



# Frequently Asked Questions (FAQs) on Central Line-Associated Bloodstream Infections (CLABSI)

## **Background:** *Central Line-Associated Bloodstream Infection (CLABSI)*

An estimated 250,000-500,000 CLABSIs occur in U.S. hospitals each year. CLABSIs fall within a general category of primary bloodstream infections that are associated with the presence of a central line at the time or before the onset of the infection. The term primary bloodstream infection refers to those in which there is no obvious source. These are serious complications in that they typically cause a prolongation of hospital stay and increased cost and risk of mortality. By contrast, secondary BSI refers to those in which there is an identified or very likely source of initial infection and the microorganism(s) causing this have reached the vascular system. An example of this would be a urinary tract infection that resulted in a BSI by spread into the bloodstream, also is often called, urosepsis.

CLABSI can be prevented through proper insertion and care of the central line. These techniques are addressed in the CDC's Healthcare Infection Control Practices Advisory Committee (CDC/HICPAC) *Guidelines for the Prevention of Intravascular Catheter-Related Infections* [MMWR 2002;51(No. RR-10):1-36].

**Settings:** Surveillance for CLABSI can occur in any of four types of locations: (1) intensive care units (ICU), (2) specialty care areas (includes hematology/oncology wards, bone marrow transplant units, solid organ transplant units, inpatient dialysis units, long term acute care areas), (3) neonatal intensive care units (NICU), and (4) any other patient care location in the institution (e.g., surgical wards).

## **Question 1. What is included within the definition of a central line?**

A central line for purposes of surveillance for CLABSI is defined as a vascular infusion device that terminates at or close to the heart or in one of the great vessels. The following are considered great vessels for the purpose of reporting central-line infections and counting central-line days in the NHSN system:

Aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, and common femoral veins.

**Please Note:** Neither the location of the insertion site nor the type of device may be used to determine if a line qualifies as a central line. The device must terminate in one of these vessels or in or near the heart to qualify as a central line. An introducer or cordis is considered a central line.

**Infusion:** The introduction of a solution through a blood vessel via a catheter lumen. This may include continuous infusions such as nutritional fluids or medications, or it may include intermittent infusions such as flushes or IV antimicrobial administration, or blood, in the case of transfusion or hemodialysis.

Pacemaker wires and other non-infusion devices, such as an intra-aortic balloon pump, inserted into central blood vessels or the heart are not considered central lines.

**Temporary Central Line:** A central line that is uncuffed and not tunneled

**Permanent Central Line:** A central line that is cuffed and tunneled – can include an implanted port.

**Question 2. What should I use to collect central line days and are there specific instructions for how to collect this data?**

**Forms:** Use the device denominator data collection form that is included in the CLABSI toolkit from Keystone. This is available from the Keystone Participant web site.

**How to collect:** Ideally, at the same time each day, count the number of patients with one or more temporary central lines. At the end of the month sum up these counts and use as a denominator for calculating CLABSI rates. Most KICU participants identify a person who works in the ICU or unit included in surveillance who collects line days for all patients with central lines on a daily basis. At the end of the month see that the completed form is forwarded to the infection control professional (ICP) at your hospital. The ICP will use this to calculate a CLABSI rate.

**Please note:** If a patient has *more than one temporary central line on a given day*, this is counted only as one central line day. If a patient has *both a temporary and a permanent central line on the same day*, the day is counted as one temporary central line day.

Here are some examples on tabulating central line days:

- i) A patient who is in a medical ICU has a peripherally-inserted central venous catheter (PICC) and a pulmonary artery or Swan Ganz catheter which has a constant infusion or “interflow” device in the connecting pressure line. Even though there are two central lines in place, only one central line-day should be tabulated for this patient on the device denominator data collection form
- ii) A patient who is being cared for in a surgical ICU has only a Swan Ganz catheter that is routinely flushed to keep it from clotting; no other infusions or withdrawals are done through the line. This patient contributes only 1 central line day to the SICU’s monthly total for each day this is in place.
- iii) A patient who is in the coronary care unit has a temporary pacemaker wire and a peripheral vascular access line. Even though there are two invasive devices in place, and one of them terminates in a central vessel/heart (the pacemaker), neither are considered central lines. Therefore, do not include this patient in the daily central line count.

**Question 3. In one of our ICUs most admits occur after 3:00pm. If I collect central line days before then, say at 2:00pm, won’t I miss some of these?**

As long as you are consistently tabulating central line days at about the same time each day over the course of a month this will make little difference on the total monthly number of days.

**Question 4. We have the ability to capture central line days per patient from a nursing flow sheet that contains a record of invasive devices. Can we use this for collecting total central line days?**

Yes, as long as you are using this alternative to direct observation on a consistent basis that is fine. If this is a new system or you are starting out a new unit, we do recommend

comparing this alternative source to manual collection using the device denominator collection form for at least one month to make sure this is accurate.

**Question 5. There are lots of equipment in the room and devices in our patients in the ICU; however a piece of equipment such as a ventilator may not be functioning or temporarily disconnected. Simply looking in the room when completing the device denominator form in this situation may not be accurate – isn't this a problem?**

Yes, direct observation by the nurse caring for the patient should verify that a device is properly identified, especially with different types of line. The nurse should verify that a central line is inserted and not be mistakenly called a central line day when in fact another device is in place such as a balloon pump. Other non-licensed personnel such as a unit clerk can collect device days but there should be training that assures this person verify a central line is present with the patient's nurse. As indicated in Question 4, other sources of central line day such as the nurse's record of invasive devices are fine to use as an alternative source.

**Question 6. I forgot to record central line days during my shift on Sunday; can I use other documentation in the patient's chart to capture the central line day for my patient even though today is Monday?**

Yes.

**Question 7. What is the difference between central line-associated BSI (CLABSI) and central line related BSI (CLRBSI or CR-BSI)?**

CLABSI is broader in scope than CLRBSI and is used for surveillance of patient populations. CLRBSI is used by researchers and clinicians who have laboratory results that clearly relate the BSI to the central line. CLRBSI means a patient with an intravascular catheter has at least one positive blood culture obtained from a peripheral vein, clinical manifestations of infections (i.e., fever, chills, and/or hypotension), and no apparent source for the BSI except the catheter Plus one of the following is also present: a positive semiquantitative ( $>15$  CFU/catheter segment) or quantitative ( $>10^3$  CFU/catheter segment catheter) culture. Also, the same organism (species and antibiogram) is isolated from the catheter segment and peripheral blood cultures; simultaneous quantitative blood cultures with a  $>5:1$  ratio CVC versus peripheral; or when there is differential period of CVC culture versus peripheral blood culture positivity of  $>2$  hours.

In many instances detailed laboratory results as highlighted, e.g. culture of the central line tip, are not available or were not ordered. This does not necessarily mean that CLABSI has not occurred. The ICP who oversees surveillance of CLABSI therefore applies **surveillance** definitions from NHSN, i.e. laboratory confirmed BSI. For CLABSI this means a central line is considered to be associated with a BSI if the line was in use during the 48-hour period before onset and at least one of the NHSN criterion – e.g. blood cultures are positive plus clinical symptoms with no other apparent source- is met.

**Question 8. The central line tip I sent for culture had  $> 15$  colony forming units (CFU) of *S. aureus* but all blood cultures are negative. Is this a CLABSI?**

No. This often is a precursor to a BSI but instead this meets NHSN definition of localized infection of the central line insertion site. NHSN classifies this as an infection of the vein. It is fine to include this in the surveillance of infectious complications of central lines. However do not use this in the calculation of the CLABSI rate. This rate is limited to central line-associated BSIs/ total number of central line days x the constant of 1,000 only.

**Question 9. The central line for one of my patients who developed a CLABSI on day three of their stay this month here in SICU was inserted in the Operating Room. Can I exclude this case from the CLABSI rate because we did not insert it here in SICU?**

No. Even though it was inserted elsewhere, the key factors are that your patient had a central line in for 48 hours or more before onset and was in your SICU. This case should be included in the numerator for the monthly calculation of this unit's CLABSI rate. If this happens often use additional analysis – perhaps Keystone's investigating a defect tool - to determine if units from which you receive patients are consistently using evidence-based processes to prevent these infections. If not then collaborate with these areas to improve performance and prevent these infections.

**Question 10. We discharged a patient from MICU 36 hours ago to our progressive care unit but the unit coordinator called and after looking into it this patient meets criteria for a CLABSI. Do I have to include this in MICU's CLABSI rate for this month?**

Yes, this BSI should be attributed to MICU even though they have been discharged because it is less than 48 hours. If it were more than 48 hours this would instead be related to the progressive care unit.