Diphtheroids, Corynebacterium spp., Bacillus spp, Propionibacterium spp., coagulase-negative staphylococci, (including S. epidermidis), viridans group streptococci, Aerococcus spp., Micrococcus spp.*

[3] Central line (also known as a central venous catheter) is a venous access device that terminates at or close to the heart in one of the great vessels. Great vessels are defined as aorta, pulmonary artery, inferior and/or superior vena cava, brachiocephalic, internal jugular, subclavian, external iliac, common iliac, femoral veins, and umbilical artery or vein.

Central lines include CVC include non-tunnelled (standard) CVC, coated or not, peripherally inserted CVC (PICC), tunnelled devices (e.g. Broviac, Hickman, tunnelled haemodialysis line, etc.) umbilical artery and vein catheters and implanted catheters (including ports). Pulmonary artery catheters are included as these are inserted via a central vein. Other arterial catheters are NOT included. Pacemaker leads and other non-infusion devices (ECMO, IABP and VAD) inserted into central blood vessels or the heart are NOT included.

[4] *NOTE*: 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.

[5] "Access" is defined as line placement, infusion or withdrawal through the line.

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:

a. If *less* than 10 days from a negative culture **OR** *less* than 10 days from completion of appropriate antibiotic therapy, consider as a relapse and DO NOT REPORT.
b. If *more* than 10 days from a negative culture (if culture was done) **AND** *more* 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 occur 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 ICUs 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.

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* located in Appendix A.
3. CLABSI surveillance will be reported on a quarterly basis. The data will be sent to DHW prior to the quarterly data entry deadline, as follows:
   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:

Centres for Disease Control (2014) Central Line-Associated Bloodstream Infection (CLABSI) Event. Retrieved from http://www.cdc.gov/nhsn/PDFs/pscManual/4PSC_CLABScurrent.pdf

Public Health Agency of Canada (2015). *Canadian Nosocomial Infection Surveillance Program: Surveillance for Central Venous Catheter Associated Blood Stream Infections (CVC-BSI): 2015 CVC-BSI Surveillance Protocol.* Public Health Agency of Canada.

Public Health Agency of Canada (2014). *Central Venous Catheter-Associated Blood Stream Infections in Intensive Care units in Canadian Acute-Care Hospitals: Surveillance Report January 1, 2006 to December 31, 2006 and January 1, 2009 to December 31, 2011.* Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada.

Safer Healthcare Now! Prevent Central Line Infections Getting Started Kit. (2012). Retrieved from http://www.saferhealthcarenow.ca/EN/Interventions/CLI/Documents/CLI%20Getting%20Started%20Kit.pdf

Appendix A:

NOVA SCOTIA

ICU Central line-Associated Bloodstream Infection Surveillance Reporting Form

Reporting Facility Choose an item.

Fiscal Year Choose an item.

Reporting Period ☐Quarter 1 (Apr 1-Jun 30) ☐Quarter 3 (Oct 1-Dec 31)
Select one only ☐Quarter 2 (Jul 1-Sep 30) ☐Quarter 4 (Jan 1-Mar 31)

ICU	# of new CLABSI cases	# of line days	CLABSI rate
Facility Total			

Person Completing Form

Position

Date

Forward completed forms by email to PSI@novascotia.ca

Information collected for this form shall be done in accordance with the *Protocol for Central Line-Associated Bloodstream Infection Surveillance (CLABSI) in Intensive Care Units in Nova Scotia.*